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Research Paper

Mineral Resources and Economic Development in Pakistan: A Sectoral Analysis

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Abstract

Pakistan has an estimated $6 trillion worth of copper, gold, coal, chromite, antimony, and rare earth elements, among other minerals. However, the mineral sector contributes merely 2-3% to GDP and remains far below its potential. Applying the "Resource Curse" framework, this paper investigates the paradox of Pakistani mineral wealth and points to institutional quality as the key factor that shapes whether mineral endowments catalyze inclusive and sustainable development. Based on national policy documents, provincial regulatory frameworks, mineral production data, and recent literature, the study identifies weak governance, fragmented federal-provincial coordination, security challenges, limited technological capability, poor geological data, and exclusion of local communities as key bottlenecks to constraining the sectoral performance. Disparities across the provinces, inadequate revenue-sharing arrangements, and political uncertainty are additional factors deterring foreign and domestic investment. Analysis indicates that, if supported by better governance structures, stronger Public–Private Partnerships (PPPs), and greater security, exports of minerals can increase from $3 billion to $6–8 billion per annum, while growth in GDP can rise from approximately 3% to 5–6% over the next few years. A number of large-scale projects, including the Reko Diq project, illustrate potential export earnings, fiscal revenues, employment generation, and regional development. These, however, need to come with associated environmental safeguards, transparent institutional mechanisms for fair benefit distribution to the local communities. The study concludes that transforming mineral wealth into long-term economic gains demands coordinated national governance, value-added mineral processing, investor-friendly reforms, and inclusive development frameworks. Strengthening institutional quality is, therefore, essential for converting Pakistan's mineral endowments from a latent resource curse into a sustainable economic opportunity.

Introduction

Natural resources are generally considered fundamental components of economic well-being, providing opportunities for fiscal revenue, exports, and industrial development. Amid developments like energy transitions, Artificial Intelligence (AI), Electric Vehicles (EVs), and high-tech military equipment, mineral resources have gained enormous importance for their use in advanced technologies. However, many resource-rich countries have not been successful in benefiting from their natural resources to achieve inclusive and sustained economic development. This phenomenon is termed as the "Resource Curse" paradox.[1] The paradox of resource wealth has remained a key point of discussion among policymakers and economists. One prominent example is the "Dutch Disease" which originated with the discoveries of huge gas and oil reservoirs in the North Sea, and the rise of exports in this sector resulted in the reduction of exports in manufacturing and agricultural sectors of Netherlands.[2]

With the passage of time, along with other factors, the role of institutional quality and governance have emerged as fundamental factors in determining why resource wealth promotes prosperity in some countries but does not appear to be playing a similar role in other resource-rich countries.[3] The World Bank defines institutional quality by certain indicators such as rule of law, regulatory quality, control of corruption, government effectiveness, voice and accountability, and political stability and absence of terrorism.[4] Recent studies have shown that factors like strong institutions, policy diversification and digital governance tools can help in turning resources from being "curse" to "blessing" by lowering the risks of rent-seeking.[5] Hence, mineral wealth alone is not enough for economic development, rather institutional capacity, governance outlines, and diversified policies also play significant role in development of a country.[6] Pakistan is a mineral-rich nation, but it has

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[1] Sachs, Jeffrey D., and Andrew Warner. "Natural resource abundance and economic growth." (1995).
[2] Pegg, Scott. "Is there a Dutch disease in Botswana?." *Resources Policy* 35, no. 1 (2010): 14-19.
[3] Mehlum, Halvor, Karl Moene, and Ragnar Torvik. "Institutions and the resource curse." *The economic journal* 116, no. 508 (2006): 1-20.
[4] World Bank. 2025. "Worldwide Governance Indicators." Accessed October 17, 2025. https://www.worldbank.org/en/publication/worldwide-governance-indicators.
[5] Sharma, Chandan, and Sudharshan Reddy Paramati. "Resource curse versus resource blessing: New evidence from resource capital data." *Energy Economics* 115 (2022): 106350.
[6] Ploeg, Frederick van der. "Natural resources: curse or blessing?." *Journal of Economic literature* 49, no. 2 (2011): 366-420.

not yet fully benefited from these resources because of poor infrastructure, poor governance, insufficient technology, and security issues in mineral-bearing areas.

Problem Statement

This paper contextualises the economic potential and governance challenges of the mineral sector in Pakistan within a conceptual, empirical, and policy-oriented framework

Methodology

This study examines how institutional factors influence the relationship between mineral wealth and economic development in Pakistan. A clear understanding of how governance structures, security environment, and government effectiveness shape economic outcomes is essential for the formulation of comprehensive and effective policies. Beginning with an overview of the country's mineral wealth, production profile, and sectoral performance, it goes on to provide a detailed presentation of metallic, industrial, and energy minerals as well as a mapping of provincial resource distribution. The sections that follow assess the evolution of mineral policies and institutional frameworks in Pakistan, highlighting governance complexities arising after the 18th Constitutional Amendment and concerns related to coordination between the provinces and the Center. The subsequent analysis studies the debate on the resource curse, mediating role of institutional quality, the implication of security, inequality, and distributional policies for inclusive mineral-based development.

The paper also reviews mineral exports in Pakistan, the potential contribution of value addition at the processing stage, and environmental implications of mining activities. Following this, a SWOT analysis summarizes strengths, weaknesses, opportunities, and threats within the sector before closing with targeted policy recommendations.

Overview of Pakistan’s Mineral Sector

Pakistan has about 92 known mineral resources. Currently, 52 of these are being commercially mined. These deposits are spread over roughly six million square kilometers. Pakistan has strong

reserves of copper, gold, coal, Rare Earth Elements (REEs) and gemstones.[7] Annual mineral production is around 68.52 million metric tons, with an overall estimated value of nearly US $6 trillion.[8] Annual revenue from these resources is around $2 billion and expected to grow to $8 billion by 2030.[9] Although approximately 5,000 mines are currently operational in Pakistan, the mineral sector contributes only 2–3% to the country's GDP.[10] This may be attributed to certain factors. For instance, there is an absence of adequate infrastructure and technological facilities, weak institutional performance in the mineral rich provinces i.e., Khyber Pakhtunkhwa (KP) and Balochistan that account for more than half of the total mineral resources of the country, and finally insufficient foreign and domestic investments in the sector.

Natural Resource Wealth and Economic Development

Different studies have presented various aspects of the relationship between natural resource wealth with economic development. For instance, Sachs and Warner (1995, 1997, 2001),[11] examine the relationship of resource abundance with that of economic growth. They found that abundance of resources is negatively correlated with economic growth hence endorsing the resource curse hypothesis. They suggest that resource dependence promotes rent-seeking and lead towards Dutch disease. In addition, institutional quality or governance quality has also been discussed widely as a mediating factor between natural resources and economic development. For illustration, according to Mehlum et al. (2006),[12] natural resources are not innately a curse but they become so when institutions behave in favor of powerful elite to extract those resources and do

[7] Altaf Moti, "Pakistan's Trillion-Dollar Treasure: The Promise And Peril Of Rare Earth Minerals – OpEd," *Eurasia Review*, April 23, 2025, https://www.eurasiareview.com/23042025-pakistans-trillion-dollar-treasure-the-promise-and-peril-of-rare-earth-minerals-oped/

[8] Altaf Moti, "Pakistan's Trillion-Dollar Treasure: The Promise And Peril Of Rare Earth Minerals – OpEd," *Eurasia Review*, April 23, 2025, https://www.eurasiareview.com/23042025-pakistans-trillion-dollar-treasure-the-promise-and-peril-of-rare-earth-minerals-oped/.

[9] Altaf Moti, "Pakistan's Trillion-Dollar Treasure: The Promise And Peril Of Rare Earth Minerals – OpEd," *Eurasia Review*, April 23, 2025, https://www.eurasiareview.com/23042025-pakistans-trillion-dollar-treasure-the-promise-and-peril-of-rare-earth-minerals-oped/.

[10] Khan, Naqib Ullah, Peng Zhongyi, Asad Ullah, and Muhammad Mumtaz. "A comprehensive evaluation of sustainable mineral resources governance in Pakistan: An analysis of challenges and reforms." *Resources Policy* 88 (2024): 104383.

[11] Sachs, Jeffrey D., and Andrew Warner. "Natural resource abundance and economic growth." (1995).
Sachs, Jeffrey D., and Andrew M. Warner. "The curse of natural resources." *European economic review* 45, no. 4-6 (2001): 827-838.

[12] Mehlum, Halvor, Karl Moene, and Ragnar Torvik. "Institutions and the resource curse." The economic journal 116, no. 508 (2006): 1-20.

not contribute to productive economic activities. Yet, natural resources can enhance economic growth and development when institutions become “producer friendly”.

Boschini et al. (2007)[13] states that the interaction between resource type and institutional quality defines the outcome. Good institutions help countries to use resource wealth for development advantages. In this regard, Ploeg (2011)[14] gathers literature which supports the notion that resource management strategies, fiscal policy, and institutional quality collectively describe why some countries are able to turn the resource curse into resource blessing and other countries do not.

Recent studies have explained the significance of institutional quality in more detail, for instance, Entele (2021)[15] discovers how strong institutions and the growth of Information and Communication Technology (ICT) services can help countries with rich resources avoid the resource curse. This study shows that ICT improves transparency, accountability, and efficiency, thus reducing rent-seeking and corruption. The findings recommend that institutional establishment coupled with digital governance reforms is important for transforming resource wealth into sustainable economic development. On the other hand, instead of using traditional resource rent measures, Sharma and Paramati (2022)[16] found that if resource wealth is successfully transformed into productive capital, it may act as a resource blessing rather than a curse. They also highlight the impact of institutional quality in defining whether resources prevent or encourage long-term economic growth.

Narh (2023)[17] criticizes the conventional measure of institutional quality with more general indicators such as corruption scores and rule of law, and states that these are too broad and cannot explain the outcome completely. This study recommends that there should be actual institutional measures, including binding long-term development plans, governance, environmental regulations and systems for just distribution of rents. Otherwise, there would be corruption, conflict and rent-

[13] Boschini, Anne D., Jan Pettersson, and Jesper Roine. "Resource curse or not: A question of appropriability." *Scandinavian Journal of Economics* 109, no. 3 (2007): 593-617.

[14] Ploeg, Frederick van der. "Natural resources: curse or blessing?." *Journal of Economic literature* 49, no. 2 (2011): 366-420.

[15] Entele, Birku Reta. "Impact of institutions and ICT services in avoiding resource curse: lessons from the successful economies." *Heliyon* 7, no. 2 (2021).

[16] Sharma, Chandan, and Sudharshan Reddy Paramati. "Resource curse versus resource blessing: New evidence from resource capital data." *Energy Economics* 115 (2022): 106350.

[17] Narh, John. "The resource curse and the role of institutions revisited." *Environment, Development and Sustainability* 27, no. 4 (2025): 8187-8207.

seeking in the areas with resource wealth thus, it will lead to a resource curse environment. Pakistan's minerals sector is far behind international standards, with deficiencies in transparency and regulations (Qi et al., 2023).[18]

Similarly, the central role of governance and institutional quality has been discussed substantially. For instance, Nyandwe et al. (2024)[19] studies the role of institutional quality for economic development in resource rich Sub-Saharan Africa, and find that institutional and governance frameworks are vital for guaranteeing that minerals contribute to sustainable development. Moreover, Zhang et al. (2024)[20] demonstrates that in South Asia natural resource rents have negative or negligible short-term effects on growth. However, effective governance and renewable energy adoption can turn these effects into positive long-term contributions. Furthermore, mineral rents and fintech happenings can depreciate sustainability unless safeguarded by strong institutions and social capital. In the same manner, in the Gulf Cooperation Council (GCC) countries, resource wealth may increase short-term growth but weakens long-run development when institutional quality is weak, while human capital and governance reforms may reverse this pattern (Shah, 2024).[21]

Additionally, Anser et al. (2025)[22] analyzes that in mineral-rich economies, dependance on resource extraction can be done through improving governance systems. For instance, implementing fiscal rules, anti-corruption measures, just distribution of resource rents, and investment in human capital may help in sustainable growth of mineral wealth. They find that resource-rich countries can overcome the problem of resource curse if they focus on governance.

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[18] Qi, Ruijuan, Ali Junaid Khan, Muhammad Farhan Basheer, Waseem Ul Hameed, and Iffat Sabir Chaudhry. "Handling the mishandling: Resolving the resource curse through effective utilization of available natural resources and claiming sustainable development." *Resources Policy* 87 (2023): 104285.

[19] Nyandwe, Eugenie M., Qinli Zhang, Daolin Wang, and Alassane D. Yeo. "Towards Sustainable Development of Mineral Resources in Sub-Saharan Africa: A Structural Equation Modeling Approach." *Sustainability* 16, no. 20 (2024): 9087.

[20] Zhang, Junyan, Tufail Muhammad, Wensheng Dai, Qasim Raza Khan, and Mushtaq Ahmad. "How Does the Resource Curse Influence Economic Performance? Exploring the Role of Natural Resource Rents and Renewable Energy Consumption in South Asia." *Sustainability* 16, no. 24 (2024): 11138.

[21] Shah, Said Zamin, Muhammad Faheem, Fatima Farooq, and Saima Aslam. "Impact of Natural Resources and Institutional Quality on Economic Growth in GCC Countries." *Sustainable Business and Society in Emerging Economies* 6, no. 4 (2024): 523-536.

[22] Anser, Muhammad Khalid, Musrat Nazir, Abdelmohsen A. Nassani, Khalid M. Al-Aiban, Khalid Zaman, and Mohamed Haffar. "Rethinking Economic Policies: Diversification and Governance Strategies to Address the Resource Curse in Mineral-Rich Economies." *Natural Resource Modeling* 38, no. 4 (2025): e70011.

Finally, Braunstein and Chuchko (2025)[23] argue that the ongoing global energy transition and the rising importance of critical minerals require a reassessment of the conventional resource-curse debate. They argue that, in the contemporary context, additional factors such as geopolitical dynamics, market maturity, and supply-chain vulnerabilities, play a decisive role in determining whether resource wealth becomes a blessing or a curse. Their analysis further underscores that international cooperation and strong governance mechanisms are essential to mitigating the risk of a "new resource curse."

From the above presented literature, this study infers that Pakistan's mineral wealth can only contribute positively to long-term development if institutional reforms tackle governance insufficiencies, participatory planning, and arrangement of the mineral policy with sustainable and inclusive growth frameworks.

Mineralogical Diversity of Pakistan

The mineral economy refers to the system of extraction, processing, trade, and utilization of mineral resources that are essential for industrial production, technological innovation, and economic development. This wealth also includes Strategic Minerals which are the minerals significant for a country's national defense, economic stability, and technological advancement, and their supply is insufficient due to limited domestic production or deposits in foreign countries.[24]

Metallic Minerals

Table 1 shows the details of various metallic minerals across the country. Pakistan possesses mineral reserves worth billions of dollars especially in Balochistan and KP. Reko Diq project alone contains 13.1 million tons of copper and 17.9 million ounces of gold over a 37 year mine life with an estimated worth of $181 billion.[25]

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[23] Braunstein, Juergen, and Marina Chuchko. "Resource curse in the age of critical minerals: Geopolitical forces and market maturity." *Energy Research & Social Science* 127 (2025): 104247.

[24] Society for Mining, Metallurgy & Exploration, "Critical and Strategic Minerals: Importance to the U.S. Economy," accessed October 17, 2025, https://www.smenet.org/What-We-Do/Technical-Briefings/Critical-and-Strategic-Minerals-Importance-to-the.

[25] "Reko Diq Project Likely to Yield Dollar 181 B Worth Copper, Gold," *The Nation*, March 26, 2025

Table 1: Metallic Minerals

Mineral Name	Type	Estimated Worth $	Amount	Location(s)
Copper	Metallic	Approx. $181 billion[26]	13.18 million Tonnes (Reko Diq Reserves)[27] 1.69 million tons(Saindak)[28]	Reko Diq (Balochistan), Saindak
Gold	Metallic	Approx. $60 billion[29]	17.9 million Ounces (Reko Diq)[30] & 2.24 million ounces in Saindak[31]	Reko Diq (Balochistan), Saindak
Iron Ore	Metallic	Value based on grade (60-65% Fe)	500 million Tons (Chiniot Initial Estimate)[32]	Chiniot (Punjab), Kalabagh, Nokundi, Haripur Chitral (KP)
Chromite	Metallic/Industrial	$126.55 Million (Annual Export 2023)[33]	2.5 million tons[34]	Muslim Bagh (Balochistan), KP
Lead & Zinc	Metallic	$ 3.12 – 3.36 billion[35]	28 million tones[36]	Duddar Gunga, Surmai, Dhungei, and (Balochistan)

[26] Khaleeq Kiani, "Study Confirms Over $60bn Copper and Gold Reserves at Reko Diq," *Dawn*, March 26, 2025, accessed October 17, 2025, https://www.dawn.com/news/1900381/study-confirms-over-60bn-copper-and-gold-reserves-at-reko-diq

[27] Khaleeq Kiani, "Study Confirms Over $60bn Copper and Gold Reserves at Reko Diq," *Dawn*, March 26, 2025, accessed October 17, 2025, https://www.dawn.com/news/1900381/study-confirms-over-60bn-copper-and-gold-reserves-at-reko-diq.

[28] Sheikh, Humais. 2023. "Pakistan: SIFC A Lifeline for Balochistan's Minerals Economy – OpEd." *Eurasia Review*, July 30. https://www.eurasiareview.com/30072023-pakistan-sifc-a-lifeline-for-balochistans-minerals-economy-oped/

[29] Khaleeq Kiani, "Study Confirms Over $60bn Copper and Gold Reserves at Reko Diq," *Dawn*, March 26, 2025, accessed October 17, 2025, https://www.dawn.com/news/1900381/study-confirms-over-60bn-copper-and-gold-reserves-at-reko-diq.

[30] Khaleeq Kiani, "Study Confirms Over $60bn Copper and Gold Reserves at Reko Diq," *Dawn*, March 26, 2025, accessed October 17, 2025, https://www.dawn.com/news/1900381/study-confirms-over-60bn-copper-and-gold-reserves-at-reko-diq.

[31] Sheikh, Humais. 2023. "Pakistan: SIFC A Lifeline for Balochistan's Minerals Economy – OpEd." *Eurasia Review*, July 30. https://www.eurasiareview.com/30072023-pakistan-sifc-a-lifeline-for-balochistans-minerals-economy-oped/

[32] Sabir Shah, "$6tr Treasure Trove of Untapped Pakistani Minerals," *The News International*, April 9, 2025, accessed October 17, 2025, https://www.thenews.com.pk/print/1299444-6tr-treasure-trove-of-untapped-pakistani-minerals?utm=.

[33] Balochistan Board of Investment & Trade, "Mines and Mineral," accessed October 17, 2025, https://bboit.gob.pk/minerals/?utm=.

[34] Balochistan Board of Investment & Trade, "Mines and Mineral," accessed October 17, 2025, https://bboit.gob.pk/minerals/?utm=.

[35] "Balochistan - A Gold Mine," *Business Recorder*, May 8, 2004, accessed October 17, 2025, https://www.brecorder.com/news/3039137/balochistan---a-gold-mine-20040508124486

[36] "Balochistan - A Gold Mine," *Business Recorder*, May 8, 2004, accessed October 17, 2025, https://www.brecorder.com/news/3039137/balochistan---a-gold-mine-20040508124486.

Antimony	Strategic	Approx. $1.34 Billion[37]	26,000 metric tons[38]	Quetta-Pishin, Chitral (Baloch-KP)

Source: Authors' compilation.

Industrial Minerals

Table 2 shows Pakistan's industrial resource potential that can stimulate the domestic industries and exports.

Table 2: Industrial Minerals

Mineral Name	Type	Amount (Volume)	Primary Location(s)
Rock Salt	Industrial	Over 25-30 billion tons[39]	Salt Range (Punjab), Khewra Mine
Limestone	Industrial	~1,205 billion tones [40]	Indus Basins, Attock-Cherat Range, Some areas in Balochistan, Peshawar and Hazara Basins, the Axial Belt, and the Karakoram
Gypsum	Industrial	~ 4.8 billion tones[41]	Kohat& Bannu (KP), Salt range (Punjab), Sulaiman range Balochistan
Barite	Industrial	13.71 million tones[42]	Lasbela, Surmai, Duddar (Balochistan),Swat (KP)
Marble/Aragonite	Industrial	297 B tonnes[43]	Swat, Bunner, Chitral (KP) Chaghi, Khuzdar, Lasbela, Loralai (Balochistan)

[37] Sabir Shah, "$6tr Treasure Trove of Untapped Pakistani Minerals," *The News International*, April 9, 2025, accessed October 17, 2025, https://www.thenews.com.pk/print/1299444-6tr-treasure-trove-of-untapped-pakistani-minerals?utm=

[38]Sabir Shah, "$6tr Treasure Trove of Untapped Pakistani Minerals," *The News International*, April 9, 2025, accessed October 17, 2025, https://www.thenews.com.pk/print/1299444-6tr-treasure-trove-of-untapped-pakistani-minerals?utm=.

[39] Punjab Mineral Development Corporation (PUNJMIN), "Rock Salt," accessed October 17, 2025, https://punjmin.punjab.gov.pk/rock-salt?utm=

[40] Malkani, Muhammad Sadiq, Muhammad Imran Alyani, Mureed Hussain Khosa, N. Somro, S. J. Arif, S. Tariq, F. Saeed, G. Khan, and J. Faiz. "Mineral resources of Pakistan—an update." *Lasbela University Journal of Science and Technology* 5 (2016): 90-114.

[41] rade Development Authority of Pakistan. 2022. *Analysis of Minerals and Metals Sector of Pakistan: A Case of Gypsum*. March. Accessed October 17, 2025. https://tdap.gov.pk/wp-content/uploads/2022/03/Analysis-of-Minerals-and-Metals-Sector-of-Pakistan-A-Case-of-Gypsum.pdf?utm=.

[42] Engr Hussain Ahmad Siddiqui, "Exploiting Barite Export Potential," *Dawn*, March 7, 2016, accessed October 17, 2025, https://www.dawn.com/news/1244101?utm=.

[43] FPCCI, "Country Holds 297 Billion Tonnes of Marble, Granite Reserves: FPCCI," *The Nation*, January 20, 2017, accessed October 17, 2025, https://www.nation.com.pk/20-Jan-2017/country-holds-297-billion-tonnes-of-marble-granite-reserves-fpcci?utm=.

Bentonite Clay	Industrial	But 36 million tons in Karak, (KP), rest is not identified.	Karak (KP), DGK & Jhelum (Punjab), AJK
Bauxite	Industrial	~ 74 million tons[44]	Mainly in Khushab
Phosphate Rock	Industrial	~26 million tons[45]	Mainly in Hazara Division (KP)

Source: Authors' compilation.

Huge deposits of salt and limestone are spread across Punjab, KP and Balochistan. Apart from that, barite, gypsum, aragonite and marble are also in high quantities which are used as raw materials for ceramics, construction and decorative stone industries. Kohat and Bannu areas in KP are home to around 90% of gypsum reserves in Pakistan.[46] On the other hand, Bauxite, bentonite clay and phosphate rock are used in aluminum, fertilizers and industries.

Fuel and Energy Minerals

Table 3 presents the details of Pakistan's fuel and energy minerals. It includes major coal reserves in Thar (Sindh), Natural gas reserves in Sui (Balochistan) and reserves for petroleum and uranium as well. With 175 billion tons of coal, 23 trillion cubic feet of gas, and 354 million barrels of oil, the Government of Pakistan (GoP) can reduce import dependency and can strengthen the energy sector of the country.[47]

Table 3: Fuel and Energy Minerals of Pakistan

Mineral Name	Type	Amount (Volume)	Primary Location(s)
Coal (Lignite)	Fuel	175 billion Tons (Estimated Deposits)[48]	Thar (Sindh), Salt Range (Punjab)

[44] Pakistan Bureau of Statistics, *Census of Mining & Quarrying Industries (CMQI) 2005-06*, Government of Pakistan, accessed October 17, 2025, https://www.pbs.gov.pk/sites/default/files/industry_mining_and_energy/publications/cmq200506/Mining%20Report%20Final.pdf?utm=.

[45] Abubakar, Muhammad, Sajjad Khan, and Muhammad Azeem. 2024. "Economic Potential and Health Risks Assessment of the Trace Elements in the Recently Discovered Phosphate Deposits of Paswal Mian, Banseri, and Shahkot Regions, Abbottabad, Khyber Pakhtunkhwa, Pakistan." *Geologica* 7, no. 2 (January 18). Accessed October 17, 2025.

[46] Farooqui, Yasir Nawaz, Salman Raza, and Dr. Khalid Mustafa. 2021. *Analysis of Minerals and Metals Sector of Pakistan: The Case of Gypsum*. Research Report No. TDAP-Mining 01/2021

[47] Geological Survey of Pakistan, *Year Book 2022-23* (Quetta: Geological Survey of Pakistan, 2023), accessed October 24, 2025, https://gsp.gov.pk/wp-content/uploads/2024/02/Year-Book-2022-23.pdf

[48] Malik, Afia. 2023. "Local Coal for Power Generation in Pakistan." *The Pakistan Development Review* 62 (4): 573–589.

Natural Gas	Fuel	19-23 trillion cubic feet [49]	Sui (Balochistan), Punjab, Sindh
Petroleum Oil	Fuel	354 million barrels[50]	Various areas of Punjab, Sindh & Balochistan
Uranium	Nuclear/Fuel	~ 6,180 tons[51]	DG khan (Punjab), Some areas of KP

Source: Authors' own compilation**.**

Provincial Spread of Mining Enterprises in Pakistan

Table 4 presents the details of mining companies working in Pakistan across various provinces. The Barrick Gold Corporation operates on the Reko Diq project in Balochistan while the Chinese mineral company Metallurgical Corporation of China (MCC) is working on the Saindak project. Recently, US Strategic Metals (USSM) and Mota-Engil Group have signed $500 million Memorandum of Understanding (MoU) with Frontier Works Organization (FWO). The agreement includes the development & processing of critical minerals (like antimony, copper, gold, tungsten, rare earths elements), it also includes exporting of readily-available minerals, and establish foundations for a poly-metallic refinery in Pakistan.[52] Following this agreement, Pakistan has sent the first batch of minerals and rare earth elements to US which includes copper, antimony, REEs such as neodymium and praseodymium.[53]

Table 4: Mining Companies Working in Pakistan

Source: Authors' own compilation.

Company Name	Location	Mineral Name	Ownership Structure
Barrick Gold Corporation	Reko Diq, Chaghai District, Balochistan	Copper, Gold	Barrick (50%); GoP/SOEs (25%); GoB (25%)[54]
China MCC	Saindak Copper-Gold Project, Balochistan	Copper, Gold	Saindak Metals Ltd (GoP-owned) with MCC lease/operation since 2002[55]
MCC Huaye Duddar Mining Company (MHD)	Duddar Mine, Lasbela, Balochistan	Lead, Zinc	Chinese JV (MCC/Hunan Nonferrous); PMDC (non-operating share) 2020
Sindh Engro Coal Mining Company (SECMC)	Thar Coal Block II, Tharparkar, Sindh	Lignite Coal	JV: GoS (54.70%), Engro, Thal, Hubco, HBL, Chinese investors [56]
Pakistan Mineral Development Corporation (PMDC)	Khewra Salt Mine, various coal projects	Rock Salt, Coal	State-owned Enterprise (GoP)[57]
Shanghai Electric Power Co Ltd	Thar Coal Block I	Lignite Coal	Owned by Shanghai Electric (China) [58]

[54] Barrick Mining Corporation, "Barrick Targets 2028 for First Production from Reko Diq," August 1, 2023, accessed October 17, 2025, https://www.barrick.com/English/news/news-details/2023/barrick-targets-2028-for-1st-production-from-reko-diq/default.aspx.

Geographical Distribution of Mineral Reserves in Pakistan

Table 6 outlines the mineral reserves located across different regions of Pakistan. As each province possesses distinct mineral resources, their effective utilization depends on the availability of appropriate technology, adequate infrastructure, sound policies, a conducive security environment, sufficient investment, and well-functioning institutions.

Table 6: Classification of Minerals

Province / Region	Major Minerals	Locations	Sources
Balochistan	Copper, Gold, Barite, Chromite, Iron Ore Marble,	Reko Diq, Saindak, Chagai, Muslim Bagh, Khuzdar, Lasbela	BBOIT (2025)[59]
Sindh	Coal, Gypsum, China Clay, Limestone, Salt	Tharparkar, Jhimpir, Badin,Dadu, Lakhra, Thatta	Sindh Mines Dept. (2024)[60]

[50] Hussain Ahmad Siddiqui, "Time Is Ripe for Oil Exploration Drive," *Dawn*, September 28, 2022, accessed October 17, 2025, https://www.dawn.com/news/1712389/time-is-ripe-for-oil-exploration-drive?utm.

[51] World Bank. 2022. *Pakistan Floods 2022: Post-Disaster Needs Assessment (Supplemental Report)*. December. Accessed October 17, 2025. https://documents1.worldbank.org/curated/en/810541468074332076/pdf/multi0page.pdf?utm.

[52] Abdullah Momand and Sanaullah Khan, "US Metals Company Signs $500m MoU with Pakistan on Critical Minerals," *Dawn*, September 8, 2025, accessed October 17, 2025, https://www.dawn.com/news/1940515.

[53] Imran, Kashif. 2025. "Pakistan Sends First Batch of Rare Earth Elements to US under $500 Million Deal — Report." *Arab News*, October 5. Accessed October 17, 2025. https://www.arabnews.com/node/2617851/pakistan.

[54] Barrick Mining Corporation, "Barrick Targets 2028 for First Production from Reko Diq," August 1, 2023, accessed October 17, 2025, https://www.barrick.com/English/news/news-details/2023/barrick-targets-2028-for-1st-production-from-reko-diq/default.aspx.

[55] Yuan Shenggao. 2021. "MCC Mining Project Winning Hearts and Minds of Families in Pakistan." *China Daily*, May 21. Accessed October 17, 2025. https://epaper.chinadaily.com.cn/a/202105/21/WS60a6fca0a31099a234356470.html.

[56] Wikipedia. 2025. "Sindh Engro Coal Mining Company." Last modified August 21. Accessed October 17, 2025. https://en.wikipedia.org/wiki/Sindh_Engro_Coal_Mining_Company.

[57] Pakistan Mineral Development Corporation. 2025. "Who We Are." Pakistan Mineral Development Corporation. Accessed October 17, 2025. https://www.pmdc.gov.pk/who-we-are/.

[58]Global Energy Monitor. "Thar Block I Power Station." *Global Energy Monitor*, accessed October 17, 2025. https://www.gem.wiki/Thar_Block_I_power_station

[59] "Mines & Minerals," Balochistan Board of Investment and Trade, accessed November 27, 2025, https://bboit.gob.pk/minerals/.

[60] "Mines and Mineral Development Department," Government of Sindh, accessed November 27, 2025, https://smd.gov.pk/Minerals.aspx.

Punjab	Salt, Coal, Gypsum, Iron Ore, Limestone, Rock phosphates	Khewra, Mianwali , Dandot, Chiniot, Kalabagh,	Mines & Minerals dep. (Punjab)[61]
Khyber Pakhtunkhwa (KP)	Marble, Antimony, Chromite, Gemstones, Fluorite, Gypsum	Buner, Dir, Kohistan, Malakand, Mohmand, Swat, Chitral	Malkani et al. (2017)[62]
Gilgit-Baltistan (GB)	Gemstones (Ruby, Aquamarine, Tourmaline, Topaz)	Ghizer, Hunza, Skardu, Gilgit	Ahrar (2025)[63]
Azad Jammu & Kashmir (AJK)	Marble, Bauxite, Graphite, Gemstones	Bagh, Muzaffarabad, Kotli, Mirpur	Mineral resource dept. (AJK)[64]

Assessment of Export Revenues from Pakistan's Mineral Sector

Pakistan's mineral sector contribution to GDP is around 3%.[65] Copper from Saindak is a major component of Pakistan's mineral exports. Pakistan mineral export for the year 2023 was around $1.63 billion.[66] The list of some major mineral exports of Pakistan is given in Table 7. Copper export value was around $841 million in 2024, and is considered as the main mineral export of Pakistan.[67] Likewise, mineral fuels, oils, and distillation export value is around $558.8 million, and for cement related minerals export value is around $537.3 million.[68] The Pink Rock Salt

[61] "Mines and Minerals Department," Government of the Punjab, accessed November 26, 2025, https://punjab.gov.pk/node/6251.
[62] Malkani, Muhammad Sadiq, Mureed Hussain Khosa, Muhammad Imran Alyani, Khalid Khan, Nasir Somro, Tehseen Zafar, Jawad Arif, and Muhammad Aleem Zahid. "Mineral Deposits of Khyber Pakhtunkhwa and FATA, Pakistan." Lasbela University Journal of Science and Technology 6 (2017): 23-46.
[63] Ahrar, "Gemstones Resources in Gilgit Baltistan," *Minerals & Gems Pak*, April 22, 2025, https://mineralspak.com/gemstones-resources-in-gilgit-baltistan/.
[64] "Major Minerals," Department of Mineral Resources, Government of Azad Jammu & Kashmir, accessed November 27, 2025, https://minerals.ajk.gov.pk/major-minerals/.

[65] Shah, Syed Akhtar Hussain. *Strategy for Mineral Sector Development in Pakistan*. Planning Commission of Pakistan, Ministry of Planning, Development & Reform, Government of Pakistan. Accessed October 17, 2025. https://www.pc.gov.pk/uploads/pub/first_05_pages_strategy_for_mineral_sector_development_in_pakistan.pdf
[66] Observatory of Economic Complexity. "Mineral-Products: Pakistan Exports." *OEC*, accessed October 17, 2025. https://oec.world/en/profile/bilateral-product/mineral-products/reporter/pak.
[67] Sheikh, Humais. 2025. "Copper Exports from Saindak Mine Crossed $800 Million in 2024." *Profit (Pakistan Today)*, August 11. https://profit.pakistantoday.com.pk/2025/08/11/copper-exports-from-saindak-mine-crossed-800-million-in-2024/
[68] "Pakistan: Exports of Mineral Fuels, Oils, Distillation Products." 2025. *Trading Economics*, accessed October 2025. https://tradingeconomics.com/pakistan/exports/mineral-fuels-oils-distillation-products#:~:text=Pakistan%20Exports%20of%20mineral%20fuels%2C%20oils%2C%20distillation,was%20last%20updated%20on%20October%20of%202025

industry's estimated worth is around $120 million.[69] However, the government needs modern exploration and processing technologies and better governance to get maximum benefit from these resources. Along with traditional mineral exports, recently there has been a specific focus on exploration, processing and export of high value minerals such as the REEs. Because of their high significance these resources are expected to bring more revenue for the country.

Table 7: Export Value of Major Minerals from Pakistan

Minerals	Export Value in 2022 ($)	Export Value in 2023 ($)	Export Value in 2024 ($)
Copper	851 million[70]	772 million[71]	841.72 million[72]
Mineral fuels, oils, and distillation products	333.8 million[73]	169 million[74]	$558.81 million[75]
Salt, Sulphur, earth, stone, plaster, lime, and cement	358 million[76]	439 million[77]	537.28 million[78]
Pink Rock Salt (Estimated)	40 million[79]	52 million[80]	~120 million[81]
Aluminum	84.9 million[82]	73.6 million[83]	55.76 million to [84]
Lead	33 million[85]	32.9 million[86]	32.99 million[87]

[69] "Pakistan's Himalayan Pink Salt Exports to $1.2 Billion in 2024." 2025. *Taxtmi*, accessed October 2025. https://www.taxtmi.com/news?id=47152#:~:text=Pakistan's%20Himalayan%20Pink%20Salt%20exports,to%20$1.2%20billion%20in%202024

[70] Trading Economics, "Pakistan Exports by Category."

[71] Trading Economics, "Pakistan Exports by Category."

[72] Pakistan Today, "Copper Exports from Saindak Mine Crossed $800 Million in 2024," *Profit by Pakistan Today*, August 11, 2025, accessed October 17, 2025, https://profit.pakistantoday.com.pk/2025/08/11/copper-exports-from-saindak-mine-crossed-800-million-in-2024/#:~:text=Once%20a%20political%20hot%20potato,of%20Pakistan's%20mineral%20export%20profile.

[73] Trading Economics, "Pakistan Exports by Category."

[74] Trading Economics, "Pakistan Exports by Category."

[75] Trading Economics, "Pakistan Exports: Mineral Fuels, Oils and Distillation Products," accessed October 17, 2025, https://tradingeconomics.com/pakistan/exports/mineral-fuels-oils-distillation-products.

[76] Trading Economics, "Pakistan Exports by Category."

[77] Trading Economics, "Pakistan Exports by Category."

[78] Trading Economics, "Pakistan Exports by Category."

[79] Trading Economics, "Pakistan Exports by Category."

[80] Trading Economics, "Pakistan Exports by Category."

[81] "A Pinch of Pink Salt in India-Pak Trade," *TaxTMI*, accessed October 17, 2025, https://www.taxtmi.com/news?id=47152.

[82] Trading Economics, "Pakistan Exports by Category."

[83] Trading Economics, "Pakistan Exports by Category."

[84] Trading Economics, "Pakistan Exports by Category."

[85] Trading Economics, "Pakistan Exports by Category."

[86] Trading Economics, "Pakistan Exports by Category."

[87] Trading Economics, "Pakistan Exports by Category."

Pearls, precious stones, and metals	24 million[88]	28.9 million[89]	28.94 million[90]
Ceramic products	7.5 million[91]	8.5milion[92]	9.14 million[93]

Source: Authors' own.

Figure 1: Pakistan's Mineral Export (2022-2024)

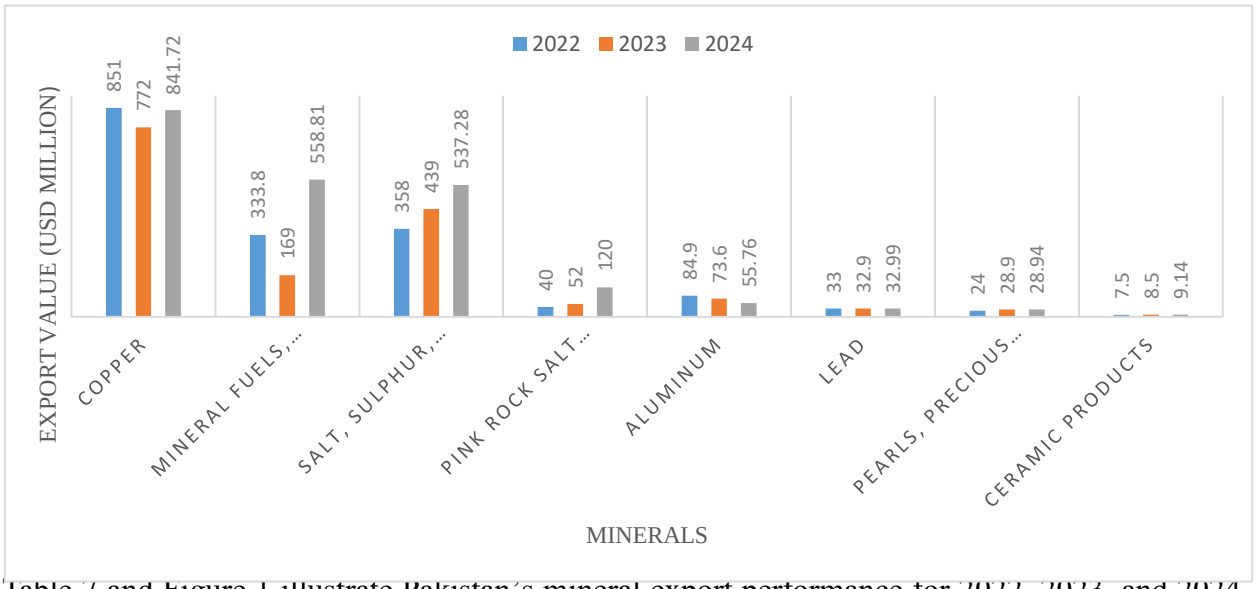

Table 7 and Figure 1 illustrate Pakistan's mineral export performance for 2022, 2023, and 2024, revealing a mixed but generally upward trajectory across key commodities. Copper remains the dominant export, though its value exhibits mild volatility declining from $851 million in 2022 to $772 million in 2023 before recovering to $841.72 million in 2024. Fuel-related mineral exports show a sharper fluctuation: they fell significantly from $333.8 million in 2022 to $169 million in 2023, but rebounded strongly to $558.1 million in 2024, marking the second-highest export category for that year. Exports of salt, plaster, lime, sulphur, cement, and related minerals demonstrate a consistent upward trend, rising from $358 million in 2022 to $439 million in 2023 and further to $537.28 million in 2024. Pink salt, a high-demand niche commodity, shows the most pronounced growth, with exports tripling from $40 million in 2022 to roughly $120 million in

[88] Trading Economics, "Pakistan Exports by Category."
[89] Trading Economics, "Pakistan Exports by Category."
[90] Trading Economics, "Pakistan Exports by Category."
[91] Trading Economics, "Pakistan Exports by Category."
[92] Trading Economics, "Pakistan Exports by Category."
[93] Trading Economics, "Pakistan Exports by Category."

2024. Conversely, aluminum exports exhibit a sustained decline, falling from $84.9 million in 2022 to $55.7 million in 2024. Exports of the remaining mineral categories remain relatively stable over the three-year period, indicating limited short-term fluctuations in their international demand.

Despite low-quality infrastructure, technology, investment and security situations in the mineral abundant areas, yet the mineral sector apart from the fuel-minerals has shown positive trend in exports. Currently, there is a shift in focus towards the mineral sector at the national level.[94]

Regulatory and Policy Framework of Mineral Development in Pakistan

The National Mineral Policy (1995) and National Mineral Policy (2013) are considered the most comprehensive polices regarding the mineral sector of Pakistan. Additional legal and regulatory tools have been required, though, due to changing global economic dynamics, technological developments, and the growing complexity of domestic governance, especially in the security-challenged provinces of KP and Balochistan. In order to address new issues, expedite regulatory procedures, and draw in investment, numerous provincial assemblies have proposed and passed a number of new acts, amendments, and provincial policies. Below is a summary of these national and local laws and policies:

National Mineral Policy (1995)

National Mineral Policy of Pakistan (1995)[95] is considered the first comprehensive mineral policy of Pakistan. This policy encouraged private partnership and international investment in the exploration and development of minerals in all provinces of Pakistan. Before this policy, the mineral sector was under the purview of the Federal Government. The 1995 policy established clear guidelines delineating the roles of federal and provincial authorities: the Federal Government was tasked with overall policy formulation and geological surveying, while provincial governments were made responsible for licensing, operational management, and on-site regulatory oversight. The policy also laid the initial groundwork for addressing environmental concerns in

[94] Aizaz Hussain and Zainab Dar, "Pakistan's Potential Path to Global Relevance Through Critical Minerals," *The Diplomat*, September 15, 2025, https://thediplomat.com/2025/09/pakistans-potential-path-to-global-relevance-through-critical-minerals/

[95] Survey of Minerals & Deposits (SMD), *National Mineral Policy* (NMP), Government of Pakistan, accessed October 17, 2025, https://www.smd.gov.pk/Portals/0/NMP.pdf.

the mining sector, which were further elaborated in the 2013 policy. To promote local development and encourage reinvestment, the 1995 framework authorized provinces to retain royalties and rents generated from mineral production.

National Mineral Policy (2013)

The National Mineral Policy (2013)[96] was formulated to further stimulate private investment in the mineral sector and enhance its contribution to Pakistan's GDP by promoting efficient and responsible utilization of mineral resources. Following the 18th Constitutional Amendment which devolved ownership and regulatory authority over minerals (excluding oil, gas, and nuclear minerals) to the provinces, the 2013 policy sought to strengthen coordination mechanisms between federal and provincial governments. This improved alignment was essential for harmonizing regulatory frameworks, facilitating investment, and ensuring more coherent governance across the mineral value chain. Under this framework, non-fuel minerals were placed under the jurisdiction of provincial governments, while the Federal Government provided coordination, policy guidance, and regulatory support. The amendment also clarified the role of key regulatory institutions, such as the Pakistan Mineral Development Corporation (PMDC), along with relevant licensing authorities responsible for ensuring compliance, oversight, and sectoral development.

It also presented the licensing mechanism on different scales: large-scale mining such as exploration license, mineral deposit retention license, mining lease, and reconnaissance license. Small scale mining included mining permit/lease, exploration license, and minerals permit. Under this policy, international companies can operate but those companies are required to operate locally. Additionally, it stressed local processing of minerals such as their smelting, refining, and concentration instead of extract-export tradition. Thus, it ensured local employment, capacity building and skill development in the localities where minerals are in abundance. Custom duties and sales tax were exempted for the import of required equipment, machinery, and materials for extraction of minerals. Also, withholding tax on dividends was set at 10%.

On the environmental side, the mining companies were required to comply with Environmental Impact Assessment (EIA), environmental audits and national environmental protection laws.

[96] Government of Pakistan. 2013. *Pakistan National Mineral Policy 2013 (English)*. Accessed October 17, 2025. https://113dstor001.s3-eu-west 1.amazonaws.com/ Community +Development +in+ Mining/Pakistan/ Pakistan_National_Mineral_Policy_2013_English.pdf.

Finally, it stressed improvement of geological surveys and data-generation, mapping, geophysical surveys and making geological data publicly available.

The main laws, regulations, and policies controlling Pakistan's mineral industry are shown in Table 8. The National Mineral Policy (1995), the Regulation of Mines and Oilfields and Mineral Development Act of 1948, and the creation of the Pakistan Mineral Development Corporation (PMDC) in 2002 were among the federal tools that largely regulated the industry prior to the 18th Constitutional Amendment in 2010. However, by giving provinces authority over the exploration, control, and marketing of non-fuel minerals, the 18th Amendment radically changed this system of governance. Provinces are now in charge of creating policies, luring investment, granting licenses, and overseeing mineral resources inside their borders, with the exception of oil, gas, and nuclear materials, which are still under federal control.

In this regard, the KP government, exercising its power under this policy, has produced the Mines and Minerals Act (2017) and Mineral Policy (2022) to ensure transparency through e-auction, environmental protection, and sustainable development. To explore the rich resources in Balochistan, the Public Private Partnership Act (2021) provides guidelines to attract the private sector, along with the public sector, to explore, process and export of the abundant mineral reserves in the province. Likewise, in 2022, the provincial assembly has passed the Regulation of Mines and Oil-fields and Mineral Development Amendment Act to facilitate large-scale projects such as Reko Diq. On the other hand, Punjab’s Mineral Policy (2018) emphasizes a transparent, modern and private investment-driven mineral sector, while Sindh has also made developments to attract private investment in the mineral sector through the Thar Coalfield as Special Economic Zone (SEZ) and Investment Incentives, mining and minerals Act (2019).

However, perceived gaps in provincial capacity and regulatory effectiveness have prompted recent efforts to re-centralize aspects of mineral governance through the Mines and Minerals Act and the Amendment Act (2025).

Table 8: Pakistan's Mineral Sector Policies & Acts

Year	Policy / Act / Rule	Level	Purpose	Source(s)

1948	Regulation of Mines and Oilfields and Mineral Development Act, 1948	Federal	Federal government controls the mines and mineral developments	The Pakistan Code (Ministry of law and justice[97]
1995	National Mineral Policy (NMP 1995)	Federal	It was the first national framework for mineral exploration and development; it opened the sector to private and foreign investment, also emphasized provincial autonomy and geological mapping.	GOVERNMENT OF PAKISTAN Ministry of Petroleum & Natural Resources (September 1995)[98]
2002	Pakistan Mineral Development Corporation (PMDC) Rules	Federal	Strengthened PMDC's commercial role in mineral productions	PMDC Website [99]
2010	18th Constitutional Amendment	Federal–Provincial	Redistributed the ownership of mineral resources. Transferred the ownership of mineral resources (except oil, gas, nuclear minerals) to the provinces.	National Assembly of Pakistan (2010)[100]
2013	National Mineral Policy (NMP 2013)	Federal	It emphasized sustainable development, environmental concerns, and coordination among provinces & Initiated One-Window Facilitation for investors as well.	Ministry of Energy (2013)[101]
2010	Thar Coalfield as Special Economic Zone (SEZ)	Sindh	Facilitating large-scale development in the Thar coalfield to address Pakistan's energy needs and attract investment in a nationally significant project.	Coal & Energy development department Govt. of Sindh[102]
2017	KP Mines and Minerals Act, 2017	KP	It established the Khyber Pakhtunkhwa Mineral Development Authority (KPMDA) & Introduced an e-auction system	KP Code KP Govt. website[103]

[97] *Regulation of Mines and Oil Fields and Mineral Development (Federal Control) Act, 1948*, Act No. XXIV of 1948 (Pakistan), accessed November 27, 2025, https://pakistancode.gov.pk/english/UY2FqaJw1-apaUY2Fqa-ap%2BUag%3D%3D-sg-jjjjjjjjjjj.

[98] Government of Pakistan, Ministry of Petroleum and Natural Resources, *National Mineral Policy 1995* (Islamabad: Government of Pakistan, 1995), http://smd.gov.pk/Portals/0/NMP.pdf.

[99] Who We Are," Pakistan Mineral Development Corporation, accessed November 27, 2025, https://www.pmdc.gov.pk/who-we-are/#glance.

[100] *The Constitution of the Islamic Republic of Pakistan* (As modified upto the 28th February, 2012), National Assembly of Pakistan, accessed November 27, 2025, https://www.na.gov.pk/uploads/documents/1302138356_934.pdf.

[101] Government of Pakistan. 2013. *Pakistan National Mineral Policy 2013 (English)*. Accessed October 17, 2025. https://113dstor001.s3-eu-west 1.amazonaws.com/ Community +Development +in+ Mining/Pakistan/ Pakistan_National_Mineral_Policy_2013_English.pdf.

[102] "Thar Coal Energy Board," Government of Sindh, accessed November 27, 2025, https://www.tceb.gos.pk/.

[103] *The Khyber Pakhtunkhwa Mines and Minerals Act, 2017*, Act No. XXXVI of 2017 (Khyber Pakhtunkhwa), accessed November 27, 2025, https://kpcode.kp.gov.pk/uploads/THE_KHYBER_PAKHTUNKHWA_MINES_AND_MINERALS_ACT_2017.pdf
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2018	Punjab Mineral Policy, 2018	Punjab	Focuses on increasing the transparency and competitiveness of the sector & A modern, private-sector-driven mineral sector that is sound environmentally and socially.	Punjab Mineral Company, Govt. of Punjab[104]
2019	Investment Incentives, mining and minerals, 2019	Sindh	A comprehensive document detailing investment incentive for the mining and minerals sector to attract investors. Thar Coalfield as Special Economic Zone (SEZ)	Sindh Investment Department[105]
2021	Balochistan Public Private Partnership Act, 2021	Balochistan	It created a framework for engaging the private sector in development projects. It also established the Balochistan Public Private Partnership Authority (BPPPA) as a "one-window solution" for projects	Balochistan Code, Govt. of Balochistan[106]
2022	KP Mineral Policy, 2022	KP	Focuses on sustainable development, environment, health, and safety	Minerals Development Department, Government of KP[107]
2022	Regulation of Mines and Oil-fields and Mineral Development (Amendment) Act, 2022	Balochistan	Facilitating the revival of large-scale projects like Reko Diq by allowing for modified deals, rather than solely relying on public tenders	Balochistan Code, Govt. of Balochistan[108]
2025	KP Mines and Minerals Amendment Bill, 2025	KP	Proposes provincial licensing authorities to consider recommendations from the MIFA and could authorize temporary licenses for projects of "national interest"	Provincial Assembly KP[109]
2025	Balochistan Mines and Minerals	Balochistan	Replaced the 2002 Rules; created new licensing authority and centralized oversight	Balochistan Code, Govt. of Balochistan[110]

[104] Government of the Punjab, Mines and Minerals Department, *Punjab Mineral Policy 2018* (Lahore: Government of the Punjab, 2018), https://pmc.punjab.gov.pk/system/files/PunjabMineral-Policy2018.pdf.

[105] Mines & Minerals," Sector Profile, Sindh Board of Investment, Government of Sindh, accessed November 27, 2025, https://sindhinvestment.gos.pk/system/files/Mines%20%26%20Minerals.pdf.

[106] *The Balochistan Public Private Partnership Act, 2021*, Act No. XXV of 2021 (Balochistan), accessed November 27, 2025, https://balochistancode.gob.pk/Document.aspx?wise=opendoc&docid=984&docc=935.

[107] "Khyber Pakhtunkhwa Minerals Development Policy 2022," Minerals Development Department, Government of Khyber Pakhtunkhwa, accessed November 27, 2025, https://kpminerals.kp.gov.pk/page/khyber_pakhtunkhwa_minerals_development_policy_2022.

[108] *The Regulation of Mines and Oil-fields and Mineral Development (Government Control) (Amendment) Act, 2022*, Act No. XX of 2022 (Balochistan), accessed November 27, 2025, https://balochistancode.gob.pk/Document.aspx?wise=opendoc&docid=1321&docc=1265.

[109] *The Khyber Pakhtunkhwa Mines and Minerals Bill, 2025*, Bill No. 52 of 2025 (Provincial Assembly of Khyber Pakhtunkhwa), accessed November 27, 2025, https://www.pakp.gov.pk/wp-content/uploads/2025/04/2.The-Khyber-Pakhtunkhwa-Mines-and-Minerals-Bills-2025-Bill-No-52-of-2025.pdf.

[110] *The Balochistan Mines and Minerals Act, 2025*, Act No. XIII of 2025 (Balochistan), accessed November 27, 2025, https://balochistancode.gob.pk/lawdir/5b706e84-be4f-46dc-a6a1-dd0b0a028589.pdf.

	Amendment Act (2025)		(MIFA); criticized for federal overreach and limited provincial consultation.	

Analysis

Natural resource abundance is generally considered as a fundamental driver of economic growth for economies because it provides employment, revenue and industrial development. Mineral wealth attracts investment and creates opportunities for economic expansion.[111] Historically minerals have contributed to economic development and helped industrialization of economies.[112] The positive relationship between resource wealth and economic development, however, does not hold true for every nation. Many resource-rich countries could not benefit from their resource wealth. Instead, the abundance of natural resources has caused disadvantages. This paradox has been termed as "Resource Curse" in the literature where a country's abundant resources negatively affect its economic, political or social wellbeing.[113] "Dutch Disease"[114] phenomenon is one explanation to this situation which argues that with a boom in the natural resources of a country, its currency starts appreciating which exerts adverse effects on the exports of other sectors of the economy such as agriculture and manufacturing industries, and ultimately lead towards deindustrialization. It was observed in Netherlands with the discovery of huge gas reserves and its export led to the decline in exports manufacturing and agricultural sectors. The other explanation is that weak institutions of resource abundant nations are responsible for turning resource abundance into curse for the economy while stronger institutions help the nations to convert their resources into blessing. Pakistan has rich mineral resources such as, copper, gold, coal, chromite, antimony, and REERs etc.[115] However, due to the structural problems of the country, despite of having such abundant resources there is no significant contribution of these resources in economic development.

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[111] Li, Aimin, and Shuyu Zhou. "Role of mineral-based industrialization in promoting economic growth: Implications for achieving environmental sustainability through financial management." *Resources Policy* 92 (2024): 105020.

[112] Clark, Gregory. "Industrial Revolution." In *The New Palgrave Dictionary of Economics*, pp. 1-11. Palgrave Macmillan, London, 2008.

[113] Ross, Michael L. "What have we learned about the resource curse?." *Annual review of political science* 18, no. 1 (2015): 239-259.

[114] Larsen, Erling Røed. "Escaping the resource curse and the Dutch disease? When and why Norway caught up with and forged ahead of its neighbors." *American journal of economics and sociology* 65, no. 3 (2006): 605-640.

[115] Malkani, M. SADIQ, and Z. A. F. A. R. Mahmood. "Mineral resources of Pakistan: a review." *Geological Survey of Pakistan, Record* 128 (2016): 1-90.

Role of Institutions in Mineral-Based Development

It is acknowledged that one of the most important factors influencing advancement in the mineral industry is institutional quality. In nations with weak institutions, widespread corruption, unstable political systems, ineffective governments, and precarious security, natural resources frequently turn into a curse. On the other hand, countries with robust, open property rights systems, efficient governance frameworks, and low levels of corruption are better equipped to use their resource endowments for long-term economic growth.[116] Institutional quality plays the role of mediator between resource endowment and economic growth.[117]

Despite the 18th Amendment's transfer of mineral resource ownership to the provinces in Pakistan, sectoral performance has not significantly improved as a result of this change. Progress is still hampered by a number of structural and governance-related issues, such as inadequate institutional capacity, political meddling, antiquated and onerous bureaucratic processes, low political stability, and enduring security issues in areas with abundant natural resources. Investment is further discouraged by other obstacles, such as disagreements over the distribution of royalties, poor community involvement, a mismatch between federal and provincial policies, and the lack of necessary infrastructure. When taken as a whole, these elements erode the trust of both domestic and foreign investors, reducing the sector's capacity to make significant contributions to regional and national development. Pakistan's 2024 institutional quality ranking of 129th out of 142 countries reflects these systemic flaws.[118]

If properly planned and executed, public-private partnerships, or PPPs, can greatly contribute to the development of Pakistan's mineral industry. Considerable preparatory work has already been done: the National Mineral Policy (2013) specifically encourages private-sector involvement, and a number of provincial frameworks, including the KP Mines and Minerals Act (2017), the Punjab Mines Policy (2018), the amended Sindh Mining Concession Rules (2019), and the Balochistan Mines and Minerals Act (2020), further encourage private investment and cooperative project development at the subnational level. Furthermore, the federal Public–Private Partnership

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[116] Mehlum, Halvor, Karl Moene, and Ragnar Torvik. "Institutions and the resource curse." *The economic journal* 116, no. 508 (2006): 1-20.

[117] Brunnschweiler, Christa N., and Erwin H. Bulte. "The resource curse revisited and revised: A tale of paradoxes and red herrings." *Journal of environmental economics and management* 55, no. 3 (2008): 248-264.

[118] Junaid Zahid, "What Is Pakistan's Reform Paradox?," *The News*, July 15, 2025, https://www.thenews.com.pk/print/1328421-what-is-pakistan-s-reform-paradox

Authority Act (2017) has introduced standardized procedures, risk sharing frameworks, and feasibility requirements to institutionalized the PPPs. The reforms were made to facilitate investors by bringing clarity in legal terms and procedures. Reko Diq project in Balochistan is prime example of PPPs which is a joint project of Barik Gold, federal and provincial governments.

On the bright side, PPP-driven reforms have shifted Pakistan's mineral sector from state dominance toward a, transparent, collaborative and investment-friendly model. Chinese companies have been working in the mining sector and the recent agreement of $500 million between USSM and Mota-Engil with FWO is a significant development. Amid the race for critical minerals, there lies an opportunity for Pakistan to engage private firms across the world in the mining sector by improving the security situation in the country.

Post-18th Amendment Transformations in Pakistan's Mineral Governance: Issues

Following the 18th Constitutional Amendment, the mineral sector falls under provincial jurisdiction, making provincial governments responsible for licensing, monitoring, and revenue collection. However, despite this devolution of authority, provinces have struggled to attract substantial investment for mineral exploration, processing, and value addition.[119]

Technical and Administrative Capacity

Provinces like KP and Balochistan are rich in mineral resources but they have limited administrative and technical capacity to make mines operational. They have weak investment facilitation framework, underdeveloped regulatory mechanism and lack of proper geological survey data. Resultantly, they rely on federal Geological Survey of Pakistan (GSP) and Pakistan Mineral Development Corporation (PMDC). For instance, there are less than 200 technical staff in Balochistan Directorate of Mines and Minerals for a province which holds most of the mineral reserves of Pakistan.[120]

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[119] Khan, Azhar. "Mineral Policy Issues & Impact of the 18th Amendment." Presentation to the 11th-Symposium "Mineral Resources – The Most Neglected Sector," Karachi, October 27, 2018. PDF. Islamabad: Pakistan Council of Architects & Engineers Deputation (PACAD), 2018.

[120] Planning Commission, Government of Pakistan, *Strategy for Mineral Sector Development in Pakistan* (Islamabad: Planning Commission, Government of Pakistan, [n.d.]), accessed October 24, 2025, https://www.pc.gov.pk/uploads/pub/FIRST_05_PAGES_STRATEGY_FOR_MINERAL_SECTOR-DEVELOPMENT_IN_PAKISTAN.pdf

Overlapping Federal-Provincial Roles and Jurisdictional Conflicts

Although provinces do have the ownership of mineral resources but federal has control over the approval of foreign investment, environment regulations, export policy, and fiscal incentives. This creates institutional overlap between provinces and the federal. For illustration, Redo Diq was initially inked by Federal Government in 1993, later the ownership changed which caused legal complications for Pakistan.[121] Provincial governments collect royalties, but custom duties, export taxes and investment incentives are under federal control. Such examples discourage private investment from abroad.

Weak Regulatory Frameworks and Delayed Policy Harmonization

Investors face multiple licensing procedures, inconsistent requirements and different royalty rates which leads to reduced transparency and efficiency.[122] Pakistan's National Mineral Policy (2013)[123] was never effectively implemented, which left the country without a unified national framework or functioning coordination bodies for the mineral sector[124]. Resultantly, investors must navigate separate and often inconsistent provincial regulations, which creates uncertainty and increases the complexity of investment decisions[125].

Local Communities and Unequal Distribution of Benefits

The limited economic inclusion of local communities is a recurring issue in Pakistan's resource sector, especially in Balochistan and KP. These communities' political and economic marginalization has led to disagreements over decision-making power, ownership, and revenue-sharing plans. These complaints frequently result in opposition to exploration and extraction operations. The Sui gas field in Balochistan is a well-known example, where local populations have received little economic benefit while other regions have reaped disproportionate benefits.

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[121] International Centre for Settlement of Investment Disputes (ICSID), *Decision on the Annulment Application in the Case of Tethyan Copper Company Pty Limited v. Islamic Republic of Pakistan* (Washington, DC: ICSID, 2020).

[122] "Minerals," *Trade Development Authority of Pakistan*, accessed October 24, 2025, https://tdap.gov.pk/minerals/

[123] Government of Pakistan. 2013. *Pakistan National Mineral Policy 2013 (English)*. Accessed October 17, 2025. https://113dstor001.s3-eu-west 1.amazonaws.com/ Community +Development +in+ Mining/Pakistan/ Pakistan_National_Mineral_Policy_2013_English.pdf.

[124] Saud bin Ahsen, "Digging Deeper: Debunking Mineral Policy – III," *Daily Times*, November 1, 2024, https://dailytimes.com.pk/1235892/digging-deeper-debunking-mineral-policy-iii/.

[125] Government of Pakistan. 2013. *Pakistan National Mineral Policy 2013 (English)*. Accessed October 17, 2025. https://113dstor001.s3-eu-west 1.amazonaws.com/ Community +Development +in+ Mining/Pakistan/ Pakistan_National_Mineral_Policy_2013_English.pdf.

The sustainability and legitimacy of mineral development projects have been threatened by this perceived exclusion, which has increased mistrust and widened the divide between the state and communities in resource-producing areas.

This challenge can be overcome by reinforcing the institutional arrangement in a manner that a certain percentage of mineral revenues is apportioned for the people of the mineral-bearing areas. Similarly, the jobs that are created as a result of the projects should be given to the inhabitants of KP and Balochistan, and the money garnered from initial project revenues needs to be utilized for investing in the wellbeing of local people. Without proper monetary or non-monetary compensation, the indigenous people are bound to have the mindset that their resources are being extracted to benefit other parts of the country at the expense of local interests. In such a context, unrest will persist in these areas, and full utilization of the resources will not be possible.

International experiences are instructive. For instance, Ghana sets aside a certain percentage of mineral revenues for local governments and for the communities from which the minerals are extracted; that has led to considerable improvements in education, infrastructure, and health services in mining areas.[126] Similar is the case in Canada.[127] Pakistan could also implement a similar participatory model to ensure that host communities share equitably in the resource development benefits.

Pakistan's Mineral Sector as a Driver of Economic Development

GDP could rise from the current level of approximately 3% to 5–6% in the coming years if Pakistan implements effective PPP frameworks, strengthens mining governance, and addresses security and community-related challenges.[128] Furthermore, the export value of minerals, currently around $3

[126] Lujala, Päivi, and John Narh. "Ghana's Minerals Development Fund Act: addressing the needs of mining communities." *Journal of Energy & Natural Resources Law* 38, no. 2 (2020): 183-200.

[127] O'Faircheallaigh, Ciaran. "Explaining outcomes from negotiated agreements in Australia and Canada." *Resources Policy* 70 (2021): 101922.

[128] Syed Akhtar Hussain Shah, *Strategy for Mineral Sector Development in Pakistan* (Islamabad: Planning Commission of Pakistan, Ministry of Planning, Development & Reform, 2018), https://www.pc.gov.pk/uploads/pub/FIRST_05_PAGES_STRATEGY_FOR_MINERAL_SECTOR_DEVELOPMENT_IN_PAKISTAN.pdf

billion, has the potential to increase to $ 6–8 billion[129] through the extraction and export of critical minerals such as copper, antimony, and gemstones. According to *Energy Update* (2025), the initial phase of the Reko Diq project is expected to attract $ 5.5 billion in investment, followed by an additional $ 3.5 billion during the expansion phase.[130] The project is projected to generate $ 2.8 billion in annual export revenue and $74 billion in free cash flow over 37 years, while creating thousands of jobs for local communities.[131]

Pakistan also has the opportunity to expand trade with other countries, particularly advanced economies through the export of minerals and value-added mineral products. At present, mineral exports are largely limited to unprocessed raw materials. By undertaking systematic exploration, establishing processing facilities, and exporting end-use mineral products, Pakistan could become a significant and reliable supplier in global mineral value chains. Countries such as the United States, China, Türkiye, Japan, South Korea, Austria, Gulf states, and European nations are increasingly seeking secure and diversified mineral supply chains for their industrial needs. This shift would not only increase Pakistan's export revenue but also facilitate technology transfer and attract investment into the mining sector.

The current export base dominated by low-value traditional products such as textiles would be diversified through mineral exports. This diversification would strengthen foreign exchange reserves, stabilize the exchange rate, and improve the current account balance. Infrastructure could also improve through bilateral projects, including the development of roads and ports under initiatives such as the China–Pakistan Economic Corridor (CPEC).

In sum, an expanded and well-governed mineral trade sector could enhance Pakistan's integration into global markets, generate employment, stimulate industrial growth, increase fiscal revenues, raise incomes for local populations, and contribute to higher long-term economic development.

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[129] "Pakistan's Mining Sector Growth Could Reach $8 Billion by 2030." *Bestpakmag*, September 18, 2025. https://bestpakmag.com/pakistans-mining-sector-growth-could-reach-8-billion-by-2030/.

[130] Zafar Bhutta, "Pakistan Eyes $8 Trillion Mineral Wealth, Plans Investor Conference," *Energy Update*, March 18, 2025, https://www.energyupdate.com.pk/2025/03/18/pakistan-eyes-8-trillion-mineral-wealth-plans-investor-conference/.

[131] Syed Akhtar Hussain Shah, *Strategy for Mineral Sector Development in Pakistan* (Islamabad: Planning Commission of Pakistan, Ministry of Planning, Development & Reform, 2018), https://www.pc.gov.pk/uploads/pub/FIRST_05_PAGES_STRATEGY_FOR_MINERAL_SECTOR_DEVELOPMENT_IN_PAKISTAN.pdf

The Case of Mineral Exports and GDP Growth: Reko Diq

For illustration, if Reko Diq and Saindak become fully functional, only copper exports from these areas could provide $3-4 billion per year by 2030 will improve foreign exchange reserves and stable the exchange rate as well.[132] Furthermore, mining sector also attracts FDI and domestic capital formation. For instance, phase1 of Reko Diq project is worth around $5.5 billion.[133] If utilized properly, these investments will increase FDI inflows which will boost industrial output, infrastructure and local employment. The mineral sector can also contribute to the GDP through the fiscal revenue channel. Government revenue will rise through export duties, profit taxes and mineral royalties which will strengthen the fiscal space for development projects. In addition, if production starts at the mining sites, there will be numerous local employments and Reko Diq alone could produce 0.3 million direct long-term jobs.[134] Studies show that instead of exporting raw materials if we convert them into value added products (for instance, refined copper, procced marble etc.), export value could double or even triple.[135]

[132] Asian Development Bank, 'ADB Approves Financing for Transformative Reko Diq Copper Mining Project in Pakistan,' news release, August 22, 2025, https://www.adb.org/news/adb-approves-financing-transformative-reko-diq-copper-mining-project-pakistan."

[133] ProPakistani, "Reko Diq Secures $5.5 Billion in Global Financing Commitments," *ProPakistani*, September 17, 2025, https://propakistani.pk/2025/09/17/reko-diq-secures-5-5-billion-in-global-financing-commitments/.

[134] Barrick Gold Corporation, "Employment & Training," Barrick Gold, accessed October 24, 2025, https://www.barrick.com/English/operations/reko-diq/employment-training/default.aspx.

[135] Gul, Aishma. “PMIF25: A Geological Dawn.” *GHAG*, April 9, 2025. Accessed October 24, 2025. https://ghag.pk/en/4760-2/?utm_source=chatgpt.com.

Mineral Policies Comparison

This word cloud, created as a result of filtered set of keywords which are related to the Balochistan Mines and Minerals Act 2025, reflects a very narrow thematic portrayal. The terms that got chosen like mineral, mining, Balochistan, framework, governance, authority, provisions, communities, implementation and environmental, indicate the focus of the Act on the regulatory structure, the administrative mechanisms and the governance frameworks. The simplicity of the visual image and the use of few words emphasize the narrow focus of the document that focuses on the responsibility of institutions, clarity of procedures, and the legal framework of mining processes in Balochistan.

Conversely, this word cloud represents a more extensive and a more varied range of words that are usually included in the general policy statements, e.g., the Mineral Policy 2013. There is a broader set of concepts in this cloud, such as government, development, sector, federal, provincial, and resources, which suggests that this policy does not exhibit a legal or administrative-oriented policy. Its more solid form and the diversity of terms shows that the national mineral sector planning is multidimensional as it involves the economic development, governance structures, and sectoral reform. In contrast to the original visualization, this one represents a broader policy area, and the edited word cloud represents the narrower regulatory purpose of the 2025 Act.

Investments in mineral sector of Pakistan

U.S.'s investment in Mineral Sector of Pakistan

In September 2025, Frontier Works Organization (FWO) of Pakistan and US Strategic Metals (USSM) signed a U.S. $500 million Memorandum of Understanding (MoU)[136]. Agreed points of this agreement include initially the exploration, extraction and processing of critical minerals and ultimately establishing a poly-metallic refinery in Pakistan[137]. The minerals list includes antimony, copper, gold, tungsten and rare-earth elements (REEs)[138]. Following this agreement Pakistan has dispatched the first batch of minerals which include copper concentrate, antimony, and rare-earth elements such as neodymium and praseodymium[139].

Potential benefits for USA

1. **Access to critical minerals:** Pakistan is home to minerals including critical minerals worth U.S. $6 trillion i.e., antimony, copper, gold, tungsten, chromite, and rare earth elements[140]. These minerals are crucial for energy transition, advance military equipment electric vehicles[141]. Since U.S. is one of the major economies of the world therefore, U.S. would need these minerals for defense, clean energy, electronics, and EV industries.

2. **Diversification away from China**: U.S. heavily dependent on China for the supply of critical minerals thus, to reduce its dependency Pakistan offers an alternative supply source[142].

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[136] Farrukh Saleem, "Comment: Converting $500m FWO–USSM MoU into cash flow," *The News International*, October 18, 2025, https://www.thenews.com.pk/latest/1351827-comment-converting-500m-fwo-ussm-mou-into-cash-flow.
[137] News Desk, "US Strategic Metals signs $500 million investment deal with Pakistan's FWO for critical minerals," *Profit by Pakistan Today*, September 8, 2025, https://profit.pakistantoday.com.pk/2025/09/08/pakistan-and-us-sign-mou-to-strengthen-cooperation-in-critical-minerals-sector/.
[138] "Pakistan signs $500m investment deals with US-based firms," *The Express Tribune*, September 8, 2025, https://tribune.com.pk/story/2565638/govt-signs-mou-with-us-firm-on-critical-minerals-cooperation.
[139] "Pakistan delivers first shipment of rare earth elements, critical minerals to US," *Business Recorder*, October 4, 2025, https://www.brecorder.com/news/40385840/pakistan-delivers-first-shipment-of-rare-earth-elements-critical-minerals-to-us.
[140] Daniel, "Pakistan's $6 Trillion Mirage: Rare Earths, Rhetoric, and the Art of Selling Shiny Rocks," *Rare Earth Exchanges*, November 10, 2025, https://rareearthexchanges.com/news/pakistans-6-trillion-mirage-rare-earths-rhetoric-and-the-art-of-selling-shiny-rocks/.
[141] International Energy Agency, "Executive Summary," *The Role of Critical Minerals in Clean Energy Transitions*, 2021, https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary.
[142] Karl Friedhoff, "Can the US Reduce its Dependence on China for Critical Minerals?," *Chicago Council on Global Affairs*, October 16, 2025, https://globalaffairs.org/commentary/analysis/can-us-reduce-its-dependence-china-critical-minerals.

3. **Lower extraction and production costs:** The untapped and lower-cost mineral reserves of Pakistan allow U.S. companies to get access to cheap minerals as compared to other markets.

4. **First-mover advantage**: Sine the mineral sector of Pakistan is largely unexplored thus provides U.S. secures long-term mining rights, supply agreements, and influence over future projects.

5. **Strengthening geopolitical influence**: The mineral cooperation between U.S. and Pakistan would deepen the strategic ties and the growing influence of China in Pakistan would also be countered.

6. **Market for U.S. technology and equipment:** The demand for U.S. machinery products, military equipment, geological tools, and refining technology would increase with the rise in supply of these minerals. in addition, U.S. firms would benefit from steady supplies and profits from exploration, processing, and trade with rising global demand for critical minerals.

China's investment in Mineral sector of Pakistan

China is a major investor in the mineral sector of Pakistan. Metallurgical Corporation of China (MCC) already operating Saindak Copper-Gold mine in Chagi, Balochistan and Duddar Lead-Zinc mine in Lasbela, Balochistan[143].

The project initially built for Pakistan government at a cost of around U.S. $84 million[144]. Then a ten years lease was awarded in 2001 where MCC was committed to arrange finances, preparation, maintenance and rehabilitation activities[145]. Later the lease was updated in 2020 till 2037 which includes the additional investment of U.S. $ 45million for exploration and development of the Ore Body[146]. While MCC contributes around $108 million out of the overall $236 million investment

[143] "Pakistan showcases mineral wealth, boosts mining ties with China at Beijing summit," *Daily Times*, May 27, 2025, https://dailytimes.com.pk/1307392/pakistan-showcases-mineral-wealth-boosts-mining-ties-with-china-at-beijing-summit/.
[144] Dawn.com, "Saindak copper-gold project: A timeline," *Dawn*, January 8, 2018, https://www.dawn.com/news/1381378.
[145] Dawn.com, "Saindak copper-gold project: A timeline," *Dawn*, January 8, 2018, https://www.dawn.com/news/1381378.
[146] Saleem Shahid, "Exploration licences of 14 companies cancelled," *Dawn*, June 30, 2020, https://www.dawn.com/news/1566257.

in the Duddar Lead-Zinc project[147]. Moreover, investment value of the other Chinese partner MCC Huaye Duddar Mining (HDM) in the Duddar Lead-Zinc project is around $101 million[148].

Recently, China has showed renewed interest in the mineral sector of Pakistan for instance, the MCC Tongsin Resources, during a meeting with Pakistan's Prime Minister, has presented plans for the establishment of "mineral park" and investments in the" mining to export oriented mineral products.[149]". In addition, amid the Health, Engineering and Minerals Show (HEMS) in Lahore multiple Chinese firms signed contracts/MoUs/LOIs for engineering, mining and related industries of estimated worth around at least U.S. $435 million[150].

Potential benefits for China

1. **Access to critical minerals and rare-earth elements (REEs):** Pakistan holds significant reserves of copper, gold, zinc, lead, antimony, tungsten and REEs, which are crucial for China's technological, industrial, and defense sectors[151].

2. **Securing long-term mineral supply:** Since China holds the major mineral processing and refining country therefore, investments in mineral sector of Pakistan will ensure the non-turbulent and predictable supply of strategic minerals, which would reduce reliance on the global markets[152].

3. **Vertical integration and value addition:** Investment will allow Chinese firms to move beyond merely extraction and start processing and refining minerals in Pakistan. Which will strengthen the supply chains by enabling value-added exports.

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[147] "MCC Achieves 500,000 Tons Lead Zinc Target in Duddar," *Business Express*, December 2019, https://bexpress.com.pk/2019/12/mcc-achieves-500000-tons-lead-zinc-target-in-duddar.
[148] "MCC Achieves 500,000 Tons Lead Zinc Target in Duddar," *Business Express*, December 2019, https://bexpress.com.pk/2019/12/mcc-achieves-500000-tons-lead-zinc-target-in-duddar.
[149] Ministry of Information and Broadcasting, "Pakistan, US Sign MoUs to Strengthen Cooperation in Critical Minerals Sector," *Government of Pakistan*, September 8, 2025, https://moib.gov.pk/News/61788.
[150] Agencies, "China signs 37 deals to promote Pak healthcare, engineering, mining," *The Nation*, April 25, 2025, https://www.nation.com.pk/25-Apr-2025/china-signs-37-deals-to-promote-pak-healthcare-engineering-mining.
[151] Daily Times, "Pakistan Showcases Mineral Wealth, Boosts Mining Ties with China at Beijing Summit," November 26, 2025, https://dailytimes.com.pk/1307392/pakistan-showcases-mineral-wealth-boosts-mining-ties-with-china-at-beijing-summit.
[152] Daily Times, "Pakistan Showcases Mineral Wealth, Boosts Mining Ties with China at Beijing Summit," November 26, 2025, https://dailytimes.com.pk/1307392/pakistan-showcases-mineral-wealth-boosts-mining-ties-with-china-at-beijing-summit.

4. **Geostrategic influence through CPEC:** Mineral investments will ensure the regional presence of China by supporting infrastructure and trade corridors, connecting mining areas to ports and Chinese markets.

5. **Support for industrialization and downstream industries:** Investments in processing facilities and mineral parks will not only encourage industrial development in Pakistan, but also benefit Chinese companies because of the supplying technology, equipment, and services[153].

6. **Cost effectiveness:** Since Pakistan and China are neighboring countries and the distance is less than other mineral rich regions thus investing in Pakistan's mineral resources will reduce the travel time and cost of transportation.

Saudi Arabia's Investments in Pakistan's Mineral Sector

Manara Minerals, a Saudi backed mining investment fund, has shown interest to attain 10-20% share in the Reko Diq project and the investment amount is around U.S. $500 million to $1 billion[154]. In addition, the Saudi mining minister also stated that another U.S. $100 million funds may also be provided through the Saudi Development Fund to develop the required infrastructure for the mining sector of Pakistan[155]. Also, the Anfal Group (Saudi firm) has initiated a U.S. $150 million mineral processing plant in Punjab which aims for processing the local minerals, expand mineral based exports and decrease the dependency on chemical imports[156].

Potential Benefits for Saudi Arabia in Mineral sector of Pakistan

- **Secures long-term access to strategic minerals:** Under the 2030 vision, Saudi Arabia needs to expand its industrial base and for that purpose they would require minerals such as gold, copper and rare elements. Pakistan is home to these minerals and investing in the

[153] Ministry of Information and Broadcasting Pakistan, " Ministry of Information and Broadcasting Pakistan, date of publication or last modification or access, https://moib.gov.pk/News/61788.

[154] Mir Sherbaz Khetran, "Unlocking Pakistan's Mineral Wealth for Sustainable Economic Growth," (Institute of Strategic Studies Islamabad, May 19, 2025), https://issi.org.pk/wp-content/uploads/2025/05/IB_Khetran_May_19_2025.pdf.

[155] Naveed Elahi et al., "Policy Pulse," *Issue No. 20* (Islamabad: National School of Public Policy, January 21, 2025), https://nspp.gov.pk/wp-content/uploads/2025/01/Issue-20.pdf.

[156] CT Report, "Pakistan, Saudi firm launch $150m minerals processing complex," *Customs Today*, June 14, 2025, https://customstoday.media/pakistan-saudi-firm-launch-150m-minerals-processing-complex/.

mineral sector would benefit them manufacturing, energy transition, electronics and defense industries.

- **Supports Saudi mineral diversification goals:** Investing in the mineral sector of Pakistan will benefit the Kingdom to diversify its mineral portfolio and reduce dependency on imports. It will also help the Kingdom to be a key player in the global supply chains of mining assets.
- **Strengthens downstream value chains:** Investing in projects such as Riko Diq and other mineral processing initiatives will enable the Kingdom to get access not only the raw minerals but also the value-added mineral products which are crucial for various industries.
- **Enhances energy and industrial security** by ensuring stable supply of critical minerals during the ongoing global energy transition.
- **Strategic geopolitical influence through economic engagement:** More investments will strengthen the ties between Pakistan and Saudi Arabia which will increase the influence of the Kingdom in the region.
- **High returns on investment from world-class deposits:** Saudi investment in the mineral sector is a beneficial investment because Pakistan holds one of the biggest mineral deposits like Reko Diq which are expected to give high returns and stable revenue flows.

Environmental Implications of Pakistan's Mineral Development and Export Expansion

Mineral sector possesses a lot of potential for economic development of the country. However, it is an energy and water intensive industry as well. Thus, the environmental effects of mining-related activities in the localities must not be ignored. Below is an overview of the environmental degradation associated with various mining activities across the country.

Reports have shown that the large-scale coal mining and power development projects in Thar (Sindh), have caused alarming damage to the underground water due to contamination of heavy metals. Water samples from the mining location has confirmed the existence of heavy metals like

arsenic, selenium, chromium, mercury, fluoride and lead.[157] A Center for Research on Energy and Clean Air (2020)[158] report predicts that there would be around 29000 deaths in the surrounding population due to air-pollution emitting from the plants and a surge in pre-term births and asthma cases following the emission of mercury and other harmful wastes. In addition, as a result of excessive mining there has been degradation of land, water table disruption and biodiversity loss in the mining locations.[159]

Similarly, mining activities for salt, cement and limestone in the salt range and in the adjacent areas have resulted in the disturbance of the water table due to high usage of water in mining process i.e., Katas Raj Pond.[160] Same is the case with Saindak, where excessive mining has contaminated the surrounding water and aquifers have depleted in the adjacent areas.[161]

The environmental stresses brought on by extensive mining operations make Pakistan even more vulnerable to the effects of climate change. Concerns about air pollution, land degradation, and water contamination in nearby communities have been brought up by various CSOs and NGOs. Adopting a thorough regulatory framework that guarantees stringent adherence to environmental protection standards is essential as the mineral sector rises in importance on the national policy agenda. To protect ecosystems and local livelihoods, mining firms must be obligated to follow Pakistan's environmental laws going forward through strict enforcement, monitoring, and open environmental impact assessments.

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[157] Usman Hanif, "Thar coal poisoning water: report," *The Express Tribune*, April 14, 2023, https://tribune.com.pk/story/2411854/thar-coal-poisoning-water-report.

[158] Lauri Myllyvirta, *Air quality, health and toxics impacts of the proposed coal mining and power cluster in Thar, Pakistan* (Centre for Research on Energy and Clean Air, 2020), https://energyandcleanair.org/wp/wp-content/uploads/2020/05/Thar-Coal-Cluster-Case-Study_Pakistan.pdf.

[159] Dr. Imran Aziz Tunio, "Pakistan: Thar coal mining expansion raises concerns on Just Transition including environmental damage, health risks and indigenous displacement," *Business & Human Rights Resource Centre*, September 22, 2025, https://www.business-humanrights.org/en/latest-news/pakistan-thar-coal-mining-expansion-raises-concerns-over-environmental-damage-health-risks-and-indigenous-displacement/?utm.

[160] Sher Ali Khan, "Why the water table is receding in a Salt Range valley," *Herald* (Dawn), updated July 15, 2018, https://herald.dawn.com/news/1398577.

[161] Li, Jiang, Zhuoying Tan, Aboubakar Siddique, Hilal Ahmad, Wajid Rashid, Jianshu Liu, and Yinglin Yang. "GIS-Based Evaluation of Mining-Induced Water-Related Hazards in Pakistan and Integrated Risk Mitigation Strategies." *Water* 17, no. 13 (2025): 1914.

SWOT Analysis: Pakistan's Minerals Sector

Pakistan has rich mineral endowments which creates several opportunities to develop local communities and earn export revenues. However, there are certain challenges and threats to the mineral sector as well like the one discussed in the previous sections. Below is a SWOT analysis of Pakistan's minerals sector:

Category	Key Points
Strengths	• Pakistan has a rich potential resource base estimated at $6 trillion, including gold, copper, chromite, iron ore, coal, marble, and rare earth elements (REEs). • Strategic reserves include ~175 billion tons of coal (Sindh), 345 million barrels of oil, and 19 TCF of natural gas. • High-value projects: Phase 1 of the Reko Diq copper–gold project is expected to attract $5.5 billion, with a further $3.5 billion in expansion. • Strong export potential: Mineral exports were around $2 billion in 2024 and could grow to $8 billion by 2030 with value addition.
Weaknesses	• The 18th Constitutional Amendment caused institutional fragmentation and dissimilar provincial regulations, leading to regulatory overlaps. • Insufficient investment and weak infrastructure (capital availability, transport networks, and affordable energy) increase production costs and limit efficiency. • Lack of updated and comprehensive geological data; as of 2023, only ~40% of land area has been mapped by the Geological Survey of Pakistan. • Low value addition: Over 90% of mineral exports are raw or semi-processed.
Opportunities	• The minerals sector can attract $5–10 billion in investment, especially through improved governance and investor-friendly policies. • Shift toward value-added mineral exports could increase earnings by $1.5–2 billion annually, particularly in marble and copper processing. • Expansion of trade linkages beyond CPEC, driven by global demand for critical minerals and REEs, with partners such as the US, UK, Japan, Germany, and others. • • Large-scale mining projects (e.g., Reko Diq) could generate 350,000+ direct jobs and over 1 million indirect jobs.
Threats	• Political uncertainty leads to policy instability, discouraging investor confidence. • Security challenges in mineral-rich regions, especially KP and Balochistan. • Weak enforcement of Environmental Impact Assessments (EIA) raises environmental risks. • • Volatility in global mineral prices (gold, copper, etc.) affects export revenues and sectoral stability.

Policy Recommendations

Given the above analysis, this study offers the following policy recommendations:

- Institutional capacity may be enhanced through digitalization of mineral records, training programs and efficient regulatory mechanisms. To attract foreign investment, ensure fair community benefits and transparent agreements Pakistan must expand PPPs.

- Instead of only exporting raw materials, the government should move towards value added products by locally developing mineral processing, refining, and smelting facilities.
- To reduce security issues and regional disparities especially in KP & Balochistan, there should be a proper and fair revenue sharing mechanism developed in consensus with all stakeholders.
- The development of infrastructure should be made an integral part of agreements in the mining sector which will ensure construction of roads, power houses, and water resources in the mining areas.
- To improve investor confidence, there must be stable contracts, tax reliefs, and simplified approval processes.
- Pakistan must make strong trade linkages through mineral exports with other advance counties such as Türkiye, Japan, European Union, and South Korea apart from U.S., UAE and China.
- There should be a proper mechanism to enforce environmental standards and waste management in and around mining projects.

Conclusion

Although Pakistan's mineral industry has enormous unrealized potential to spur economic change, its contribution is still far less than what one might anticipate from an endowment worth almost $6 trillion. The resource-curse paradox, which states that weak institutions, poor governance, and political instability frequently cause resource-rich nations to develop more slowly, provides a helpful lens through which to view Pakistan's current difficulties. This paradox is not unavoidable, though. Mineral abundance can be a significant economic advantage rather than a drawback with the correct institutional and policy changes. Major infrastructure upgrades, access to cutting-edge mining and processing technologies, consistent and predictable policies, improved law and order, and increased regulatory system transparency are all necessary to realize this potential. High-value minerals like gold, copper, antimony, and rare earth elements can be exploited and processed with added value to greatly increase employment opportunities, boost export earnings, enhance foreign exchange reserves, and promote regional industrialization. Deeper public-private partnerships (PPPs), improved coordination between federal and provincial authorities, and a conscious move away from exporting raw minerals and toward the development of domestic mineral value chains

are all necessary to achieve these goals. In the end, ensuring community involvement, upholding environmental protections, and creating an investor-friendly governance environment that can reverse the dynamics typically associated with the resource curse are necessary to turn Pakistan's mineral wealth into a sustainable driver of GDP growth, fiscal stability, and global economic integration.

Action Matrix

Policy Area	Key Action	Lead Institution	Supporting Institutions	Timeframe	Expected Outcome
Institutional Capacity	Digitise mineral records and build a national geological database with transparent access	Geological Survey of Pakistan	NADRA, Provincial Authorities	Medium term	Improved data availability, lower entry barriers for investors
Investment Framework	Expand PPP frameworks with transparent contracts and community benefit clauses	BOI	Finance Ministry, Provincial Govts	Medium term	Increased FDI, reduced social conflict
Value Addition	Develop domestic mineral processing, refining, and smelting facilities	Ministry of Industries	Energy Ministry, Private Sector	Medium–Long term	Shift from raw exports to value-added production
Regional Equity & Security	Design a fair revenue-sharing mechanism with KP and Balochistan through stakeholder consensus	Finance Ministry	Provincial Governments	Medium term	Reduced regional grievances, improved security environment
Infrastructure Development	Integrate road, power, and water infrastructure commitments into mining agreements	Planning Commission	Provincial Govts, Private Investors	Medium–Long term	Improved project viability and regional development
Investor Confidence	Ensure contract stability, targeted tax relief, and simplified approvals	Finance Ministry	FBR, BOI	Short term	Lower regulatory risk and faster project execution
Trade Integration	Strengthen mineral trade linkages with Türkiye, Japan, EU, South Korea, alongside US, UAE, China	Ministry of Commerce	Foreign Office	Medium term	Diversified export markets and higher export earnings
Environmental Governance	Enforce environmental standards and waste-management mechanisms around mining projects	Ministry of Climate Change	Provincial EPAs	Short–Medium term	Sustainable mining and reduced environmental damage

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