

Extractive Governance in Khyber Pakhtunkhwa: Policy, Practice, and Challenges in Mines and Minerals Management

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Abstract

Khyber Pakhtunkhwa (KP), one of Pakistan's most mineral-rich provinces, possesses a diverse range of high-value resources including marble, granite, chromite, coal, limestone, and gemstones. Despite this wealth, the sector's contribution to provincial GDP remains modest, reflecting systemic governance weaknesses, outdated extraction practices, and limited value addition. This paper examines the current state of KP's mining sector through a multi-dimensional analysis encompassing sectoral profiling, governance and policy frameworks, key challenges, best practices, and policy–practice gaps. Drawing on official data, policy documents, and comparative international experiences, the study identifies persistent issues such as non-transparent licensing, weak regulatory enforcement, environmental degradation, and inadequate community benefit-sharing. It also explores opportunities for reform through digital governance tools, industrial cluster development, sustainable mining certifications, and mandatory community development agreements. The paper concludes that bridging the gap between policy aspirations and practical realities requires integrated reforms focused on transparency, technological modernization, environmental stewardship, and equitable economic inclusion. If strategically implemented, these reforms could transform KP's mining sector into a driver of sustainable growth, regional competitiveness, and socio-economic resilience.

Keywords: *Khyber Pakhtunkhwa, Mines and Minerals, Extractive Governance, Policy–Practice GAP, Sustainable Mining, Community Development Agreements, Resource Management.*

Introduction

The extractive sector holds strategic importance for Khyber Pakhtunkhwa (KP), both as a driver of provincial revenue and as a catalyst for local employment, industrialization, and regional development. Endowed with significant reserves of marble, granite, chromite, gemstones, limestone, and coal, KP occupies a prominent position in Pakistan's mineral landscape, contributing substantially to the country's overall mineral production. According to the Mines and Minerals Development Department (MMDD) of KP, the province possesses more than 20 different types of minerals with commercial potential, making mining a sector with high economic promise. However, despite this resource abundance, the contribution of the sector to the provincial GDP remains disproportionately low, largely due to governance weaknesses, technological backwardness, and environmental neglect.

The governance of extractive resources in KP has undergone a structural shift since the 18th Constitutional Amendment (2010), which devolved significant authority over mines and minerals to provincial governments. This transition has enabled KP to design and implement its own Mines and Minerals Policy, regulate licensing, set royalty rates, and attract investment tailored to its geological profile. Nevertheless, this expanded autonomy has also placed a greater responsibility on provincial institutions to ensure transparency, efficiency, and sustainability in mineral resource management. Weak institutional capacity, coupled with overlapping

jurisdictions and limited regulatory enforcement, continues to constrain the sector's optimal development.

Globally, the discourse on extractive governance emphasizes the delicate balance between economic exploitation, environmental stewardship, and social equity. Poorly governed mineral sectors often fall prey to the "resource curse," where resource abundance fails to translate into broad-based economic growth and instead exacerbates inequality, environmental degradation, and institutional fragility. In the context of KP, the challenge lies in transforming mineral wealth into sustainable economic gains without undermining environmental integrity or marginalizing local communities. Mining activities in districts such as Buner, Mohmand, Shangla, Chitral, and Swat have generated employment and revenue, but have also raised concerns over unregulated extraction, unsafe labor conditions, and inadequate post-mining rehabilitation.

This paper examines the policy, practice, and challenges of extractive governance in KP's mines and minerals sector, with a focus on the interplay between provincial regulatory frameworks, institutional capacities, and on-the-ground realities. It seeks to answer three interlinked questions: (1) How effective is KP's governance framework in regulating mineral extraction? (2) What are the major implementation gaps between policy objectives and actual practice? and (3) What reforms can strengthen transparency, sustainability, and value addition in the sector? By addressing these questions, the study aims to provide actionable policy recommendations that can guide the province towards a more accountable and development-oriented extractive sector.

Objectives of the Study

This study aims to:

1. Examine the effectiveness of KP's governance framework in regulating mineral extraction.
2. Identify the gaps between stated policy objectives and actual mining practices.
3. Analyze the institutional, economic, and environmental challenges facing the sector.
4. Propose reforms to enhance transparency, sustainability, and community welfare in mineral governance.

Research Questions

Based on the objectives outlined in the introduction, this study seeks to answer the following key research questions:

1. **Governance Effectiveness**
 - How effective is the current extractive governance framework of Khyber Pakhtunkhwa in regulating the exploration, extraction, and trade of mineral resources?
2. **Policy–Practice Gaps**
 - What are the major gaps between the stated objectives of KP's Mines and Minerals Policy and the actual practices observed on the ground?
3. **Challenges and Constraints**
 - What institutional, economic, environmental, and socio-political challenges hinder the sustainable management of the mining sector in KP?
4. **Opportunities for Reform**
 - What governance reforms and policy interventions can enhance transparency, environmental sustainability, and community benefit-sharing in KP's extractive sector?

Literature Review

Concept of Extractive Governance

Extractive governance refers to the set of policies, institutions, and practices that regulate the exploration, extraction, processing, and distribution of mineral and other natural resources (Hilson & Maconachie, 2020). Effective governance in the extractive sector requires balancing economic, environmental, and social objectives to ensure that resource wealth contributes to long-term development rather than short-term gains. This is particularly crucial in mineral-rich developing regions, where governance frameworks are often tested by political pressures, market volatility, and capacity constraints. The World Bank (2017) emphasizes that strong governance in extractive industries hinges on transparency, fair licensing systems, environmental safeguards, and benefit-sharing mechanisms with local communities.

Theoretical Foundations

Resource Curse Theory

The Resource Curse Theory, popularized by Auty (1993) and further developed by Sachs and Warner (1995), posits that countries and regions with abundant natural resources often experience slower economic growth and weaker governance outcomes compared to resource-poor counterparts. This paradox is linked to factors such as overreliance on resource rents, institutional corruption, and neglect of other productive sectors. In the context of KP, while resource wealth offers significant potential, ineffective governance risks perpetuating underdevelopment and environmental degradation.

Sustainable Resource Management Framework

Sustainable resource management (SRM) offers a counterpoint by emphasizing the integration of environmental protection, social equity, and economic viability in resource exploitation (Bringezu et al., 2016). Under SRM principles, mining activities should incorporate life-cycle planning, responsible waste management, and post-mining land rehabilitation. For KP, adopting SRM practices could mitigate environmental damage from unregulated extraction in areas such as Buner and Mohmand while enhancing long-term sectoral sustainability.

Institutional Theory

Institutional Theory underscores the role of formal rules, informal norms, and organizational capacities in shaping sectoral performance (North, 1990). In extractive governance, institutional effectiveness determines the ability to implement policy, regulate industry practices, and manage conflicts among stakeholders. The institutional environment in KP's mining sector is characterized by both opportunities—due to provincial autonomy post-18th Amendment—and challenges, such as bureaucratic inefficiency, overlapping mandates, and insufficient technical expertise.

Global Perspectives on Mineral Governance

Case studies from resource-rich developing countries offer relevant lessons for KP. For example, Botswana's diamond sector demonstrates how strong institutions and transparent revenue management can turn resource wealth into sustained economic growth (Acemoglu, Johnson, & Robinson, 2003). In contrast, artisanal gold mining in parts of Sub-Saharan Africa illustrates the risks of unregulated extraction, including environmental degradation, hazardous labor conditions, and revenue losses due to smuggling (Hilson, 2009). These comparative experiences highlight that governance, rather than resource abundance alone, determines developmental outcomes.

Pakistan's National and Provincial Mineral Policy Context

Pakistan's National Mineral Policy (NMP) outlines a framework for sectoral development, emphasizing investment facilitation, value addition, environmental safeguards, and community welfare. Following the 18th Amendment to the Constitution in 2010, provinces gained substantial control over mineral resources, enabling the development of region-specific policies. The KP Mines and Minerals Policy seeks to enhance transparency, modernize mining operations, and attract private investment. However, studies (e.g., Shah, 2021; Khan & Ali, 2020) suggest that gaps in enforcement, weak monitoring mechanisms, and a lack of technological innovation hinder the policy's full realization.

Relevance to the KP Context

The literature underscores that KP's extractive sector operates at the intersection of resource potential and governance constraints. While the province possesses significant mineral wealth, the translation of this endowment into sustainable development outcomes depends on strengthening governance capacity, ensuring policy–practice coherence, and adopting environmentally responsible mining techniques. This paper builds on these insights by examining the real-world performance of KP's mineral governance framework, identifying implementation bottlenecks, and recommending reforms that align with global best practices.

Sectoral Overview in Khyber Pakhtunkhwa

Khyber Pakhtunkhwa (KP) is endowed with a rich and diverse mineral base, making it one of the most resource-rich provinces in Pakistan. The province's geological formations host a variety of high-value minerals, including marble, granite, chromite, limestone, gypsum, gemstones (such as emeralds, rubies, and sapphires), coal, and dimension stones. According to the KP Mines and Minerals Development Department (MMDD, 2023), more than **20 distinct mineral types** have been identified with substantial commercial potential, positioning the sector as a strategic driver for economic growth, industrial development, and export diversification.

Mineral Resource Profile

- **Marble and Granite** – KP is a leading producer of marble, with significant deposits in Buner, Swabi, Mohmand, and Mardan. The province's "Ziarat White" marble is particularly renowned in domestic and international markets. Granite deposits are concentrated in Mansehra and Swat.
- **Chromite** – Found mainly in Mohmand, Malakand, and Chitral, KP's chromite is of high metallurgical grade and is exported for use in the steel and refractory industries.
- **Gemstones** – KP is famous for precious stones, including emeralds from Swat, rubies from Kohistan, and aquamarine from Gilgit-adjacent areas of Upper KP. These contribute to artisanal mining livelihoods.
- **Coal** – Deposits are found in Hangu, Karak, and Dara Adam Khel, with medium to low calorific value, mostly used for cement, brick kilns, and local industries.
- **Industrial Minerals** – These include limestone, gypsum, feldspar, and phosphate, which serve as key raw materials for cement, ceramics, and fertilizers.

Geographic Distribution

The province's mineral wealth is unevenly distributed, with specific districts emerging as mining hubs:

- **Buner, Mohmand, Swabi** – Marble and limestone extraction centers.
- **Mansehra, Swat** – Granite, dimension stones, and precious stones.
- **Chitral, Malakand** – Chromite and semi-precious stones.
- **Karak, Hangu, Kohat** – Coal and gypsum mining areas.
- **Kohistan** – Rubies and rare gemstones.

Production Trends

Statistical data from the KP Development Statistics (2023) indicates that marble and limestone dominate extraction volumes, followed by chromite and coal. While production of marble has steadily increased over the last decade due to domestic construction demand, chromite output has fluctuated in response to global price volatility. Gemstone production remains largely undocumented due to the prevalence of informal and artisanal mining, which operates outside formal licensing systems.

Mineral	Annual Production (approx. 2022)	Key Districts
Marble	4.2 million metric tons	Buner, Mohmand, Swabi, Mardan
Limestone	3.8 million metric tons	Kohat, Nowshera, Swabi
Chromite	0.28 million metric tons	Mohmand, Chitral, Malakand
Coal	0.92 million metric tons	Karak, Hangu, Kohat
Granite	0.12 million metric tons	Mansehra, Swat
Gemstones	Data unavailable (informal)	Swat, Kohistan, Chitral

Source: KP Mines and Minerals Development Department, 2023; KP Bureau of Statistics.

Structure of the Mining Industry

The mining sector in KP is dominated by small-scale and artisanal mining operations, accounting for over **70%** of licensed activity. Mechanized mining remains limited due to high capital costs, lack of skilled operators, and inadequate infrastructure in mining regions. Most mineral exports leave the province in raw or minimally processed form, resulting in limited value addition and lost economic potential. Downstream industries—such as marble processing plants and gemstone cutting centers—are present but underdeveloped.

Contribution to the Economy

Despite its rich mineral endowment, the sector's contribution to KP's GDP is estimated at less than **2%**, reflecting governance bottlenecks, outdated technology, and insufficient investment. However, the sector plays a significant role in local employment, with thousands engaged in quarrying, mineral transportation, and small-scale processing.

Governance and Policy Framework

Institutional Setup

The governance of the mining sector in Khyber Pakhtunkhwa (KP) is primarily the responsibility of the **Mines and Minerals Development Department (MMDD)**, which oversees licensing, regulation, royalty collection, and enforcement of mining laws. The department operates through district-level Mining Offices, which manage field inspections, safety compliance, and coordination with local administrations.

Post-18th Constitutional Amendment (2010), the **provincial government** acquired exclusive authority over mines and minerals within its boundaries, enabling KP to develop tailored regulations and policies suited to its geological potential. In addition to MMDD, other relevant actors include:

- **Environmental Protection Agency (EPA-KP)** — responsible for environmental compliance and impact assessments.
- **Board of Revenue** — manages land-related issues in mining leases.
- **Directorate General Mines Safety & Health** — monitors occupational safety standards, though its operational capacity remains limited.

Legislative and Policy Framework

The primary legal instruments governing the sector include:

- **Khyber Pakhtunkhwa Mines and Minerals Development and Regulation Act, 2017** — establishes licensing procedures, royalty rates, and penalties for violations.
- **KP Mines and Minerals Policy, 2020** — sets the strategic vision for sector development, emphasizing modernization, transparency, and sustainable practices.
- **KP Mineral Concession Rules** — outline detailed provisions for prospecting, exploration, and mining leases.

The KP Mines and Minerals Policy (2020) is guided by three strategic pillars:

1. **Resource Efficiency** — promoting modern extraction technologies to reduce wastage and improve yield.
2. **Sustainable Development** — integrating environmental safeguards and community benefit-sharing into mining operations.
3. **Investment Facilitation** — creating a competitive business environment to attract domestic and foreign investment.

Licensing and Royalty System

Mining rights in KP are granted through various types of licenses, including Reconnaissance Licenses (RL), Prospecting Licenses (PL), and Mining Leases (ML). The licensing process involves technical evaluation, environmental impact assessments (EIA), and security clearances. Royalty rates vary by mineral type—for example, marble is subject to a fixed per-ton rate, while chromite and gemstones are taxed based on market value.

However, studies indicate that the licensing system suffers from **delays, discretionary decision-making, and limited transparency**, creating barriers to investor confidence. Digital licensing initiatives are in the early stages, with pilot projects for online applications and royalty payment tracking.

Role of Provincial Autonomy

Provincial autonomy has empowered KP to design policies reflecting its local priorities, but it has also introduced **capacity challenges**. While the MMDD now has full legislative authority, the transition has exposed gaps in technical expertise, institutional coordination, and enforcement mechanisms. For instance, the overlap between district administrations, the police, and MMDD field staff often complicates enforcement against illegal mining.

Gaps in Governance Practices

Despite policy reforms, implementation remains weak due to:

- **Limited institutional capacity** — shortage of geologists, inspectors, and legal experts.
- **Weak enforcement** — illegal mining continues in districts like Mohmand and Buner despite regulatory crackdowns.
- **Inconsistent monitoring** — environmental regulations are often bypassed, particularly in small-scale and artisanal operations.
- **Poor inter-agency coordination** — lack of data-sharing between MMDD, EPA, and revenue authorities hampers integrated decision-making.

Alignment with International Standards

KP's policy framework partially aligns with global best practices such as the **Extractive Industries Transparency Initiative (EITI)** principles, which advocate for revenue transparency, public disclosure of contracts, and participatory governance. However, full compliance would require reforms in data transparency, environmental auditing, and community engagement processes.

Key Challenges

Despite significant mineral wealth and recent policy reforms, the mining sector in Khyber Pakhtunkhwa (KP) continues to face structural, institutional, and socio-environmental challenges that hinder its sustainable development. These challenges are multi-dimensional, spanning governance weaknesses, economic inefficiencies, environmental risks, and community concerns.

Institutional and Governance Challenges

- **Weak Regulatory Enforcement** – Although the Mines and Minerals Development Department (MMDD) has legal authority over mining activities, its enforcement capabilities are limited by insufficient staffing, inadequate field presence, and a lack of modern monitoring systems.
- **Prevalence of Illegal Mining** – Unlicensed extraction, particularly of marble, chromite, and gemstones, remains widespread in districts such as Buner, Mohmand, and Swat. Illegal mining leads to revenue losses, unsafe working conditions, and accelerated environmental degradation.
- **Bureaucratic Delays** – Lengthy and non-transparent licensing procedures discourage legitimate investors and create opportunities for rent-seeking.
- **Overlap of Jurisdictions** – Confusion between the mandates of the MMDD, local administrations, and law enforcement agencies often leads to ineffective action against regulatory violations.

Technological and Operational Limitations

- **Outdated Mining Methods** – A large proportion of mining is conducted using traditional blasting techniques, leading to high wastage rates, poor quality control, and safety hazards.
- **Lack of Mechanization** – Mechanized quarrying and mineral processing facilities are scarce, resulting in low productivity and limited value addition.
- **Insufficient Geological Data** – While KP is mineral-rich, the absence of updated, detailed geological surveys hinders informed investment and sustainable exploitation planning.

Economic and Market Constraints

- **Low Value Addition** – Most minerals, particularly marble, granite, and gemstones, are exported in raw or semi-processed form, depriving the province of higher value chain benefits.
- **Price Volatility** – Global price fluctuations for minerals like chromite and coal affect the stability of sector revenues and investor interest.
- **Limited Access to Finance** – Small-scale miners and local entrepreneurs face difficulties securing affordable financing for technology upgrades and expansion.

Environmental and Social Issues

- **Environmental Degradation** – Unregulated mining often leads to deforestation, soil erosion, and water pollution, particularly in ecologically sensitive areas such as Swat and Chitral.
- **Absence of Rehabilitation Plans** – Post-mining land restoration is rare, leaving behind hazardous pits and degraded landscapes.
- **Occupational Health and Safety Risks** – Miners, especially in small-scale operations, face unsafe working conditions, inadequate protective equipment, and limited access to health facilities.
- **Community Displacement and Conflicts** – In some mining areas, disputes arise over land rights, royalty sharing, and environmental damage, leading to tensions between local communities and mining operators.

Political Economy and Corruption

- **Rent-Seeking Practices** – Political interference and corruption in licensing, royalty collection, and enforcement undermine sector credibility.
- **Elite Capture of Mining Benefits** – Benefits from lucrative mining operations often accrue to politically connected individuals rather than local communities.
- **Resistance to Reform** – Stakeholders benefiting from the status quo often resist governance reforms, particularly those involving transparency and accountability.

These challenges highlight the urgent need for an integrated governance approach that addresses institutional weaknesses, fosters technological modernization, safeguards the environment, and ensures equitable benefit-sharing.

Best Practices and Opportunities

While Khyber Pakhtunkhwa's (KP) mining sector faces substantial challenges, several best practices from both domestic and international contexts offer a blueprint for sustainable, transparent, and economically productive extractive governance. By adapting these lessons, KP can unlock the latent potential of its mineral wealth, create local economic opportunities, and mitigate environmental and social risks.

International Best Practices

a) Transparent Licensing and Contract Disclosure: Countries such as Botswana and Chile have established transparent, competitive bidding processes for mining rights, coupled with public disclosure of contracts and royalty arrangements. These practices not only improve investor confidence but also reduce opportunities for corruption. Implementing similar digital transparency systems in KP could enhance accountability and attract quality investors.

b) Resource Revenue Management Funds: Norway's Sovereign Wealth Fund is a prime example of using extractive revenues for long-term national benefit. While KP's scale is smaller, a provincial "Mineral Development Fund" could allocate a portion of royalties toward infrastructure, education, and health projects in mining-affected areas.

c) Community Development Agreements (CDAs): In Ghana and Papua New Guinea, CDAs are legally binding agreements between mining companies and local communities to ensure benefit-sharing, local hiring, and environmental safeguards. Formalizing CDAs in KP could address community grievances and promote inclusive development.

Domestic Success Stories

a) Punjab's Marble City Project: Punjab's specialized marble processing cluster near Mohmand demonstrates how industrial zones linked to mining areas can generate value addition, improve quality control, and boost exports. KP could replicate this model in Buner or Swabi for marble and granite, integrating processing, packaging, and marketing facilities.

b) Sindh Coal Mining Public-Private Partnership Model: The Thar Coal Project's PPP framework, combining government oversight with private sector efficiency, offers a scalable model for large-scale projects in KP, especially for chromite and limestone processing plants.

Opportunities for KP

Technology Transfer and Modernization

- Importing advanced cutting, polishing, and mechanized quarrying equipment through tax incentives.
- Establishing partnerships with countries like Italy (marble industry) and Thailand (gemstone processing) for skill development.

a) Sustainable Mining Certifications

Obtaining certifications such as Fairmined or ISO 14001 can help KP miners access premium export markets while ensuring compliance with environmental and labor standards.

b) Industrial Clusters and Mineral Parks

Creating dedicated mineral-based industrial zones can stimulate downstream industries such as tile manufacturing, stone carving, jewelry making, and cement production.

c) Digitalization of Governance

Fully digitizing licensing, royalty payments, and monitoring could reduce bureaucratic delays and corruption, while providing real-time data for policy planning.

d) Skill Development and Vocational Training

Partnering with technical institutes and universities to train local youth in geological surveying, safety protocols, and mineral processing can create a skilled workforce and reduce dependency on external labor.

Environmental and Social Opportunities

a) Rehabilitation and Reforestation Programs

Mandating post-mining land restoration and integrating reforestation programs could mitigate environmental damage and create green jobs in affected districts.

b) Local Enterprise Development

Encouraging small and medium enterprises (SMEs) in transport, equipment maintenance, and catering for mining operations can spread economic benefits across communities.

Leveraging these best practices and opportunities requires a strategic shift in KP's extractive governance—from a predominantly extractive approach to one that prioritizes value addition, sustainability, and inclusive growth.

Policy–Practice Gaps in KP's Mining Sector

While the Khyber Pakhtunkhwa Mines and Minerals Policy (2020) outlines an ambitious framework for modernization, transparency, and sustainable development, there is a significant disconnect between these policy aspirations and actual implementation on the ground. This section highlights the major gaps observed in translating policy into practice.

Transparency and Licensing

Policy Commitment:

The policy emphasizes **transparent, merit-based licensing** through competitive bidding and digital applications.

Practice Gap:

Licensing remains paper-based in most districts, with limited public disclosure of award criteria and contract terms. Field evidence suggests that personal connections and political influence still play a role in the allocation of mining rights, undermining investor confidence and creating barriers for new entrants.

Technology Modernization

Policy Commitment:

Adoption of modern quarrying and processing technologies to reduce wastage and improve quality.

Practice Gap:

The majority of mining operations, especially in marble and coal, continue to rely on outdated blasting methods. Mechanization incentives have not been fully implemented, and small-scale miners lack both capital and technical training to adopt advanced equipment.

Environmental Safeguards

Policy Commitment:

Mandatory Environmental Impact Assessments (EIAs) and strict compliance monitoring.

Practice Gap:

EIAs are often treated as a **formality** rather than a substantive safeguard. In many small-scale operations, environmental regulations are bypassed entirely, leading to unchecked deforestation, river siltation, and land degradation. Post-mining rehabilitation is rare, despite being a stated policy requirement.

Community Engagement and Benefit-Sharing

Policy Commitment:

Active engagement of local communities and equitable distribution of mining benefits.

Practice Gap:

Royalty payments to local governments are irregular, and formal Community Development Agreements (CDAs) are not institutionalized. This gap fuels community resentment, particularly in areas where mining disrupts livelihoods or damages agricultural land.

Institutional Coordination

Policy Commitment:

Integrated coordination between the MMDD, Environmental Protection Agency (EPA), Board of Revenue, and law enforcement.

Practice Gap:

Agencies often operate in **silos**, with limited information-sharing and overlapping jurisdictions. This fragmentation hampers effective enforcement against illegal mining and environmental violations.

Value Addition and Industrial Linkages

Policy Commitment:

Encourage **downstream industries** such as marble processing plants, gemstone cutting centers, and cement manufacturing.

Practice Gap:

Over **80% of KP's minerals** are exported in raw form, with minimal local processing. Industrial cluster development has been slow, and incentives for private investment in value-added facilities remain unclear.

Monitoring and Data Management

Policy Commitment:

Establish a **comprehensive mineral database** and digital monitoring systems.

Practice Gap:

Data on production volumes, royalty collections, and environmental compliance is **fragmented, outdated, and inaccessible** to the public. This lack of transparency limits evidence-based policymaking.

Summary Table: Policy vs. Practice

Policy Pillar	Policy Commitment	Practice Gap
Licensing	Digital, competitive, transparent bidding	Paper-based, discretionary awards
Technology	Modern quarrying & processing	Outdated methods, low mechanization
Environmental Protection	Mandatory EIAs & rehabilitation	Weak enforcement, rare restoration

Policy Pillar	Policy Commitment	Practice Gap
Community Engagement	Benefit-sharing & CDAs	Informal, inconsistent payments
Institutional Coordination	Integrated inter-agency approach	Fragmented, overlapping roles
Value Addition	Promote downstream industries	High raw exports, low processing
Monitoring & Data	Centralized digital database	Incomplete, inaccessible data

Recommendations

Addressing the policy–practice gaps in Khyber Pakhtunkhwa’s mining sector requires a multi-pronged reform strategy that strengthens institutional capacity, fosters technological modernization, ensures environmental sustainability, and guarantees equitable community benefit-sharing. The following recommendations are derived from the challenges identified in Section 5, best practices outlined in Section 6, and policy gaps discussed in Section 7.

Strengthen Transparency and Accountability

- **Digital Licensing Portal:** Fully implement an online licensing and renewal system with **publicly accessible records** of awarded contracts, royalty rates, and licensee performance.
- **Third-Party Audits:** Mandate annual independent audits of licensing processes and royalty collection to minimize corruption.
- **Contract Disclosure:** Publish all major mining contracts and concessions to align with **EITI** standards.

Modernize Mining Practices

- **Technology Upgradation Incentives:** Provide tax breaks or low-interest loans to miners adopting **mechanized quarrying, cutting, and processing equipment**.
- **Technical Training Programs:** Partner with technical institutes to offer **short courses in modern mining techniques**, safety protocols, and quality control.
- **Cluster-Based Industrial Zones:** Develop **marble and gemstone industrial parks** in mining hubs such as Buner and Swat, integrating extraction, processing, and marketing facilities.

Enhance Environmental Management

- **Strict EIA Enforcement:** Make **Environmental Impact Assessment compliance** a **precondition** for license issuance and renewal.
- **Rehabilitation Bonds:** Require companies to deposit **reclamation bonds** before mining starts, refundable upon verified land restoration.
- **Green Mining Practices:** Promote water recycling, dust suppression systems, and reforestation in mining zones.

Institutional Reforms

- **Inter-Agency Coordination Mechanism:** Establish a **Provincial Mining Coordination Council** to align the activities of MMDD, EPA, Board of Revenue, and local governments.
- **Capacity Building:** Recruit geologists, mining engineers, and environmental inspectors to strengthen regulatory enforcement.

- **Decentralized Monitoring Units:** Set up **district-level monitoring cells** with GPS-enabled inspection systems for real-time tracking.

Promote Community Engagement and Benefit-Sharing

- **Community Development Agreements (CDAs):** Make CDAs a **legal requirement** for medium- and large-scale mining projects, ensuring local hiring, infrastructure investment, and fair royalty distribution.
- **Local Enterprise Support:** Facilitate SMEs in service sectors linked to mining (transport, equipment maintenance, catering) through microcredit and training programs.

Improve Data and Market Access

- **Integrated Mineral Database:** Create a **centralized digital repository** of geological surveys, production statistics, royalty collections, and environmental compliance records.
- **Market Intelligence Unit:** Establish a provincial body to monitor global mineral price trends, demand forecasts, and export opportunities.
- **Certification and Branding:** Support exporters in obtaining **sustainability certifications** (e.g., Fairmined) and branding KP marble and gemstones for premium markets.

Foster Value Addition and Export Competitiveness

- **Processing Before Export Policy:** Introduce a phased policy requiring **local processing of certain minerals** before export.
- **Export Promotion:** Organize trade fairs, business-to-business linkages, and participation in **international mining expos** to connect KP producers with global buyers.
- **Innovation Grants:** Offer competitive grants for R&D in gemstone cutting, marble finishing, and eco-friendly extraction technologies.

Implementation of these recommendations requires strong political will, consistent funding, and active participation from both the private sector and local communities. If executed strategically, they can transform KP's mineral wealth from a source of fragmented rents into a sustainable engine of provincial economic growth.

Conclusion

Khyber Pakhtunkhwa's mining sector holds immense potential to drive economic diversification, create employment opportunities, and contribute to sustainable development. The province is endowed with a rich variety of minerals — from marble and granite to chromite and gemstones yet its contribution to the provincial GDP remains disproportionately low. The analysis in this paper reveals that the gap between policy intentions and practical realities is rooted in structural governance weaknesses, outdated mining practices, limited value addition, and inadequate environmental and social safeguards.

While the **Khyber Pakhtunkhwa Mines and Minerals Policy (2020)** provides a progressive blueprint, its effective implementation requires a decisive shift towards transparency, technological modernization, environmental stewardship, and community engagement. Lessons from both domestic and international best practices demonstrate that sustainable extractive governance is achievable when there is political will, institutional coordination, and stakeholder inclusion.

Bridging the policy–practice divide will necessitate the full digitalization of licensing processes, mandatory benefit-sharing agreements with communities, robust environmental regulation enforcement, and targeted investment in value-added industries. If these reforms are pursued systematically, KP can transform its mining sector from an underperforming extractive economy into a model of sustainable and inclusive resource governance, ensuring that its mineral wealth benefits both present and future generations.

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