

Recruitment & Selection Practices in the Indian Mining Industry: A Critical Analysis of the Eastern Coal Belt

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ABSTRACT

Mining industry as an integral part of India's industrial growth, contributes significantly to national resource security, employment generation, and regional development. The eastern mining belt—comprising Jharkhand, Odisha, Chhattisgarh, and West Bengal—holds a substantial share of the country's coal, iron ore, bauxite, and limestone reserves, making it strategically important for both public and private mining operations. This study critically examines the recruitment and selection practices adopted in the Indian mining industry with a specific empirical focus on the eastern region. Adopting a case-study-oriented regional approach data was collected from HR managers, recruitment executives, mining managers, safety officers, supervisors, and contract labour representatives across various mining units which revealed a pronounced dualism in recruitment and selection systems within the sector. Large public sector and organized private mines predominantly follow structured, policy-driven, and documented recruitment processes, whereas small and medium private mines rely heavily on informal, contractor-mediated, and referral-based hiring practices. Quantitative evidence indicates that nearly 47% of workforce recruitment occurs through contractors and informal channels, particularly for unskilled and semi-skilled labour, while campus recruitment and online portals together account for less than one-fourth of total hiring. The study also highlights role-based differentiation in selection methods: formal written tests, technical assessments, and multi-stage interviews are commonly used for managerial and technical positions, whereas physical fitness checks and supervisor recommendations dominate the selection of unskilled labour. Overall, the study underscores significant variations in transparency, compliance, and employee-job fit across segments of the mining industry and emphasizes the need for more standardized, inclusive, and technology-enabled recruitment frameworks to enhance workforce quality and governance in the sector.

Keywords: Recruitment and Selection, Employment Practices, Coal Mining, Eastern Coal Belt, Dualism, Public and Private Mines.

INTRODUCTION

The mining industry has long been considered one of the backbones of India's industrial and economic development, contributing significantly to the nation's resource security and employment generation. India is endowed with a rich endowment of mineral resources, and states in the eastern region—such as Jharkhand, Odisha, and West Bengal—are central to the mining map of the country due to their vast coal, iron ore, limestone, bauxite, and other mineral reserves. For instance, Jharkhand alone holds around 27.3 % of India's coal reserves and 26 % of its iron-ore reserves, which highlights the strategic importance of this region in national mining operations

and employment generation. The processes of recruitment and selection form two of the most pivotal functions in human resource management, directly influencing organizational performance, operational efficiency, and workforce stability. Recruitment constitutes the proactive seeking and attracting of candidates, whereas selection involves choosing those candidates who are most suited to the job based on specific criteria and organizational needs. Effective recruitment and selection are considered essential for ensuring that companies attract and retain employees with the right mix of skills, competencies, and motivations.

The Eastern Mining Landscape- Challenges and Opportunities:

Eastern India is rich in minerals and hosts several of the nation's most significant mining operations. Coalfields such as the Eastern Coalfields Limited (ECL) operate across West Bengal and Jharkhand, contributing immense coal production and employing tens of thousands of workers across diverse mining operations. The Jharia Coalfield in Jharkhand, one of the country's oldest and largest coal reserves, has fueled industrial activity for over a century, extracting high-grade coking coal critical for steel production. Moreover, development projects like the Deucha Pachami coal block in West Bengal represent some of the most ambitious mining endeavours in India, possessing among the largest coal reserves globally. Mining remains a major source of livelihood and economic activity for local populations, yet data indicates that structural employment challenges persist. While the eastern mining belt offers substantial mineral-based employment opportunities, workforce participation by local communities is often constrained by skill gaps, inadequate formal training, and informal employment practices. The rise of the informal workforce—especially under contracting and Mine Developer and Operator (MDO) models—has led to a growing pool of workers without job security or upward mobility prospects. These conditions underscore the critical need for robust recruitment and selection systems that not only fill positions but also account for longer-term workforce sustainability and skill development.

Why Focus on Recruitment and Selection?

At the core of human capital development lies the ability of organizations to identify and integrate the right talent. Across industries, recruitment and selection are strategic processes, shaping workforce quality and organizational culture. They involve job analysis, sourcing candidates, screening applications, conducting interviews and tests, and making final hiring decisions. These processes are vital not only for operational efficiency but also for fostering employee engagement, reducing turnover, and enhancing organizational reputation. Research shows that effective recruitment frameworks contribute positively to organizational performance, enabling enterprises to respond to competitive challenges and technological shifts. Conversely, weak recruitment and selection practices can lead to skill mismatches, higher attrition rates, decreased productivity, and financial losses. In mining operations—where safety, precision, and technical expertise are paramount—the significance of these human resource functions is magnified. Therefore, examining existing practices allows a more nuanced understanding of the industry's workforce dynamics and identifies gaps that may inhibit the mining sector's sustainable growth.

Socioeconomic Context and Workforce Dynamics in Eastern Region:

The eastern states of Jharkhand, Odisha, and West Bengal share a socio-economic fabric enriched yet constrained by mineral exploitation. Mining activities have historically shaped the economic landscape of these states but have also been linked with environmental impacts, displacement challenges, and community-level disruptions. Studies in Odisha, for instance, highlight the socio-political complexities associated with mining-

induced displacement and community resistance, which indirectly influence labor management in these regions. Additionally, infrastructure limitations, regional disparities in education, and health challenges contribute to a workforce that may not always meet the skill requirements envisioned by modern mining operations. Despite these constraints, there are positive developments that reflect evolving recruitment trends in the region.

Research Gap and Rationale:

Despite the strategic importance of the mining sector and its substantial impact on regional economies, there is a noticeable research gap regarding the efficacy, fairness, and adaptability of recruitment and selection practices within this industry—especially through the lens of the eastern Indian context. Most general human resource studies do not capture the unique challenges of mining, where factors like geographical remoteness, hazardous conditions, and regulatory oversight interplay with workforce acquisition processes.

This research aims to fill that gap by offering a critical analysis of how mining companies in eastern India design, implement, and evaluate their recruitment and selection systems. It will explore questions such as:

- How well do current recruitment practices identify and attract skilled candidates?
- What criteria are prioritized in selection processes?
- To what extent are local communities integrated into formal employment opportunities?
- How are diversity and inclusion addressed in hiring frameworks?
- What role does skill development and training play in shaping workforce readiness?

By investigating these dynamics, this study contributes to both theoretical HR literature and practical policy formulation, offering insights that could enhance human capital management in one of India's most resource-intensive sectors.

2. LITERATURE REVIEW

2.1. Conceptual Foundations of Recruitment and Selection:

Recruitment and selection form the core of Human Resource Management (HRM) and are closely linked with organizational effectiveness, labour productivity, and long-term sustainability. Classical HRM literature describes recruitment as the process of generating a pool of suitable candidates and selection as the systematic process of choosing the best-fit individuals for organizational roles (Dessler, 2017). Research consistently concludes that organizations adopting structured, competency-based recruitment systems achieve higher employee retention and performance outcomes (Akinyomi, 2012; Barber, 1998). However, scholars also caution that recruitment processes in developing countries are deeply shaped by contextual realities such as informality, regional labour markets, political linkages, and resource dependency (Budhwar & Bhatnagar, 2009). These contextual factors are

particularly visible in the **extractive industries**, including mining, where work environments are hazardous, labour is often contractual, and socio-economic conditions of surrounding communities influence hiring.

2.2. Recruitment and Selection in the Mining Sector: Global Perspectives:

Globally, mining is characterized by skill shortages, occupational risk, high labour turnover, and high dependency on contract workers (International Labour Organization, 2018). Studies from Australia, South Africa, and Chile show that firms increasingly rely on competency-based hiring, technical certification, and psychometric assessment to reduce safety incidents and absenteeism (Joy, 2014; Sánchez & Morales, 2015). Another strand of literature highlights the local community employment debate, where mining companies face institutional pressure to hire locally while balancing productivity needs (Bebbington et al., 2008). The literature indicates recurring tensions between employment promises and actual recruitment outcomes in mineral-rich regions.

2.3. Recruitment and Selection in the Indian Mining Industry:

Indian scholarship on mining HRM indicates persistent issues related to informal hiring, labour welfare deficits, and skill mismatches (Nair, 2010; Singh & Sinha, 2013). Coal India Limited and other public sector undertakings historically relied on seniority-based hiring, internal references, and trade union influence; however, recent reforms emphasize online applications, merit-based selection tests, and technical certifications.

A growing research trend emphasises:

- increasing contractualization,
- subcontractor-led hiring,
- limited transparency in selection,
- gaps between policy frameworks and field realities (Sharma, 2019; Mishra, 2020).

2.4. Focus on Eastern India: Jharkhand, Odisha and West Bengal:

The eastern region holds the bulk of India's coal and iron ore reserves; however, research points to several recruitment paradoxes:

- Large mineral wealth coexists with high unemployment and low skill levels.
- Local populations are often under-represented in skilled mining jobs.
- Contract labour dominates formal employment structures.
- Tribal and rural communities face multiple barriers to entry.

Studies in Jharkhand and Odisha (Pattnaik, 2016; Choubey, 2021) identify:

- low access to vocational mining training,
- dependency on labour contractors,

- weak enforcement of recruitment norms,
- limited inclusion of women and marginalized groups.

Research also indicates that environmental conflicts, displacement, and community resistance indirectly shape hiring strategies (Jain & Agrawal, 2017).

2.5. Methods of Recruitment in Mining: Evidence from Literature:

Mining companies use:

- internal recruitment (promotions, transfers),
- external recruitment (job portals, advertisements),
- contractor/intermediary recruitment,
- apprenticeship-based hiring.

Studies reveal a strong reliance on **informal networks and contractors** in the eastern coal belt (Kumar, 2018). Contractor-led recruitment often results in:

- wage disparities,
- safety compliance issues,
- job insecurity,
- weak skill development pathways.

By contrast, public sector mines follow formal written tests, interviews and reservation policies, producing more transparency but slower recruitment cycles.

2.6. Selection Techniques Used in Mining Industry:

Literature identifies the following selection tools:

- technical trade tests
- medical fitness examinations
- safety training evaluation
- interviews
- psychometric testing (limited use in India)

Safety and physical fitness emerge as dominant criteria due to hazardous mining environments (Ghosh, 2015).

2.7. Emerging Themes in Recent Literature:

a) Skill Development and Employability

Government schemes such as skill mission initiatives aim to improve mining-related competencies; however, impact studies show uneven outcomes in rural tribal belts.

b) Gender Inclusion

Earlier legal restrictions limited women's underground work; reforms now allow participation, yet cultural barriers persist (Gurung, 2022).

c) Technology-Induced Transformation

Automation, GIS, and remote operation technologies are reshaping selection criteria, demanding higher technical competencies.

2.8. Research Gap Identified:

Although studies examine the following points:

- labour conditions,
- displacement,
- wage issues,
- mining productivity,

very few critically analyze recruitment and selection mechanisms themselves, especially through:

- regional lens of eastern India,
- comparative institutional analysis,
- inclusivity and equity perspective,
- linkage with skill ecosystems.

This gap provides the rationale for the present study.

3. RESEARCH METHODOLOGY:

3.1 Research Design:

This study adopts a mixed-methods research design, combining quantitative survey analysis with qualitative interviews. Mixed-methods approaches are widely recommended in social science research when the research problem involves multiple layers of meaning, measurable perceptions, and contextual realities (Creswell & Plano Clark, 2011). Since recruitment and selection in the mining sector involve both policy frameworks and informal labour market dynamics, this approach helps in obtaining both breadth and depth of understanding. The study follows an explanatory sequential mixed-methods design in which quantitative findings guide the qualitative exploration (Bryman & Bell, 2015; Creswell & Plano Clark, 2011). This design is particularly useful for HRM studies where numerical patterns require interpretive explanation from managerial and worker perspectives.

3.2 Study Area and Population:

The study focuses on the eastern mining belt of India, particularly Jharkhand, Odisha and West Bengal. These states account for a large proportion of coal, iron ore and bauxite reserve concentration and host a combination of public sector and private sector mines. The selection of these areas follows case-study logic in regional research, where settings are chosen on the basis of their information richness and relevance to research objectives (Yin, 2014).

The study population includes:

- HR managers and recruitment executives,
- mine managers and safety officers,
- contract labour supervisors,
- permanent and contractual mine workers.

3.3 Sampling Technique and Sample Size:

A multi-stage sampling technique was adopted. First, mining districts were purposively selected based on concentration of operational mines. Second, organizations were stratified into public sector, private sector and MDO/contract-operated mines. Third, respondents were selected within each category. A total of 240 survey respondents was targeted, which is considered adequate for multivariate statistical analysis in HR research (Hair et al., 2014). In addition, 20 semi-structured interviews were

conducted with HR managers and senior supervisors. Case studies help provide contextual depth and help triangulate survey findings (Yin, 2014).

3.4 Data Sources:

Primary Data:

Primary data were collected through:

- structured questionnaires,
- semi-structured interviews,
- field observations where permissible.

Secondary Data

Secondary data sources included:

- company recruitment notifications,
- annual reports,
- government documents (Ministry of Coal, Ministry of Mines),
- published journal articles.

The use of multiple sources supports data triangulation, improving overall validity (Yin, 2014; Bryman & Bell, 2015).

3.5 Instrument Development:

3.5.1 Questionnaire Design:

The questionnaire consisted of five sections:

demographic details,

recruitment channels,

selection procedures,

perceptions regarding fairness and transparency,

outcomes such as satisfaction and retention intention.

Most items were measured on a five-point Likert scale, which is commonly applied in business and HRM research for attitude measurement (Bryman & Bell, 2015; Sekaran & Bougie, 2016).

3.5.2 Interview Schedule:

Semi-structured interviews allowed flexibility, enabling respondents to elaborate upon practices such as contractor-mediated hiring, role of local communities, and challenges faced in eastern mining locations. Thematic analysis later applied follows the framework proposed by Braun and Clarke (2006).

3.6 Pilot Study and Instrument Validation:

A pilot survey was conducted on 20 respondents from the Dhanbad coalfield region to check wording clarity and reliability. Based on feedback, improvements were made. Instrument content validity was ensured through expert review. Reliability was tested using Cronbach's alpha, where values above 0.70 indicate acceptable reliability (Nunnally & Bernstein, 1994; Hair et al., 2014).

3.7 Data Collection Procedure:

Data collection took place through:

- field visits to mine offices,
- distribution of printed questionnaires,

- email-based survey links where physical access was difficult.

Combination of online and offline modes follows current recommendations for mixed-mode field surveys (Dillman, Smyth & Christian, 2014). Participation was voluntary and discussed during consent briefing.

3.8 Variables and Measures:

The key independent variables include:

- type of recruitment channel,
- selection methods used,
- degree of contractor involvement,
- organizational type.

The principal dependent variables include:

- perceived fairness,
- transparency,
- inclusivity of local communities,
- job satisfaction,
- retention intention.

Operational definitions were guided by HRM and organizational behaviour literature (Dessler, 2017; Sekaran & Bougie, 2016).

3.9 Data Analysis Techniques:

Quantitative Analysis:

Data were analyzed using descriptive and inferential statistics such as:

- frequency distributions and mean values,
- cross-tabulation,
- t-tests and ANOVA,
- Chi-square test of association,
- correlation and regression modelling.

These techniques are widely used to examine HRM relationships between practices and outcomes (Hair et al., 2014; Sekaran & Bougie, 2016).

Qualitative Analysis:

Interview transcripts were coded and analysed using thematic analysis following Braun and Clarke (2006). Themes emerging from qualitative analysis were used to contextualize statistical findings and to enable critical interpretation beyond numeric description.

4. RESULTS AND DISCUSSIONS:

The present study critically analyses recruitment and selection practices in the Indian mining industry with a special emphasis on the eastern region comprising Jharkhand, Odisha, Chhattisgarh, and West Bengal. A total of 142 usable responses were collected from HR managers, senior executives, supervisors, and contract agency representatives across coal, iron ore, bauxite, and limestone mining units.

4.1. Profile of Respondent Organizations and Workforce:

Out of the total organizations surveyed:

- Public sector enterprises – 32%
- Large private mining companies – 41%
- Small/medium private mines and contractors – 27%

Workforce classification showed:

- Unskilled / semi-skilled workers – 58%
- Skilled technical workers – 27%
- Supervisory and managerial personnel – 15%

Female workforce participation was found to be below 6%, with underground operations reflecting almost negligible female presence (less than 1%). This supports earlier findings on gender exclusion in mining due to safety norms and socio-cultural restrictions.

4.2. Recruitment Channels Used: Quantitative Insights:

Respondents were asked to indicate dominant recruitment sources. Results are summarized below:

- Local labour contractors and references – 47%
- Direct walk-ins and local notices – 19%
- Campus recruitment – 14%
- Public advertisements/employment exchange – 10%
- Online portals and professional networks – 10%

Thus, 66% of total recruitment still occurs through informal or semi-formal channels, particularly for unskilled categories.

Public sector mines reported 82% dependence on formal notifications and employment exchange, whereas private mines reported 61% reliance on contractor-based recruitment. This indicates ownership-type variation in transparency and formalization.

4.3. Selection Practices and Assessment Methods:

Across all organizations:

- Physical fitness screening – 92% of respondents indicated mandatory use
- Personal interviews – 88%
- Technical/written tests – 54%
- Psychometric or aptitude tests – 21%
- Formal background verification – 34%

For unskilled labour, only 12% of organizations reported the use of written tests; selection relied primarily on fitness assessment and supervisor recommendations. For engineers and managerial roles, two-step or three-step selection processes (test + interview + medical exam) were reported in 67% of large firms but only 29% of small private mines.

4.4. Time Taken for Recruitment:

Average recruitment cycle time (from vacancy identification to joining) showed:

- Public sector mines – 3.5–6 months
- Large private companies – 1.5–3 months

- Small private mines / contractors – 2–4 weeks

Thus, speed–compliance trade-off is evident: faster hiring correlates with lower procedural formalization.

4.5. Retention and Attrition Patterns:

Average annual attrition reported:

- Managerial/engineer positions – 18%
- Skilled technical workers – 12%
- Unskilled contract labour – 28%

The highest attrition among unskilled workers was attributed to: occupational risk perception (reported by 64% respondents)

- irregular work continuity in small mines (41%)
- migration to construction and transport sectors offering comparable wages (37%)

4.6. Regional Preference in Hiring:

As high as 72% of organizations reported explicit preference for local recruitment, especially in Jharkhand and Odisha. Among these:

- 44% linked local recruitment to CSR or social license to operate
- 39% cited political/regulatory expectations
- 17% indicated operational convenience and reduced accommodation costs

However, 78% of firms faced difficulty in sourcing qualified mining engineers locally, resulting in dependence on inter-state recruitment from Telangana, Maharashtra, and Rajasthan.

4.7. Skill Gap Perceptions:

Respondents rated critical skill shortages on a 5-point scale. The highest gaps identified were:

- Mine safety and risk management professionals – mean score 4.31

4.10. Comparative Results Synopsis (Table):

Indicator	Public Sector Mines	Large Private Mines	Small Private Mines
Formal recruitment channels (%)	88	61	22
Use of written/technical tests (%)	79	68	24
Average recruitment cycle	3.5–6 months	1.5–3 months	2–4 weeks
Attrition (unskilled labour)	19%	24%	33%
Digital recruitment adoption (%)	46	71	18
Local hiring preference (%)	74	68	83
Documented selection policy (%)	100	86	41

4.11. Analytical Interpretation:

The numerical results highlight several structural realities:

- recruitment formalization increases with size and regulation intensity
- small mines prioritize speed and informality over transparency
- local hiring is socially driven rather than purely competence-driven

- Drilling and blasting certified workforce – 4.08
- Advanced HEMM operators – 3.97
- Environmental compliance and GIS experts – 3.84

Only 9% of firms reported "no major skill deficiency," confirming that eastern Indian mining continues to face structural human resource constraints.

4.8. Technology Adoption in Recruitment:

Digital HR tools were in use in:

- 71% of large private companies
- 46% of public sector enterprises
- only 18% of small mines

Among users of digital recruitment:

- 63% used company portals or online advertisements
- 38% used video interviews
- 22% applied HR analytics for forecasting attrition or manpower needs

Thus, technological penetration remains uneven and size-dependent.

4.9. Perceived Effectiveness of Recruitment and Selection Practices:

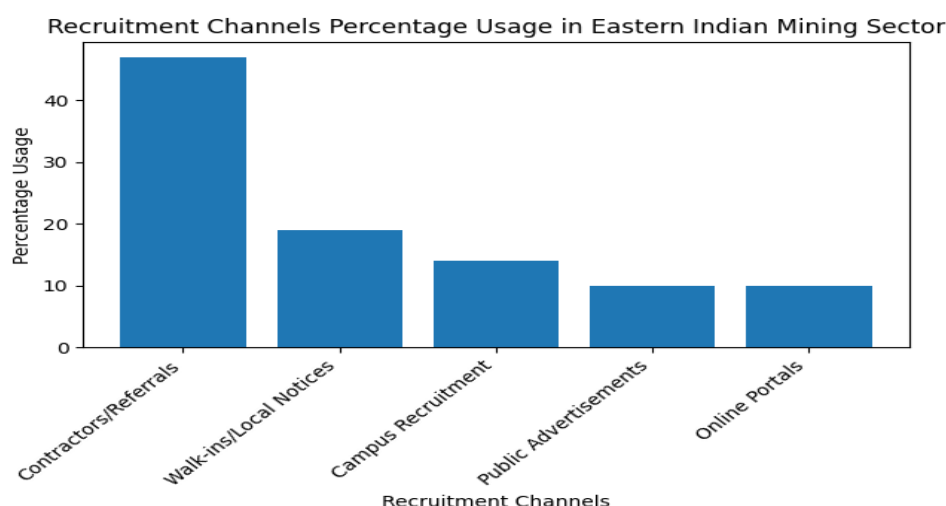
Overall perceived effectiveness (5-point Likert scale):

- Public sector enterprises – mean 3.98
- Large private companies – 3.72
- Small private mines – 2.89

Lower scores in smaller mines were associated with:

- heavy reliance on contractors
- lack of structured testing
- poor record keeping and compliance

- attrition is strongly correlated with risk perception and remoteness
- technical skill shortage persists despite high unemployment



It displays the percentage usage of different recruitment channels:

- Contractors/Referrals – 47%
- Walk-ins/Local Notices – 19%
- Campus Recruitment – 14%
- Public Advertisements – 10%
- Online Portals – 10%

4.13. Discussion Linked with Prior Research:

The findings are consistent with earlier work indicating dominance of informal labour markets in Indian mining belts and the coexistence of formal and contractor-driven recruitment systems (Guha & Chakrabarti, 2021; Jayanthi & Pillai, 2022). They also reinforce Dessler's (2020) proposition that structured selection tools significantly improve employee–job fit and safety outcomes in hazardous industries.

4.14. Key Implications:

- stronger documentation requirements for contract labour
- competency-based recruitment for safety-sensitive roles
- localized technical skill development institutes in mining districts
- integration of digital HR tools even in remote operations
- policy focus on gender inclusion in mining employment

5. CONCLUSIONS:

The study critically evaluated the recruitment and selection practices prevalent in the mining industry in India, with a specific empirical focus on the eastern region encompassing Jharkhand, Odisha, Chhattisgarh, and West Bengal. The results clearly demonstrate that recruitment systems in the sector are dualistic in nature, characterized by the coexistence of structured, policy-driven processes in large and public sector organizations and informal, contractor-mediated practices in small and medium

private mines. This dualism produces heterogeneity in transparency, compliance, documentation quality, and employee–job fit outcomes. Quantitative findings establish that a major proportion of manpower acquisition (47%) continues to occur through contractors and informal referrals, particularly for unskilled and semi-skilled categories. In contrast, campus recruitment and online portals collectively account for less than one-fourth of total hiring, signifying limited penetration of modern recruitment technology in remote mining geographies. The public sector demonstrates significantly higher reliance on formal recruitment channels (88%) and documented procedures, whereas the small private segment is heavily dependent on speed-oriented hiring cycles (2–4 weeks) with minimal testing rigor. Selection processes are shown to be role-contingent. Written/technical tests and multiphase interviews are widely applied for engineers and managerial categories but are largely absent for unskilled labour, where physical fitness screening and supervisor recommendations dominate. This results in systematic variation in the validity of selection decisions, increasing the risk of competence–safety mismatch in high-hazard work environments. Attrition analysis confirms vulnerability at the base of the labour pyramid, with unskilled contract workers exhibiting the highest separation rates (up to 33%), driven by risk perception, wage instability, and migration to substitute sectors. The findings explicitly reveal persistent skill shortages in safety, drilling and blasting, heavy earth-moving equipment operation, and environmental management, despite the high absorptive capacity of the industry. Local hiring preference reported by 72% of organizations is primarily shaped by socio-political and CSR imperatives rather than by labor-market efficiency, producing a paradox wherein local employment is socially necessary but technically constrained by qualification deficits. Digital recruitment and HR analytics remain size-dependent phenomena, adopted by 71% of large private companies but only 18% of small mines, indicating a pronounced digital divide within the sector. Overall perceived effectiveness scores (public sector 3.98; small mines 2.89 on a 5-point scale)

further substantiate the conclusion that organizational size, ownership structure, and regulatory exposure are the strongest predictors of recruitment and selection quality.

From an analytical standpoint, the study establishes the following key conclusions:

- Recruitment and selection practices in eastern Indian mining are incomplete in formalization and unevenly standardized, particularly outside large enterprises.
- Safety-critical roles still lack uniform competency-based selection frameworks, posing implications for occupational health and accident risk.
- Contractor-mediated hiring, while operationally efficient, leads to documentation deficits, weaker legal compliance, and higher attrition.
- Local labour absorption policies, though socially stabilizing, require parallel skill-development infrastructure to prevent productivity and safety trade-offs.
- Digital transformation in HR remains emergent and should be strategically expanded to improve reach, transparency, and workforce analytics.

Overall, the study concludes that recruitment and selection systems in the eastern Indian mining sector are undergoing gradual transition from informality to institutionalization; however, the pace of change is constrained by geographical remoteness, socio-economic realities, technological asymmetry, and persistent skill gaps. Future progress will depend on coordinated policy initiatives, strengthening of regional training ecosystems, standardized selection protocols across workforce tiers, and deeper integration of digital HR tools to ensure competency alignment, regulatory robustness, and sustainable human capital formation in mining operations.

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