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The Geopolitics of Mining Minerals in Lao PDR: China's Influence and Regional Implications

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Executive Summary

- Lao PDR, a landlocked country in Southeast Asia's heart, boasts abundant mineral resources, including copper, gold, and tin. Exploring these resources has become pivotal to Laos' economic development and garnered attention from various regional and global actors.
- China's dominant role in the mining industry, particularly in controlling critical minerals, has significant regional implications. On one side, China's strategic investments and partnerships in Lao PDR, highlight its intent to secure long-term access to these valuable resources. Furthermore, China's influence in Laos and other resource-rich regions strengthens its economic power and expands its geopolitical reach.
- On the other hand, this dominance by China raises concerns about resource security, as it concentrates the supply and control of essential minerals needed for various industries, including technology and renewable energy.
- This paper examined international relations, geopolitics, and political economy to dissect the complex interplay of interests, power dynamics, and strategic calculations surrounding mineral extraction in Laos.

Introduction

The increasing adoption and development of the green energy revolution in Europe, the United States, and China have resulted in a discernible upswing in the need for rare-earth metals (REMs), which are fundamental components of renewable energy technology. Rare earth elements are crucial for developing various useful devices and technologies, such as electric vehicles (EVs), renewable energy systems, advanced electronics, and many more.[1] Hence, this energy transitional

[1] Balaram, V. "Rare Earth Elements: A Review of Applications, Occurrence, Exploration, Analysis, Recycling, and Environmental Impact." *Geoscience Frontiers*.Last Modified July 1, 2019.https://doi.org/10.1016/j.gsf.2018.12.005.

race has been stirring countries to explore the hidden resources beneath the earth in their territory, and it is anticipated that the demand for these materials will increase by a factor of six due to the global pursuit of the "green energy revolution"[2], from the traditional non-renewable supply of energy from coal to a cleaner supply of renewable energy. A recent International Energy Agency (IEA) report predicts that renewable energy will make up more than 90% of the new electricity capacity added worldwide between 2022 and 2027.[3] This means there will be a big push for cleaner energy sources like solar and wind power. The demand for rare earth elements (REEs) is especially high in industries like electric cars, wind turbines, and hydrogen fuel cells, contributing to greener energy. The IEA also expects that REEs used in clean energy technologies will see even more growth from 2020 to 2040.[4]

Even though rare earth elements (REEs) are found in the earth's crust, it is not easy to find enough of them in one place to mine them.[5] This makes the global supply chain for REEs quite delicate. The pandora's box is that there is a heavy reliance on just a few countries to produce them, like the United States, Australia, Malaysia, and especially China. Hence, if something disrupts production in one of these countries, it can cause big problems for the supply of REEs worldwide. China's dominant role in the mining industry, particularly in controlling critical minerals, has significant regional implications.

China's strategic investments and partnerships in mineral-rich regions, such as Laos PDR, highlight its intent to secure long-term access to these valuable resources. Furthermore, China's influence in Lao PDR and other resource-rich regions strengthens its economic power and expands its geopolitical reach. In addition, China's increasing influence in mining minerals in Laos and

[2] "Green Energy Revolution - KS3 Humanities Geography - BBC Bitesize." *BBC Bitesize*. Last Modified October 2, 2023. https://www.bbc.co.uk/bitesize/articles/zxnsp4j#:~:text=The%20green%20energy%20revo%20lution%20means.
[3] International Energy Agency. "Renewables 2022: Analysis and forecast to 2027." 2022. https://www.iea.org/%20reports%20/renewables-2022.
[4] "The Role of Critical Minerals in Clean Energy Transitions – Analysis - IEA." *IEA*. Last Modified May 1, 2021. https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions.
[5] Humphries, Marc. "Rare Earth Elements: The Global Supply Chain." *Congressional Research Service*. Last Modified December 16, 2013. https://sgp.fas.org/crs/natsec/R41347.pdf.

other countries raises questions about the potential "resource curse."[6] While Laos' current contribution to the global rare earth element market is relatively small, its potential as a rare earth producer has attracted attention. If significant deposits are successfully developed and production scales up, Laos could become a more prominent player in the global REE market. This could potentially contribute to diversifying the global supply chain and reducing dependence on a single dominant producer like China. Please see Illustration 1 at the end of the paper.

As a result of energy transitions, the swift implementation of renewable energy technologies will substantially increase the demand for minerals, bringing Lao PDR into this quest for the REE. In a cabinet meeting in November 2023, Prime Minister Sonexay of Laos released the plan for exploring the REEs material, followed by the feasibility study of the impact as well. He noted that this could be the key to Laos's economic development and the profit generated from these high-demand resources.[7] The mining sector in Lao PDR remains a significant source of state revenue and attracts foreign direct investment from countries like China, Vietnam, and Thailand despite the current low global commodity prices.[8] In today's globalized world, the extraction and trade of minerals have profound political and economic implications. Hence, this insight will examine China's extensive influence in Lao PDR's rare earth elements (REE) sector. This influence has significant regional implications, as it not only shapes the economic landscape of Laos but also impacts regional dynamics by affecting global REE supply chains, regional economic dependencies, and China's geopolitical influence in Southeast Asia.

[6] "The Political and Economic Challenges of Natural Resource Wealth." *Natural Resource Governance Institute*. Last Modified March 2015. https://resourcegovernance.org/sites/default/files/nrgi_Resource-Curse.pdf.
[7] Lapuekou, Chono. "Laos Explores Rare Earth Token Project to Boost Economy - Laotian Times." *Laotian Times*. Last Modified December 1, 2023. https://laotiantimes.com/2023/12/01/laos-explores-rare-earth-token-project-to-boost-economy/.
[8] Tappe, Oliver. "Is Laos Mining Itself Into a Crisis?" *ThinkChina - Big Reads, Opinion & Columns on China*. Last Modified April 29, 2021. https://www.thinkchina.sg/society/laos-mining-itself-crisis.

Rare Earth Elements (REEs): Significance and Strategic Importance

Rare earths are critical to the future of economic powerhouses, as they hold the key to unlocking many economic benefits. These elements are not actually rare in terms of abundance in the Earth's crust, but they are typically found in low concentrations and are challenging to extract. According to the American Geoscience Institute:

> *"Rare-earth elements (REE) are a set of seventeen metallic elements. These include the fifteen lanthanides on the periodic table plus scandium and yttrium. They are the necessary components of more than 200 products across a wide range of applications, especially high-tech consumer products, such as cellular telephones, computer hard drives, electric and hybrid vehicles, and flat-screen monitors and televisions."* [9]

Given the geopolitical implications of rare elements, many countries actively explore alternative sources and invest in domestic production to reduce dependence on a single supplier. Efforts are being made to diversify the supply chain and develop new extraction technologies. China currently dominates the global production of rare elements, accounting for a significant portion of the world's supply. This concentration of production creates geopolitical concerns as it gives China substantial control over the global rare earth market. Reiterating the fact that rare elements are crucial for the manufacturing of many high-tech devices and technologies. They are used in producing smartphones, computers, electric vehicles, wind turbines, advanced batteries, lasers, and many other products. According to the American Geoscience Institute:

> *"Although the amount of REE used in a product may not be a significant part of that product by weight, value, or volume, the REE can be necessary for the device to function. For example, magnets made of REE often represent only a small fraction of the total weight, but without them, the spindle motors and voice coils of desktops and laptops would not be possible."*[10]

[9] "What Are Rare Earth Elements, and Why Are They Important?" *American Geosciences Institute.* Last Modified February 1, 2018. https://www.americangeosciences.org/critical-issues/faq/what-are-rare-earth-elements-and-why-are-they-important.
[10] Ibid. See 6.

Mineral Elements in Lao PDR: Abundance and Potential

Over seven million hectares, or more than 30% of the country's total land area, are devoted to mining and mineral development in Laos.[11] For the last decades, the minerals and energy sectors have been the two crucial industries that have led Laos to achieve economic prosperity. The recent recognition of Laos as one of Asia's most resource-rich countries underscores its mineral wealth's immense potential. Laos has a substantial endowment of valuable resources with over 570 identified mineral deposits, including significant gold, copper, zinc, and lead reserves. [12]Among these, the reserves are particularly noteworthy, with estimated gold reserves totaling 500 tons, copper reserves amounting to 8 million tons, and zinc reserves reaching 2 million tons. These abundant reserves represent a significant opportunity for economic development and investment in Laos' mining sector, offering the prospect of substantial revenues, employment opportunities, and infrastructure development.[13] Please see Illustration 2 at the end of the paper.

Lao PDR holds significant potential in the Rare Earth Element (REE) sector. In addition to bauxite, gold, silver, copper, iron, and gypsum, Laos has good geological potential for the development of other commodities such as potash, sapphire, and coal, and, to a lesser extent, tin, lead-zinc, and building materials.[14] Around 570 sites have been discovered to have economic mineral potential throughout the country. Geologically, the country is divided into four regions containing important elements of rare earth minerals, with the location in the northwest being called the Sukhothai belt, the Loei belt in the middle, and the Truongson belt and Khorat Plateau situated in the southeast and the southwest, respectively (see illustration 1 above).[15] Previously, the primary players in the Lao mining industry were the Phu Bia Mine in Xaysomboun province and the Xepon Mine in Savannakhet province, focusing on gold and copper mining. Australian mining corporations constructed these mines following economic policy reforms inspired by the World Bank in the

[11] "Laos to See Mineral Earnings of USD 463 Million in Fourth Quarter." *Laotian Times*. Last Modified November 23, 2021. https://laotiantimes.com/2021/11/23/laos-to-see-mineral-earnings-of-usd-463-million-in-fourth-quarter/.
[12] Ibid.
[13] Department of Geology (DOG). "Geological Strategy Development Plan in 2008- 2010 and 2011- 2020 (in Lao)". 2009. Vientiane: Department of Geology, Ministry of Energy and Mines. Unpublished.
[14] "Geological and Mineral Resources Map of Lao People's Democratic Republic." *Japan International Cooperation Agency*. Last Modified 2008. https://openjicareport.jica.go.jp/pdf/11899903.pdf.
[15] Department of Mines (DOM). (2008). Annual Mine Report 2008. (in Lao), Vientiane: Department of Mines, Ministry of Energy and Mines.

1990s, and they were subsequently acquired by Chinese companies.[16] Before the eventual shutdown of the copper mines in 2020, which was planned before the pandemic for profitability reasons, the Phu Bia and Xepon mines contributed up to 90% of the state's mining revenues.[17]

Following are the main minerals found in Laos[18]:

Gold and copper

Gold and copper deposits can be found in the junction between the Loei Belt and the Trusongson Belt. The majority of which are porphyry Cu-Au type stockworks and skarns. Gold production is a major source of income in the Laos economy. Three mines produce gold and copper: Sepon, Ban Houayxai, and the Phu Kham. Currently, a joint venture, Phu Bia Mining Limited, between the Laos government and an Australia-origin company named PanAust jointly mine gold and copper in a 2,600 square-kilometer concession Phu Bia Contract Area.

Lead-zinc

The Loei belt, the Truongson belt's northern prolongation, contains lead-zinc deposits. The Kaiso deposit is the only zinc deposit developed in Vientiane province. According to the data provided by the Global Economy, lead-zinc production capacity in the country from 2003 to 2013 averaged around 2575 metric tons.

Tin

The Tin ore reserve is estimated to be around 45 million tons and is sparely located in the provinces of Vientiane, Xiengkhouang, Houaphan, Khammouane, and Champasak in the south. The Boneng-Phontiou mines in Khammouane province have been entirely mined from superficial deposits.

Bauxite

[16] Ibid. See 8.
[17] Ibid. See 8.
[18] Karinen, Tuomo, Esko Korkiakoski, Phichith, and Phommakeysone. "Laos – Invest in Mining." *ResearchGate*. Last Modified May 1, 2011. https://www.researchgate.net/publication/259076848_Laos_-_Invest_in_Mining.

Bauxite, the dominant aluminum ore, is mostly found in the Khorat plateaus. Measured bauxite reserves are 125 million tonnes, whereas estimated resources are 700 million tonnes. Iron ore deposits can be discovered in the Xienghouang province, northwest of Vientiane. The most well-known and well-established iron deposits are those of ores in Phou Nhouan and Pha Lek. Both are skarn-style deposits in the contact zones between acid to moderate intrusives of uncertain age and Paleozoic carbonate strata. As of 2024, there has been no exact data demonstrating the bauxite production yet, but the Vietnamese company, Viet Phuong Group, constructed the Bauxite-Alumina Mining Industrial Complex in 2022, expected to produce 1 million tons of bauxite per annum.

Coal

The country is also enriched by coal. In the Lao PDR, there are two different kinds of coal occurrences: lignite from the Tertiary epoch and anthracite from the Paleozoic to the Mesozoic era. According to 2016 data, Laos held around 554 million tons of proven coal reserves. The country is estimated to have consumed around 4.5 million tons of oil equivalent (Mtoe) of coal in 2018, mainly from the country's first and largest coal power plant, the Hongsa Thermal Power Plant. In 2020, the government signed an agreement allowing two companies - Singapore-based Evolution Power Investment Corporation (EPIC) and domestic-origin Khounmixay Bridge and Road Construction and Repair Company (KMX) to conduct a feasibility study on the development of a 1,000-megawatt (MV) coal pant in Sekong province.

Potash

Laos is also the ninth-largest potash-producing country. Its potash reserves are predicted to be around 10 billion tonnes. The Chinese-based Asia-Postash International Investment, under the name of Sino-Agri Potash Co Ltd, is the biggest producer, with around 600,000 metric tons of capacity.

Gypsum

The mining capacity of Gypsum is about 500,000 tons per year, with Khounxay Gypsum Mining being the country's leading mining company. The State Gypsum Mining Enterprise excavates

gypsum resources in Sovannakhet province. About 95% of the products are exported to Vietnam to support its cement industry.

Mining is a major industry that contributes to the growth of Laos's economy. Over 50% of the national total revenues come from the export of minerals, with the combined taxes of the sector accounting for 20-25% of the public income[19]. In the first nine months of 2021, the country earned around USD 1.18 billion in revenues from the mineral product.[20] The same year, the Ministry of Energy and Mines reported that about 124 mining companies operated 209 projects, including mineral exploration and processing. The mining sector contributed around 30% of total foreign direct investment in the country. Gold, for example, has played a huge role in driving the country's economic growth.[21] The Phu Bia and Sepon mines earned around 90% of the total state revenues from the mining sector.[22] According to AIF Gold, the only gold-licensed company in the country, the reserve of gold can range from around 500 to 600 tonnes. Gold production in Laos is normally divided into three categories: wealth: 60%, jewelry: 35%, and industrial uses: 5%.[23]

Lao PDR's Extraction Policies: Balancing Economic Imperatives and Environmental Concerns

Since 1990, the Laos government has granted foreign and domestic investors the right to undertake mining operations. Around 570 mining deposits are scattered throughout the country. In 2019, the government allowed 110 companies to launch mineral exploration and licensed 171 more private ventures to begin mineral production.

The government of Laos is committed to developing its mineral resources effectively by adopting mineral laws, sustainable development schemes, and environmental protection regulations, as well

[19] "Macroeconomic Stability Amidst Uncertainty." *World Bank Group*. Last Modified January 2019. https://documents1.worldbank.org/curated/en/818841549314902040/pdf/134324-REPLACEMENT-PUBLIC-LEM-2019-January.pdf.
[20] Ibid. See 15.
[21] Ibid. See 11.
[22] Tappe, Oliver. "Artisanal, Small-scale and Large-scale Mining in Lao PDR." *Yusof Ishak Institute*. Last Modified April 15, 2021. https://www.iseas.edu.sg/wp-content/uploads/2021/03/ISEAS_Perspective_2021_44.pdf.
[23] "Laos' Gold Market." *Singapore Bullion Market Association*. Last Modified 2017. https://sbma.org.sg/asean-bullion-market/laos/.

as shaping the scope of impact on the local people who reside around the excavated site. The government also considers the equity of mineral revenues to eradicate poverty so that the country can graduate from the least developed countries in the future. Mineral Laws drafted in 2011 signified that mineral resources on the ground, underground, and underwater of Lao PDR's territory are governed by the national communion under the national government's authority. The Department of Geology and Minerals (DGM) is in charge of managing investments, continuing geoscience research, conducting geologic and mineral surveys, and creating pertinent laws, whereas the management and promotion of mining, mineral processing, and mineral product commerce are overseen by the Department of Mines (DOM), which is part of the Ministry of Energy and Mines (MEM).

According to Article 6 of the Mineral Law, mining of such resources shall be implemented under 4 basic principles:[24]

> i). Should adhere to policies, strategies, national socio-economic development plans, mineral development plans, laws, and actual capabilities within each respective time period;
> ii). Mineral activities and business shall ensure that the mineral products are produced efficiently and transparently while maintaining sustainable development of the mineral area and environmental protection;
> iii). Work in tandem with the construction of infrastructure to promote community growth, alleviate poverty across all ethnic communities, and maintain social security and public order;
> iv). Production, labor, food, equipment, mineral resources, and mineral preservation should all be handled by local communities, organizations, and administrative authorities.

The Laos government has also formulated committees and strategies for managing rare earth minerals. In a cabinet meeting, the Laos Prime Minister, Sonexay, directed authorities to fast-track

[24] "The Promulgation of the Law on Minerals (Revised Version)." Last Modified December 13, 2017. https://policy.asiapacificenergy.org/sites/default/files/Law%20on%20Minerals%20%282017%20Ed.%29%28EN%29.pdf.

the process of forming regulations and critical legislation to supervise the effectiveness of the country's mining industry.

Laos-China Relations: Dynamics and Implications

Laos is a landlocked country in Southeast Asia. Due to this geographical trap, the Lao PDR has been put in a subordinate power dynamic with respect to its coastal neighbors, such as Vietnam, Cambodia, Thailand, and China. Landlocked countries rely on their neighboring countries for access to the sea in four key aspects: transportation infrastructure, stability, administrative procedures, and cross-border political interactions.[25] In this regard, Laos has always relied on Vietnam to access the sea route. Besides the geographical factor, Laos chose Vietnam for other reasons. Recalling the Cold War era, the two communist states fought together against the United States during the Vietnam War.[26] Moreover, under the serving Prime Minister, Thongloun Sisoulith, who is proficient in Vietnamese, there has been an increase in the Vietnamese presence in Laos through commercial activities and other symbolic icons for relations, such as the donation of a new parliamentary building for Laos in 2021.[27]

However, with the recent arrival of China, Lao PDR's honeymoon phase with Vietnam has been shaking as China also sought intimacy with Laos. In the same year, Laos designated a former schoolmate of Chinese President Xi Jinping to assume the role of principal assistant to the newly appointed leader of this landlocked southeast Asian nation.[28] Moreover, China has superseded Vietnam as the primary economic investor in Laos, along with many mega infrastructure projects under the BRI.[29] China is the primary foreign investor and donor of aid to Laos and ranks as its

[25] Mahdi, Samiullah. "Security and Foreign Policy of Landlocked States." *ScholarWorks at UMass Boston*. Last Modified 2016. https://scholarworks.umb.edu/masters_theses/399/.
[26] Nguyen Khac Giang. "Vietnam's Tug of War With China Over Laos | East Asia Forum," *East Asia Forum*. Last Modified December 7, 2023. https://www.eastasiaforum.org/2021/05/12/vietnams-tug-of-war-with-china-over-laos/.
[27] "New Lao National Assembly House: A Symbol of Vietnam – Laos Special Relationship," *Nhan Dan Online*. Last Modified August 10, 2021. https://en.nhandan.vn/new-lao-national-assembly-house-a-symbol-of-vietnam-laos-special-relationship-post101891.html.
[28] "Laos Deepens China Tilt by Appointing Xi's Ex-schoolmate as Presidential Aide," *Financial Times*. Last Modified April 7, 2021. https://www.ft.com/content/3305871c-939a-4d6d-8b76-0d922ddb891d.
[29] Nguyen Khac, Giang. "2023/82 'Vietnam Seeks Intimate Ties With Cambodia and Laos'." *ISEAS-Yusof Ishak Institute*. Last Modified October 16, 2023. https://www.iseas.edu.sg/%20articles-commentaries/iseas-perspective/2023-82-vietnam-seeks-intimate-ties-with-cambodia-and-laos-by-nguyen-khac-giang/.

second most significant trade partner, following Thailand. [30]In 2022, China conducted 30 investments with Lao PDR, totaling 339 million US dollars. These investments were made in the mining sector, 18 energy projects, 1 project; the consulting services sector, 3 projects; the industry and crafts sector, 6 projects; public health, 1 project; and other sectors, 2 projects. Additionally, the largest tungsten manufacturer in China, Xiamen Tungsten Corporation (XTC), has partnered with Chifengjilong Gold Mining Co. (Chifeng Gold), a producer of rare and precious metals, to explore rare-earth resources in Laos. The joint company was established with a registered capital of 60 million yuan, or $8.45 million; Chifeng Gold contributed 51% of the investment, and XTC 49%. The joint project will facilitate access to domestic policy assistance and encourage rare-earth prospecting in Laos. As most of China's rare-earth minerals are imported from Myanmar, opening up the Laos market will enhance import sources and contribute to developing an upstream rare-earth industrial chain in Southeast Asian countries. The China-Laos Railway's opening could also help create a rare-earth supply chain in the region.

China's Influence in Lao PDR's Rare Earth Element Industry: Opportunities and Challenges

According to a study from the prestigious Brookings Institution, China presently produces 60% of the world's rare earth elements and processes 85% of them. This dominance has nothing to do with a geological accident that has placed the bulk of rare earth deposits in Chinese territory. On the contrary, despite the word "rare" in the name, rare earth elements are far from rare. They are more abundant than both silver and gold. Nor are they especially concentrated. They are in China's control presently only because the mining and refinement of these metals is environmentally destructive, something that, until recently, China cared less about than the developed nations of the West. China has also gained popularity with many developing nations, such as BRI, in project development. China has a pragmatic approach to both economic diplomacy and foreign policy. Many resource-rich developing nations view China as an appealing political and economic partner

[30] "Laos says Chinese firm can explore for rare earth minerals." *RFA.* Last Modified January 25, 2022. https://www.rfa.org/en glish/news/laos/minerals-01252022180600.html

because of its commitment to the non-interference principle and its "no-string-attached" assistance policy.[31]

The Senegalese president Abdoulaye Wade once said:

> *"If I wanted to do five kilometers of road with the World Bank, or one of the international financial institutions, it takes five years. One year of discussions. One year of back and forth. One year of I don't know what. With the Chinese it is a few days and I say yes or no, they send a team and we sign."*[32]

China's increasing demand for minerals, driven by rapid industrialization and urbanization, has led to significant investments in mining projects in Lao PDR. Chinese investments in Laos' mining sector have been substantial over the years. According to data from the Ministry of Planning and Investment of Laos, Chinese investments in the mining sector amounted to approximately $3.6 billion USD from 2010 to 2020.[33] These investments cover a range of minerals, including copper, gold, and potash. Many Chinese companies have formed joint ventures with Laotian counterparts to exploit mineral resources. For example, the China Nonferrous Metal Mining Group (CNMC) has partnered with the Lao government to develop the Sepon copper mine, one of the largest copper mines in Southeast Asia. This joint venture brings capital and technology and enhances bilateral economic ties between Laos and China.[34]

Moreover, the flow of Chinese investments in Laos' mining sector often includes infrastructure development projects to facilitate the extraction and transportation of minerals. This includes the construction of roads, railways, and ports. One of the flagship infrastructure projects in Laos is the China-Laos Railway. This railway, funded and constructed by China, connects the Laotian capital, Vientiane, with the Chinese border, passing through key mining areas. The China-Laos Railway

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[31] Aidoo, R.and Steve, H."Non-Interference 2.0: China's Evolving Foreign Policy towards a Changing Africa", in: Journal of Current Chinese Affairs, 44, 1, 107–139.
[32] Comment by Senegal's President Abdoulaye Wade on the EU-Africa summit in Lisbon, 8-9 December, 2007.
[33] "China Investes More Than 900 Projects in Laos." *Lao News Agency*. Last Modified November 15, 2023, https://beta.kpl.gov.la/EN/detail.aspx?id=78213#:~:text=in%20Lao%20PDR.-,(KPL)%20China%20has%20invested%20more%20than%20900%20projects%20worth%20more,in%20Vientiane%20on%20November%2014.
[34] Lafaye de Micheaux, E."The rise of China and social norms in Southeast Asia: The role of investment". https://www.cairn-int.info/journal--2020-1-page-59.htm.

project is a significant example of Chinese infrastructure investment under the Belt and Road Initiatives in Laos. This railway, funded and constructed by China, aims to connect Vientiane, the capital of Laos, with Kunming, the capital of China's Yunnan Province. The railway passes through key mining areas such as Phonsavan and Luang Prabang.[35] According to reports from the Lao Ministry of Public Works and Transport and Chinese state media, the project has seen substantial progress, with sections of the railway being completed and inaugurated.[36] This railway facilitates the transportation of minerals and enhances connectivity between Laos and China, promoting trade and economic integration. The China-Laos railway has significantly decreased the time required to transport commodities from Thailand to China through Laos. The transportation of goods from Vientiane to Kunming via truck typically requires a duration of two to three days. Rail transportation can complete the task within a time frame of 20 to 24 hours, resulting in a reduction of transportation expenses by 20% to 40%. Chinese and Laotian state media reports indicate that imports to China via the China-Laos Railway surpassed 120,000 tons, while exports from China exceeded 70,000 tons by mid-March 2022.[37]

Moreover, the Ministry of Agriculture and Cooperatives has stated that Thailand sold 1,000 tons of rice to China in January via the China-Laos high-speed railway. As per the Ministry of Transport, after the railway was opened, exports from Nong Khai Province experienced a 2.6-fold rise in weight and around a 50% increase in value compared to the previous year. Highly sought-after commodities like durian and natural rubber are also crucial cargo delivered via train, particularly due to their great demand in China.[38]

The mighty Mekong River is a vital inland waterway in Southeast Asia, especially in Laos. The river expands through six nations: China, Myanmar, Thailand, Lao PDR, Cambodia, and Vietnam.

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[35] "A Road of Prosperity -- China-Laos Railway Promotes Common Development" *Xinhua.* Last Modified August 20, 2023. https://english.news.cn/20230820/df697b041b5f4c828929405553aaa3ab/c.html.
[36] "China-Laos Railway Paves Way for Socio-economic Development of Laos," *Xinhua*. Last Modified December 05, 2023. https://english.news.cn/20231205/9c5bda8aa0c54a75aa809408353ffb27/c.html.
[37] Kishimoto, Marimi. "Laos' Logistics Vision for ASEAN: All Rails Lead to Vientiane." *Nikkei Asia*. Last Modified April 4, 2022. https://asia.nikkei.com/Business/Transportation/Laos-logistics-vision-for-ASEAN-All-rails-lead-to-Vientiane.
[38] "Thailand Ships 1,000 Tonnes of Rice to China via Laos-China Railway - Laotian Times." *Laotian Times*. Last Modified January 21, 2022. https://laotiantimes.com/2022/01/21/thailand-ships-1000-tonnes-of-rice-to-china-via-laos-china-railway//.

The regulation of inland navigation in the Mekong River is governed by two separate regional agreements. One is the Agreement on Commercial Navigation on the Lancang-Mekong River, which applies to the Upper Mekong Basin. The other is the Agreement on Cooperation for the Sustainable Development of the Mekong River, which applies to the Lower Mekong Basin. Lao PDR signed both agreements, respectively, in 2000 and 1995.[39] China has also invested in port development along the Mekong River, a vital transportation route for mineral exports from Laos.[40] Empirical evidence from project reports and media sources confirms the involvement of Chinese companies in these infrastructure projects. For instance, official announcements from the DRC government and Chinese state media highlight the progress and completion of railway construction projects, underscoring China's role in improving transportation infrastructure for the mining sector.

Port facilities are essential for loading materials onto ships for export to international markets, and Chinese investments in port infrastructure enhance Laos' capacity to export its mineral resources. China has also invested in port development along the Mekong River in Laos.[41] Port diplomacy in Laos is crucial in shaping the country's economic development and broader geopolitical relations. Laos relies heavily on its river networks, particularly the Mekong River, as a landlocked nation for connectivity and trade. Port infrastructure along the Mekong River is a vital gateway for Laos to access international markets and facilitate the export of its key commodities, including minerals. Chinese investments in port development along the Mekong River in Laos exemplify port diplomacy, as they enhance Laos' maritime connectivity and deepen economic ties between the two countries. Through port diplomacy, Laos seeks to leverage its strategic location and riverine resources to strengthen partnerships with neighboring countries, including China, and promote regional cooperation. Additionally, port diplomacy Initiatives in Laos may contribute to broader regional integration efforts, such as the Lancang-Mekong Cooperation framework, fostering

[39] Cacaud P., "Conditions of work in inland navigation in Southeast Asia The case of the Mekong River system." *The International Labor Organization*. Last Modified December 7, 2021. https://webapps.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/meetingdocument/wcms_898328.pdf.

[40] "China-Laos Railway Sees Progress After 2 Years." *The State Council Information Office, China PRC.* Last Modified December 05, 2023. http://english.scio.gov.cn/m/beltandroad/2023-12/05/content_116858537.htm.

[41] Xue Gong. "The Mekong Region Is a Test of China's Global Development and Security Model." *Carnegie Endowment for International Peace.* Last Modified December 1, 2023. https://carnegieendowment.org/2023/12/01/mekong-region-is-test-of-china-s-global-development%20-and-security-model-pub-91144.

dialogue and collaboration among Mekong riparian states. By harnessing the diplomatic potential of its port infrastructure, Laos aims to enhance its economic resilience, geopolitical standing, and connectivity within the ASEAN region and beyond. For example, the construction of ports in cities like Luang Prabang and Pakse has been facilitated by Chinese investments, improving Laos' capacity to export its mineral resources.[42]

Chinese proposals for developing industrial parks in Laos have been documented in various sources, including government reports and media articles. Upon a year-long study, the government of Laos and SINO-KCL signed a Memorandum of Understanding (MOU) on a project titled "Asia-Potash International Intelligent Circular Industrial Park" in Thakhek and Nongbok districts of Khammuan province. The project aimed to produce potash, one of the raw materials for fertilizer production. [43]An industrial park is an area zoned and planned for the purpose of industrial development. These parks typically provide infrastructure such as roads, utilities, and sometimes housing for workers, making them attractive locations for businesses to set up manufacturing facilities. Industrial parks often offer various incentives to attract investment, such as tax breaks, streamlined regulatory processes, and access to shared services and facilities.[44] These industrial parks are envisioned as hubs for processing and refining minerals extracted from mining sites. While specific projects may still be in the planning or proposal stages, empirical evidence suggests that China's interest in industrial park development in Laos is driven by the desire to add value to mineral exports, create employment opportunities, and promote industrialization in the country.[45]These industrial parks would add value to Laos' mineral exports, create employment opportunities, and promote industrialization in the country.

Lao PDR's challenges

[42] "Greater Mekong Subregion Regional Investment Framework 2022." *Greater Mekong Subregion.* Last Modified November 2019. https://greatermekong.org/gms-regional-investment-framework-2022.
[43] "China Donates 7,000 Saplings to Support Pakistan's Efforts in Environmental Protection." Xinhua. Last Modified March 27, 2023. http://www.news.cn/english/asiapacific/2021-12/08/c_1310359557.htm.
[44] "International Guideline for industrial parks." UNIDO. Last Modified November 2019. https://www.unido.org/sites/defau lt/files/files/20 19-11/International_Guidelines_for_Industrial_Parks.pdf
[45] Orabourne, S."Lao PDR's Industrial Development Policy and Intermediate Goods Trade in Intermediate Goods Trade in East Asia: Economic Deepening Through FTAs/EPAs". 2011. https://www.ide.go.jp/library/English /Publish/Reports/Brc/p df/ 05_chapter8.pdf

Chinese investments in Laos' mining sector also have geopolitical implications. China's increasing presence in Laos, particularly in strategic sectors such as mining, enhances its geopolitical influence in the region. This influence may extend beyond economic matters to political and security domains, shaping Laos' foreign policy orientation and alignment with Chinese interests. Large-scale Chinese investments in strategic sectors such as mining could raise concerns about sovereignty and control over natural resources. There may be fears that excessive Chinese involvement in extracting and exporting minerals could undermine Laos' ability to regulate its own resources and benefit fully from them. This could exacerbate tensions between local communities and the Laotian government, especially if there are disputes over land rights or environmental impacts[46]. The Resource Curse theory, popularized by scholars like Jeffrey Sachs and Paul Collier, suggests that countries rich in natural resources often experience economic challenges and governance problems due to mismanagement and corruption. [47]

In Laos, Chinese investments in mining raise concerns about the potential for resource curse dynamics to occur. Excessive reliance on mining revenues and foreign investment may undermine governance structures and exacerbate tensions between the government, local communities, and external actors like China. Critical geopolitics scholars like Gerard Toal and John Agnew emphasize the importance of power relations and discourses in shaping geopolitical dynamics.[48] Chinese investments in Laos' mining sector can be understood through a critical geopolitics lens, as they involve economic transactions and negotiating power and influence. The discourse surrounding these investments, including debates over sovereignty, environmental impact, and local community rights, reflects broader geopolitical struggles over resource control and regional dominance. From this perspective, Chinese investments in Laos' mining sector can be understood as economic transactions and negotiating power and influence. The discourse surrounding these investments, including debates over sovereignty, environmental impact, and local community

[46] Lin, Joane. "THE MYTH OF THE 'VASSAL STATE': CHINA'S INFLUENCE IN LAOS IS WANING." 9DashLine. Last Modified July 13, 2023. https://www.9dashline.com/article/the-myth-of-the-vassal-state-chinas-influence-in-laos-is-waning.

[47] Franke, Jeffrey. "The Natural Resource Curse: A Survey of Diagnoses and Some Prescriptions." International Monetary Fund. Last Modified October 24, 2012. https://www.elibrary.imf.org/display/book/9781616353797/ch002.xml

[48] Bachmann, Veit, and Gerard Toal. "GEOPOLITICS - THICK AND COMPLEX. A CONVERSATION WITH GERARD TOAL." *JSTOR*. Last Modified 2017. https://www.jstor.org/stable/26663997.

rights, reflects broader geopolitical struggles over resource control and regional dominance. As such, careful analysis of the political economy of mining in Laos is essential to understanding the complex interplay between economic interests, power dynamics, and regional geopolitical rivalries.

The rapid expansion of mining activities facilitated by Chinese investments in Laos has raised significant concerns about environmental degradation, posing threats to the delicate ecosystems, biodiversity, and the livelihoods of indigenous communities. The intensive extraction of minerals often entails extensive deforestation as forests are cleared to make way for mining operations, leading to the loss of crucial habitats for numerous plant and animal species. Additionally, mining activities can result in water pollution due to the release of toxic chemicals and heavy metals into water bodies, contaminating local water sources and endangering aquatic life. This pollution risks human health and disrupts the ecological balance of aquatic ecosystems. Moreover, habitat destruction caused by mining operations directly impacts indigenous communities who rely on these resources for their livelihoods. Many indigenous groups in Laos depend on forests, rivers, and land for subsistence agriculture, hunting, and gathering. The loss of these resources threatens their cultural heritage, traditional way of life, and food security, exacerbating poverty and marginalization among these communities.

Furthermore, the inadequate enforcement of environmental regulations exacerbates these challenges, allowing mining companies to operate with impunity and disregard environmental protection measures. This lack of oversight contributes to environmental degradation and social tensions, fueling resentment and opposition from affected communities. In response, indigenous groups and local communities often mobilize protests and advocacy campaigns against the Laotian government and Chinese investors, demanding greater accountability, transparency, and respect for their rights. In addition, mining rare earth elements (REEs) involves digging big holes in the ground, which uses up lots of energy and can cause environmental problems. It can pollute water and leave behind radioactive waste, hurting plants and animals in the area. In 2010, even China's government said mining for rare earths was messing up the environment, causing landslides, and blocking rivers. It made the land less green, dirtying the water and soil where food grows.[49]

[49] Gramling, C.” Rare earth mining may be key to our renewable energy future. But at what cost?”

Addressing these environmental and social impacts requires comprehensive measures to strengthen environmental regulations, enhance monitoring and enforcement mechanisms, and promote sustainable mining practices. It is essential for both the Laotian government and Chinese investors to prioritize environmental protection, respect indigenous rights, and engage in meaningful dialogue with affected communities to address their concerns and ensure that mining activities contribute to sustainable development and the well-being of all stakeholders. Resource governance refers to managing and regulating natural resources within a country to ensure their sustainable and equitable use.[50] Each country has its own governance framework, policies, and regulations to manage its resources, including rare earth materials if they are present. In Laos, the governance of natural resources is primarily overseen by the Ministry of Energy and Mines. The ministry is responsible for formulating policies, laws, and regulations related to mineral extraction, processing, and export. The Ministry of Natural Resources and Environment is also involved in environmental protection and sustainable development efforts. The state needs to play an undivided regulatory role regarding efficient resource management to avoid the resource curse.[51]

i). Firstly, ensuring transparency in allocating mining licenses, revenue collection, and resource management processes is crucial for building trust and accountability. Public disclosure of contracts, revenues, and environmental impact assessments can help hold government and industry actors accountable for their actions.

ii). Involving local communities, indigenous groups, and civil society organizations in decision-making processes related to resource extraction is vital for addressing social concerns, protecting land rights, and promoting inclusive development. Meaningful consultation and participation can help mitigate conflicts and ensure that the benefits of mining are shared equitably.

iii). Implementing robust environmental and social safeguards is essential for minimizing the negative impacts of mining activities on ecosystems, biodiversity, and local

[50] Bansard, Jennifer and Schröder, Mika. “The Sustainable Use of Natural Resources: The Governance Challenge.” International Institute for Sustainable Development. Last Modified April 15, 2021. https://www.iisd.org/articles/deep-dive/sustainable-use-natural-resources-governance-challenge.

[51] Corrigan, C. "Breaking the Resource Curse: Transparency in the Natural Resource Sector and the Extractive Industries Transparency Initiative". 2013. Resources Policy. 40. 10.1016/j.resourpol.2013.10.003.

communities. This includes measures such as environmental impact assessments, rehabilitation plans, and community development initiatives to mitigate the adverse effects of mining operations.

iv). Establishing effective mechanisms for managing and allocating resource revenues is critical for ensuring that the benefits of mining are reinvested in sustainable development initiatives. This may involve establishing sovereign wealth funds, investing in infrastructure and human capital, and diversifying the economy to reduce dependence on resource extraction.

Conclusion

With the history of colonialism, Laos fell into a small state paradox. The "small state paradox" is a concept in international relations and political science that refers to the phenomenon where smaller states often have a disproportionately large influence in international politics compared to their size and resources. This paradox arises because smaller states can often wield significant influence and power in certain contexts despite their limited capabilities. This paper has explored the geopolitics of mining minerals in Lao PDR, focusing on the minerals and Rare Earth Elements (REEs) and other minerals and China's influence on the country's mineral extraction industry. Through a comprehensive analysis, this insight has gained insights into the complexities of Laos-China relations, the challenges Lao PDR faces in managing its mineral resources, and the regional implications of China's involvement in the Rare Earth Element industry.

Firstly, I discuss the significance of Rare Earth Elements and their strategic importance in various high-tech industries, including electronics, renewable energy, and defense. Recognizing the growing global demand for REEs and their critical role in shaping technological innovation, I discuss the potential economic benefits for Lao PDR in tapping into its REE reserves.

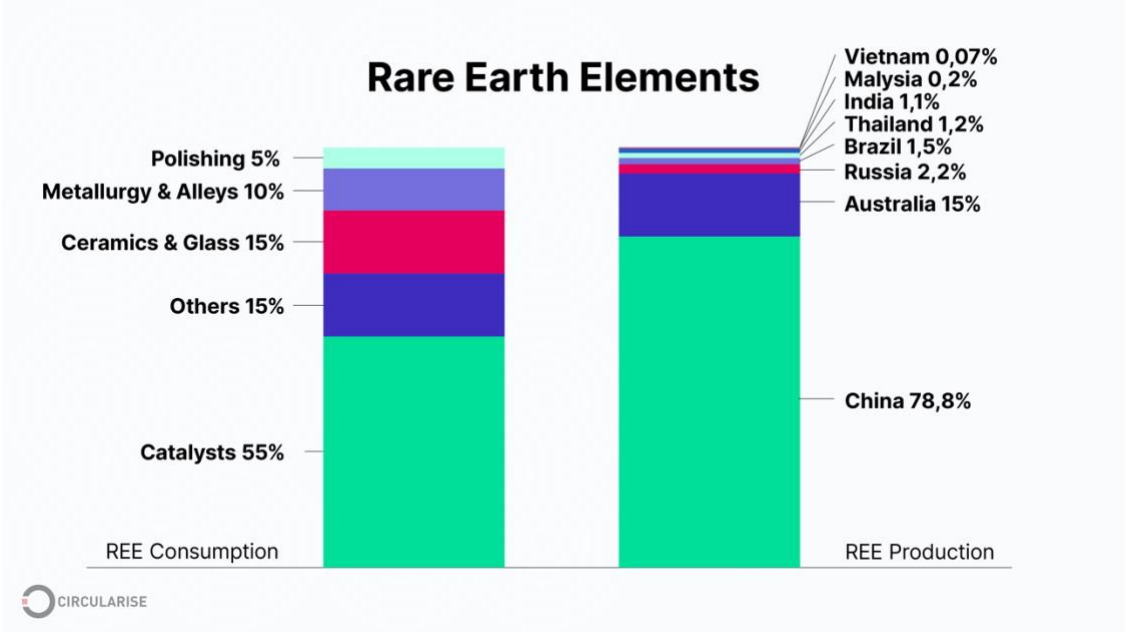
Secondly, the mineral elements in Lao PDR and the country's mineral extraction and resource management policies are examined. As global demand for minerals continues to rise, Laos' rich resource base positions the country as a key player in the regional and international mining industry, with the potential to drive sustained economic growth and prosperity. However, realizing this potential requires careful management, sustainable practices, and equitable distribution of

benefits to ensure that mineral extraction contributes to long-term development and prosperity for the people of Laos. Despite its abundant mineral resources, Laos faces challenges in developing its mining sector sustainably, including environmental degradation, social conflicts, and governance issues. We emphasized the importance of implementing transparent and responsible mining practices to maximize the benefits of mineral extraction while minimizing its adverse impacts.

Moreover, we analyzed Laos-China relations and China's influence on Lao PDR's Rare Earth Element industry. China's significant investments in Laos' mining sector, particularly in REE extraction and processing, have raised concerns about dependency, sovereignty, and environmental sustainability. We discussed the implications of China's dominance in the global REE market and its potential effects on regional dynamics and power relations. It is essential for Laos to navigate the complex dynamics of international relations while safeguarding its national interests and promoting sustainable development. This requires strategic diplomacy, prudent economic policies, and effective governance mechanisms to address challenges such as poverty, inequality, and environmental degradation.

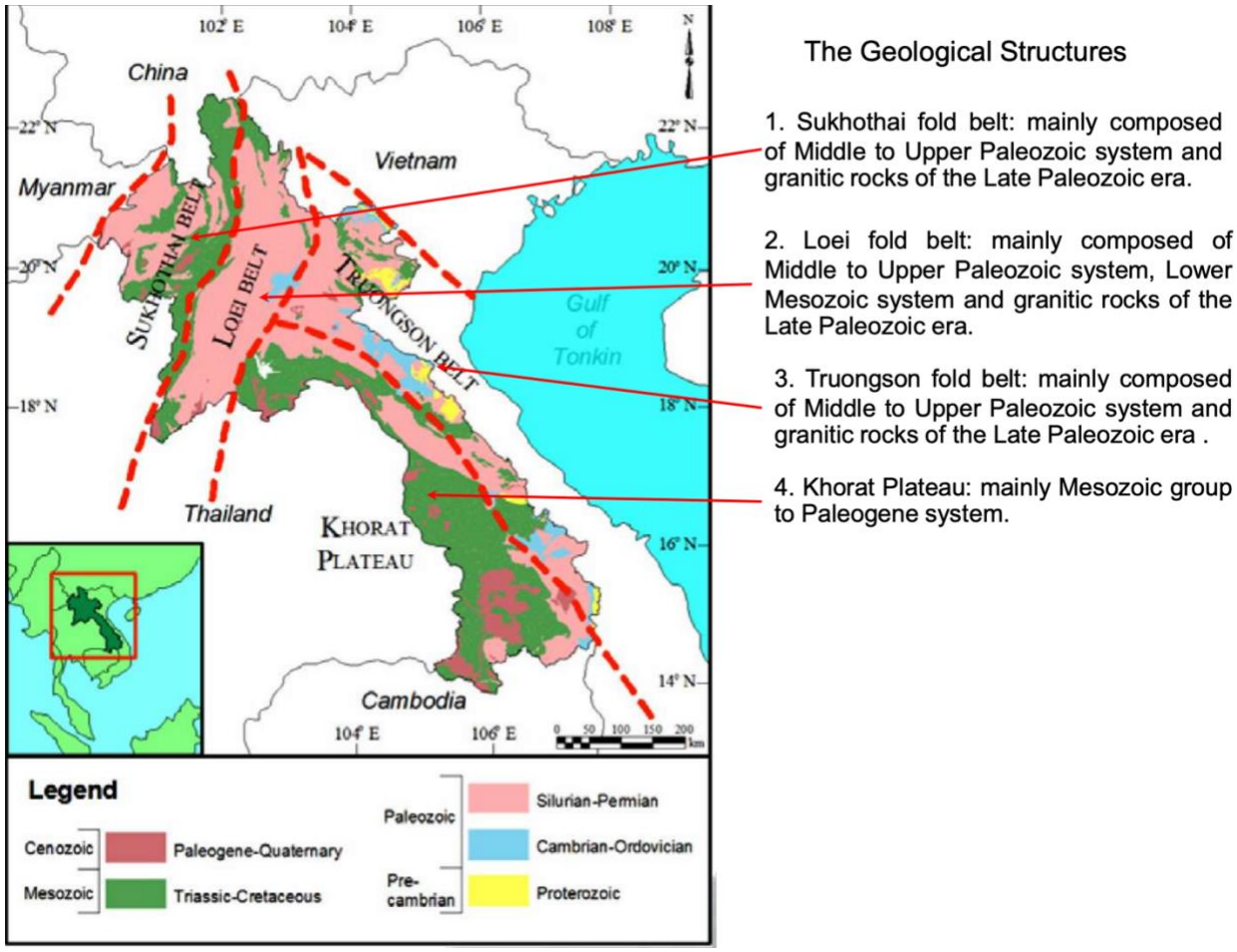
In conclusion, Lao PDR's international relations are characterized by a delicate balance between regional dynamics, economic imperatives, and strategic partnerships. By leveraging its unique position and resources, Laos has the potential to achieve inclusive and sustainable development, contributing to peace, stability, and prosperity in Southeast Asia and beyond.

Illustration 1



Source: The graphic is taken from https://www.circularise.com/blogs/the-rare-earth-problem-sustainable-sourcing-and-supply-chain-challenges.

Illustration 2



Source: The graphic is taken from

https://mric.jogmec.go.jp/kouenkai_index/2012/briefing_120316_3.pdf.

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Illustration 3

Source: The image is taken from https://shorturl.at/hrvO8

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