

Strategic HR Planning and Skill Development in the Mining Industry: A Case Study of Central Coalfields Limited (CCL), Ranchi

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Abstract

Strategic human resource planning is increasingly important in the mining industry because workforce requirements are changing with technological development, safety expectations, mechanisation, and changing patterns of work. This study examines the relationship between strategic HR planning and skill development in Central Coalfields Limited (CCL), Ranchi. The study adopts a descriptive, qualitative, and case-based design and relies primarily on secondary evidence from CCL's annual reports, government publications, international institutional reports, and peer-reviewed research. The analysis focuses on workforce planning, training, skill-gap identification, reskilling, upskilling, safety capability, and preparedness for technology-driven changes in mining operations. CCL's 2024–25 training data indicate that its Management Training Centre conducted 71 programmes involving 2,422 participants across technical, functional, managerial, and behavioural categories. Managerial programmes accounted for the largest share of participants, while technical and behavioural programmes also represented substantial components of the training portfolio. The study argues that workforce planning should extend beyond estimating employee numbers to include systematic identification of present and future competencies. The findings suggest that closer coordination between HR and operational functions, regular training-needs assessment, practical learning, knowledge transfer, and technology-oriented skill development can strengthen workforce readiness. The study contributes a focused case-based perspective on strategic HR planning and skill development in an Indian coal-mining enterprise.

Keywords: strategic human resource planning, skill development, mining industry, workforce planning, employee training, reskilling, Central Coalfields Limited

1. Introduction

Mining remains a strategically important sector in India and requires a workforce capable of operating safely and effectively in technically demanding environments. The increasing use of mechanisation, digital systems, advanced equipment, monitoring technologies, and changing safety practices has altered the competencies required in mining work. Consequently, human resource planning cannot be limited to estimating the number of employees required. It also needs to address the capabilities that employees possess, the competencies that will be required in the future, and the mechanisms through which those competencies can be developed.

Strategic human resource management links people-related decisions with organisational strategy. Wright and McMahan (1992) explain strategic HRM through theoretical perspectives that connect HR practices with organisational and strategic conditions. From a resource-based perspective, human capabilities can constitute strategically valuable resources when they contribute to organisational effectiveness and are difficult to replace

(Barney, 1991). Empirical research has also shown that coherent HR practices can be associated with employee and organisational outcomes, including productivity and turnover (Huselid, 1995).

Central Coalfields Limited (CCL), headquartered in Ranchi, Jharkhand, provides a relevant setting for examining these issues because it operates a large and diverse workforce in an industry characterised by operational risk, technological change, and specialised skill requirements. CCL's human resource development activities include technical, functional, managerial, and behavioural training, together with apprenticeship and other capability-building initiatives (Central Coalfields Limited [CCL], 2025).

The present study therefore examines how strategic HR planning can support skill development at CCL. Rather than treating training as an isolated HR activity, the study considers training and

development as part of a broader workforce-planning process involving competency identification, skill-gap assessment, knowledge transfer, technology readiness, and future workforce requirements.

2. Literature Review

2.1 Strategic Human Resource Planning

Strategic HR planning concerns the alignment of workforce requirements and employee capabilities with organisational objectives. It includes forecasting workforce requirements, analysing existing competencies, identifying skill gaps, planning recruitment and deployment, and preparing employees for future roles. Wright and McMahan (1992) provide a theoretical foundation for strategic HRM by showing how HR practices can be understood through behavioural, resource-based, institutional, and other perspectives. Delery and Shaw (2001) further emphasise the importance of coherent employment systems and the strategic management of people in organisations.

2.2 Human Resources and Organisational Performance

Huselid (1995) found significant associations between high-performance HR practices, employee outcomes, and corporate performance. Although the present study does not estimate a causal effect on CCL's performance, this literature supports the proposition that workforce practices should be considered in relation to broader organisational outcomes rather than as purely administrative activities.

2.3 Skill Development and Training

Training and development can benefit individuals, teams, organisations, and society by improving knowledge, skills, and work-related capabilities (Aguinis & Kraiger, 2009). Training

becomes particularly important in industries where technology and operating procedures change rapidly. The ILO-SCOPE study on public-sector enterprises in India identifies skill gaps and future skill requirements as important considerations for preparing human capital for transitions in the world of work (International Labour Organization, 2024).

2.4 HRM Challenges in Mining

Recent research specifically addressing mining organisations highlights the importance of workforce-related, social, and organisational factors in sustaining mining operations. Khatua et al. (2024a) identify major HRM

factors relevant to mining organisations, while Khatua et al. (2024b) develop a benchmarking model of HRM elements in large mining industries using interpretive structural modelling. These studies support the need to examine mining HRM as a system rather than as a collection of separate administrative practices.

2.5 Research Gap

Existing literature provides substantial theoretical and empirical support for strategic HRM, training, and workforce development. However, there is comparatively limited case-based research connecting these themes specifically with the workforce-development practices of CCL in Ranchi using recent organisational evidence. The present study addresses this gap by examining CCL's workforce and training context and interpreting its skill-development activities through a strategic HR-planning lens.

3. Objectives of the Study

- To examine the role of strategic HR planning in meeting current and future workforce requirements at CCL, Ranchi.
- To examine the contribution of training and skill development to workforce capability in CCL.
- To identify major workforce-development challenges associated with technological and operational changes in mining.
- To examine how reskilling, upskilling, apprenticeship, and knowledge transfer can support future workforce readiness.
- To propose practical measures for strengthening strategic HR planning and skill development at CCL.

4. Methodology

The study uses a descriptive, qualitative, and case-based research design. The unit of analysis is Central Coalfields Limited, with particular reference to its workforce-development and HRD activities reported for the Ranchi-based organisation. The study relies on secondary data obtained from CCL annual reports, Coal India Limited reports, Government of India publications, international institutional reports, and peer-reviewed academic literature. Data were analysed through document review and descriptive interpretation. No primary employee survey was conducted for the present study; therefore, the study does not claim statistical relationships between HR planning and employee outcomes.

For the organisational training analysis, CCL's reported programme and participant figures for financial year 2024–25 were used. Participant shares in Table 1 were calculated by the researcher using the total number of participants reported by CCL. The calculation was: $\text{category participants} \div \text{total participants} \times 100$.

5. Findings and Discussion

5.1 Training Profile at CCL

CCL's 2024–25 annual report provides direct evidence of a structured training portfolio. The Management Training Centre reported 71 programmes involving 2,422 participants across four broad categories: technical, functional, managerial, and behavioural training (CCL, 2025).

Training category	Programmes	Participants	Share of participants
Technical	17	508	20.98%
Functional	11	345	14.24%
Managerial	31	1,156	47.73%
Behavioural	12	413	17.05%
Total	71	2,422	100.00%

Note. Source: Central Coalfields Limited (2025), Annual Report and Accounts 2024–25. Percentages are researcher calculations based on the reported total of 2,422 participants.

Managerial training represented the largest participant share (47.73%), followed by technical training (20.98%), behavioural training (17.05%), and functional training (14.24%). This distribution indicates that CCL’s training portfolio extends beyond technical capability to include managerial and behavioural development. From a strategic HR perspective, such breadth is relevant because future workforce effectiveness in mining depends not only on equipment-related skills but also on supervision, decision-making, communication, leadership, and adaptation.

5.2 Strategic Workforce Planning and Skill Development

Strategic workforce planning is particularly relevant when organisations must maintain

operational capability while workforce requirements change. CCL’s reported training activities provide evidence that skill development is being used as an organisational capability mechanism. An effective strategic approach would connect workforce forecasting with competency mapping, training-needs assessment, deployment, succession planning, and future technology requirements.

The strategic importance of skill development is also consistent with the ILO-SCOPE study, which examines skill profiles and future skill needs in Indian public-sector enterprises (International Labour Organization, 2024). For a mining enterprise, this means that training priorities should be periodically reviewed as equipment, processes, digital systems, and safety requirements change.

5.3 Knowledge Transfer and Workforce Continuity

Mining organisations also possess substantial tacit knowledge accumulated through employees’ practical experience. Strategic HR planning should therefore include structured mentoring, job-based learning, documentation of operational knowledge, and succession arrangements. Such practices can reduce the risk of knowledge loss when experienced employees retire or move out of the workforce and can accelerate the development of less-experienced employees.

5.4 Safety and Technology Readiness

Safety and technology readiness should be integrated into workforce planning because mining employees work with complex equipment and under potentially hazardous operating conditions. Training needs should therefore cover not only technical operation but also safe work practices, emergency response, digital systems, equipment changes, and adaptation to new technologies.

This integrated perspective is consistent with recent mining-HRM research that places employee development and organisational sustainability within a broader HRM system (Khatua et al., 2024a, 2024b).

6. Implications of the Study

- CCL can strengthen workforce planning by linking manpower forecasts with competency requirements and technology-transition plans.
- Regular skill-gap assessments can help HR and operational managers prioritise training according to actual and emerging job requirements.
- Training programmes should combine classroom learning with practical demonstrations, simulations, supervised workplace learning, and mentoring where appropriate.
- Succession planning and knowledge-transfer mechanisms can preserve critical operational knowledge held by experienced employees.
- Reskilling and upskilling should be treated as continuing workforce strategies rather than one-time training interventions.
- HR and operational departments should jointly review training outcomes and future competency requirements.

7. Limitations

The study is based on secondary data and does not include responses from CCL employees, supervisors, HR managers, or operational managers. Accordingly, it cannot statistically test the relationship between strategic HR planning, skill development, and employee performance. The case-study focus also limits generalisation to other mining organisations. Future research should use primary data from employees and managers and apply reliability testing, correlation, regression, and group-comparison techniques to examine the proposed relationships empirically.

8. Conclusion

Strategic HR planning and skill development are closely connected in a mining environment where workforce requirements are shaped by technology, safety, operational complexity, and changing competencies. The CCL case demonstrates that workforce development encompasses multiple forms of training, including technical, functional, managerial, and behavioural

development. CCL's 2024–25 training profile, with 71 programmes and 2,422 participants at its Management Training Centre, provides evidence of a structured organisational commitment to employee development (CCL, 2025).

The central implication is that strategic HR planning should move beyond workforce numbers and incorporate systematic competency assessment, skill-gap analysis, technology readiness, knowledge transfer, and continuous learning. Future-oriented HR planning can help CCL maintain an adaptable workforce while supporting safe and efficient mining operations. Because the present study is secondary and case-based, these conclusions should be interpreted as evidence-informed implications rather than causal claims. Primary empirical research would provide an important next step for testing the relationship between HR planning, skill development, and employee or organisational outcomes.

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