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Green Livelihood Opportunities in Coal Dependent Regions of India and the Need for Skill Enhancement

– Cases of Odisha and West Bengal

As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Published by:
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Registered offices:

Bonn and Eschborn, Germany
Indo-German Programme for Vocational Education and Training II (IGVET II)
A2/18, Safdarjung Enclave, New Delhi
110 029 India

+91 11 4949 5353
+91 11 4949 5391
info@giz.de
www.giz.de/india

Responsible:
Dr. Rodney Reviere, SPSD Cluster Coordinator rodney.reviere@giz.de

Author:
Rageshree Bose, Senior Research Associate, CUTS International
Bipul Chattopadhyay, Executive Director, CUTS International
Arnab Ganguly, Former Associate Director, CUTS International
Sucharita Bhattacharjee, Former Policy Analyst, CUTS International
Suman Sarkar, Consultant, West Bengal
Ashok Satpathy, Consultant, Odisha

Editor:
Navonil Das, Vocational Training and Labour Market Advisor, IGVET II Project, GIZ India

Design/Illustration:
CUTS International

Picture Credits:
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As at
July 2024
New Delhi, India
GIZ is responsible for the content of this publication.

On behalf of the
German Federal Ministry for Economic Cooperation and Development (BMZ)

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Abbreviations

CIL:	Coal India Limited
CO_2:	Carbon Dioxide
CTI:	Central Training Institute for Instructors
CTS:	Craftsman Training Scheme
DGT:	Directorate General of Training
DIC:	District Industries Centres
DRE:	Decentralised Renewable Energy
EoDB:	Ease of Doing Business
EV:	Electric Vehicle
GHG:	Greenhouse gas
GIZ:	Deutsche Gesellschaft für Internationale Zusammenarbeit
GLS:	General Lighting Service
GMR:	Global Coal and Mining Pvt. Ltd.
GoO:	Government of Odisha
GoWB:	Government of West Bengal
GRIDCO:	Grid Corporation of Odisha
GSDP:	Gross State Domestic Product
GSVA:	Gross State Value Added
GW:	Gigawatts
IGVET:	Indo-German Programme for Vocational Education and Training
ILO:	International Labour Organisation
INR:	Indian Rupee
IPR:	Intellectual Property Rights
IT:	Information Technology
ITES:	Information Technology Enabled Services
ITI:	Industrial Training Institute
JBCCI:	Joint Bipartite Committee for the Coal Industry
KIIT:	Kalinga Institute of Industrial Technology
KPCL:	Karnataka Power Corporation Limited
KW:	Kilowatt
LPG:	Liquefied Petroleum Gas

MCL:	Mahanadi Coal Limited
MDO:	Mine Development Office
MoU:	Memorandum of Understanding
MSME:	Micro, Small & Medium Enterprises
MT:	Metric tonne
MW:	Megawatts
NAPCC:	National Action plan on Climate Change
NGO:	Non-governmental Organisation
NLC:	Neyveli Lignite Corporation Limited
NOS:	National Occupation Standards
NSDC:	National Skill Development Corporation
NSTI:	National Skill Training Institute
NTPC:	National Thermal Power Corporation
OCL:	Orissa Cement Limited
OCPL:	Odisha Coal and Power Limited
OSDA:	Odisha Skill development Authority
PLI	Scheme: Production Linked Incentive Scheme
PV:	Photovoltaic
QP:	Qualification Pack
SAPCC:	State Action Plans on Climate Change
SCCL:	Singareni Collieries Company Limited
SDG:	Sustainable Development Goal
SGST:	State Goods and Service Tax
UNESCO:	United Nations Educational, Scientific and Cultural Organisation
USD:	United States Dollar
WBECBC:	West Bengal Energy Conservation Building Code
WBPCB:	West Bengal Pollution Control Board
WBSEDCL:	West Bengal State Electricity Distribution Company Limited

Executive Summary

Coal is a primary source of energy, and it plays a major role in the global economy. But it is also the chief source of manmade carbon dioxide (CO_2) emissions. Therefore, reducing its use is crucial for achieving the global climate goals. Thus, in advanced economies, the dependence on coal has begun to decline declining, translating into lower demand for coal.

While reducing dependence on coal is necessary for environmental reasons, it is important to plan the eventual phasing out of coal in a manner that will be considered fair or "just" in every sense. The transition can become "just" only if a two-pronged approach is adopted:

- First investing in alternate environmentally friendly renewable energy sources
- Second, providing a safety net to the coal sector workers by generating alternate livelihood opportunities

Taking the cue from the International Labour Organisation (ILO)'s definition of just transition as: *"Greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind"*, strategic planning for just transition in coal in India ought to entail:

In India, coal is the predominant fossil fuel catering to 55 per cent of the nation's energy requirements. With a growth of almost 22.6 per cent, India's total coal production increased dramatically to 893.08 MT in FY23 from 728.72 MT in FY19. However, coal accounts for 3.1 gigatonnes of CO2 equivalent emissions annually which amounts to almost 6.5 per cent of the total greenhouse gas (GHG) emissions worldwide.

In keeping with its goal of achieving a "net-zero" economy by 2070, the Government of India is contemplating "phasing down" coal mining nationwide. India announced in COP26 Summit in 2021 that it will enhance the installed capacity of renewables by 500GW within 2030 and will become a net zero nation by 2070, thereby considering a

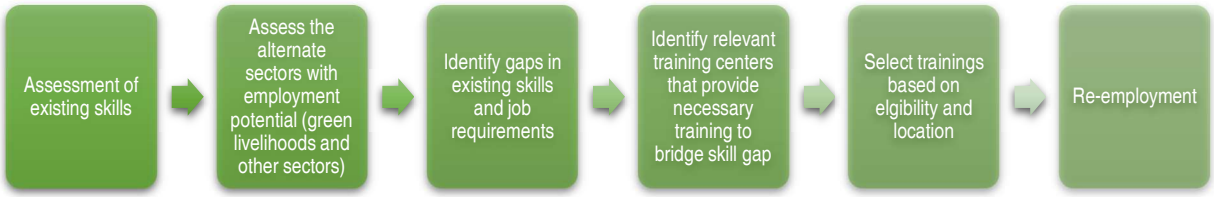
49-year period at hand for developing an energy transition strategy and consequent phasing down of coal mines.

While transitioning from coal to renewable sources of energy might reduce pollution and health hazards, closure of coal mines will have an economic impact on communities and miners. Therefore, to address the dual challenges of gradual "phasing down" coal mining and ensuring a socially just transition for coal-dependent populations, CUTS International with support from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has undertaken this study to identify skill training and capacity-building gaps within coal sector workforce (direct workforce, both unskilled and semi-skilled), suggest necessary training and identify relevant training partners for enabling them to get re-absorbed in green sectors; thereby cushioning the economic impact of transition on the workers.

The eastern coal belt of India is the primary focus of the study, with a particular emphasis on the states of Odisha (Talcher coalfield) and West Bengal (Raniganj coalfield).

It is seen that many of the unskilled and semi-skilled coal sector workers in India as a whole and especially in the select coalfields, are employed informally, with a small proportion engaged in long-term contracts. Given that the formal employees in the coal sector are deployed by Government agencies, in the event of a phase-down, they are likely to be absorbed in alternate sectors directly by the Government. It is the informal and contractual labour that is likely to face the brunt of the closure of mines. Therefore, careful planning is imperative for re-employing them in alternate sectors.

Strategy for re-employing potentially displaced workers of the coal sector:



The unskilled and semiskilled labour in the coal value chain in Odisha and West Bengal have educational qualifications ranging between 5th and 12th standards. It is necessary to consider this while planning for their re-employment. Another important factor that must be considered while planning for a just transition is ensuring minimum displacement of the workers from their homes. Therefore, strategies have to be adopted to find employment in coal areas such that the existing workforce may be repurposed to other alternatives. Given that the workers and their families have been heavily dependent on coal mining and activities around the mines, for absorbing them

in similar roles in alternate sectors, in this case, renewables should be the first choice, as this will ensure minimum migration and leverage transferable skills.

The study suggests alternate livelihood opportunities and matches them with relevant skill training courses and trainers/institutes, for coal workers in Odisha and West Bengal in three aspects:

- **Green jobs** such as Solar, EV, Biowaste, Wind energy etc.
- **Jobs in State-specific prominent sectors** such as textiles, handicrafts, food processing, logistics, IT & ITES, tourism etc.
- **Jobs in repurposed coal mines** that may emerge with eco-tourism and green hydrogen.

The study has also identified gaps in the existing ecosystem, such as a lack of supportive policies/ incentives on green skill development across sectors in line with emerging green jobs, limited awareness about specific roles within green jobs among youth, limited awareness about existing skill training/ government initiatives and limited effectiveness of several programmes due to a lack of equipment, a lack of skilled trainers, and a lack of synergy between skill-development organisations and industries.

Recommendations and Conclusion

The transition from coal mining will have profound social implications for communities in the region, including potential job losses and changes in livelihoods. It is essential to address the needs of affected communities by providing alternative employment opportunities, skills training, and social support systems. Governments at the national and state levels have put in place several vocational and technical training programmes that can aid the re-employment of the coal sector workers who are likely to be displaced. However, alongside such skill training programmes, it is necessary to tailor the programmes to the dynamic demands of the industry. The government and civil society should come together to make such programmes available to the displaced workers and provide market linkages for re-employment and self-employment.

Also, early consultation with workers and marginalised groups and coal companies, local authorities, and regional governments through community-based programmes should be conducted for a smooth transition. Education and skill development of women should be in focus since women are the first in line to bear the brunt of any loss in livelihood. While planning for a just transition through re-employment in alternate sectors, corrective wages for alternate sectors/green livelihoods will need to be decided so that workers don't end up getting less wages in the green sectors as compared to their existing wages.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1 Introduction

Coal has served as the world's predominant source of energy over the centuries, and has served the lion's share of the world's energy needs. Coal continues to play a major role in the global economy as the primary energy source for producing cement, steel, and power. Notably, global coal demand increased by 4 per cent year over year to 8.42 billion tonnes in 2022, driven mainly by huge demands from Asia. Within Asia, in China, the demand rose by 4.6 per cent, and in India by 9 per cent rise Indonesia witnessed a whopping 32 per cent rise in demand.

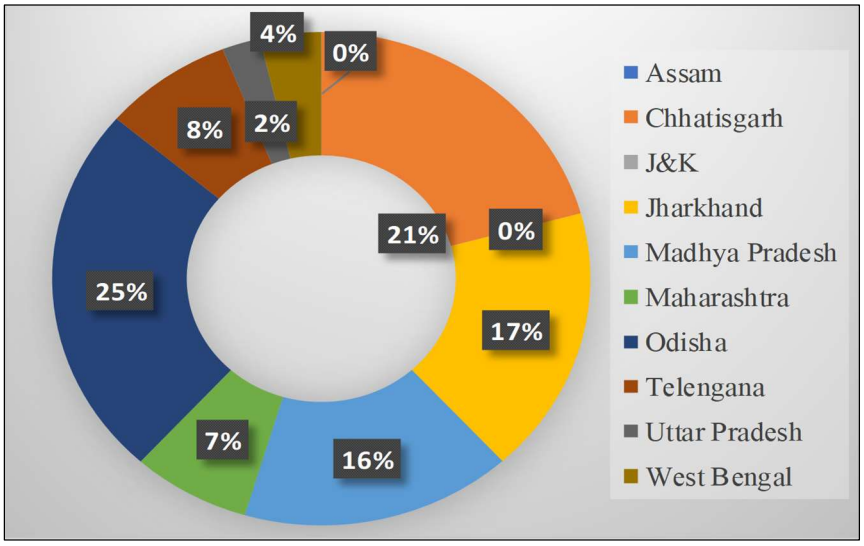
However, since coal is the main source of manmade carbon dioxide (CO_2) emissions, reducing its use is crucial for achieving global climate goals. In fact, in advanced economies, the dependence on coal has started declining translating into lower demand for coal. Notably, the United States saw a decrease in demand by 8 per cent in 2022. By 2026, global coal demand is expected to be 2.6 percent less than that of 2023 (International Energy Agency, 2023).

However, while reducing dependence on coal is necessary, it is important to plan the phasing out of coal in a manner that will be fair or "just". This transition can only become "just", if there is an investment in alternate environmentally friendly energy sources and a simultaneous socio-economic improvement for the huge mass of the labour force associated with coal. Taking a cue from the International Labour Organisation's (ILO) definition of just transition as: "Greening the economy in a way, that is as fair and inclusive as possible to everyone concerned, while creating decent work opportunities and leaving no one behind", it can be inferred that strategic planning for just transition in coal should be in a phase-wise manner.

Phase wise just transition for the coal economy should look like this:

- Phase 1: Build the backbone of the green industry with investment in technology and legislative initiatives for phasing out coal.
- Phase 2: Plan re-employment opportunities for displaced workers from the coal value chain.
- Phase 3: Shift to renewable energy (RE), green industrial processes, RE-based electricity with storage green hydrogen, technological advancements, and an established ecosystem for supporting these industries and ancillary processes.
- Phase 4: Organise skill training for displaced workers. Specific focus ought to be laid on gender-inclusive skills for employment in green sectors as well as for creating self-employment opportunities.

Figure 1: Coal Production in India (2022-23) in MT



Source: Ministry of Coal

In the Indian context, coal stands as the predominant and vital fossil fuel, catering to 55 per cent of the nation's energy requirements.[1] With a growth of almost 22.6 per cent, India's total coal production increased dramatically to 893.08 MT in FY23 from 728.72 MT in FY19.[2] Notably, Odisha is the largest contributor followed by Chhattisgarh, Jharkhand, Madhya Pradesh, Telangana, Maharashtra, West Bengal, Uttar Pradesh, Assam and Jammu and Kashmir (Figure 1). India's coal is dispersed across 27 major coalfields with a concentration in the eastern and south-central regions of the country.

India is second to China in terms of the global use and production of coal, and it has the fifth-largest coal reserve worldwide.[3] Having 399 gigawatts (GW) of installed capacity and generating 1,490 billion units of electricity annually, India is the third-largest producer of electricity globally.[4] India's reliance on coal is far more intricate when compared to that of the Global North. Hence, any deviation in the patterns of supply and demand that leads to a scarcity of coal will have a cascading effect on the energy sector and economy of India. Coal dominates India's energy mix.

In the Indian context, coal accounts for 3.1 gigatonnes of CO_2 equivalent emissions annually, which represents around 6.5 per cent of the total GHG emissions worldwide[5]. This underscores the significant influence of India's coal-

1 Retrieved March 06, 2024, from https://coal.nic.in/en/major-statistics/coal-indian-energy-choice

2 IBEF Presentation

3 Retrieved on October 03, 2023 from https://www.worldometers.info/coal/coal-production-by-country/

4 Retrieved March 8, 2024, from https://www.pwc.in/assets/pdfs/research-insights/research-insights-hub/our-take.pdf

5 Retrieved on 04 October, 2023 from https://www.statista.com/statistics/265638/distribution-of-coal-production-

dependent economy on environmental issues. Given this, the Indian government has pledged to progressively replace coal with greener and more sustainable sources of energy. In keeping with its goal of having a "net-zero" economy by 2070 (Kripal Singh et al., 2023), the government has begun contemplating "phasing down" coal mining nationwide.

Coal India Limited (CIL) and its subsidiaries have already shut down over 293 coal mines, which has affected India's varied power sector (Sekar, 2023). The complexities of India's dependency on coal make phase-down a complex and significant political and socio-economic endeavour, especially considering discussions on coal phase-down and fair transition planning and strategies post-CO26. India has focused on reducing consumption at the individual or household level and included carbon capture, use and storage (CCUS)[6] system in the strategy.

India announced at the COP26 Summit, that it will enhance the installed capacity of renewables by 500GW by 2030 and will become a net zero nation by 2070, thereby ensuring 49 years at hand to develop an energy transition strategy and consequent phasing down of coal mines. The pledge to phase down coal usage along with other nations has made India a significant market for renewable energy projects like solar.

Although transitioning from coal to alternative renewable energies such as bioenergy, solar and wind energy, might reduce pollution and health hazards, coal mine closures will have an impact on communities and miners, and industry clusters in the coal value chain. Therefore, this transition to clean and sustainable energy from coal necessitates meticulous planning as well as considerations of social and distributive justice to avoid future catastrophes likely to be brought about by climate change.

A decline in coal usage and the resultant energy shift will affect the lives and livelihoods of many marginalised and impoverished communities across the nation, regardless of how quickly or slowly the shift happens. It is critical to evaluate the repercussions on the people residing in the coal districts because they largely rely on the coal industry for their financial well-being and sustenance, both directly and indirectly through related industries like transportation, electricity generation and so on. As a result, just transition needs to take this complex equation into account. Additionally, finding sectors that can absorb the workers who might be displaced from their employment, identifying gaps in skills, and charting new career paths in green industries is crucial. This will support the development of a long-term skill-building strategy to enable a just and inclusive shift.

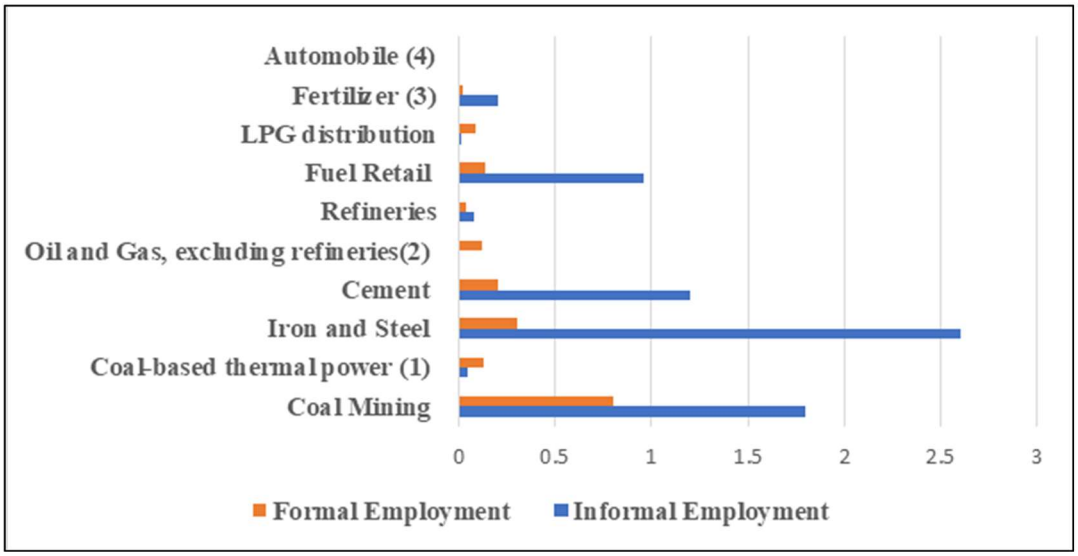
worldwide/#:~:text=Globally%2C%20China%20is%20the%20greatest,share%20of%20nearly%20nine%20percent

6 COP27: India lays out plan for long-term decarbonization | Reuters

2 Context

There are around 1.8 million formal workers and 6.9 million informal workers working across the entire coal value chain in India (Figure 2). These 8.7 million individuals will be the most significant victims of the climate change-induced event of a coal "phase out." Providing for one's family and making sure that labour is reabsorbed will be the greatest challenge to any switch from coal to alternative renewable energy sources.

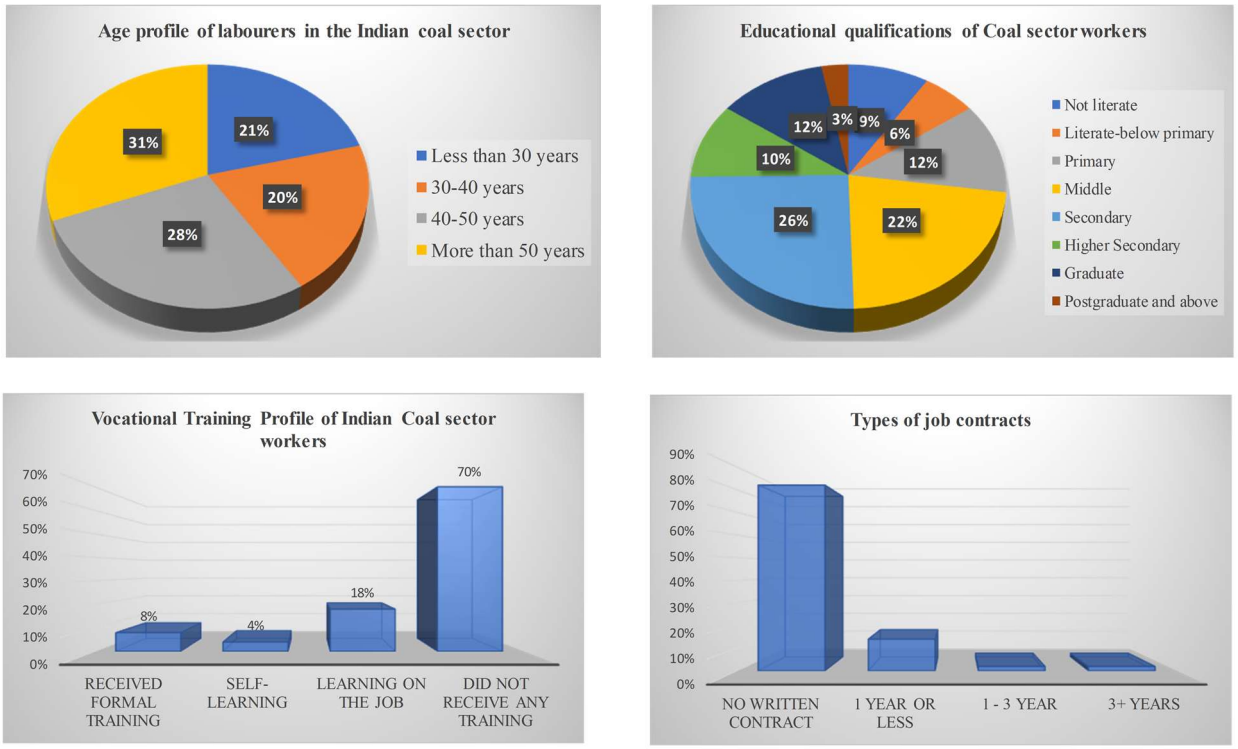
Figure 2: Approximate Workforce (in millions) in the Coal Value Chain in India



Source: International Forum for Environment, Sustainability & Technology (iFOREST), New Delhi.

The mean age of the workforce in the coal sector in India is around 44 years, with 31 per cent above 50 years of age, 28 per cent between 40 and 50 years of age, 20 per cent between 30 and 40 years of age and 21 per cent less than 30 years. Around 70 per cent of the workers have educational qualifications between 5th and 12th standards. 70 per cent of the workers have not received any formal training and 83 per cent of the workers are working without any written contract (Figure 3).

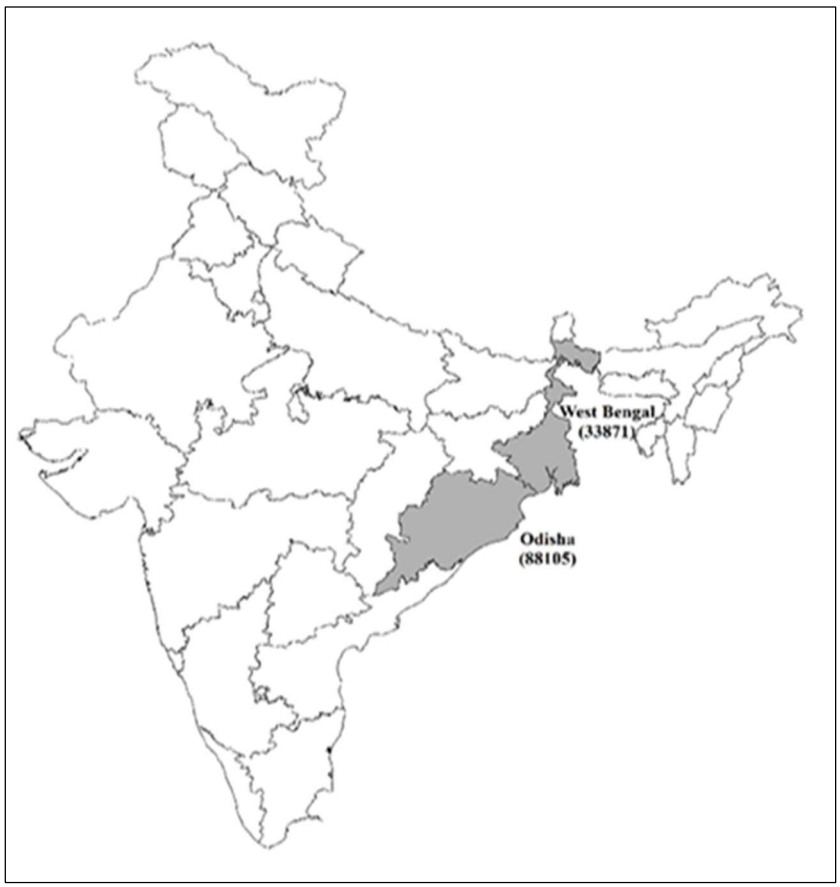
Figure 3: Labour Profile of Coal Sector Workers in India as of 2021



Source: National Foundation for India, 2021

Every year, almost 1.8 million people are inducted in various formal and informal sectors of the coal value chain of India (Chowdhury & Bhattacharjee, 2023). However, beyond the formal setup, a large chunk of the coal value chain involves informally employed or contractual labour in the unskilled and semiskilled domains. Thus, it is estimated that the shift will affect the livelihoods of approximately 8.7 million people (including formal and informal labour) engaged in the coal value chain in India (Chowdhury & Bhattacharjee, 2023).

Figure 4: Geological Resources of Coal in Odisha and West Bengal in Million Tonnes (as of April 01, 2022)



Source: Ministry of Coal

Therefore, a planned transition through gauging employment needs in alternative sectors, in particular green sectors, is needed.

As India is shifting towards a green economy, new job roles are emerging, creating the need for young job seekers and existing workers, to adapt, and upskill themselves.

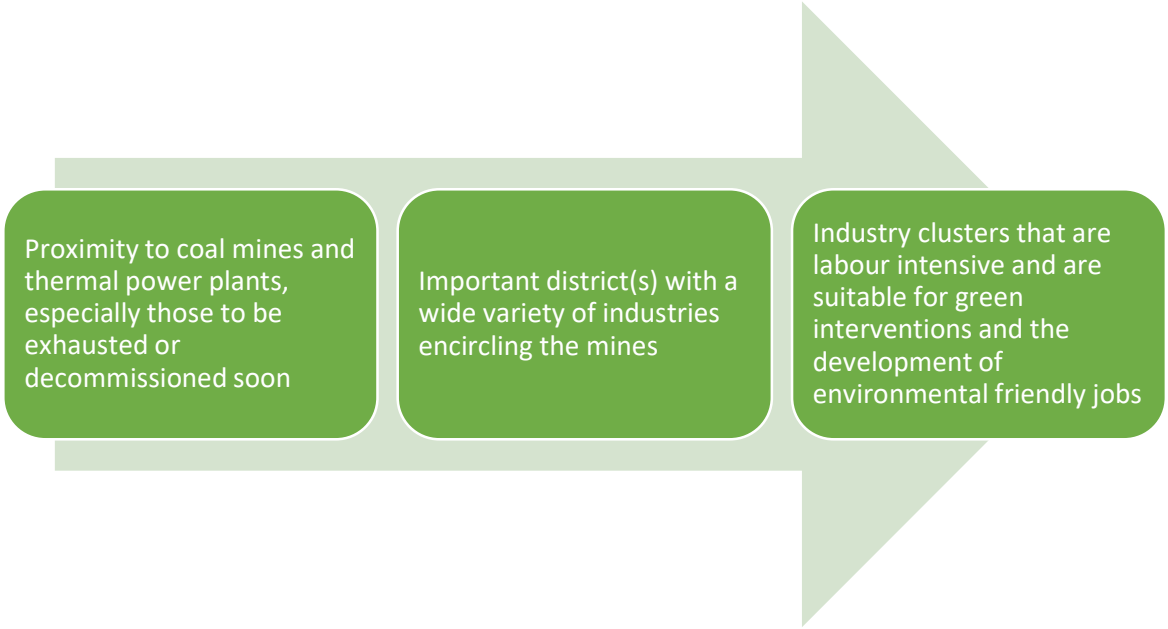
To address the dual challenges of gradually "phasing down" coal mining and ensuring a socially just transition for coal-dependent populations, CUTS International with support from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has undertaken this study to identify skill training and capacity-building gaps within the coal sector workforce (direct workforce- unskilled and semi-skilled), suggest necessary training and locate relevant training partners for enabling them to be active agents of the much-envisaged transition to a cleaner and greener future.

The eastern coal belt of India is the primary focus of the study, with a particular emphasis on the states of Odisha, and West Bengal, which have 24 and 11 percent of the nation's total coal reserves, respectively (Chowdhury & Bhattacharjee, 2023). The study has:

- Identified alternative livelihood opportunities beyond conventional mining
- Assessed barriers mainly in terms of skill gaps in accessing these opportunities, including those relevant to the women in the region
- Mapped the skills required to overcome barriers and proposed suitable skilling and upskilling programmes in the two concerned states. It has guided the design and implementation of industry-relevant, and gender-sensitive skill development programmes as well as livelihood promotion interventions. This will create a roadmap for enabling communities in the affected regions of Odisha and West Bengal to gain relevant skills and knowledge that will allow them to actively contribute towards a socially just transition to a greener economy.

3 Location Mapping

Locations within Odisha and West Bengal were chosen according to the following criteria:

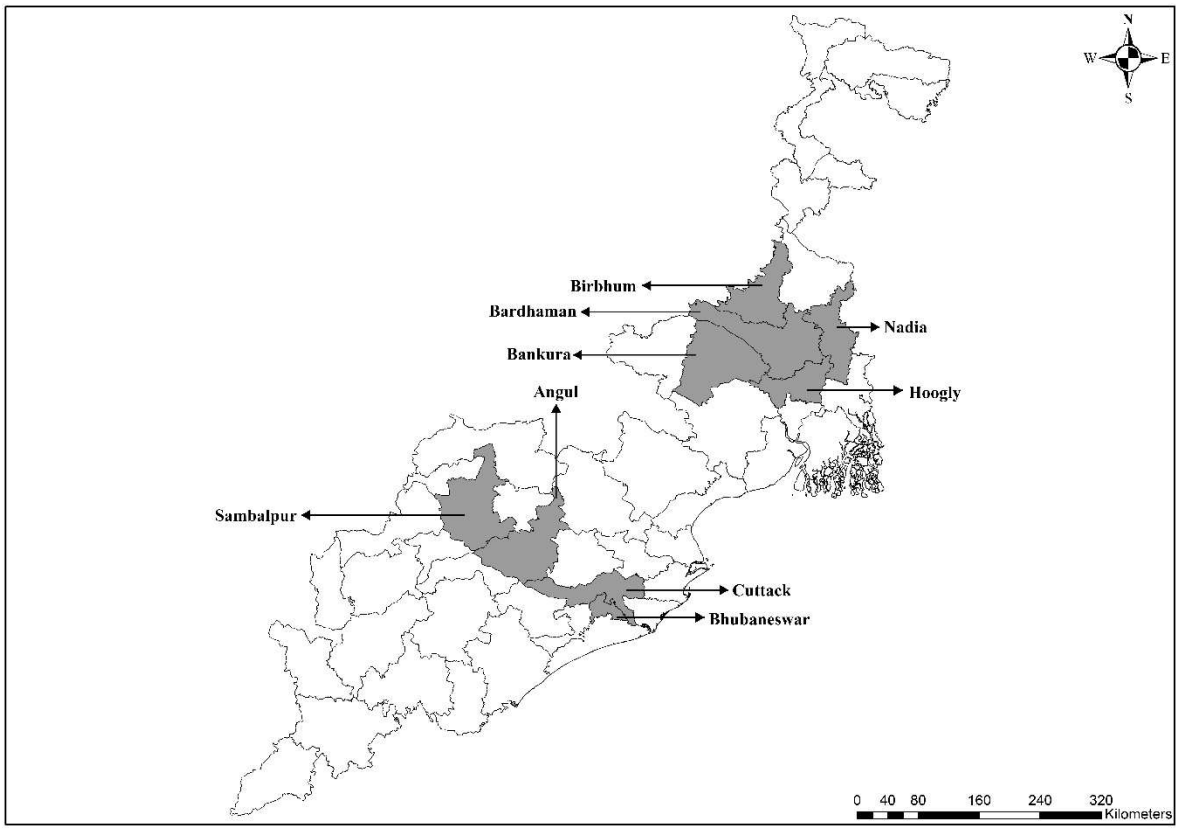


Based on the above criteria the following districts of the two states were selected:

Odisha	West Bengal
• Angul- Talcher coal mining region located in the Angul district • Sambalpur • Cuttack	• Raniganj Coalfield in the Asansol and Durgapur subdivisions of Purba (East) and Paschim (West) Bardhhaman. • Birbhum • Bankura • Nadia • Hooghly

Additionally, consultations with Government agencies in the capital cities of both the states viz. Bhubaneswar (Odisha) and Kolkata (West Bengal) were conducted, in view of the concentration of skill training institutes in these cities.

Figure 5: Selected Locations from Odisha and West Bengal



Source: Author's contribution

4 Brief Profiles of the States

4.1 Odisha

The state of Odisha, on India's eastern coast, is endowed with abundant natural and cultural resources. Odisha has shown rapid economic development in the past decade. With large mineral deposits including iron ore, coal, chromite, and bauxite the mining industry is one of the main drivers of Odisha's economic expansion. The state has made a name for itself as a significant producer and exporter of minerals and is the homeland of multiple noteworthy mining businesses.

In addition to mining, Odisha has focused on other industries to build a diversified economic environment. Industries such as aluminium, food processing, petrochemicals, power generation, steel and textiles have witnessed tremendous expansion in the state.

Odisha has put in place several measures and policies to attract investments and improve its Ease of Doing Business (EoDB) status. The infrastructure and amenities provided by the state government for the creation of industrial parks and special economic zones are intended to aid in the development and growth of new industries.

Nevertheless, the state requires greater foreign investments to boost its economy, provide more jobs for its expanding labour force, and facilitate the switch to renewable or clean energy sources. To achieve this, the state administration is pushing for regulatory simplification, market liberalisation, and rolling out of initiatives like "Make in Odisha," and "Skilled in Odisha", which aim to establish the state as a major national centre for skilled labour.

Table 1 represents the state's primary economic indicators.

Table 1: Major Economic Indicators of Odisha

Indicators		Values
	Economic growth rate at constant prices	7.8 per cent in 2022-23
	Per capita income at current prices	₹150676 (US$607.61)[7] in 2022-23
	Labour Force Participation Rate	56.5 per cent in 2020-21
	Worker Population Ratio	53.5 per cent in 2020-21
	Unemployment Rate	5.3 per cent in 2020-21
	Labour Migration Rate[8]	33 per cent in 2021

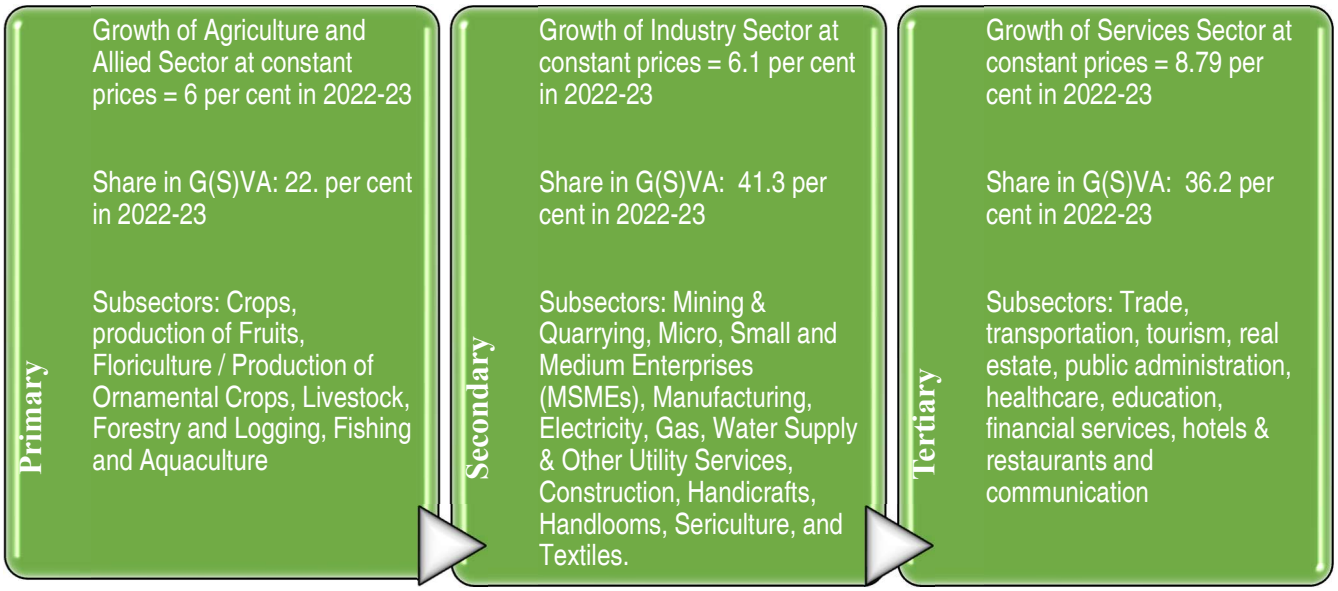
Source: Odisha Economic Survey 2022-23 & India Employment Report 2024

7 Conversion rate US$ 1= ₹83.36 as of April 19, 2024

8 wcms_921154.pdf (ilo.org)

The primary, secondary and tertiary sectors in Odisha comprise 22.5 per cent, 41.3 per cent and 36.2 per cent of Gross State Value Added (GSVA) by economic activities respectively (Figure 6).

Figure 6: Sectoral Composition: Odisha



Source: Odisha Economic Survey 2022-23

4.1.1. Landscape of the Coal Industry in the State

In 2022-23, Odisha produced 218.981 million metric tonnes of coal, amounting to 24.52 per cent of India's total output, thereby securing the position of the highest coal-producing state[9] in the country (Ministry of Coal Government of India, 2023). Remarkably, Odisha shipped a staggering 218.023 million metric tonnes, or 24.85 per cent of the total coal supplied across India (Ministry of Coal Government of India, 2023). In terms of imports, Paradip Sea Port and Dhamra Port in Odisha imported 19.893 million metric tonnes and 197.233 million metric tonnes respectively in 2022-23 (Ministry of Coal Government of India, 2023).

As of March 31, 2024, the total number of coal mines in the state stood at 53, of which 33 mines are for captive power consumption, 12 mines for captive consumption of the Non-Regulated Sector and eight mines for commercial sale of coal.[10] Domestic production and imports taken together make the state first in line to supply the country's expanding energy requirements.

9 Retrieved March 6, 2024, from https://coal.nic.in/sites/default/files/2023-10/17-10-2023a-wn.pdf

10 Two New Coal Mines Start Production in January 2024 – Odisha Diary, Latest Odisha News, Breaking News Odisha (orissadiary.com)

According to the Coal Directory of India, Odisha is home to major mining subsidiaries such as Mahanadi Coal Limited (MCL), a subsidiary of Coal India Limited (CIL), Neyveli Lignite Corporation Limited (NLC), National Thermal Power Corporation (NTPC), Odisha Cement Limited (OCL), Odisha Coal and Power Limited (OCPL), Karnataka Power Corporation Limited (KPCL), as well as private companies like Essel Mining & Industries Ltd, Global Coal and Mining Pvt. Ltd. (GMR), and others in collaboration with the state government. These institutions collectively have access to 13 per cent of the total coal blocks in the country and account for 22 per cent of the total coal reserves. As per the Indian Bureau of Mines, Odisha has two coalfields, namely Talcher and Ib-Valley.

Being the largest coal-producing state in India, Odisha will unavoidably be impacted by the energy shift from fossil fuels toward renewable energy. Like several of the nation's coal-rich areas, it is not a powerhouse for renewable energy. Nonetheless, some of the state's emerging renewable technologies, including wind and solar energy, can lessen to some extent the negative economic effects of the transition.

In addition, there ought to be thorough plans for reusing land from closed thermal power plants and coal mines, as well as reskilling and training initiatives that may be essential for the energy transition from the perspective of the workforce. Creating social security programmes for workers and offering pension benefits to qualified employees would also be important aspects of an equitable energy transition. Additionally, a sound strategy for aiding the transition of temporary or informal workers must be in place.

Reorganizing and balancing the state's industrial operations and economy will be necessary components of a Just Transition for Odisha's coal mines. Nevertheless, the process needs to unfold in stages through comprehensive policies and strategies. This includes repurposing lands from discontinued coal mines and thermal power plants, labour assistance as well as skilling and reskilling of displaced workers, in particular the unskilled or semi-skilled workers.

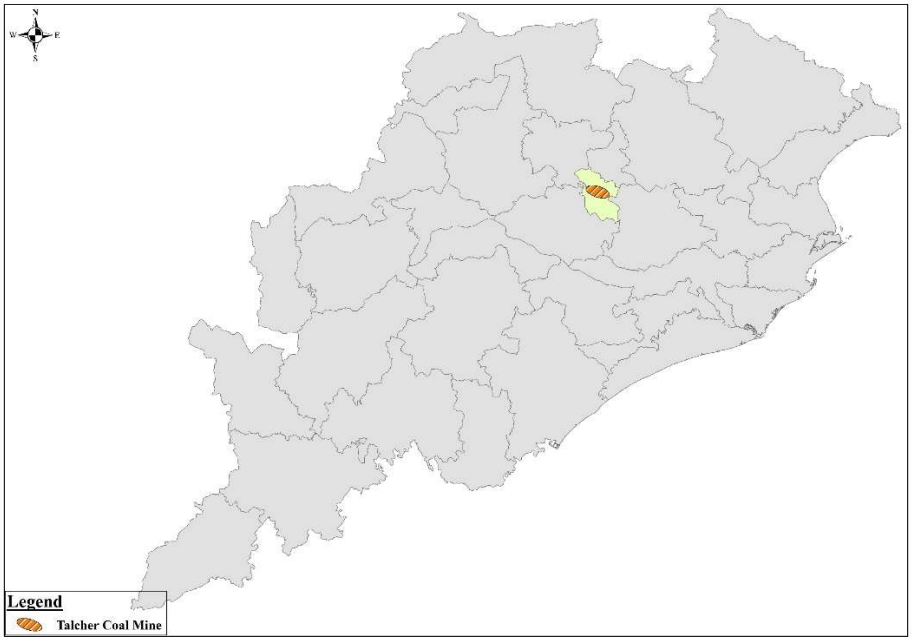
4.1.2. Case Study in Focus -Angul (Talcher)

Situated between rivers Brahmani and Mahanadi, the Angul district is home to the Talcher coalfield, the largest repository of power-grade coal in India (Figure 7). It is the third largest coal-producing district in India, after Korba in Chhattisgarh and Singrauli in Madhya Pradesh.

The coal sector employs about 15 per cent of Talcher's workforce either directly or indirectly. This includes two thermal power facilities that operate under the aegis of the National Thermal Power Corporation. (NTPC).[11]

Coal and coal-based industries, such as thermal power plants, coal washeries, transport, steel, and aluminium industries, constitute the major source of income for Angul. The local economy heavily relies on coal; and phasing it out would result in unemployment and devastating economic damage, especially for coal-dependent districts like Angul (Chowdhury, Bhattacharjee, 2023).

Figure 7: Talcher (Angul) Coal Mine in Odisha

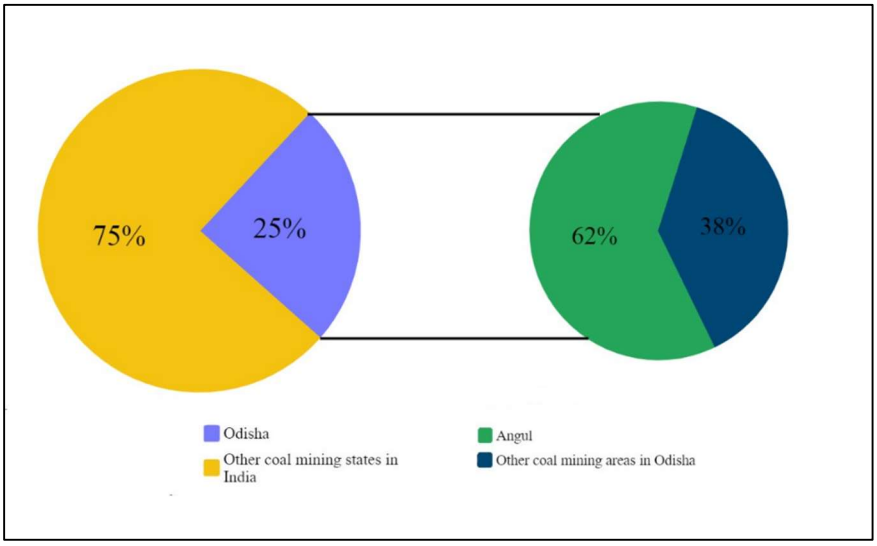


Source: Author's Contribution

The Talcher coalfield alone holds 51220.67 MT of reserves, constituting 62 per cent of Odisha's total coal reserve (Chowdhury, Bhattacharjee, 2023). In the Angul district within the Talcher coalfield, 90.0 MT of coal was produced in 2023.

[11] Sharma, V., Greig, C., & Lant, P. (2021). What is stopping India's rapid decarbonisation? Examining social factors, speed, and institutions in Odisha. Energy Research & Social Science, 78, 102117. Doi:10.1016/j.erss.2021.102117 101016/j.erss.2021.102117

Figure 8: Angul's Share in Coal Mining in Odisha



Source: Report on Identifying Emerging Green Jobs in Coal and Thermal Power Sector in the wake of Just Transition in the Eastern Part of India

4.1.3. Socio-economic Condition of Coal Value Chain Workers in Angul

The transformation from producers to consumers in the wake of industrialisation has brought about a significant shift in the livelihoods of communities. Villagers, once primarily engaged in agriculture, now grapple with displacement and a scarcity of cultivable land. The transition, fuelled by mining activities, has led to economic opportunities and a higher standard of living, albeit at the expense of adverse environmental and health effects on mining-related communities. The shift from agriculture and forest resources as major income sources to a mining-centric economy has increased overall economic activity in the region and enhanced incomes for the communities (given wages in the coal sector are higher than those in any other sector).

Major Challenges of Communities: Despite providing employment opportunities, the mining companies face challenges in land allocation for rehabilitation. The clash between development goals and the preservation of cultural identities poses a significant threat. Displaced communities struggle to acquire suitable land and build homes with the compensation provided, which, although higher than government offerings, is still not adequate due to increased market prices. Women, once engaged in collecting forest products, now actively participate in mining-related work, earning daily wages. In contrast, women in 'control villages'[12] maintain their traditional livelihoods through agricultural and forest activities.

[12] Control villages: Villages selected under the study where the major livelihood depends on coal sector

4.2 West Bengal

West Bengal is the sixth-largest state in India from an economic perspective, and it is expected to have a Gross State Domestic Product (GSDP) of 17.19 trillion (US$208.24bn)[13] in 2023-24. The state's overall export revenue in FY23 was US$12.74bn. Important exports from West Bengal included steel and iron as well as marine goods.

One of the primary business and financial hubs of Eastern India, West Bengal has a population of 91.3 million (ranking 4th in terms of population in India)[14] and is the 10th largest consumer of electricity. Notably, much of the electricity comes from coal.

The state accounts for 4.38 per cent of total energy consumption in the country.[15] It has 10,762.36 MW of installed power production capability as of September 2023; 5,997.95 MW of that capacity was within state amenities, 2,951.07 MW was under the private sector, and 1,813.34 MW was under central utilities. Thermal power accounted for 8,730.34 MW of the installed power capacity, hydropower for 1,396 MW, and renewable energy for 636.02 MW16.

Major economic indicators of West Bengal are represented in Table 2.

13 Retrieved on Feb 18, 2024 from *https://www.ibef.org*

14 Reserve Bank of India - Publications (rbi.org.in)

15 https://powermin.gov.in/sites/default/files/uploads/joint_initiative_of_govt_of_india_and_West_Bengol.pdf

16 Retrieved on Feb 18, 2024 from *https://www.ibef.org*

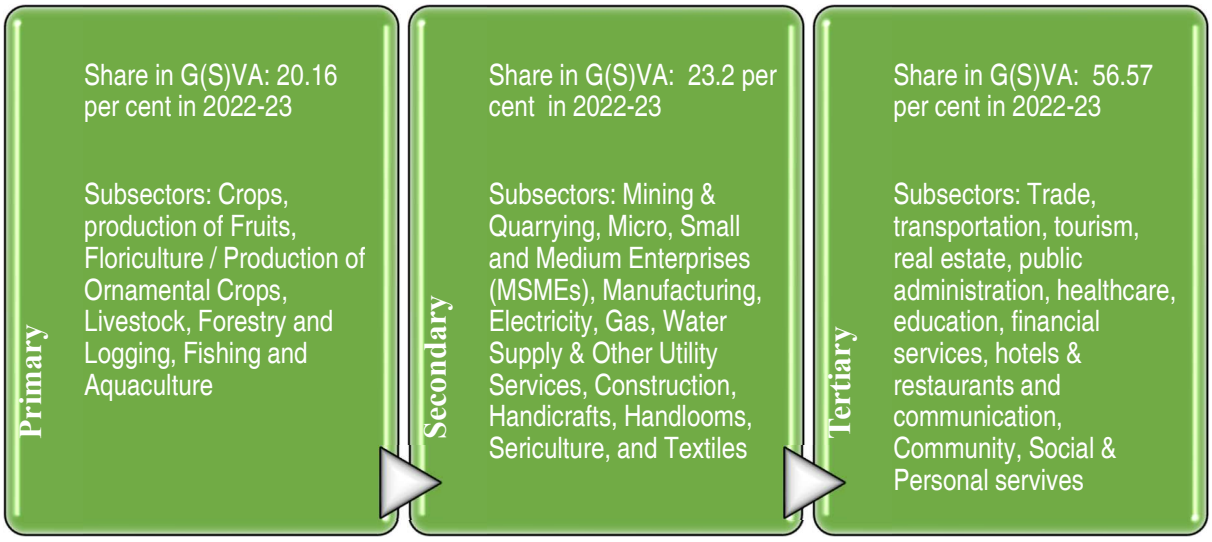
Table 2: Major Economic Indicators of West Bengal

Indicators		Values
	Average annual GSDP growth rate[17]	12.62 per cent between 2015-16 and 2020-21.
	Per capita income at current prices[18]	₹1,41,373 (US$1,695.06) in 2022-23
	Labour Force Participation Rate[19]	54.9 per cent in 2020-21
	Worker Population Ratio[20]	49.7 per cent in 2020-21
	Unemployment Rate[21]	3.8 per cent in 2020-21
	Labour Migration Rate[22]	31.7 per cent in 2021

17 West Bengal State Presentation and Economy Growth Report | IBEF
18 https://www.pib.gov.in/PressReleasePage.aspx?PRID=1942055
19 https://dge.gov.in/dge/sites/default/files/2022-11/EMPLOYMENT_INDICATORS_IN_INDIA_0.pdf
20 *Ibid*
21 *Ibid*
22 wcms_921154.pdf (ilo.org)

The primary, secondary and tertiary sector's composition in GSVA is 20.16 per cent, 23.26 per cent and 56.57 per cent respectively in 2022-23 (Figure 9).

Figure 9: Sectoral Composition: West Bengal



Source: India Brand Equity Foundation (IBEF), July 2023

4.2.1. Landscape of the Coal Industry in the State of West Bengal

West Bengal, the third-largest contributor of mineral production in India, and it accounts for approximately one-fifth of India's total output. The state's mineral landscape is primarily dominated by coal, constituting 99 per cent[23] of the extracted minerals. Notably, West Bengal possesses 11 per cent of the nation's coal reserves. As of 2022-23, coal production in the state was 32.83 MMT (Ministry of Coal), with significant coal fields located in places such as Raniganj and Barjora.

The coal-rich belt of West Bengal encompasses the following key areas: Asansol-Raniganj, Durgapur in the Bardhhaman district, the North Western Purulia and Bankura District, and the Deocha-Pachami-Dewanganj-Harisingha area in Birbhum District.[24]

4.2.2. Case Study in Focus- Raniganj Coalfield in the Asansol and Durgapur subdivisions of Purba (East) and Paschim (West) Bardhhaman

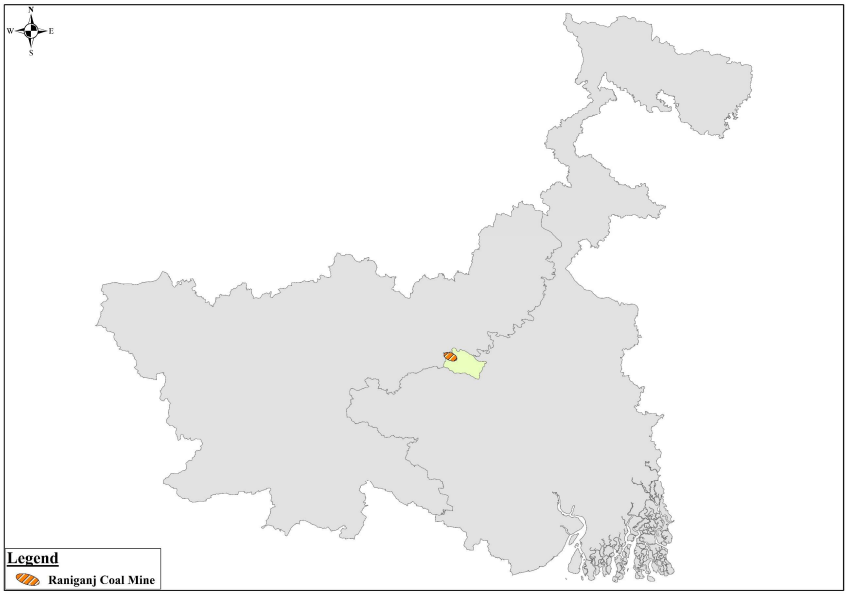
Over the past decades, West Bengal's steel and mining industries have flourished owing in large part to the old Raniganj Coal Belt. Although coal was abundant in this area, it wasn't until British domination in the later part of the 18th century that the commercial potential of coal was fully realised. This area continued to add

[23] Retrieved March 6, 2024, from https://wb.gov.in/business-mining-industry.aspx

[24] *Ibid*

considerably to the nation's coal output and was the key to the British empire's growth throughout the Indian subcontinent. The coalfield is spread over many districts, including Bardhhaman, Birbhum, Bankura, Purulia, and Dhanbad in Jharkhand. Its central region is located between the Ajoy and Damodar rivers in the Bardhhaman district. The entire coalfield area measures approximately 443.50 sq. km. The coalfield, which hosts some of the oldest collieries in the country, barely exhibits any symptoms of aging, and the discovery of new mining locations highlights the immensity of its unexplored potential.

Figure 10: Raniganj Coal fields in West Bengal



Source: CUTS Compilation

4.2.3. Socio-economic Condition of Workers in Raniganj Coalbelt

The primary sources of income in the region are washeries, coal mining, and agriculture. The coal sector does better than all other industries that use coal in terms of wages. Contract workers receive pay that is one-third that received by formal workers in practically every other industry but, in the coal industry, the National Coal Wage Board, labour unions, and local political economy guarantee that rates of pay are competitive for every worker.

Coal contract workers are afraid of reprisals from their employers because they do not belong to official labour unions (job contractors). For example, in 2021 the revised salaries guarantee that the daily salary for contract workers is comparable to that of workers in the formal sector by tying it to the average Consumer Price Index. Additionally, coal may be the only industry with a provident fund of its own for retired employees and workers, supported by Coal India Limited (CIL). Coal workers, both

formal and contract, earn better than workers in other industries in terms of daily wages; over 93 per cent of them are regular salary or wage earners.

Major Challenges of communities: Contract workers usually have poorer working circumstances than full-time employees. Compared to company employees, who work three shifts of eight hours each, contract workers—both outsourced and Mine Development Operators (MDO)—usually put in two shifts of ten hours each. The mines that are fully run by MDOs employ the minimum workforce; they are usually private-sector miners who frequently make use of cutting-edge technology. Furthermore, contract workers are not represented in the coal community as they are not members of labour unions.

Requirements for technical, vocational, and educational preparation are mirrored in larger labour trends. Merely 13 per cent of the participants in the study possess an undergraduate degree, and just 3 per cent are qualified to go further. This will probably have an effect throughout the transition because graduate degree holders may participate in any green skilling course offered by ITIs under the Green Jobs Skill Council. Women engagement is noticed only in coal washeries, but not in the mining sector and accounts for less than 5 percent of the workforce.

5 Wages and Skills of Coal Sector Workers in the Eastern Coalbelt

A majority of the labourers employed in the coal sector is engaged by private contractors who have ties with coal businesses and get inadequate remuneration. Their employment terms are dispersed, sometimes *ad hoc* or short-term, and heavily reliant on intermediaries. Since the very nature of their involvement is ad hoc, there is an increase in the number of daily wage workers in coal districts who execute tasks like cleaning, loading, and unloading. The daily remuneration for unskilled labourers is between ₹300 and ₹400 (US$4-5), while their monthly income is between ₹6,000 and ₹8,000 (US$72-96). For the semi-skilled workers, the wage rate varies between ₹700 and ₹750 (US$8-9).

Remuneration for coal gatherers and sellers varies according to local coal prices. These workers in West Bengal and Odisha usually make about ₹400 (US$5) a day selling coal alone. Individuals who engage in both collecting and selling make significantly more money.

Figure 11: Labour Skills and Wages in Coal Sector

Semi-skilled workers

Type of work	Average daily wage (Rs.)
Maintenance work	750
Drivers in coal transportation	700

Unskilled workers

Type of work	Average daily wage (Rs.)
Helpers in coal transportation	250-300
Loading/unloading	400
Cleaning	250-300
Miscellaneous casual labor	Varied
Coal sellers only	400
Coal gatherers and sellers	550

Source: Report on Identifying Emerging Green Jobs in Coal and Thermal Power Sector in the wake of Just Transition in the Eastern Part of India

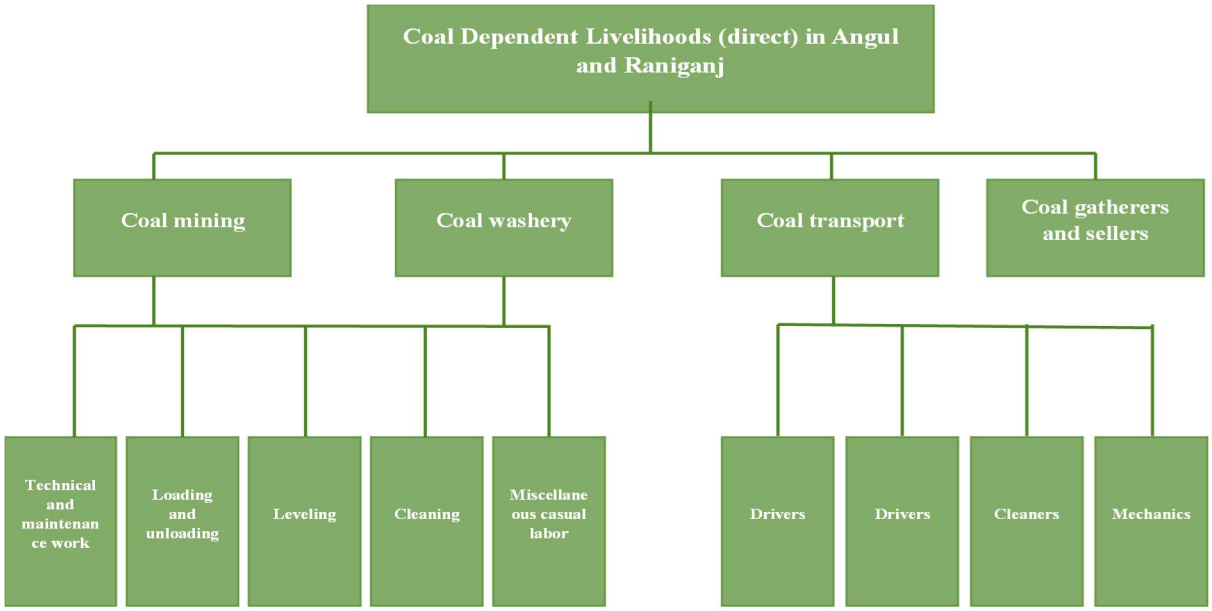
Informal workers are paid far less. The Joint Bipartite Committee for the Coal Industry (JBCCI), which is made up of representatives from Central Trade Unions, Coal India Limited (CIL), its subsidiaries, and the Singareni Collieries Company Limited (SCCL), sets the basic wages for workers hired by coal-related businesses. The Committee's most recent rates (December 2021) indicate that the minimum daily wages for workers with different skill levels fall between ₹787 and ₹877 (US$9.44-10.52). The amount of money obtained by informal workers is also significantly less than the minimum salaries prescribed by the Indian government for every occupation.

For instance, ₹553 (US$6.4) a day is the minimum wage for cleaning and loading/unloading duties. But the workers doing cleaning work receive only half of this amount, and the workers doing loading and unloading receive a meagre three-fourths.

6 Transition Strategy for Coal Workers in the Eastern Coalbelt

Workers directly employed in the coal fields operate across various domains like coal mining, coal washeries, coal transport and coal gathering and selling (Figure 12). This includes both formal and informal workers. Informal workers comprise labourers who are engaged in coal washeries and the coal transport sector. Coal gatherers and sellers, sometimes known as "own account workers", are among the unorganised or informal workers in this industry.

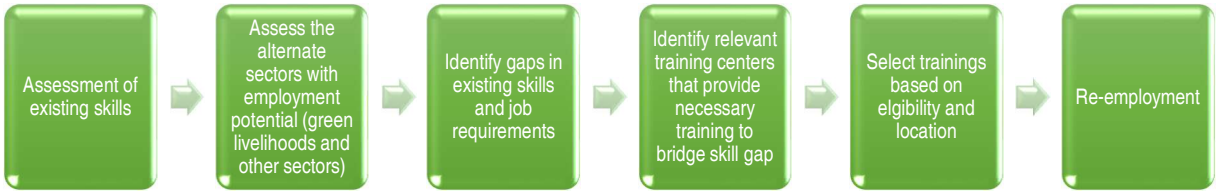
Figure 12: Direct Employment in Angul and Raniganj Coal Sector



Source: Author's compilation

In order to re-employ these workers across other sectors within the state, there is a need to map the existing skills of these workers with the available job opportunities in other sectors and provide them commensurate training. The first step in that direction would require identification of the alternate sectors including green livelihoods and sectors across districts surrounding the coalfields. It is estimated that workers in the coal sector will be able to leverage their skills for getting employed in the green sectors. Therefore, the first target would be to look at opportunities in green sectors. Thereafter, depending on additional opportunities, alternate sectors across neighboring districts will need to be looked at. On the basis of potential job requirements of alternate sectors, relevant training should be provided to the potentially displaced workers.

Figure 13: Step-by Step Re-Employment of Displaced Workers

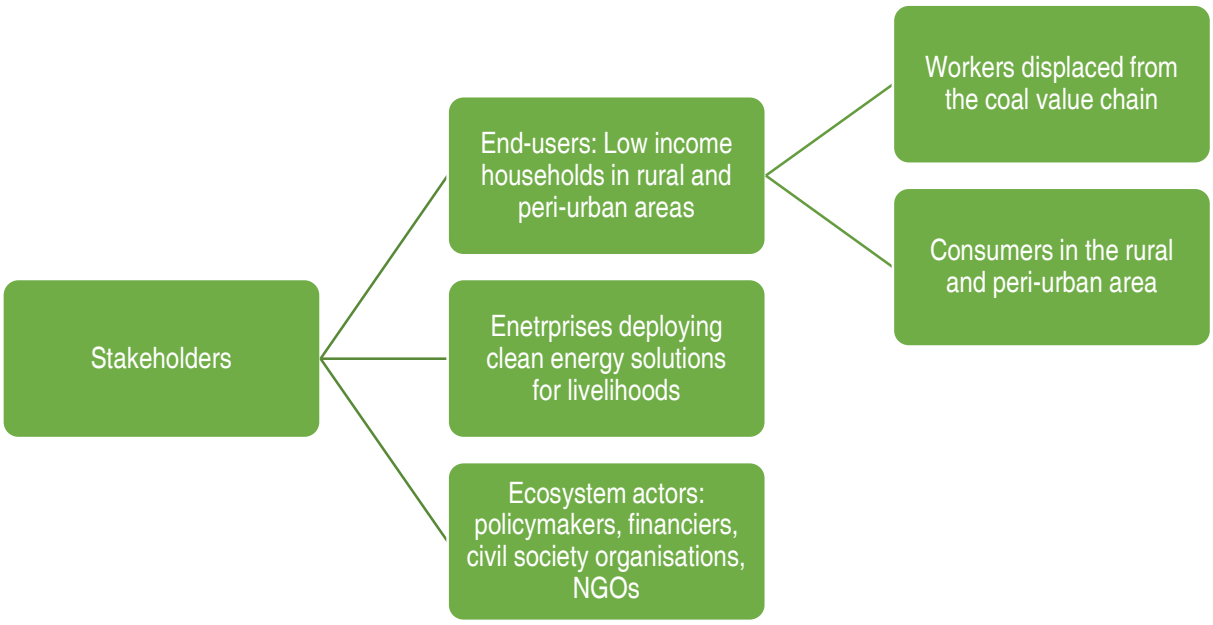


Source: Author's Contribution

7 Matching Alternate Livelihood Opportunities and Relevant Trainings

The major stakeholders involved in the process of just transition in Odisha and West Bengal's coal belt include the end users i.e. the low-income households in rural and peri-urban areas (including the displaced workers), enterprises deploying clean energy solutions for livelihoods, ecosystem actors such as policymakers, financiers, civil society organisations, NGOs etc. (Figure 14).

Figure 14: Stakeholders in the path of Just Transition in Eastern Coal Belt



Source: Author's Compilation

Communities in the area will face significant social ramifications as a result of the shift from coal mining, including possible job losses and changes in means of subsistence. To meet the requirements of the impacted populations, it is imperative to skill, upskill and reskill the workforce alongside social support programmes.

The unskilled and semiskilled labour in the coal value chain in Odisha and West Bengal have educational qualifications ranging from the 5th to 12th standards. This ought to be taken into consideration while planning for their re-employment. Another important factor that must be considered while planning for a just transition is ensuring

minimum displacement of the workers from their homes. Therefore, strategies to find employment in the coal areas which may be repurposed to other alternatives could also be helpful. Also, given that the workers and their families have been heavily dependent on coal mining and related activities, looking for similar job roles in alternate sectors, in this case, renewables should be the first choice, as that will ensure minimum migration and leveraging transferable skills.

Therefore, alternate livelihood opportunities for coal workers in Odisha and West Bengal could be in terms of:

- **Green jobs:** They focus on protecting the environment, reducing waste, conserving natural resources, and creating more sustainable ways of living and working.
- **Jobs in State-specific prominent sectors** that are relatively green or have the potential to become green
- **Jobs in repurposed coal mines**

7.1 Green Jobs

Renewable energy, by generating significant employment opportunities, can have a significant effect on the society and the economy of the coal belts of Odisha and West Bengal. Notably, the job creation potential of decentralised renewable energy (DRE) projects[25] is higher than utility-scale projects (India's Expanding Clean Energy Workforce, 2022). In particular, DRE projects have the potential to create more rural jobs as compared to urban areas.[26] Around 80,000 jobs have already been created by DRE in India in 2021.[27]

Achieving 500 GW of clean energy by 2030 is expected to create around 3.5 million jobs in rooftop solar systems. DRE can augment around 25 million livelihoods by 2030 (Council on Energy, Environment and Water, 2022).

In addition to The Central Government schemes such as the National Green Hydrogen Mission, Production Linked Incentive Scheme (PLI Scheme) for High-Efficiency Solar PV Modules, Offshore Wind Energy, Solar Parks, PM KUSUM, Rooftop Solar and Surya Mitra, the state Governments of Odisha and West Bengal have been undertaking several schemes in the solar and EV domain that are expected to generate employment in the respective states. The displaced workers naturally will have an advantage in leveraging the transferable skills to get absorbed in these state-specific green jobs.

25 DRE is defined as on-site, off-grid, mini-grid or distributed energy systems that use renewable energy resources including small hydro, agriculture & forest biomass waste, wind, solar, and other new renewable energy resources.

26 Decentralised renewable energy set to see increased jobs in rural India (mongabay.com)

27 *Ibid*

It is noteworthy that the Governments of West Bengal and Odisha have put in place respective State Action Plans on Climate Change (SAPCC). The strategies in the action plan can assist the state in aligning its developmental objectives along a low-carbon path. The design of the action plan is envisaged to facilitate the implementation of various missions of the National Action Plan on Climate Change (NAPCC)[28] at a state level.

Some state-specific initiatives undertaken by the respective Governments in the energy sector that further enhance the potential of green livelihood creation in the states are indicated in the following tables.

Table 3: State Government Initiatives that Can Aid Green Jobs

Odisha Government Initiatives
Renewable Energy Policy in 2022. The primary objective of this policy is to achieve a renewable energy capacity of 10 GW by 2030. Key focus areas include the development of floating solar and canal-top solar projects, utility-scale solar plants, and the creation of solar cities.[29]
In June 2023, the Grid Corporation of Odisha (GRIDCO) signed a Memorandum of Understanding (MoU) with[30] the National Hydroelectric Power Corporation (NHPC) to develop at least 1 GW of solar energy projects in the state.
Odisha Electric Vehicle Policy 2021 to boost large-scale adoption of EVs in the state.[31] To boost the manufacturing of EVs, the State Government is also taking a few initiatives such as SGST reimbursement for the manufacturing of EVs, an extension of incentives under IPR 2015 and MSME policy 2016 for small and micro-EV battery manufacturing, and battery assembling units.
Govt. of Odisha has approved the setting up of green hydrogen (20 KTPA) and green ammonia (100 KTPA) plants in Paradip with an investment of ₹2,000 crore (US$23.98mn). These plants are expected to generate 2000 jobs.[32]
The Government of Odisha as per the state Sustainable Development Goal (SDG) budget 2022-23, has allocated ₹1772.22 crores (US$0.2bn) for universal access to affordable energy. SDG-7 with its focus on affordable and sustainable energy consumption has an allocation of ₹3008.18 crores (US$0.3bn) in 2022-23

28 Eight missions of NAPCC are towards (i) harnessing solar energy, (ii) enhancing energy efficiency, (iii) sustainable agriculture, (iv) integrated water resources management, (v) sustainable urban habitats, (vi) sustaining Himalayan ecosystems, (vii) greening India through forests, and (viii) developing strategic knowledge

29 3354-Energy dept. 1.pdf (odisha.gov.in)

30 Solar in Odisha: Potential, Policy and Solar Subsidy (2024) (ornatesolar.com)

31 1360_1.pdf (odisha.gov.in)

32 Odisha approves 10 projects worth Rs 74,620 cr; to generate over 24,000 jobs - BusinessToday

A 30 MW solar park at Balasore is expected to come up. National Skill Development Corporation (NSDC),[33] and Skill Council for Green Jobs (SCGJ) will be working in tandem with the industry to train individuals to get absorbed in the sector.

Odisha Government has entered into a partnership with JSW to set up an integrated EV manufacturing facility in the state entailing an investment of ₹40,000 crore.[34]

West Bengal Government Initiatives

To boost EV manufacturing in the state, GoWB is set to implement initiatives that include providing investment subsidies, tax rebates, interest subvention, etc., ensuring the availability of land in clusters, with readymade facilities for power, water sewage and testing facilities along with dedicated testing tracks. To boost employment, reimbursement of minimum wages for all new unskilled and semi-skilled jobs created by the manufacturer in EV-related and charging infrastructure manufacturing industries in the State will be provided. The minimum monthly wages of employees will be capped at ₹1,000 (US$12) per month from the start of manufacturing (West Bengal EV Ecosystem Policy, 2022).

West Bengal State Electricity Distribution Company Limited (WBSEDCL)'s Solar Power Generation Department has formulated project proposals for the deployment of large-scale solar power projects with a capacity of 10 megawatts (MW) in the state. Notably, the canal bank solar power project near Teesta Canal Fall Hydro Electric Power Plant, Stage – II in Uttar Dinajpur district, is nearing completion, alongside plans for three 10 MW solar power projects in Purulia and Bankura districts, with tender finalisation underway.[35]

Framing West Bengal Energy Conservation Building Code (WBECBC), 2016 which mandates public buildings to install solar devices for meeting electricity requirements and other applications. Notably, all existing and upcoming commercial and business establishments with more than 1.5 megawatts (MW) of contract demand are required to install solar rooftop systems to meet a minimum of 2 per cent of the electrical load. Additionally, all existing and upcoming schools, colleges, hospitals, large housing societies and government establishments with total contract demand above 500 kilowatts (KW) are required to install solar rooftop systems to meet at least 1.5 per cent of the total electrical load.[36]

Roof top-based solar power plants of a total 26.47MW[37] capacity have been installed in different parts of West Bengal

[33] NSDC is the awarding body for vocational trainings. In solar they have 23 qualifications and an overall of 70 training modules. They provide training of trainers and certify them. NCVET is responsible for approving these courses after which they are imparted.

[34] https://www.business-standard.com/companies/news/jsw-signs-mou-with-odisha-to-set-up-rs-40-000-crore-ev-project-in-state-124021000577_1.html

[35] https://wbpower.gov.in/solar-projects/

[36] Content (theclimategroup.org)- West Bengal State action plan on climate change

[37] http://www.environmentwb.gov.in/pdf/WBSAPCC_2017_20.pdf

West Bengal Pollution Control Board (WBPCB) is installing 17 rooftop SPV power plants in different schools/ institutions and has taken steps for the management of Fresh Solid Waste through Composting, Bio-machination and Material Recovery Facility[38]
Other initiatives: • Installation of grid-connected pole-top solar street lighting • Remote village electrification by solar power

Source: Author's Compilation

In terms of solar energy, jobs are expected to be created particularly in areas of:

- ❖ Installation
- ❖ Maintenance
- ❖ Repair of solar panels and related equipment

These require understanding photovoltaic technology, electrical wiring, and safety protocols.

Similarly, in the EV sector, jobs are expected to be created around:

- ❖ Assembly
- ❖ Maintenance
- ❖ Repair of electric vehicle
- ❖ Technicians for charging infrastructure

These require potential job seekers to understand battery technology, electric motors, and vehicle diagnostics.

Many potentially displaced workers may get absorbed in the above green sectors. However, these jobs are technical in nature and would require specific training.

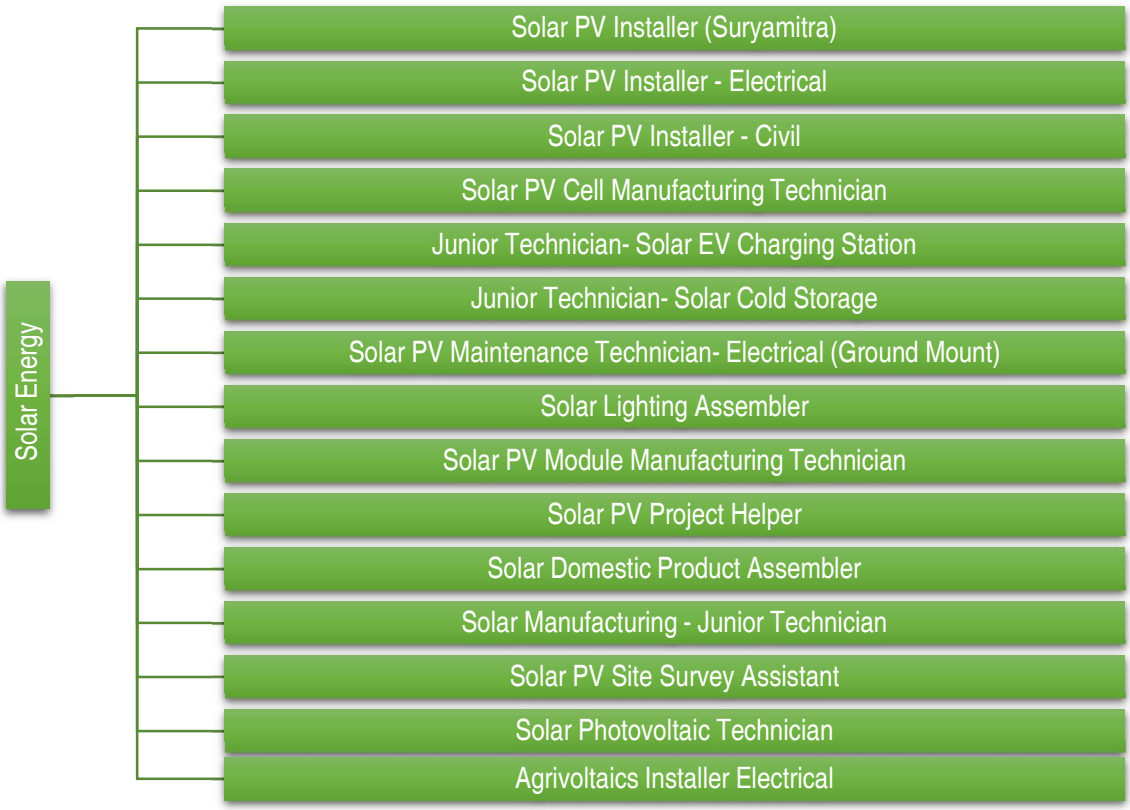
7.1.1. Relevant Training Availability

At present more than nine government bodies and sector skill councils aligned with the Skill India mission, are creating qualification packs and certifying candidates in green jobs. So far, more than 390 courses have been implemented by private training partners affiliated with sector skill councils who are providing training qualifications. Additionally, more than 400 private non-affiliated independent institutes such as universities, private institutes, NGOs, etc. are offering awareness modules for various sectors as well as specialised courses online/offline.

[38] untitled (wb.gov.in)- Economic Review 2021-22

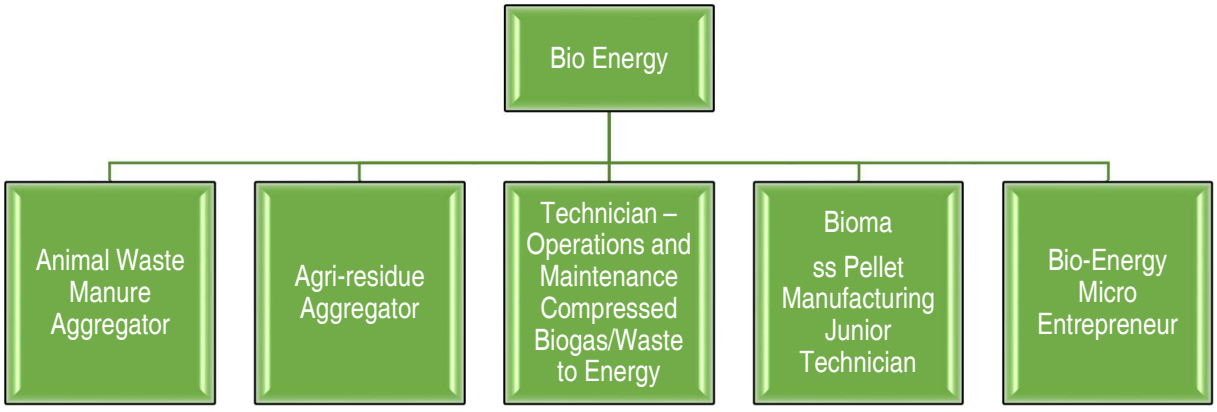
Based on the educational qualifications of potentially displaced workers, 46 green job training qualification packs, provided by the National Skill Development Corporation (Green Sector Skill Council) have been identified (Detailed in Annexure-1). These include:

Figure 15: Qualification Packs/Courses in Solar Energy



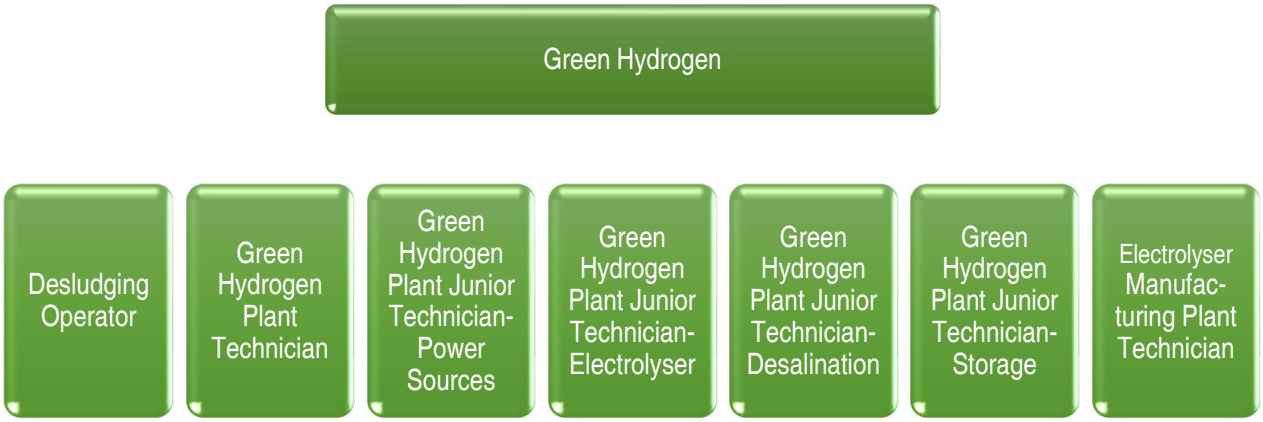
Source: NSDC (Skill Council for Green Jobs)

Figure 16: Qualification Packs/Courses in Bio Energy



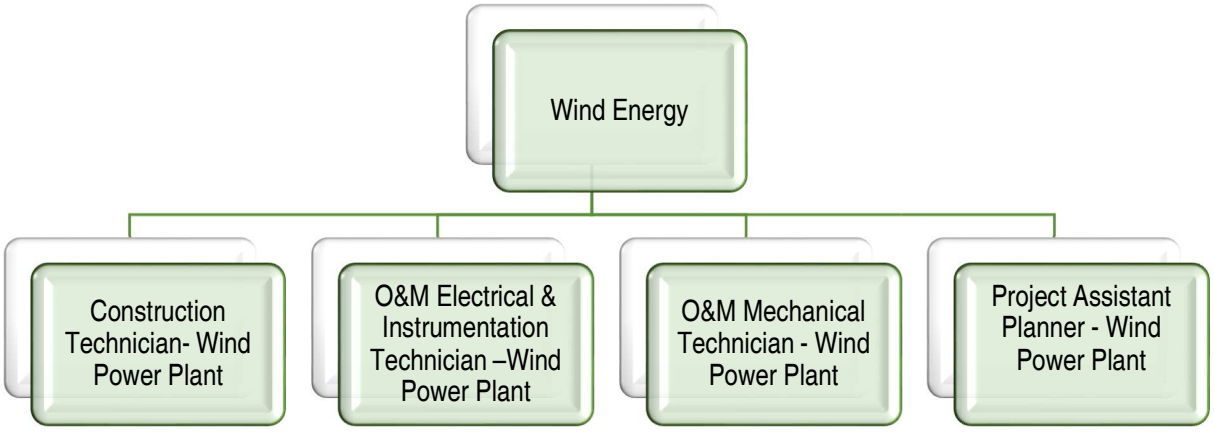
Source: NSDC (Skill Council for Green Jobs)

Figure 17: Qualification Packs/Courses in Green Hydrogen



Source: NSDC (Skill Council for Green Jobs)

Figure 18: Qualification Packs/Courses in Wind Energy

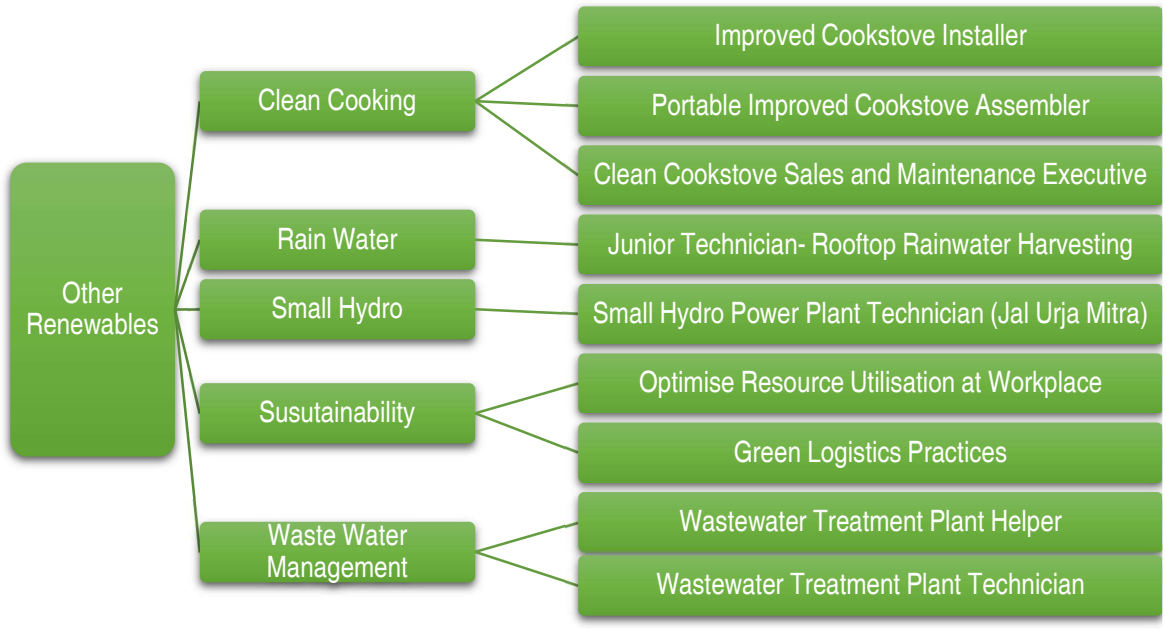


Source: NSDC (Skill Council for Green Jobs)

Figure 19: Qualification Packs/Courses in Waste Management

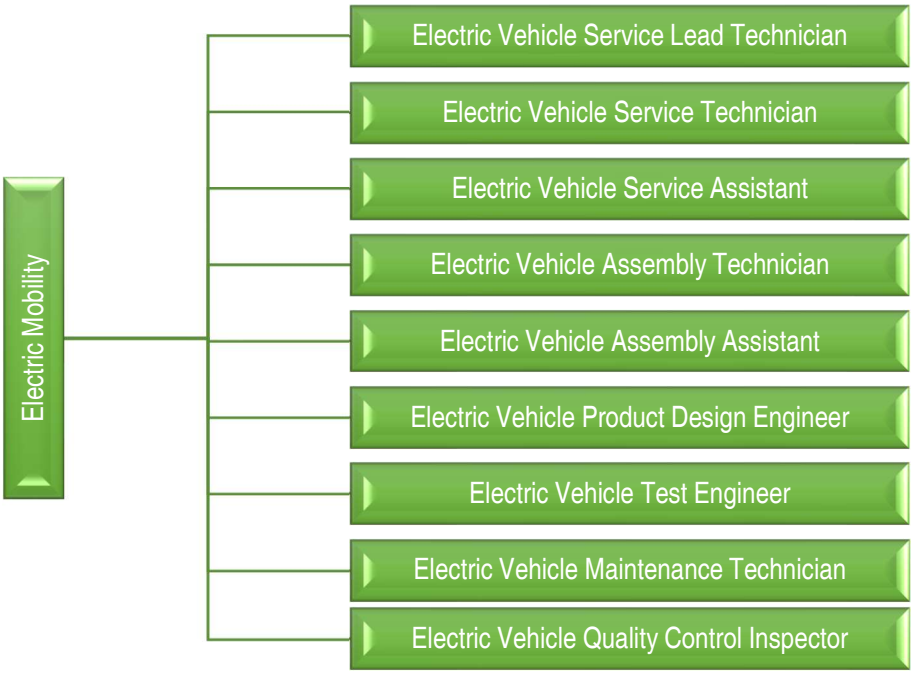
Source: NSDC (Skill Council for Green Jobs)

Figure 20: Qualification Packs/Courses in Other Renewables



Source: NSDC (Skill Council for Green Jobs)

Figure 21: Qualification Packs/Courses in Electric Mobility



Source: Automotive Skill Development Council

Additionally, to integrate greening attributes across all job profiles and skill levels, SCGJ has developed two Greening National Occupation Standards (NOS) viz. “Optimise resource utilisation at the workplace” and “Adopt sustainable practices at workplace.” These are being successfully integrated into all job roles across various training programmes, with an emphasis on fostering "green knowledge" and "green methods" for skill development across all pertinent industries (Tyagi, Nagarwal, 2022).

7.2 State-Specific Alternate Livelihoods

In terms of alternate livelihood opportunities in the neighbouring districts (within an approximate radius of 100 to 150 km), several sectors have been identified. These sectors have been chosen according to their growth and employment generation potential, particularly for MSMEs. Located at the periphery of the coalfields, it is expected that displaced workers in these areas may only have to commute daily instead of migrating. All these locations are also well connected via railways, ensuring ease of commute for displaced workers once absorbed.

7.2.1. Odisha

For Odisha, the alternate districts selected include **Sambalpur** and **Cuttack**.

Sambalpur: The district is bordered by Subarnapur and Angul in the south, Bargarh and Jharsuguda in the west, Sundergarh District in the north, and Deogarh District in the east. Sambalpur's economy depends mostly on agriculture, forestry and textiles. The region is well known for its locally produced, internationally acclaimed *Baandha* textiles. Sambalpur has gained fame for its hand-loomed textile creations, commonly referred to as Sambalpuri Textile.

The total number of registered industrial units in Sambalpur was 1402 in 2019-20. In terms of employment, Sambalpur's small-scale industries generated 13713 jobs in 2019-20 while medium and large industries generated 7121 jobs in 2019-20 (Table 4).

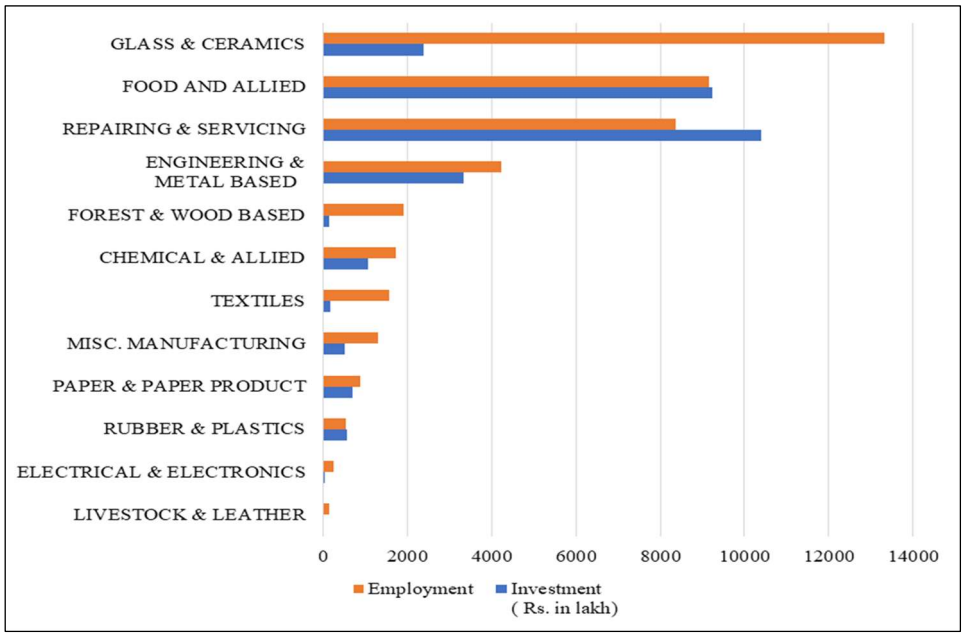
Table 4: Industrial Profile of Sambalpur

Sl. No	Particulars	Units
1	Registered Industrial Units	1402
2	Total Industrial Unit (GIP)	13958
3	Registered Medium & Large Unit	16
4	Employment in Small Scale Industries	13713
5	Employment in large and medium industries	7121
6	No. of Industrial Area	2
7	Investment of Small Scale Industries	4531.05
8	Investment of medium and large scale industries	1707107.92

Source: Brief Industrial Profile of Sambalpur District 2019-20

The top ten employment-generating sectors in the district in 2016 were glass and ceramics, food and allied sectors, repairing and servicing, engineering and metal-based industries, forest and wood-based industries, chemical and allied industries, textiles, manufacturing, paper and paper-based products, and rubber and plastics

Figure 22: MSMEs in Sambalpur: Investments Made vs Employment Generated in 2016



Source: Brief Industrial Profile of Sambalpur District 2019-20

Cuttack: The district has a long history of cottage and handicraft industries, among other sectors. Silver filigree creations from the district are well-known. This place also features a highly developed Patta Chitra, Dokra Casting, Terra Cota, Wood Carving, Art Leather, and Brass/Bell Metal crafts industry that exhibit export potential. Wood carving is mostly done in the Salipur Block and the town of Cuttack. For cane and bamboo handicrafts, Banki-Dampada and Jilinda Narsinghpur are well-known. Famous crafts in Banki include terracotta work and those in Nischintkoili and Salipur Block include jute weaving. Baramba Narsinghpur is famous for Dhokra casting. Tangi Chudwar's Bhatimunda is well-known for its bell metal and brass. In Mahanga, stone carving is well-known.

In Cuttack City and Banki, applique work is a common form of employment. In Baranga leather art is famous. The Patta Chitta craft of Athagarh is well-known, as are the Cuttack Sadar Block's palm leaf items. In Cuttack, artisans create horn pieces in addition to Jarimali sculptures.

Table 5: Industrial Profile of Cuttack

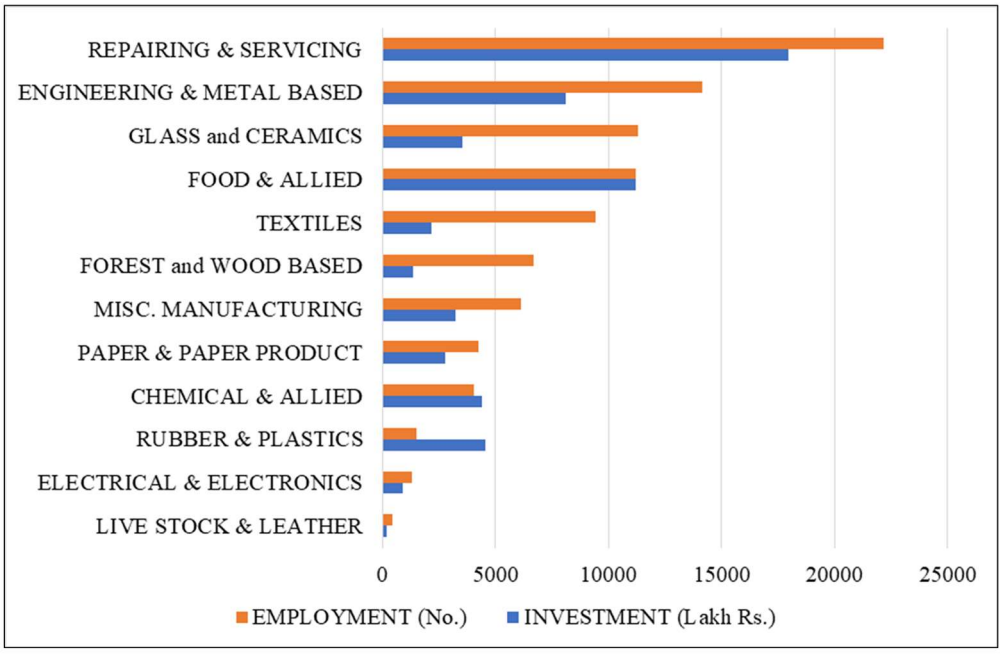
Sl No.	Particulars	Number
1	Registered industrial units, 2017-18	3357
2	Total industrial unit	18737
3	Registered medium & large unit	19
4	Employment in 2017-18	9319
5	No. Of industrial area	8
6	Investment, 2017-18	14601.75

Source: Brief Industrial Profile of Cuttack District 2019-20

The total number of registered industrial units in Cuttack was 3357 in 2017-18. Employment generated in Cuttack was 9319 in 2017-18 (Table 5).

The top ten employment-generating sectors in the district were repairing and servicing, engineering and metal-based industries, glass and ceramics, food and allied industries, textiles, forest and wood-based industries, miscellaneous manufacturing, paper and paper products, chemical and allied, and rubber and plastics (Figure 23).

Figure 23: MSMEs in Cuttack: Investment vs Employment in 2016



Source: Brief Industrial Profile of Cuttack District 2019-20

Training across the value chain of these sectors in Sambalpur and Cuttack will be necessary to absorb the displaced workers of Angul.

Self-Employment Potential in Odisha

Beyond these industries, handicrafts clusters around Pipili and Bargarh as well as some service sectors such as operating heavy machinery, beautician courses etc. have become popular across the state that could generate self-employment for these displaced unskilled and semiskilled labourers.

Figure 24: Handicraft Cluster at Pipili, Odisha

Source: CUTS International

Hundreds of households in Pipili and Bargarh are associated with handicrafts. The required training is usually passed on through generations. However, in recent times, local associations and NGOs working to improve livelihood opportunities and living standards among tribals have organised necessary training in the handicraft sector, as a result of which small-scale short-term courses are available which can help displaced workers to become self-employed. The handicrafts clusters across the state get support from the State Government whereby associated entrepreneurs are provided market linkages at fairs and shops across the nation.

However, in Odisha, one major factor that needs to be considered is that due to the prevalence of significant caste issues, individuals from lower castes especially the scheduled castes and scheduled tribes are allowed to operate mostly at the bottom strata of the textile value chain i.e. in fibre production.

7.2.2. West Bengal

For West Bengal, the districts selected include Hooghly, Nadia, East and West Bardhhaman, Birbhum and Bankura, given their proximity to the Raniganj coal belt, where the potentially displaced workers may find suitable livelihood opportunities.

Bankura: Major industries in Bankura include Ferro Alloy Based Industries, Fly Ash Bricks, Plastic Industries, Cement Industries, Stone Crushing Units, Dairy Products, Cattle Feeds, Poultry Feeds, Seed Processing Industries, Rice Mills, Cold Storage activities, Flour Mill, Oil Mill, Puffed Rice, Chira Mill, Besan Mill, Husking mill, Baluchari Saree, other Silk products, other handloom products, Terracotta, Dokra, Brass and Bell Metal activities, Stone curving, Wood curving, Jute products, Sal Leaf products, and other need-based activities like steel fabrication and other handicrafts products.

The district's major industrial estates are Barjora Plasto Steel Park, Bishnupur Growth Centre and two other Industrial Parks at Gangajalghati & Raipur have been taken up for development. Amongst these, the more industrially significant areas are Barjora, Saltora, Gangajalghati, and Bishnupur. Alongside, food processing industries proliferate around areas such as Patrasayer, Indus, Joypur, Kotulpur, Onda etc.[39]

Table 6: Industrial Profile of Bankura

Sl No.	Particulars as of 2021	Number
1	Registered Working Factories	313
2	Micro & Small-Scale Enterprises	5766
3	Employment in Registered Working Factories (Daily Average)	15471
4	Employment in Micro & Small-Scale Enterprises	40430
5	No. of Industrial estates	2

Source: District Statistical Handbook, 2021

The total number of registered factories in Bankura was 313 and the number of micro and small enterprises were 5766 as of 2021. Employment in the micro and small enterprises stood at 40430 as of 2021 (Table 6).

Potential service industries include agricultural services, screen printing, offset printing, automobile repairing and servicing, repairing and servicing of domestic electrical appliances, beauty parlour services, dry cleaning, spray painting, battery charging etc.

Birbhum: MSMEs in the district mainly comprise agro-based industries such as modern rice mills, rice bran oil, mahua oil extraction, mustard oil seed crushing, coconut oil mill, wheat grinding etc, leather products, Bakery items, GLS lamps, Plastic modern items, Ceramic Insulating items, cotton and silk weaving, metalware, and pottery manufacture, and artisanal handicrafts items such as Shola-pith, artistic leather goods, Macrame ornaments, Suri bowls. Brass and Bell Metal, and Shantiniketan Leather Goods are some of the major clusters.

Table 7: Industrial Profile of Birbhum

Sl No.	Particulars	Number
1	Registered MSMEs as of 2018	13611
2	Employment in Registered Working Factories (Daily Average)	8057
3	Employment in Micro & Small Scale Enterprises	67718

Source: District Industrial Profile, Birbhum, 2017-18

39 DISTRICT INDUSTRIES CENTRE | Bankura District, Government of West Bengal | India

Major growth centres are 1) Bolpur 2) Suri 3) Rampurhat 4) Md. Bazar 5) Sainthia 6) Patel Nagar and 7) Nalhati. Additionally, Webel IT Park has been set up in Bolpur Growth Centre to promote growth in IT-enabled service enterprises.

East Bardhhaman: East Bardhhaman mainly comprises of rural and agricultural areas. Beyond agricultural practices, handicrafts such as wooden doll making, bamboo handicrafts, Dokra and shola artefacts are employment-generating sectors. Dokra from the Dariyapur village has gained much demand over the years at the national as well as international levels. Almost every household of the Dariyapur village, (situated around 30 km from Bardhhaman railway station) churns out exquisite pieces of Dokra Art. Almost 70 families at present are involved in making Dokra artefacts. The Government of West Bengal has developed the village into the Dariyapur Dokra Artisan Co-operative Industrial Society Limited. This has been done in association with UNESCO, to transform it into a Rural Craft Hub.

Table 8: Industrial Profile of East Bardhhaman

Sl No.	Particulars	Number
1	Registered Working Factories, 2018	1465
2	Micro & Small-Scale Enterprises in 2017-18	24644
3	Employment in Registered Working Factories (Daily Average) in 2018	124763
4	Employment in Micro & Small-Scale Enterprises in 2017-18	92130
5	No. of Industrial estates	2

Source: District Statistical Handbook, East Bardhhaman, 2019

There is a Community Museum in the village also showcasing the Dokra tradition. Market linkage has also been provided to artists to sell their products in Kolkata as well as other major cities in India by the District Industries Centres (DIC), Government of West Bengal as well as Central Government agencies. While no formal training has been provided to the artists in Dariyapur since they have acquired the skill by working with the older generations in the village, Government agencies have been contracting the artisans for conducting short-term training sessions (10 days). These are organised in various schools and colleges as well as other centres, within and outside West Bengal where Government agencies arrange for the accommodation, subsistence as well as compensation of the artisans who provide the training.

West Bardhhaman: West (Paschim) Bardhhaman is mainly a mining district of West Bengal producing coal, steel, and other metal products. However, there are several other sectors, especially MSMEs, which are labour-intensive and exhibit the potential to absorb additional labour. These include computer-based servicing units and cold storage, modern rice mills, rice bran oil, cold storage, oil mills, rice flakes mill, bakery,

LPG filling plants, transformer manufacturing/repairing automobile spare parts etc. Additionally, handicrafts especially bamboo products such as baskets, lampshades, coasters, mirrors, handheld fans, sieves, and jewellery are all produced in small pockets across the district. Rice milling, wooden craft, and red bricks are some of the clusters in the West Bardhhaman district.

Box Story: Trainings Across Cooperatives in Bolpur Providing Livelihood to Hundreds of Workers

One of the major towns, Bolpur is a hub of handicrafts and textiles. Artisans from all over Birbhum and nearby districts come to Bolpur to sell their products, particularly in the popular weekly market (haat) where they find buyers from all over West Bengal. Also, a cooperative has been developed – "Amar Kutir Society for Rural Development (AKSRD)" to rejuvenate and develop rural handicrafts.

Since its inception in 1978, it has been organising training and production of traditional handicrafts of the district. It has more than 1200 artisans with 100 permanent staff and caters to rural artisans from 50 varied communities from Birbhum. Major products sold include lacware, cane and bamboo craft, woodwork, terracotta, dokra, sola, kantha sticth and leather products. Also, the society runs its own workshop where trainees are imparted skills on leather product manufacturing through one-two month workshops. At the end of the training, trainees are provided certificates, a stipend and around 5-10 per cent of their products are procured by the Government for sale in Amar Kutir showrooms. The trainees find market for the remaining products at the Haat as well as fairs organised within Birbhum (Srishtisree) and other places in West Bengal (Hastashilpa, Sabala Mela etc.) This designer's leather crafts cum export mart have been developed with the help of ASIDE scheme. The society has 27 acres of land and infrastructure to support more artisans especially for Tussar Silk, Batik Print, Kantha Sticth, leather work etc.

At present, the society is engaged in skill building of artisans of Batik Print and leather work with new technology. AKSRD has partnered with Tata Power Community Development Trust (MPL) for capacity building of women under income generation programme for rural poor in Jharkhand. Also, ethnic communities through interventions of various NGOs are getting connected to the DICs, where they are given empanelment cards and are being invited to various fairs to showcase their products. A few more cooperatives such as Banalakshmi, Hesel Ghar, Shilpa Niketan etc. are also present in Bolpur that procure products from SHGs for selling.

Also, urban centres such as Durgapur, Bardhhaman, Asansol, Raniganj, Chittaranjan, Kalna and Katwa with a middle-class and upper-middle-class population provide an attractive market for various consumer durables and non-durables, implying greater scope of livelihood generation.

Nadia: Nadia district is dominant in agriculture activities. Additionally, a large number of MSMEs mainly in food processing, and handloom textiles are also present. While clusters such as Shantipur and Phulia are popular for textiles, especially sarees, clay doll-making art at Ghurni also has national and international recognition. Both the sectors - jute processing and the agro and food processing units - are labour-intensive and exhibit potential for absorbing labour in the days to come.

Several domains like cotton yarn dyeing and bleaching, cotton knitwear making, woollen garments, leather footwear, resin utility articles, and folk instrument making are in demand of significant labour. Employment for the displaced labourers could happen across trades in respect of both self-employment and industrial employment. These include dry cleaning, beautician services, offset printing, screen printing, spray painting, batik printing, tailoring, pathological laboratories, bookbinding etc.

Hooghly: The district exhibits significant potential across agricultural and some industrial sectors. Some major industries include manufacturing automobile parts, jute mill machine parts, textile machine parts, cold storage machine parts, rice/flour machine parts, dairy machine parts and rubber industry machine parts.

The total number of cluster units in Hooghly district is 2174 with employment of more than 21,330 and investment of ₹15,427 lakhs (US$18.5mn). Sectors covered under the cluster development plan (CDP) are imitation jewellery, brass bell metal, plastic-based, zari embroidery, clay pottery, silk screen printing, leather-based, electrical and electronics, bamboo forest-based, hosiery garments, rural craft-based industries.

Figure 25: Textile Processing Work at Amar Kutir Society, Birbhum

Source: CUTS International

Self-Employment Opportunities in West Bengal

Across various districts, a few training sessions are being organised by the state Government where they engage local artisans to train other people on indigenous art and craft including handicrafts and textiles. The trained people at the workshops are often provided with the requisite market linkages for selling their products. Potentially displaced

coal workers may explore these opportunities and avail the necessary training and get self-employed.

Over the past few years, Government agencies, both state and central, have been active in promoting local handicrafts and have provided market linkages that have helped artisans to scale up their volume of production. As a result, the next generation is also getting involved in these businesses thereby reducing migration. The Govt of West Bengal has been promoting these industries by providing market linkages with various fairs organised within West Bengal such as Hastashilpa Mela, Sabala Mela, International Trade Fair etc., as well as through procuring products for Biswa Bangla Marketing Corporation Ltd. in Kolkata, New Delhi, Siliguri and Darjeeling and Manjusha showrooms under the West Bengal Handicrafts Development Corporation Limited (both under Department of MSME & Textiles, Government of West Bengal).

Figure 26: Bikna Village Common Facility Centre

Source: CUTS International

Additionally, a few private institutes empanelled with the West Bengal State Skill Development Society (WBSDS) better known as Paschim Banga Society for Skill Development (PBSSD) as training partners have been providing vocational training in textiles to the youth in the Raniganj area. Most students availing such training hail from Below the Poverty Line (BPL) or low-income families.

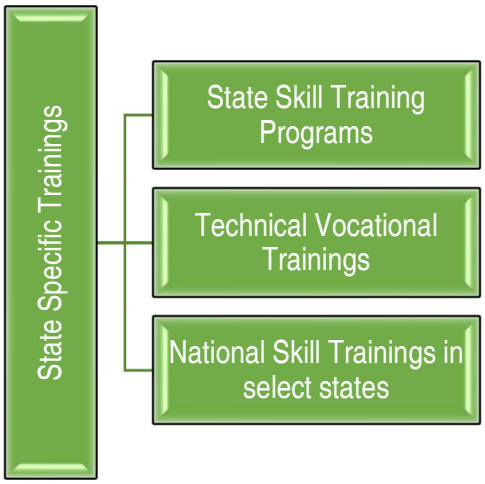
To encourage maximum participation, a monthly stipend of ₹1,000 (US$12) is provided under the National Backward Classes Finance and Development Corporation (NBCFDC), a Government of India undertaking under the aegis of the Ministry of Social Justice and Empowerment. Once the students complete the training course and get the certificate, they are nominated to get this financial support. An amount of total ₹3,000 (US$36) {₹1,000 (US$12) per month for 3 months} is directly transferred to the beneficiary's account.

7.2.3. Relevant Training Availability in Alternate Sectors in Select Districts of the States

The state-specific sectors with maximum employment potential in adjoining districts to the coal belt that have been identified included Agriculture, Tourism, Logistics, IT & ITES, Production and Manufacturing and Textiles. A few job roles have been identified under these broad sectors that require technical training. Accordingly, skill training for

these job roles has been identified, keeping in mind the skills of the potentially displaced workers. Alongside these districts, state capitals: Bhubaneswar (Odisha) and Kolkata (West Bengal) have also been considered in terms of identifying the relevant trainers since several of them are concentrated in these cities.

Figure 27: Trainings Available at the State Level



Source: Author's Compilation

The trainings are divided into: State Skill training programmes, Vocational Trainings through Industrial Training Institutes, and National Skill Training Institute trainings.

7.2.3.1. State-Skill Training Programmes

For Odisha, these trainings are mainly conducted by the Odisha Skill Development Authority (OSDA) under the programme, Skilled in Odisha.

For West Bengal, these trainings are conducted under the Paschim Banga Society for Skill Development.

Table 9: Number of Training Centres Under the State Skill Training Programmes in Odisha and West Bengal (Major Identified Sectors)

Odisha		West Bengal	
Sector	**No. of trainers/training centre (s)**	**Sector**	**No. of trainers/training centre (s) (Selected districts)**
Agriculture	1	Agriculture	97
Tourism	28	Tourism	120
Logistics	7	Logistics	5
IT & ITES	31	IT & ITES	211
Production & Manufacturing	12	Production & Manufacturing	0
Textiles	21	Textiles	27

Source: Author's Compilation

A detailed list of trainings and respective training centres in Odisha is provided in Annexure 3.1

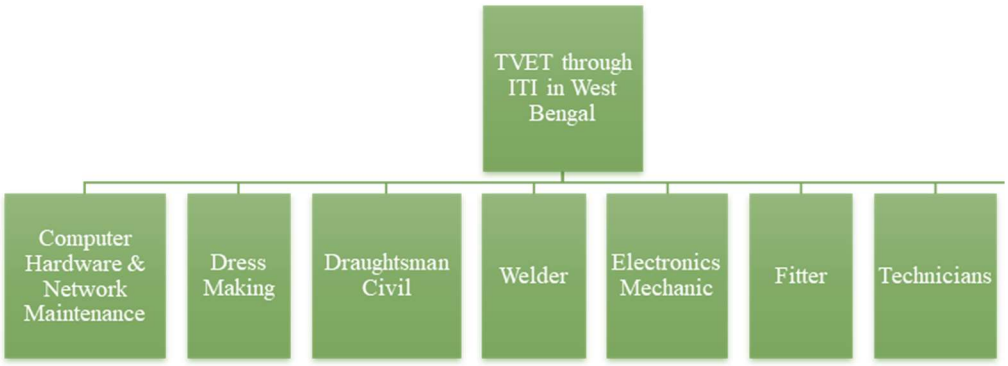
A detailed list of trainings and respective training centres in West Bengal is provided in Annexure 3.2.

7.2.3.2. Vocational and Technical Skill Training Programmes

For Odisha the Directorate of Technical Education and Training, Odisha implements various schemes and programmes for promoting technical education and training in the state. State Council for Technical Education & Vocational Training is the examining and certifying body of Diploma & ITI colleges in the State. Several trainings are provided across the ITI in Angul, Sambaplur, Cuttack and Bhubaneswar. (Detailed list in Annexure 4.2)

For West Bengal, the Directorate of Industrial Training (DIT), under the Department of Technical Education, Training and Skill Development, Government of West Bengal provides training in different trades for the supply of skilled manpower to different industries. These are offered through the state ITIs (Industrial Training Institutes) and certified by NCVT. Additionally, it provides training under the National Apprenticeship Training Scheme (NATS).[40] Few trainings are provided across the ITI in East, West Bardhhaman, Hooghly, Nadia, Birbhum, Bankura, and Kolkata (Detailed list in Annexure 4.2)

Figure 28: Broad Training Categories Across ITIs in Select Locations in Odisha and West Bengal



Source: Skill Development & Technical Education Department, Government of Odisha; Department of Technical Education, Training and Skill Development, Govt. of West Bengal

[40] Recently Govt. of India has introduced National Apprenticeship Promotional Scheme (NAPS) under Apprenticeship Act. National Apprentice Promotional Scheme (NAPS) runs as per Apprentices Act 1961 and the rules framed there under. Freshers and ITI Graduates can register themselves in the National Apprenticeship Portal www.apprenticeship.gov.in for undergoing apprenticeship training. Manufacturing and Service sector establishments can register themselves for engagement of Apprentices and also for availing financial assistances/reimbursement of training cost as applicable.

7.2.3.3. National Skill Training Programmes in Odisha and West Bengal

National Skill Training Institute (NSTI) managed by the Ministry of Skill Development and Entrepreneurship's Directorate General of Training (DGT), Government of India conducts trainings in Odisha and West Bengal that can cater to the demand for growing jobs in solar as well as other sectors that exhibit employment potential (detailed list in Annexure 5).

NSTI Bhubaneswar has introduced two new-age courses on ***Solar Technician*** (Electrical) under the Craftsman Training Scheme (CTS) Scheme and the New Age Course in 2019-20.

NSTI Kolkata, erstwhile known as Central Training Institute for Instructors (CTI) offers two divisions: NSTI General and NSTIW for women.

Courses offered by NSTI General Kolkata include:

Table 10: Trainings Offered by NSTI General Kolkata

Craftsmen Training Scheme	New Age Course
i. Foundryman ii. Machinist iii. Machinist (Grinder) iv. IoT Technician (Smart Agriculture) v. Technician Mechatronics	i. IoT Technician (Smart Agriculture) ii. Technician Mechatronics

Courses offered by NSTI Women Kolkata include:

Table 11: Trainings Offered by NSTI W Kolkata

Craftsman Training Scheme	Craftsman Instructor Training (training of vocational trainers)	New Age Course	Advanced Diploma
• Basic Cosmetology • Fashion Design and Technology • Computer Operator and Programming Assistant	• Dress Making • Fashion Designing Technology (FDT) • Cosmetology • Computer Software Applications (CSA)	• Drone Technician	• Advanced Diploma in IT, Networking and Cloud Computing

7.3 Harnessing Job Potential at Repurposed Coal Mines

Repurposing coal mines for local benefits presents a promising avenue for sustainable development. Initiatives such as land reclamation and afforestation can mitigate the environmental impacts of mining while providing additional benefits such as carbon sequestration and biodiversity conservation. Engaging local communities in decision-making processes regarding the repurposing of coal mines is essential to ensure that their needs and concerns are adequately addressed and to foster a sense of ownership and equity in the benefits that are likely to accrue from these initiatives.

Additionally, investigating the possibility of building green hydrogen-producing plants on regained and abandoned coal mining areas could be explored. The phase-out of coal, resulting in land availability along with the available infrastructure and funds, may be utilised to produce green hydrogen at a reasonable cost. The mined parcels of land can create more than one million metric tonnes of green hydrogen yearly, even if only 10 per cent of them can be used for green hydrogen facilities (Bapuly, 2023).

Possible advantages of using abandoned and recovered coal and lignite mines as green hydrogen production sites will not only overcome the obstacles of land demand, availability of clean water, and transmission facilities but also offer a financially advantageous option. Furthermore, it may boost the local economy by reviving coal-dependent towns and generating green job possibilities.

The generation of green hydrogen on reclaimed mine-lands might be considerably accelerated by carrying out such preliminary research and providing incentives to private entrepreneurs to select mined regions.

8 Challenges

While there are several public and commercial skill-training institutions that provide online and offline courses for various industries, a few issues in the supply and demand ecosystems must be resolved in order to ensure industry-ready green-workforce.

These include:

- Lack of supportive policies/incentives on green skill development across sectors in line with emerging green job roles
- Limited awareness about specific job roles within green jobs among youth. While many have heard about 'green' or climate-positive jobs, most of them are unaware of the specific job roles in the sector or the relevant skill development centres who may aid the same
- Insufficient coverage and depth of green skill development within existing interventions
- Limited effectiveness of several programmes due to a lack of equipment, a lack of skilled trainers, and a lack of synergy between skill-development organisations

9 Recommendations

In India, coal transitions are likely to be difficult and disorganised processes unless they are carefully thought through. Just livelihood generation in coal should therefore consider the following recommendations:

- ***At the planning level, alignment between the central, state, and sector-level roadmaps is required.*** Strategies for decarbonisation cannot be put into practice while the coal industry is growing and receiving funding. Otherwise, it will be difficult to make the necessary investments to achieve net zero and hence extend the carbon lock-in.

- ***A well-defined approach is necessary for coal transition workers, emphasising contractual and informal labour in addition to considerations of their socioeconomic background***. Transition policies won't assist a sizable section of the labour force without such a plan. This will eliminate disparities in the calculation of the economic and financial costs associated with the shift.

- Generations of coal miners forge a sense of community and identification with the sector. During the transition, community engagement may lower the likelihood of social strife. This should commence from the planning phase and continue through the mine closures. ***Policymakers ought to indulge in early consultation with workers and marginalised groups and involve all relevant stakeholders including coal companies, local authorities, and regional governments through community-based programmes.***

- Rural women encounter specific challenges such as limited work opportunities and limited access to formal employment. At present, only 5 per cent of women within the working age group in the coal belts are engaged in the workforce. They also experience gender-based wage disparities and a lack of social protection in both formal and informal sectors, while high unemployment rates contribute to economic inequality. ***To foster inclusive economic progress, it is crucial to address these disparities by giving equal importance to education and skill enhancement for men and women.***

- The current regulations within the labour and industrial sectors are inadequate in addressing the concerns regarding job security, wages, and compensation. These aspects are crucial for a seamless transition, particularly in the context of the future workforce. Making necessary changes in the existing labour and industrial laws to enhance the terms of engagement, retrenchment procedures, and compensations,

will ensure a fair transition for coal workers in the region. One aspect that needs to be ensured is to ***engage workers through long-term contracts to guarantee job security and uphold their entitlement to rights. Also, safety nets for contractual and informal workers who are likely to be the most vulnerable during the phasing down must be ensured***.

- The minimum daily wage for coal sector workers in Odisha and West Bengal is already higher than other sectors. Therefore, while devising ***just transition policies, corrective wages for alternate sectors/ green livelihoods will be necessary so that workers don't end up getting less in the green sectors as compared to their existing wages***.

- Job readiness training is the need of the hour. ***Internships and on-the-job training in partnerships with renewable energy companies should be facilitated***. Partnerships with Govt. funded institutions such as Utkal University in Odisha and Jadavpur University in West Bengal and privately sponsored institutions like KIIT University in Odisha and St. Xavier's College in Kolkata, West Bengal, could provide a platform for internships, field visits, and practical training opportunities in collaboration with local green industries.

- Industry-Academia Partnership: ***Training modules should be developed in partnership with the industry to cater to relevant requirements of the industry and ensure employment linkages with the respective sectors***

- ***Establishing green business incubators specific to the needs of Odisha and West Bengal would serve as pivotal hubs for fostering innovation in sustainable ventures***. These incubators could offer specialised training programmes, access to shared resources, and mentorship opportunities, nurturing the development of eco-friendly startups.

- ***Collaborative efforts of the Governments and civil societies can be fundamental in generating awareness and addressing concerns and misconceptions within local populations*** by acknowledging challenges of transition and underscoring the potential for new job opportunities and improved quality of life.

- ***Civil society organisations and NOGs could be engaged by respective Governments for undertaking thorough monitoring and evaluation to gauge the economic and social impacts of transitioning to green livelihoods***. Regular assessments should include comprehensive surveys and consultations with local communities to solicit feedback on the ongoing transition efforts.

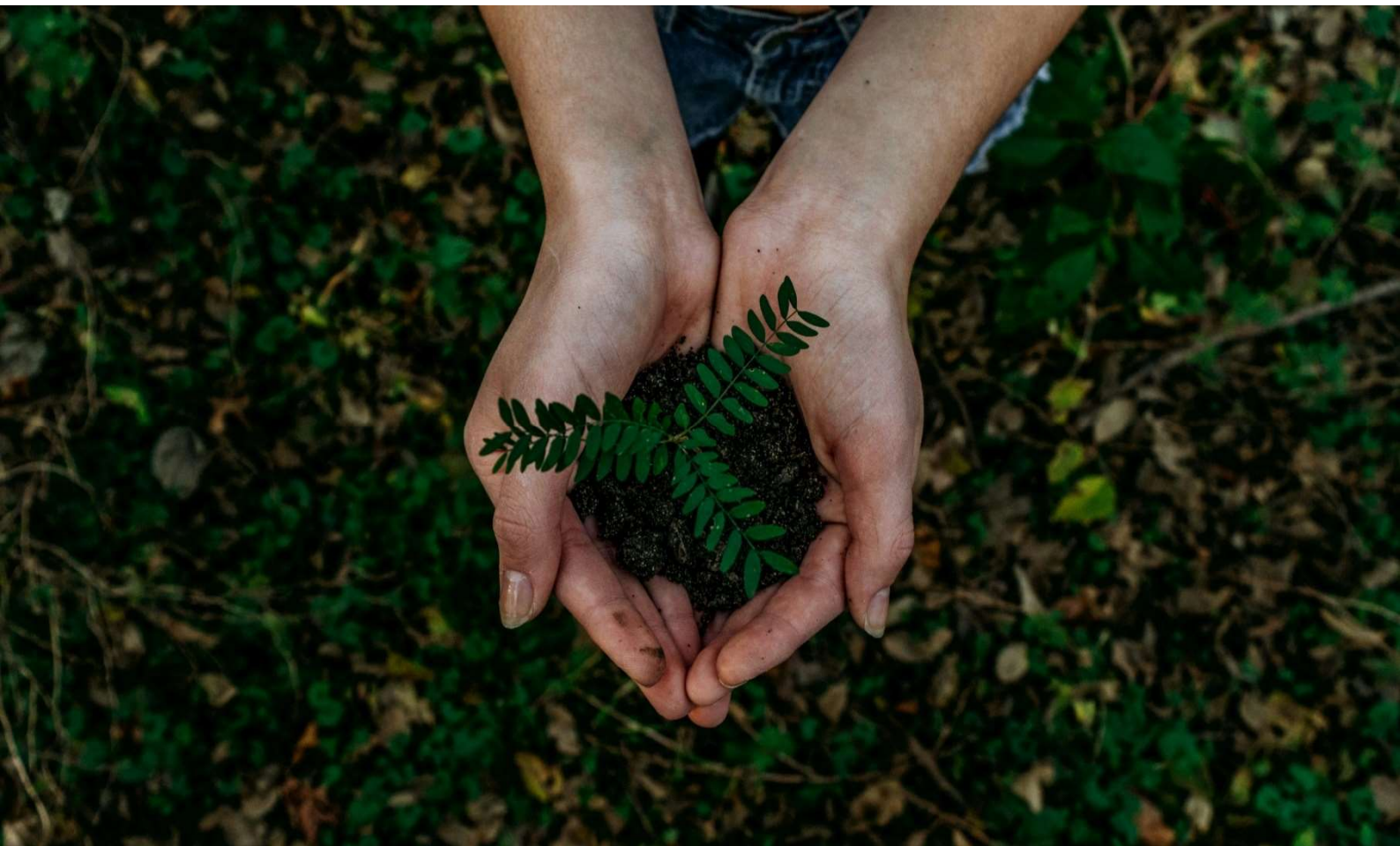
- Through collaboration with local training centres and vocational institutions in renewable energy- Courses on solar energy, including installation and maintenance of solar panels, green hydrogen production techniques, wind energy expertise, and energy efficiency practices may be devised. ***Courses on sustainable agriculture practices and skills relevant to eco-tourism should be integrated into the curriculum.***

- Though fully nationalised, the coal sector maintains a substantial amount of informal employment; however official descriptions, data and statistics concerning such informal workers and their services to the coal ecosystem are minimal if not altogether non-existent. The absence of comprehensive information on both formal and informal employment within the coal and thermal power sector is one of the most significant barriers to the development of policies for "Just Transition". ***Furnishing and updating data on employment in coal should be a regular practice on the part of Government agencies to make policies toward just transition inclusive.***

10 Conclusion

Coal mining has entailed significant environmental degradation, including land subsidence, water pollution, and air pollution from coal fires. Transitioning from coal mining provides an opportunity to mitigate these environmental impacts by implementing measures such as land reclamation, afforestation, and pollution control measures. Integrating sustainable land-use practices and promoting renewable energy sources can further contribute to environmental conservation and climate change mitigation efforts. The transition from coal mining will have profound social implications for communities in the region, including potential job losses and changes in livelihoods.

It is essential to address the needs of affected communities by providing alternative employment opportunities, skill training, and social support systems. Governments at the National and state levels have put in place several vocational and technical training programmes that can aid in the re-employment of the coal sector workers who are likely to be displaced. However, skill training programmes ought to be tailored to the dynamic demands of the industry. The government and civil society should come together to make such programmes available to the displaced workers and provide necessary market linkages for their re-employment and self-employment.



Annexures

S. No.	Annexure	Please scan here
1	Annexure 1: Green Jobs Qualification Packs: NSDC (Skill Council for Green Jobs)	
2	Annexure 2: QPs in the Automotive Sector (source ASDC)	
3	Annexure 3.1: Sector-wise Training Centres in select locations in Odisha	
4	Annexure 3.2: Sector-wise Training Centres in select locations in West Bengal	
5	Annexure 4.1: Odisha ITI trainings	

S. No.	Annexure	Please scan here
6	Annexure 4.2: West Bengal ITI trainings	
7	Annexure 5: NSTI Trainings	

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CUTS International
D-217, Bhaskar Marg, Bani Park, Jaipur 302016, India
Tel: +91.141.2282821, Fax: +91.141.2282485
Email: cuts1@cuts.org, Web site: www.cuts-international.org

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