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SWOT Analysis of Afghanistan's Coal Trade in International Market

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Abstract

This study examines the SWOT analysis of Afghanistan's coal trade in the international market. The analysis highlights the strengths, weaknesses, opportunities, and threats. Afghanistan has huge amount of coal reserves about 73 million tons that can be exploited for exports to international market. Also, this paper identifies the ways to growth of Afghan coal trade in the international market. There are several issues in the Afghan coal trade in the international market for addressing. Afghanistan has several opportunities for growth of coal trade that should be capitalized, such as coal demand increasing and development of infrastructure. There are several threats that should be mitigated, such as environmental concerns. Also, this paper identifies Afghanistan position in the international market of coal trade. Afghanistan has moderate position in the international market of coal trade. Currently, Afghanistan has exports of coal to Pakistan. The amount of coal trade to Pakistan was 2.7 million tons in 2022 with 12 billion and 143 million AFG revenue.

Keywords: International market, Afghanistan, Coal trade, Strengths, Weaknesses, Opportunities, Threats

Introduction

Afghanistan is a landlocked country in the heart of Asia that possesses a large amount of Coal, Oil, and Gas reserves (Rahmaty, Ershad, & Sabory, 16-19 November 2020). After the copper resource, the second large resource in Afghanistan is coal resource. Afghanistan's coal reserves were estimated at 1.3 billion metric tons in 2017 and most of them are located in the northern provinces are shown in (Figure 1). Also, the recent studies show that Afghanistan has 73-million-ton reserves of coal. Afghanistan coal resources include Shabashak, Dehne Tor, Lilav Qara Naver, Western and Eastern Gramak, Sertor, Rashak and Qoubi, Sar Asiyab, Gole Chakark, and Sabzak Kotel in Samangan province, Ashpashte and Klich in Bamyan province, Gazstan, Bezghur and He mentioned salt water in Takhar province, Taleh, and Barfak and Nahrin in Baghlan province, a wooden mosque in Sabzak, Herat, and Balkhab resources in

Sarpol province (JAMAL & KHATAMI, 2023; Sharifi, Mohsini, Aslami, Noori, & Patmal, 15 Sebtember 2023). At present, there are over 1,400 mineral deposits, for instance, Coal, Oil, and Gas (Gouhari).



Figure 1. US Geological Survey of Minerals IN AFGHANISTAN (JAMAL & KHATAMI, 2023).

Still, we don't have comprehensive and clear research about Afghan coal quality due to a lack of expert personnel, investment, and lack of access to contemporary technology (JAMAL & KHATAMI, 2023). Afghan coal often varies from anthracite to lignite but has never been tested or analyzed for power generation (Siddiqui, 2022).

Afghanistan's coal consumption and export have increased. Therefore, coal mining in Afghanistan has increased. Coal mining has a very important role in the economy of a country and energy supply. Using coal has negative impacts on the environment, such as greenhouse gas emissions, air and water pollution, deforestation, and displacement of local communities. At present, more than a hundred countries of the world produce coal as well as 40% electricity of in the world is generated from coal. Also, coal is a very important material for the production of clean fuel and different chemicals. According to geological studies, in the east-southeast and northeast-southwest of Afghanistan, two large coal mining is existing. The east-southeast area is not studying in the perfect form, yet. The northeast-southwest coal zone started in the form of a belt from Badakhshan province and passed via the Takhar, Kunduz, Baghlan, Samangan, Balkh, Sarpul, Baymyan, Daikendi, Jawzjan, and Badghis to Sabzak mine in Herat province. In addition, the geological research of the Ministry of Mines and Petroleum confirms the existence of 113 mines, including 18 reserves of coal with a total amount of more than 847 million tons that it is the most important achievement of the Ministry. Afghanistan's coal mining is very old and unprofessional. After the rule of the Taliban in 2021, Afghanistan's coal mining has increased due to the support of the financial resources by exporting it to Pakistan at the half price of coal in the world market. Using of coal in the winter as home heating by

the country's people has increased in recent years. Therefore, unprofessional extraction as well as entry to the domestic market without any refinement steps has increased which is the major reason for the country's air pollution (JAMAL & KHATAMI, 2023). Mining of resources hurts the environment. Planting the mining area with trees and other plants is very necessary to keep the environment against various disasters and abrasion. Therefore, the mining operation is monitored by the environmental and social unit in the Ministry of Mines (Gouhari).

Coal is a very important source for Afghanistan for energy production and home heating in the winter. Also, coal in Afghanistan is used for other goals, such as electricity generation, industries of iron smelting, cement factories, and other sectors. In the current, the major usage of coal in Afghanistan is for home heating in the winter. According to the Ministry of petroleum reports 2018, the customers of Da Afghanistan Breshna Company were 3.1 million that only 34% of the population has access to electricity through imported electricity from neighboring countries and little domestic production. Afghanistan needs to enforce its energy supply by electricity generation from coal reserves. 40% of the electricity of the world is provided by coal due to cheapness. Therefore, it is the best option to increase domestic production by the using country's abundant coal reserves as well as its cheapness. At present, Afghanistan provides 23% of electricity demand via domestic production. According to International Energy Agency (IEA), 74% of iron production in the world is done by using coal as a main resource. In Afghanistan, 8 iron production factories are existing but none of these use form coal as the major energy source. At present, Afghanistan consumes about 2 million metric tons of cement in a year. To develop and extend Afghanistan's cement sectors the best option is the usage of coal as the main energy source. For the production of one metric ton of cement, about 200 Kg of coal is necessary (JAMAL & KHATAMI, 2023).

In Afghanistan, a lot of unexplored reserves are existing, such as copper, coal, iron, gas, cobalt, mercury, gold, lithium, and thorium which have cost about 1 trillion dollars. All investors can use these reserves due to its open site. Therefore, China is very interested in trading as well as working with chines companies in Afghanistan to send natural resources to China (Bukhari , 2012). Afghanistan's coal exports are increasing to Pakistan due to low prices. Afghanistan exports coal at the half price of the world's coal prices to Pakistan. Afghanistan's revenue from exporting coal to Pakistan increased from US\$ 63.6 million in 2021 to US\$ 81.8 million in 2022 (Boni, 2022). EXCEPT research group report in 2022 shows the increase of coal exports to Pakistan in the Taliban government with \$ 160 million income (The express tribune , 2023). The report of the Ministry of Finance shows the exports of 2.7 million tons of coal in the last ten months. The report of the Ministry of Information indicates 12.5 billion AFG from exports of coal. Afghanistan exported about 948,000 tons of coal in the first ten months of 2021 and earned 1 billion and 893 million AFG. In the first ten-month of 2022 customs of the country exported 2.7-million-ton coal with 12 billion and 143 million AFG revenue (Adib, 2023).

Currently, Afghanistan has coal trade transactions with Pakistan. Unfortunately, the Afghanistan position is not clear in the international market of coal due to the lack of research.

The objective of this research, analysis the strengths, weaknesses, opportunities, and threats of coal trade of countries in the international market and estimating of Afghanistan's position in the international market of coal trade by IFE and EFE matrix.

Literature Review

SWOT analysis a tool for investigating Strength, Weaknesses, Opportunity, and Threats factors of business or a company. Also, SWOT analysis identifies the Strength, Weaknesses, Opportunity, and Threat through appropriate strategy for achieving the purpose (Wahyudi, Agustini, & Ferijani, 2 Jan 2023). Many companies, establishments, governments, and merchants use from SWOT analysis in their planning, quality control, policies, and laws (Namugenyi, Nimmagadda, & Reiners, 2019). The Strength is the positive internal factor, Weaknesses is the negative internal factors, Opportunity is the positive external factor, and Threats is the negative external factors are shown in (Table 1) (Wahyudi, Agustini, & Ferijani, 2 Jan 2023).

Table.1. Shows the SWOT analysis internal factors and external factors.

Factors	Strength	Weaknesses	Opportunity	Threats
Internal	$\sqrt{}$	$\sqrt{}$		
External			$\sqrt{}$	\checkmark

Systematic SWOT analysis is carried out by below steps:

- 1. Ascertain priorities from SWOT analysis elements.
- 2. Identify and classify the potential opportunities in different trades.
- 3. Classify and list the trade's strengths
- 4. Pick out objectives of SWOT analysis.
- 5. Create and develop a strategy to address the issues and challenges of SWOT in multiple industry contexts.
- 6. Classify and list potential threats of trades.
- 7. Classify and list the weaknesses of a trade or industry.
- 8. Investigate the trade, industry, and market situation.

The SWOT analysis has a specific framework to investigates and determines the internal and external factors of a projects, products, place, or a trade that described by above steps (Namugenyi, Nimmagadda, & Reiners, 2019).

International's coal trade

Major exporters and importers of coal

Currently, coal trade to international market is about 300 million tons. In 2020, Australia was exported 55 % coal to international market and counted the biggest exporter in the world with 65% of hard coal quality. Exportation of Other countries to international market was in the small percentage than Australia, such as united state about 15%, Canada 10%, Russia

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8% in 2020. Also, China, Japan, India was the major importers as shown in (Figure 2). Coal is usually used in industry of steel as metallurgical (A-BLASChKE, 2021).

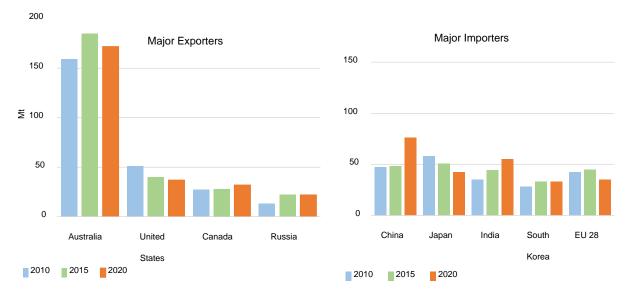


Figure 2. Major coal traders to international market and major importers in 2020 (A-BLASChKE, 2021).

Prices of coal in international market

Rising of coal price in the international market happened in recent years. War of Russia and Ukraine have significant impact on the coal price in the international market. Rising of coal price in the international market happened since 2022. On 3rd January 2022 price of one ton of coal in the international market was \$157 and rose to \$439 in 8th September 2022 (analysis, 3 september 2022). Also, the analysis of coal price from 2016 by 2022 are shown in (Figure 3). China was the largest producer and some time was the largest importer of hard coal that the rising of price of coal has significant impact on economy of this country (A-BLASChKE, 2021).



Figure 3. Rising coal price in the international market from 2016 by 2022, in \$.

Transportation of coal to international market

Transportation of coal to international market carry out by various equipment such as, Track, Train or railway, Barge, and pipeline. The most trade of coal fulfills by Track and train (Sribna, Trokhymets, Nosatov, & Kriukova, 2019).

Afghanistan coal trade

Afghanistan doesn't have high exports of coal to international market. Currently, Afghanistan export coal to Pakistan and it is in the rising due to low price. Exported Afghan coal price to Pakistan is half price of the real price of international coal. Afghanistan revenue of exported coal to Pakistan has increased from \$63.6 million in 2021 to \$81.8 million in early of 2022 as shown in (Figure 4). EXCEPT research group's report depict \$160 million in the recent of 2022 (The express tribune, 2023). The report of the Ministry of information shows the 948,000-ton exportation of coal to Pakistan in 2021 and earned 1 billion and 893 million AFG and 2.7-million-ton coal with 12 billion and 143 million AFG in 2022. Due to huge amount reserves and significant impact of coal exports on economy of country Afghanistan new government, the Islamic Emirate of Afghanistan paid more attention to mining of coal (Adib, 2023; analysis, 3 september 2022).

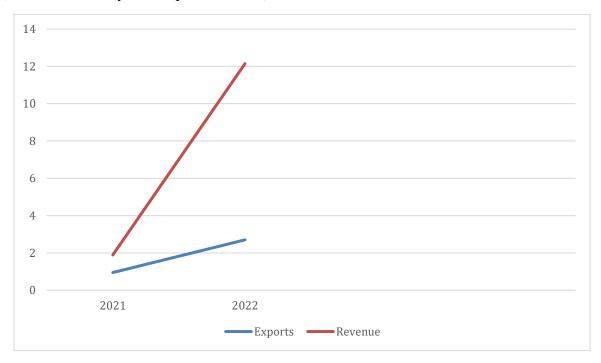


Figure 4. Exported coal to Pakistan in million ton and incomes of Exportation in billion.

Status of Afghanistan's coal trade

Afghanistan is located in the heart of Asia with large reserves of Coal, Oil, and Gas (Rahmaty, Ershad, & Sabory, 16-19 November 2020). The amount of Coal reserves of Afghanistan are 73 million tons that the most of them are located in the northern provinces (Sabory, Danish, & Senjyu, Afghanistan's Energy and Environmental Scenario, December 2020; JAMAL & KHATAMI, 2023). Strategic location of Afghanistan is very good for trading of coal because the region's countries have high demand for coal, such as India demand of coal

was 1.1 billion tons and China demand of coal was 3.8 billion tons in 2020 year (Sabory N., Danish, Senjyu, & Ahmadzai, 07 March 2023). Low transportation cost: The transport cost of Afghanistan coal is very low than other countries. Coal transportation carry out by private markets. At present, the cost of both coal with transport are \$65-\$90 (Malik, 2011).

for delivery of coal from mine to international market, the lack of roads, railways, and ports are the biggest troubles (Ahmedi, 2023). At present, the locations of coal reserves in Afghanistan have huge risk for investors and miners (Sabory N., Danish, Senjyu, & Ahmadzai, 07 March 2023). annually production of coal in Afghanistan is very low and poor as shown in (Figure 5). The annual coal production of Afghanistan is about 200,000 tons (Malik, 2011; Sharifi, Mohsini, Aslami, Noori, & Patmal, 15 Sebtember 2023). Afghanistan's coal mining is very old and unprofessional. The lack of advance technology and equipment are the huge problems in mining of country (JAMAL & KHATAMI, 2023).

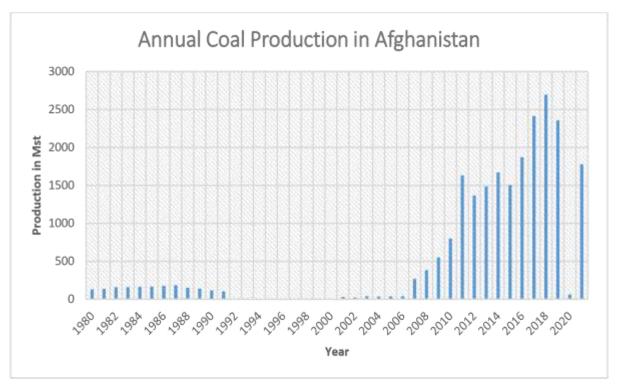


Figure 5. Annual Coal production in Afghanistan from years 1980 to 2021 (Sharifi, Mohsini, Aslami, Noori, & Patmal, 15 Sebtember 2023).

Increasing coal demand in the neighbor's countries, such as India and China is the huge opportunity for Afghanistan to increase its exports of coal. China demand for coal will be 3.5 billion tons and India will be 2.9 billion tons in 2050 year (Sabory N., Danish, Senjyu, & Ahmadzai, 07 March 2023). in recent, two infrastructure projects Lapis-Lazuli and the Five Nations Railway Corridor (connecting China, Kyrgyzstan, Tajikistan, Afghanistan and Iran), have been signed as shown in (Figure 6). it is the best opportunity for easy, and cheap coal trading to international market (Sabory N., Danish, Senjyu, & Ahmadzai, 07 March 2023).



Figure .6. Lapiz-Lazuli transit and transport corridor (Sabory N., Danish, Senjyu, & Ahmadzai, 07 March 2023).

Two coal thermal power plants Ishpushta TPP, and DraSuf TPP have planned are shown in (Table 2). These power plants play significant roles in the coal operating rate, consumption, and attracting attention of foreign investment for advanced mining technology (Rahmaty, Ershad, & Sabory, 16-19 November 2020).

Table.2. The planned thermal power plants of coal.

TPP	Grid Capacity Fuel Segment			Efficiency	Operating Hour	OPEX	General Availability		
Unit		MW		%	hr/yr	1000 M\$			
Ishpushta TPP	NEPS_AFG	400.0	Coal	32.5	6000	25.5	2027-2032		
DraSuf TPP	NEPS_AFG	800.0	Coal	32,5	6000	25.5	2029-2032		

The Economic Cooperation Organization (ECO) was created. ECO has ten members Afghanistan, Iran, Pakistan and Turkey, Azerbaijan, Kazakhstan, Kyrgyz, Tajikistan, Turkmenistan and Uzbekistan. The aims of this organization are development of trade, transport, energy, and economy for 2025. It is a good opportunity for Afghanistan to growth its coal trade to international market (Sabory N. , Danish , Senjyu , & Ahmadzai , 07 March 2023).

Other coal producing countries, such as Australia, Indonesia, and japan are the big threats for Afghanistan coal trading in the international market. Indonesia was exported 434 million tons, Australia 58 million tons, china 52.8 million tons, and japan 47.74 million tons as shown in (Figure 7). Indonesia was the biggest exporter of the coal in 2016 (Atteridge, Aung, & Nugrobo, April 2018; Jotzo, Mazouz, & Wiseman, Sep 2018).

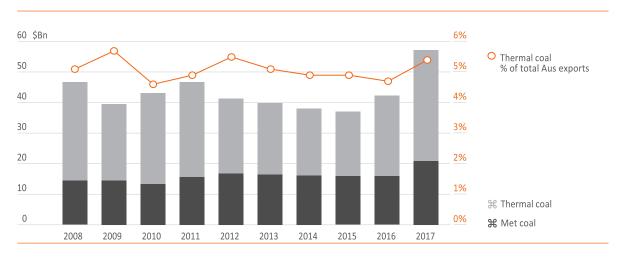


Figure .7. Australia exportation o thermal, and met coal to international market during 2008-2027 (Jotzo, Mazouz, & Wiseman, Sep 2018).

The burning and mining of coal have hazardous impacts on environment, such as air pollution and emissions of greenhouse gases CO_2 , CO, and NO_2 (Rahmaty, Ershad, & Sabory , 16-19 November 2020).

Research Method

The methodology used in this study includes a comprehensive review of literature review on SWOT analysis, current state of Afghanistan's coal trade including (strengths, weaknesses, opportunities, and threats), and international coal trade. Secondary data have been used in introduction and literature review that collected from reliable sources academic articles, papers, and reports related to Afghanistan's coal trade in the international market. The data of literature review was analyzed using quantitative approach. The analysis was done by specifying of Strengths, weaknesses, opportunities, and threats of Afghanistan's coal trade in the international market. Use a SWOT analysis Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrix to organize and categorize the finding and assign weight 0-1 and rating 1-4 to each factor based on their level of importance and impact on Afghanistan's coal trade. Finally, we analyzed the result of IFE and EFE to estimate the strategies for leverage Afghanistan's coal trade strengths, address its weaknesses, capitalize on opportunities, and mitigate threats.

Results

After conducting a SWOT analysis of Afghanistan's coal trade in the international market, it was found that Afghanistan has huge amount of coal reserves, significant strategic location, and low transportation cost for growth. However, there are several weaknesses lack of infrastructure, security concern, low production rate, and lack of mining technology that need to be addressed. Also, there are several opportunities increasing demand for coal, development of infrastructure, planned thermal power plants, and member of ECO. These opportunities should be capitalized and there are two threats competition from other coal-

producing and exporter countries, and competition from other coal-producing and exporter countries should be mitigated.

IFE and EFE matrix

The identified internal factors strengths and weaknesses are assigned to evaluate the internal condition as shown in the IFE matrix (Table 3). The identified external factors opportunities and threats are assigned to evaluate the external condition as shown in the EFE matrix (Table 4).

Table 3. Internal Factors Evaluation (IFE) Matrix.

No	Internal Factor	Weight	Weight Rating					Weight x
			R1	R2	R3	R4	Average	Rating (Weighted score)
Streng	ths (S)							
1.	Huge reserves of coal	0.17	4	4	4	4	4	0.68
2.	Strategic location	0.17	4	4	4	4	4	0.68
3.	Low transportation cost	0.13	4	4	3	4	4	0.52
Weak	Weaknesses (W)							
6.	Lack of infrastructure	0.09	2	2	2	2	2	0.18
7.	Security concerns	0.07	2	2	2	2	2	0.14
8.	Low production rate	0.05	2	2	2	1	2	0.10
9.	Lack of mining technologies	0.03	1	1	2	1	1	0.03
Total		0.71						2.33

The total score of IFE matrix 2.33 depicts that Afghanistan's position in the international market coal trade has moderate strengths in reserves, strategic location, and low transportation cost. Also, has moderate weaknesses in lack of infrastructure, security concerns, low production, and lack of mining technologies. The total score of 2.33 suggests that has moderate competition in the international market of coal trade.

Table 4. External Factors Evaluation (EFE) Matrix.

No	External Factor	Weight	Rating					Weight x Rating
			R1	R2	R3	R4	Average	(Weighted
								score)
Opportu	Opportunities (O)							
-								
1.	Increasing demand for coal	0.17	4	4	4	4	4	0.68
2.	Development of infrastructures	0.17	4	4	4	4	4	0.68

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3.	Planned thermal coal power plants	0.05	2	2	2	1	2	0.1
4.	Member of ECO	0.05	2	2	2	1	2	0.1
Threats (T								
1.	Competition from other coal-producing and exporter countries	0.13	2	2	2	1	2	0.26
2.	Environmental concerns	0.04	2	1	2	1	2	0.08
Total	ı	0.61						1.9

The total score of EFE matrix 1.9 suggests as shown in (Figure 8). there is some opportunity for growth and expansion in the market, but also some threats to be aware. According to EFE score, Afghanistan has moderate position in the international coal trade market.

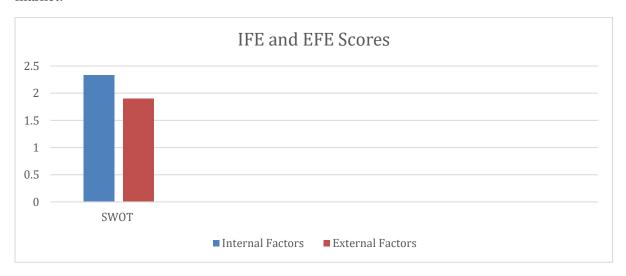


Figure 8. Internal factors and external factors scores.

To answer the first research question, main issues trade of Afghans coal in the international market are Lack of infrastructure, Security concerns, Low production rate, Lack of mining technologies, Competition from other coal-producing and exporter countries, and Environmental concerns. Addressing these issues would require a comprehensive approach focusing on improving infrastructure, security, production rate, mining technologies, competition from other coal-producing and exporter countries, and environmental concerns.

To answer the second research question, to enhance Afghanistan's coal trade in the international market, the below tools and solutions should be considered:

a) Develop security: creating a safe and secure environment are essential to attract native and foreign investment and ensure the safe operation of coal mining. Providing a secure

- environment, implementing effective law enforcement, and addressing political inconstancy will create a favorable atmosphere for coal trade.
- b) Develop infrastructure: concentration on growth of transportation infrastructure, contain rail ways, roads, and ports, ensure efficient and effective cost movement of coal.
- c) Encourage foreign investment: absorb Foreign Direct Investment (FDI) via suggesting incentive, such as tax breaks, simplified procedures, and investment protection measures. Create suitable policies to develop partnership with international companies to leverage their expertise, technologies, and market access.
- d) Environmental sustainability: enhance responsible coal mining practice according to international environmental standards. Making strategies for reducing impacts, such as implementing clean coal technologies.
- e) Strengthen regional collaborations: enforce regional cooperation and trade contracts with neighbor countries to facilitate cross-borders trade of coal.

Discussion

Afghanistan has abundance reserves of coal as well as good strategic location that these have positive impact on Afghan coal trade in the international market. Also, there are several opportunities to growth, such as increasing coal demand in neighbor countries. The Afghanistan government should invest in creating and development infrastructures, such as railways, roads, and ports to facilitate the transportation of coal to international market. Investing in infrastructure will increase the competitiveness of Afghan coal in the international market and reduce the transportation costs. The government should try to create a secure and favorable environment to attract the foreign investment who can bring in capital, technology, and expertise to develop the coal sector. The major challenge in Afghanistan is political instability that government should pay attention and fix these instabilities and create a stable political environment to growth and promoting. Mining practice is also the major issue in coal sector of Afghanistan that government should pay more attention to bring new technologies for sustainable mining, environmental protection, and community development. Afghanistan economy belong to agriculture and industrial extractions, including coal. The government should diversify the economy by promoting other sectors, such as manufacturing and trade.

Conclusion

Afghanistan has huge coal, oil, and gas reserves that the coal reserves amount was estimated about 1.3 billion metric tons in 2017. The most these reserves are located in the northern provinces. Also, the recent studies show that Afghanistan has 73-million-ton reserves of coal. Afghan coal quality is not obvious yet due to lack of expert personnel, investment, and contemporary technologies. Afghanistan's coal exports have increased in the last decades. Therefore, coal mining in Afghanistan has increased. In Afghanistan coal has various usages, such as for heating of homes in the winter, iron smelting, cement factories, and electricity production. Also, Afghanistan has some exports to Pakistan. The Afghan coal export was 948,000 tons' coal in 2021 and it increased to 2.7 million tons in 2022. SWOT analysis is a

tool for investigating strengths, weaknesses, opportunities, a threat. SWOT analysis is used for planning, quality, control, and policies by companies, government, and merchants. Strength and weakness are the internal positive and negative factors. Also, the opportunity and threat are the external positive and negative factors. Australia, United States, Canada, and Russia are the major exporters of the coal in the world and China, Japan, India, South Korea, and EU28 are the major importers of the coal in the world. Australia was exported 55 percent of coal to international market. Price of coal in the international market has increased in recent years due to Russia and Ukraine war. The price of one-ton coal rose from \$157 to \$439 in 2022.

The quality of coal in the international market is often hard coal. Often, coal export to international market by track, train, and barge. Afghanistan has little exports of coal to international market. Currently, Afghanistan has exports of coal to Pakistan about 2.7 million tons with 12 billion and 143 million AFG revenues. The strengths of Afghanistan's coal trade in the international market are huge coal reserves, strategic location, and low transportation costs. The weaknesses are included lack of infrastructure, security, low production rate, and lack of mining technology. The opportunities are included increasing demand for coal, development of infrastructure, planned thermal power plants, and member of ECO. The threats are included competition from other coal producing and exporters, and environmental concerns. The IFE and EFE scores show that Afghanistan has moderate position in the international market of coal trade. Afghanistan should leverage the strengths, capitalize the opportunities, mitigate the threats, and addressing the issues for growth.

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