

Pakistan-Tajikistan Relations and Prospects for Energy Collaboration through CASA-1000

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ABSTRACT

This article uses qualitative methods to explore the CASA-1000 project as it relates to the prosperity of central and south Asia and the energy needs of Pakistan. During the 2000s there was a surge in energy demand in Pakistan, exceeding supply. Its economy was crippled by the energy crisis, drawing attention to the need for a comprehensive and sustainable energy strategy. Efforts made by Pakistan to address this issue demonstrate a constructive approach to cooperation in the region and have led to the CASA-1000 project in collaboration with Tajikistan, a country with an advantageous geographic position and abundance of natural resources. Most Central Asian republics are seeking opportunities to enter the energy export market in order to effectively use their excess energy during the summer season. Similarly, South Asian countries are eager to acquire these resources to meet their energy requirements. Central Asian states can turn their energy resources into liquidity, which will boost their economies and bring about prosperity. It is apparent that ongoing projects such as CASA-1000 will benefit not only Pakistan and Tajikistan, but also other countries of south and central Asia.

Keywords: Wakhan corridor, Natural resources, Hydroelectricity, Surplus energy, Regional connectivity.

INTRODUCTION

The country Tajikistan is also simply described as the “Land of Tajiks,” and is delineated by an intricate interlocking network of mountain ranges: the Hissor, Tian Shan and Pamir (IEA, 2022). Sometimes called the “roof of the world” due to its preponderance of hilly terrain (93 percent of its land area), Tajikistan is landlocked and borders the People’s Republic of China to the east, Republic of Uzbekistan to the

west, Republic of Kyrgyzstan in the north and Afghanistan to the south (Khong Kie & Eshonov, 2009). Tajikistan is located in close proximity to Pakistan, with the two countries separated only by Afghanistan's 16-kilometer-wide Wakhan Corridor, which also shares a border with China (Fahim, 2020). The Yasin and Gupis bridges link Pakistan with Tajikistan and function as a buffer against any potential Afghan advancement into the Hunza and Ghizer districts (Munir & Shafiq, 2018).

Pakistan is strategically situated at the confluence of three significant areas in south, central, and west Asia, offering the most direct maritime access for central Asian landlocked nations such as Tajikistan (Anwar, 2011; Bhutta, 2022). The most viable option for Tajikistan to access ocean is through Pakistani ports (Shahnawaz, 2022). The opening of crossings in the mountain range of the Hindu Kush provides access to the Wakhan Corridor: the Khan Khun Pass (4,985 meters high), Darwaz Pass (3,893 meters high), Ochhili Pass (5,553 meters high), Karambar Pass (4,358 meters high) and Broghal Pass (3,801 meters high). These passes are of significant geostrategic importance for Pakistan (Munir & Shafiq, 2018).

Tajikistan has a population exceeding 9.9 million individuals, with more than 70 percent residing in rural areas. The primary source of livelihood for these individuals is agriculture, which is also the largest sector of the country's national economy. People of Tajikistan value their families and are renowned for their kindness and hospitality. The biggest indigenous population in the nation is the Tajiks, who are descendants of the ethnic Persian heritage. The Tajik culture and identity have a history spanning thousands of years and share significant similarities with other cultures in Iran and Afghanistan, particularly in terms of language, beliefs, and customs. The Pamiri people are also indigenous to Tajikistan and mostly live in the autonomous Gorno-Badakhshan province. In addition, many Kyrgyz, Kazakh, Uzbek, Bukharan, Uyghur, Turkmen, and European Jews also live in the country, which traces its history to when territorial boundaries in Central Asia were redefined by the Soviets. Ukrainians, Ossetins, Crimean Tartars, Koreans, Byelorussians, Armenians and Georgians are also present in the country (Pakistan Business Council, 2021).

Many more diverse people, groups, and linguistic communities have established settlements within the geographical area of Tajikistan since 4,000 BC. As a result, Tajikistan has been ruled by various empires and cultural groups throughout its history. Tajiks were under the rule of the Persian Empire during the reign of Darius I, which was ultimately brought down by Alexander the Great in 333 BC. Alexander the Great annexed the Persian Empire to the Greco-Bactrian Kingdom during the Hellenistic period (Pakistan Business Council, 2017). In addition to their close proximity, Pakistan and Tajikistan have cultural, religious, and historical links. The Umayyad Caliphate, based in Damascus, ruled Pakistan and Tajikistan in the eighth century. Subsequently Tajikistan fell under the governance of the Persian Samanid dynasty, which also exerted control over certain regions of present-day Pakistan (Mishra, 2017). The seventh and eighth centuries witnessed a significant turning point in the historical trajectory of Central Asia, as the Arab forces successfully conquered the region and introduced the Islamic faith. During the 9th and 10th centuries, several cultural and intellectual developments emerged in the area, including the introduction of trade, crafts, science, art, literature, and most significantly adoption of the Tajik language.

Tajik civilization reached to its peak under the reign of the Samanids (Pakistan Business Council, 2017). Some say the people of Central Asia have a Sufi influence and nomadic psyche (Sharma, 2014). In the subcontinent, Sufis played an important role in preserving Muslim heritage and perhaps the true essence of humanity. Hazrat Data Ganj Bakhsh, from the Khujand area of Tajikistan, was an important figure in this context. Bukhara is considered to be the birthplace of the Naqshbandiya school of Sufism (Kavak, 2022). The Tajik people were subjected to governance by various powers, including the Uzbeks, Afghans, and ultimately the Russians starting from the 1860s. During the nineteenth century, the Russian Empire expanded its territorial influence over Central Asia, eventually gaining control of Tajikistan between the years 1864 and 1885. The Arab and Persian culture had a significant impact on pre-independent India as well. Both the Mughal and the Sikh empires recognized Persian as their official language (Mishra, 2017).

In 1924 the Bolsheviks established the Tajik Autonomous Soviet Socialist Republic. The name of the city Dushanbe means Monday in the Tajik language, and it served as a market village when Bukhara Amir was in charge. The Bolsheviks, after the conclusion of the Russian civil war in 1924, changed the town, which is situated between the Kofarnikhon and Varzob rivers, by importing a Slavic population, and developed its infrastructure, ultimately turning it into the capital of the Autonomous Soviet Socialist Republic of Tajikistan, formerly a constituent unit of the Uzbek Soviet Socialist Republic. It attained the status of a fully-fledged republic in 1929. In that year, Dushanbe had its name changed to Stalinabad, but in 1961 it reverted to its previous name (Pakistan Business Council, 2017).

The collapse of the Soviet Union in 1991 presented Pakistan with new prospects in Central Asia, enabling it to progress its vision of establishing an Islamic commonwealth within the region and a security belt with the Central Asian republics serving as its pivot, spanning from Turkey to Pakistan. The goal was to provide Pakistan with strategic depth and forge new alliances in order to bolster its economic and strategic pursuits within the region (Sharma, 2014).

Tajikistan declared its independence on 9 September, 1991, after the disintegration of the Soviet Union. Pakistan was among the first countries to recognize the sovereignty of Tajikistan. Pakistan and Tajikistan established official diplomatic ties in 1992, marking the beginning of a new phase in the bilateral relations between the two Muslim and fraternal nations (Fahim, 2020). Pakistan established its Dushanbe embassy in 1993. More than 1.2 million Tajik refugees fled to Pakistan due to the post-independence political turmoil in Tajikistan and the Soviet-Afghan war, which was promptly followed by a five-year civil conflict, spanning from May 1992 to June 1997 (IPRI, 2015). Despite the considerable financial burden incurred by Pakistan in accommodating refugees, Pakistan has consistently extended a helping hand to Tajikistan and provided the country with land and sea access. The decade after the civil war witnessed substantial economic development, marked by notable advancements in poverty reduction and economic expansion (IEA, 2022).

Pakistan has been a dependable partner for Tajikistan in various areas such as political ties, security cooperation, economic collaboration, and cultural exchange (Pakistan Business Council, 2021). In Pakistani literature, the Persian language has imprinted vibrant marks. For example, a major portion of Allama Muhammad Iqbal's poetry is based on the Persian language. Although this linguistic bond is ancient, it is

still relevant; this bond was the reason that Pakistan quickly recognized Tajikistan after its independence. Pakistan-Tajikistan relations are not typical, but rather exhibit a bond linking two regions (Mishra, 2017).

The proximity of Pakistan is advantageous for Tajikistan since it allows access to a more dispersed global economy through the expansion of the China-Pakistan Economic Corridor into Afghanistan and Central Asia (Korybko, 2021). Tajikistan, on the other hand, acts as a gateway to the central Asian market for Pakistan. Further, Tajikistan collaborated with Pakistan in stabilizing Afghanistan following the long-awaited US pullout in late 2021.

Central Asia needs access to warm waters through a modern seaport facility for transit trade. Gwadar port, located in the Arabian Sea at a distance of 1,600 km from the Indian Ocean, is the closest and viable option for landlocked Central Asian Republics (CARs). The effective use of Gwadar port for transit trade is contingent upon the establishment of peace and security in Afghanistan, as a majority of routes connecting CARs to Gwadar pass through Afghanistan (Pakistan Business Council, 2021).

Being located at the intersection of the CARs, the Strait of Hurmoz and the Caspian Region, Pakistan needs to handle its diplomacy with a pragmatic approach aligned with the interests of regional powers. In order to obtain optimal advantages, Pakistan should keep its pledge to continue working for the establishment of collaboration with Tajikistan, Afghanistan, and China (Munir & Shafiq, 2018). The CARs, particularly Kyrgyzstan and Tajikistan, are in desperate need of access to global markets through Gwadar port, which will improve trade between countries along the Silk Road route and give CARs an affordable marine route to export to the Gulf states, America, and Australia (PILDAT, 2015). Pakistan offers to CARs the shortest conceivable route to ocean.

Pakistan is interested in buying electricity from Tajikistan and is prepared to make investments in Tajik hydropower ventures ("Pakistan," 2021). Pakistan is also looking to import Tajik power to its northern areas, as Tajikistan has huge hydropower potentials and possibly the cheapest electricity in the world. In 2007, an agreement was signed by Pakistan, Afghanistan, Kyrgyzstan and Tajikistan for energy cooperation in the region. Kyrgyzstan and Tajikistan are primarily concerned with selling their surplus power in order to generate cash, while Pakistan and Afghanistan are attempting to lower their significant electricity deficits in order to sustain their economies during summers (PILDAT, 2015).

Pakistan, being an energy-hungry nation, attaches considerable significance to its ties and energy collaborations with countries with surplus energy resources (Rustam, 2024). There are vast hydrocarbon reserves in Central Asia (Umbreen & Azhar, 2015). Pakistan and CARs are highly motivated to establish economic, energy, transportation, and commercial ties (Sethi, 2016). Bilateral and regional collaboration has been shown to be effective in fostering closer relations between CARs and Pakistan (Rustam, 2024). The significance of Pakistan's geopolitical and geostrategic position as well as the desire to provide Central Asia, a landlocked region rich in energy, access to the Gwadar port, are key factors.

Gwadar is situated in close proximity to the Persian Gulf to the east of the Gulf of Oman, which is approximately 75 kilometers from Iran and 460 kilometers from Karachi. The Strait of Hormuz is relatively near to Gwadar. Pakistan has inherent

advantages as an energy and commercial corridor for Central Asia. By developing Gwadar port and linking it to the rail and road networks, Pakistan may serve as the central hub for energy and trade in the region (Sethi, 2016). While Pakistan, China, Russia, Turkey, Iran, and India are major actors in Central Asia, Pakistan has the most potential to emerge as an efficient and secure transit trade route for landlocked CARs, facilitating their connectivity with other nations (Jamil, 2017). Pakistan should reevaluate its foreign policy and strategically maneuver its cards in the aftermath of the US withdrawal from the area in order to maintain regional stability and safeguard its commercial and energy interests in Central Asia. Throughout history, Pakistan has always promoted itself as an economic corridor for Central Asia. The impending four to five years are of utmost importance for maintaining peace and stability in the region and for the development of the Gwadar port. This is not only important for CARs – if China intends to trade with countries from the Middle East, the shortest route is through Pakistan (Irfan, 2023). Gwadar port can in this way become the Hong Kong of the region (Sethi, 2016).

METHODOLOGY

This article uses descriptive qualitative methods to examine the emerging ties between Pakistan and Tajikistan, with a specific emphasis on the prospects for energy cooperation through the CASA-1000 project. Specifically, it carries out a comprehensive review of existing literature on the subject. It provides a thematic analysis and interpretation of these sources. This study examines the relationship between the independent variable, Tajikistan's hydropower (natural) resources, and the dependent variables, i.e., the installation of hydropower plants (HPPs) in Tajikistan, as well as the construction of related transmission lines and other infrastructure in Kyrgyzstan, Afghanistan, and Pakistan.

This article propounds that Tajikistan's geographic proximity to Pakistan presents enormous opportunities under CASA-1000. In creating a common regional electricity market, it will be a win-win initiative for Pakistan, Tajikistan and other CARs. Pakistan and Tajikistan have mutual interests in enhancing regional connectivity, working together to prevent the spread of security threats originating from Afghanistan, and maintaining stability (Rashid et al., 2022). The ideas behind their potential strategic alliance are solid, to the extent that both countries have the political will to turn this vision into a reality. It will take time for their efforts to bear fruit, but the seeds have been planted, therefore making it quite likely that their bilateral relations will evolve into a strategic partnership in the foreseeable future (Shahnawaz, 2022). Secondary sources used for this article include dissertations, theses, news articles, research papers, journals, and other scientific publications. This study contributes to the existing knowledge on the subject and will be of interest for International Financial Institutions (IFIs), academia, policymakers, and diplomats of south and central Asian countries.

NATURAL RESOURCES AND THE HYDROELECTRIC POTENTIAL OF TAJIKISTAN

Tajikistan is rich in natural resources including uranium, aluminum, silver, gold, zinc, tungsten, oil, gas, and, importantly, coal (Pakistan Business Council, 2017). Official statistics shows that there are 21 coal mines with a total of 3.6 billion tons of lignite stocks, anthracite, and bituminous coal with an estimated high calorific value of 73.4 percent (2,656 Mt). Preliminarily estimated reserves account for 17.8 percent (641.5 Mt) and industrial reserves make up 8.8 percent (317.2 Mt) of high calorific coal (IEA, 2022).

Tajikistan inherited a large number of state-owned energy enterprises after its independence from the Soviet Union (De Decker, 2018) and the Tajik economy relies on electricity. Energy security continues to be a paramount concern at the national level, with the primary objective of government being the augmentation of electricity generating capacity to fuel industrial growth, especially the refining of aluminum, and to increase electricity exports (IEA, 2022). Tajikistan is recognized as a prominent nation in terms of energy resources and the generation of electricity and has the highest potential in Central Asia for generating hydroelectric power (Fedorenko, 2013). It could be described as a 'water power' due to its significant water resources and substantial hydropower generating capabilities (de Decker, 2018) from glaciers, lakes and rivers.

There are an estimated 1,000 lakes in the country, with 80 percent of them located over an altitude of 3,000 meters above sea level. Tajikistan also has 948 rivers with a combined length of 28,500 km (Khong Kie & Eshonov, 2009). The mountainous regions of Tajikistan exhibit perpetual snow cover, which, in conjunction with ice and glaciers, spans around 8,476 square kilometers, accounting for almost six percent of the nation's overall land area. These frozen formations serve as reservoirs, holding an estimated volume of 576 cubic kilometers of fresh water throughout the year (Shahnawaz, 2022). Tajikistan is home to over 8,000 glaciers in total, which cover an area of approximately 8.5 thousand square kilometers, including the 77-kilometer-long Fedchenko Glacier which is at times more than 800 meters thick (Satti, 2014).

Because of these features, Tajikistan possesses nearly four percent of all hydropower potential globally. The current installed capacity for hydroelectric power generation system is approximately 5,500MW (Shadrina, 2019), which surpasses its domestic energy requirements. The annual energy production potential of hydropower plants is estimated to be 527 billion KWt/hours (5.27 million MWt/hours) in the country (Satti, 2014). Tajik electricity is relatively green and statistics reveal that hydropower provides all renewable energy in the country (Pakistan Business Council, 2017). The annual electricity production of Tajikistan at present is limited to 16.5 billion KWh, which accounts for just 4-5 percent of its total potential reserves. This production level is achieved by utilizing only half of the existing 5,190 MW producing capacity (Farkhod, 2016). Meanwhile, hydroelectric power constitutes an estimated five percent share and exhibits substantial growth prospects in light of the escalating cost of hydrocarbon fuels, for which it serves as a viable substitute. In terms of water resources, Tajikistan ranks first in Central Asia and eighth in the globe (World Energy Council, 2016). However, it is worth noting that the

country's present utilization of its hydro potential remains rather low, with only about six percent of stock harnessed.

Tajikistan generates 98 percent of its electricity from hydropower (Pakistan Business Council, 2017). The chief HPP is Nurek Hydro Power Plant (3,015MW), with a 300-meter-tall dam is the world's biggest hydroelectric station in Tajikistan, producing 2,700 million KWh of electricity annually (Khong Kie & Eshonov, 2009). The Rogun Dam Project concerns a 335 meter high dam with a 3,600MW plant, estimated to be finished by 2032, at a cost of over \$4 billion, and it is pivotal to accomplishing the goals of Strategy 2030. Tajikistan aims to be a net exporter of energy (IEA, 2022). Currently, the following HPPs are operational in the country: Nurekskaya (3000MW), Baipazinskaya (600MW), Golovnaya (240MW), Perepadnaya (30MW), Central (15MW), Sangtudinskaya-1 (670MW), Kairakkumskaya (126MW), and Varzobsky (25MW) (Pakistan Business Council, 2017). The Sangtudinskaya-2 (220MW) and Rogunskaya (3600MW) hydroelectric power plants are still under construction and many more are in the planning stages: Dashtidjumskaya (4000 MW), Shurobskaya (850MW), Sangvorskaya (800MW), Urfatinskaya (850MW), Shtienskaya (600MW), Evtachskaya (800MW), Kaftaguzarskaya (650MW), Nijne-Kafiriganskaya (120MW), Yavrozskaya (400MW), Ramitskaya (450MW), Sarboskaya (250MW), Vistonskaya (200MW), Siamskaya (250MW), Putusskaya (400MW), Guskharskaya (220MW), Oburdonskaya (120MW), Dargskaya (130MW), Sangistanskaya (140MW), Fandarinskaya (300MW), Aininskaya (160MW), Yavanskaya (120MW), Dupulinskaya (200MW), and Penjikent 1,2,3 (50MW) (Katarzyna & Piotr, 2022). There are 300 HPPs with generating capacities of less than 1MW and 1-3 MW and 11 medium and large HPPs operational in the country with the potential to significantly augment power generation (Farkhod, 2016). New hydropower ventures under the CASA-1000 will not only meet the energy requirements of the region, but also of Pakistan and energy-hungry markets (Satti, 2014).

THE CASA-1000 AND ITS ENERGY PROSPECTS

The memoranda of understanding between south and central Asian countries, known as the CASA-1000 power export initiative, were inked in Kabul (Afghanistan) in 2007 and Islamabad (Pakistan) in 2008 (Umbreen & Azhar, 2015). Discussions about the project began in 2007, and it was formally initiated in 2016. By October 2021, only 15 percent of electricity lines had been completed, despite the fact that the intended date of completion was set to 2023. Construction was delayed due to unstable conditions in Afghanistan (Dimitris, 2022).

CASA-1000 is a 1,250-kilometer-long energy transmission initiative that aims to transfer 1,300MW of hydroelectric electricity from Tajikistan and Kyrgyzstan to Afghanistan and Pakistan (Syed & Khan, 2018). Both Pakistan and Afghanistan would reap the advantages of this endeavor, as in these countries millions of people either do not have access to energy or are subject to frequent power outages. The economic growth of Pakistan has been impeded by the frequent occurrence of energy crises, which have resulted in power deficits ranging from 5,000-5,500MW. Afghanistan, similar to Pakistan, also requires surplus electricity to sustain its developing economy.

The energy requirements of both countries are part of the overall growth in demand for energy throughout Asia. Demand for petrol and oil is projected to rise by

22-27 percent from 2007 to 2035 (Arshad et al., 2014). The CARs are endowed with large energy resources, on the basis of which they might be able to play significant roles as security and economic partners for south and east Asian countries (Muzalevsky, 2013). Tajikistan and Kyrgyzstan have an excess of approximately 6000 GWh of electrical energy during the summer, which would be exported through CASA-1000 to Afghanistan and Pakistan in the future (Halimjanova et al., 2016). Special substations and power transmission lines need to be constructed to facilitate the import of excess summer hydroelectric energy from Tajikistan and the Kyrgyz Republic to Pakistan and Afghanistan. As part of this project, a 477-kilometer long, 500 kV AC line from Datka to Khoujand will transport excess electricity from the Kyrgyz Republic to Tajikistan, where it will then be routed through the Tajikistan national grid to Sangtuda (Anzar et al., 2016), the 1,300MW AC-DC converter station in Tajikistan (Halimjanova et al., 2016). A further 80-kilometer, 220 kV AC line in Tajikistan connects the Nurek and Sangtuda substations. A 750-kilometer high-voltage direct current line (HVDC) connects Sangtuda to Kabul (Afghanistan) and Peshawar (Pakistan); a 300MW DC-AC converter station is being built in Kabul to facilitate the export of energy; and a Peshawar HVDC line in Tajikistan, Afghanistan, and Pakistan have lengths of 117 km, 562 km, and 71 km respectively, with a 1300MW DC-AC converter station (Swati, 2018). Furthermore, it also traverses three AC-DC converter stations (Sangtuda 1.3GW/500kV), (Kabul 300MW/220kV) and (Peshawar 1.3GW/220kV) spanning 120km, 560km and 70km in Tajikistan, Afghanistan and Pakistan respectively, as well as a 750km long HVDC 500kV (1.3GW/220kV) transmission line will run from (Sangtuda) Tajikistan to (Nowshera) Pakistan (NS Energy, 2019). The transmission lines will facilitate the transmission of electricity between Kyrgyzstan and Tajikistan to a distance of 477km and a further 570km from Tajikistan to Afghanistan, which when passing through Sher Khan Port will traverse seven provinces (Kunduz, Baghlan, Panjshir, Kapisa, Kabul, Laghman, and Nangarhar) before arriving at Nowshera (Pakistan) by the Torkham Port ("CASA-1000," 2020).

The funding for this regional initiative is provided by the World Bank, the Islamic Development Bank, the European Investment Bank, the European Bank for Reconstruction and Development, the UK Department for International Development, the Afghanistan Reconstruction Trust Fund (US \$40 million), and the US government (World Bank, 2016). The projected cost of CASA-1000 amounts to a total of US \$1.17 billion (Swati, 2018). The estimated total cost in Tajikistan is approximately US \$251 million, while in Kyrgyzstan it is expected to be US \$196 million (Fedorenko, 2013). Afghanistan will provide US \$300 million, Tajikistan will allocate US \$270 million, while Pakistan and Kyrgyzstan will contribute US \$200 million each. Both the World Bank and the Islamic Development Bank have reached an agreement to provide financing of US \$200 million for the Pakistani share of the project (Umbreen & Azhar, 2015). The World Bank provided US \$526.5 million, while the United States Agency for International Development and the Islamic Development Bank have pledged to provide US \$1.17 billion in funding (Sayed Masood, 2015).

The constant pursuit of energy resources, fundamental to today's technology, puts the human species in danger (Sethi, 2016). The level of energy consumption in a country directly correlates with its level of development and overall advancement. The more energy a country uses, the higher the growth of its economy generally

(Sayed Masood, 2015). Poorer countries are obtaining energy to fulfill basic needs and stimulate their economic growth, while developed nations are acquiring energy to dominate the globe. The demand for energy has distorted our perception of the universe. It is undeniable that energy is crucial for the economic vitality of contemporary societies. A country cannot thrive without an adequate supply of energy (Sethi, 2016).

Pakistan is facing a protracted energy crisis owing to insufficient generating capacity, increased demand for oil and gas, losses in the energy distribution system, untargeted subsidies, and a lack of an overall integrated energy strategy. Energy sector malfunctioning in Pakistan is causing a four percent annual loss in Gross Domestic Product (GDP) (Huma & Vaqar, 2015). The country is not capable of meeting its energy needs. Thirty percent of the populace and around 40,000 villages lack access to electricity (Sayed Masood, 2015). The progress in Pakistan to address energy problems is slow-paced, owing to the scarcity of financial resources. Accelerated population growth has stimulated a corresponding rise in demand for energy. The power industry in Pakistan has an average deficit of over 4,000MW and a shortage of roughly 2 billion cubic feet per day in the natural gas sector ("7 Facts," 2016). The shortfall may further increase to 7,000MW, which is equivalent to 32 percent of overall energy needs. The economy of Pakistan incurs billions of rupees due to the chronic power shortage annually (Ali Haider, 2018). The power supply industry in Pakistan is mostly reliant on fossil fuels, including coal, gas, and petroleum. This industry has been steadily expanding its generating capacity in order to meet the rapidly growing demand for electricity. However, this reliance on fossil fuels has resulted in considerable environmental and climate change issues. It is estimated that if the price of fossil fuels, especially petroleum, continues to rise, several nations will face higher energy costs and a substantial danger of power disruptions due to their incapacity to meet the growing demand (Priyantha et al., 2015). The cost of producing one MWh of electricity in Pakistan varies from US \$25 to US \$350 or US \$65 to US \$150. The upper range signifies the cost of generating energy from oil and diesel, while the lower range represents the production costs of hydropower. Pakistan will have access to comparatively cheaper electricity from CARs under the CASA-1000 than that generated by high cost oil-fired power plants in the country. These factors highlight how important the CASA 1000 project is for Pakistan. The transmission of electricity by CASA-1000 from Tajikistan and Kyrgyzstan will help lessen the need for new power plants in Pakistan. Islamabad will have more leverage in negotiations with Tajikistan and Kyrgyzstan regarding the pricing discussions concerning electricity generated by hydropower, if it is able to increase its gas imports. Utilizing gas imported from Turkmenistan through CASA-1000 will lower energy prices, compelling hydropower producers in CARs to maintain relatively low energy export rates (Syed, 2016).

Pakistan will benefit from the prompt execution of CASA-1000. Pakistan will receive 1,300MW of surplus electricity from Kyrgyzstan and Tajikistan on an annual basis (Fahim, 2020). It will also facilitate the transportation of natural gas through the Tajikistan-Afghanistan-Pakistan-India pipeline, and aims to provide employment opportunities for a significant number of skilled and jobless young people, while also ensuring the building of improved educational facilities and the supply of water to the targeted locations (IPRI, 2015). It is apparent that the project will not only provide

Pakistan and Afghanistan with extra energy supplies, but will also contribute to the enhancement of electricity infrastructure in all participating countries (Abbas et al., 2019). It is crucial to have a steady and uninterrupted supply of energy in order to facilitate the growth of modern infrastructure and technology in a nation like Afghanistan, which is experiencing rapid economic growth. The project will adequately meet needs and generate income by the export of surplus power (PILDAT, 2015). Last year, Afghanistan made the announcement that it would discontinue its intended share of 300MW energy imports under CASA-1000 due to low demand. The resulting distribution of its allocation was shifted to Pakistan, increasing its share from 1,000MW to 1,300MW anticipated initially. In this way, Pakistan will turn out to be the primary energy importer under the project (Mishra, 2017).

During the summer, both Kyrgyzstan and Tajikistan have an excess of energy, a situation set to continue for more than 15 years. If the surplus energy is squandered, it will result in a loss of financial and material resources. CASA-1000 would not only allow income generation from electricity exports, but also utilize the extra energy it produces (IPRI, 2015). Kyrgyzstan and Tajikistan can earn foreign currency, while Afghanistan and Pakistan get much-needed electricity for both domestic and industrial usage, thereby helping to balance the foreign currency exchanges. It could potentially result in a mutually advantageous and reciprocal impact on the GDP of participants (Abbas et al., 2019). The economies of Kyrgyzstan and Tajikistan rely heavily on agriculture as their primary source of revenue and have high unemployment rates. CASA-1000 will not only create thousands of employment opportunities for the general populace, but also improve their quality of life. The drainage system in the mountainous areas of Tajikistan is either fragile or nonexistent altogether. The dams built under the project will offer an effective irrigation system to water their agricultural crops as well as supply clean drinking water to the inhabitants. The shortage of electricity in Tajikistan and Kyrgyzstan during winter is a significant challenges for the countries. The revenue earned by the export of surplus electricity will be utilized to enhance resources for sustainable power generation during the winter (PILDAT, 2015).

The relevance of CASA-1000 project extends beyond the fact that it is intended to generate and transport energy to alleviate deficits. It also functions as a medium for promoting regional collaboration, establishing the essential basis for reliable energy supplies, which are crucial for economic development and the creation of new jobs (Anum, 2023). Not only will CASA-1000 provide an energy system that offers direct advantages to the people of Tajikistan, Kyrgyzstan, Afghanistan, and Pakistan, but it will also develop energy grids. This initiative will provide a framework for energy and economic collaboration between the south and central Asian countries (Ali Haider, 2018). It is a component of the envisioned CAREC Energy Work Plan, which is a partnership between ten countries and six international organizations (Sayed Masood, 2015). CASA-1000 also demonstrates cooperation between Kyrgyzstan, Tajikistan, Pakistan, and Afghanistan toward a proposed regional electricity market. The initiative will provide additional benefits to participating countries (Swati, 2018). It would enable Tajikistan and Kyrgyzstan to enhance their exports of power, while also assisting Afghanistan and Pakistan in developing their economies, which are currently hampered by frequent blackouts and shortages of electricity (Muzalevsky, 2013). The initiative may also help economically disadvantaged nations of Kyrgyzstan

and Tajikistan to generate revenue ("CASA-1000," 2020) and could meet short-term objectives and electricity requirements (Krupa, 2020). If successfully implemented, the project would build a regional power market, help inter-regional development in central and south Asia, and foster deeper collaboration between these two poorly linked regions (Muzalevsky, 2013).

RESULTS

The principal aim of CASA-1000 is to establish framework for a long-lasting electricity trade between Tajikistan and Kyrgyzstan, and Afghanistan and Pakistan (Pakistan Business Council, 2017). It will ensure economic linkages between CARs, allowing Pakistan to use central Asian equipment and technological support to better exploit its oil and gas deposits. While Russia maintains a dominant position in the energy sector in Central Asia, the United States is also actively pursuing investment opportunities. Since the United States withdrew its forces from Afghanistan, it has sought to make investment in CARs to cater the economic hegemony of Russia. The United States has already committed to invest US \$15 million in CASA-1000. However, notable concerns pertain to the construction of the Rogun dam in Tajikistan (IEA, 2022). The projected dam linked to CASA-1000 has escalated political tensions, as while it has the potential to benefit Tajikistan, it has the potential to restrict downstream water supplies to Uzbekistan. Consequently, both the United States and Russia may explore other avenues for engaging in bilateral investment and trade in Tajikistan. Russia has already chosen to openly back the dam (IPRI, 2015).

CASA-1000 should be a brilliant chance for both Pakistan and Tajikistan to achieve economic prosperity. This project should be advantageous to all participating nations, benefiting cooperation, regional stability (Sufiyev, 2019), as well as economic connectivity. It will also provide opportunities for the region to shift farther away from regionalism to regionalization. This mutually beneficial win-win situation will inspire people to explore more avenues for collaboration in the region (Abbas et al., 2019). With the export of surplus power to Pakistan throughout the summer, Tajikistan and Kyrgyzstan may generate income that can be used to address shortages during winter (Mishra, 2017). CASA-1000 will help Pakistan to mitigate its energy shortfall on the one hand, and it will also position Afghanistan as a trustworthy transit partner on the other (Satti, 2014).

There are obstacles to the success of the project, even making completion look improbable. A lack of adequate funding for implementation, diplomatic disparities between participating nations, and security are the primary concerns (Summaiya, 2023). The primary risk pointed out by critics is geopolitics. Disputes over borders and water resources in Central Asia, strained ties between Tajikistan and Uzbekistan, and conflict between Pakistan and Afghanistan are problem zones (Muzalevsky, 2013). The World Bank has admitted that security continues to be the most significant obstacle to CASA-1000 ("Challenges," 2016). Numerous terrorist groups operate in each of the four nation states, but Afghanistan poses the most significant danger.

According to information from Afghan security and defense authorities in February 2017, there were 20 terrorist organizations involved in insurgent activities and fighting against the government. Afghanistan plays a crucial role in the project since it covers the largest portion of the total length of transmission line. It also serves

as a focal point and crucial link between central and south Asia. Although the transmission line is intended to traverse east Afghanistan, relatively secure compared to the west, it remains vulnerable. The weak economy, lack of sufficient technology, small and untrained military and difficult terrain makes Afghanistan an ideal location for terrorist organizations to establish base camps and train their members. Terrorist groups operating in other countries often use Afghanistan as a safe haven. The Pakistan army successfully eliminated terrorism and restored the writ of the government in majority of areas through the operation Zarb-e-Azb. Terrorists who were active Khyber Pakhtunkhwa and the Federally Administered Tribal Areas were either killed or forced to escape. After being forced to retreat, they established base camps in Afghanistan. They could target the transmission line in Afghanistan (Abbas et al., 2019). The abrupt loss of 1000MW of energy from the national grid might force the system to trip and result in a complete blackout throughout the country (Saeed, 2016).

Militants affiliated with terrorist organizations operating in Afghanistan are often from Tajikistan and Kyrgyzstan, which undermines opportunities for a good relationship between other CARs and Afghanistan (Swati, 2018). The southern regions of Khatlon and Gorno-Badakhshan in Tajikistan are facing instability and unrest as a result of the dire situation in Afghanistan. Boundary disputes and concerns in the region could be fatal to building transmission lines. The security situation in border provinces of Afghanistan and Tajikistan, including Badakhshan, Takhar, and Kunduz, is perilous (Abbas et al., 2019). The Islamic Movement of Uzbekistan (IMU), which operates in CARs and Afghanistan, is well-established in Tajikistan also. Jamaat Ansarulloh, which is financed by Al-Qaeda, and is connected to the IMU, also operates in Tajikistan.

For its part, Kyrgyzstan has been seen as a state with terrorists. A lot of Kyrgyz citizens joined the Islamic State (IS) and other groups in Syria and Iraq (Noor & Mehdi, 2017). In order to advance their objectives, sympathizers and covert cells of IS, IMU, and other terrorist groups may threaten to the transmission line. The Xinjiang-based East Turkestan Islamic Movement maintains a presence in CARs and Pakistan through various offshoot groups. It aspires to establish a Muslim caliphate encompassing south Asia, central Asia, and regions in Western China. For the East Turkestan Islamic Movement, CASA-1000 would be an excellent target to garner significant attention in all of its agenda areas (Abbas et al., 2019). For the foreseeable future, it is no exaggeration that transmission lines are at risk from terrorists, but also from counterterrorism efforts (Michael, 2013).

The realization of CASA-1000 may also be impeded by diplomatic strains between participating nations (Sayed Masood, 2015), because projects like CASA-1000 necessitate a high degree of trust and a positive relationship between partner states. Issues can occur during and after its completion, requiring diplomatic settlement. Four member countries of the project do not have a good record of diplomatic relations (Abbas et al., 2019). The most significant challenge arises from the lack of trust existing between Pakistan and Afghanistan and the blame game of assigning responsibility for terrorist actions occurring on either side of their border (Fauzia, 2016). Afghanistan and Tajikistan are also not on friendly diplomatic terms due to hostility and territorial disputes. Tajikistan consistently blames Afghanistan for allowing drug trafficking.

Domestic opposition to CASA-1000 is another challenge. Critics in Kyrgyzstan propose collaborating with Russia, India, and China instead, since these countries have more finances and will to support the development of energy industry. They contend that conclusion of the “Dataka-Kemin” power communication lines and other projects of a similar kind, according to their argument, would enable Kyrgyzstan to export electricity to China and Kazakhstan at higher rates. This kind of collaboration, according to them, is more advantageous than working together with Afghanistan and Pakistan, which are economically less developed and politically insecure countries (Muzalevsky, 2013). Pakistan in fact attempted to incorporate Russia into the project (Bhutta, 2022), but Tajikistan vetoed it, even though Russia had already engaged in discussions and proposed investing up to US \$500 million in Pakistan and Afghanistan (“CASA-1000,” 2020).

Kyrgyzstan used to be compelled to import electricity from Kazakhstan and relied on Russia for its gas needs. Due to its own energy problems, there is some uncertainty about whether Kyrgyzstan will be able to fulfill its obligations to provide the necessary 30 percent share of electricity to Afghanistan and Pakistan. Tajikistan would have a sufficient safety margin to prevent its own supply from being affected by a shortage in Kyrgyzstan. However, it is uncertain whether Tajikistan will be required to compensate for the difference from its own power grid in exchange for the Kyrgyz share of the profit. Currently, there is no agreement in place to address this contingency (Saeed, 2016).

Uzbekistan has been accused of taking drastic measures, such as interrupting gas supplies and obstructing railway transit, to convey its dissatisfaction with various matters, and in consequence has impeded the development of hydropower in Tajikistan and Kyrgyzstan. Tashkent allegedly proposed the construction of three hydroelectric power plants on the Swat River in order to dissuade Islamabad from pursuing CASA-1000 (Muzalevsky, 2013). Another peril that might put the CASA-1000 in jeopardy is a Chinese pledge to supply 3.2 gigawatts of electricity to Pakistan, which could reduce consumption of electricity in the country and will have significant consequences to the project. It is reported that CASA-1000 will transfer 1,300MW of electricity, with 1,000MW being allocated to Pakistan and the remaining 300MW to Afghanistan, which recently made a decision not to acquire 300MW of electricity through CASA-1000 because of the higher comparative cost (“CASA-1000,” 2020). Last but not least, there are doubts with respect to capacity of the CARs to provide their pledged share of electricity within the framework of CASA-1000 (Saeed, 2016). The HVDC transmission lines under CASA-1000 will necessitate the installation of updated energy management technology and transformers, which are currently unusable in central and south Asian countries. There are apprehensions that the power infrastructure built under CASA-1000 will not provide the desired benefits to participant nations (Dimitris, 2022).

The CASA-1000 was formally approved in 2014. Upon approval, the completion date was scheduled for the end of 2018; however, it has been delayed since then. The groundbreaking ceremony took place on 12 May, 2016 in Dushanbe, Tajikistan, although physical construction work is yet to begin, notwithstanding transmission lines and procuring AC/DC converters (Abbas et al., 2019). One potential issue that might jeopardize the project is the inadequate financial support system behind the plan. CASA-1000 is expected to receive funding from the Islamic

Development Bank, the World Bank, and other smaller contributions from allied governments. The withdrawal of a single donor backing out of financing could put the entire project in jeopardy and threaten the investment in infrastructure made thus far. This lack of fiscal transparency and the resulting instability makes CASA-1000 a risky investment from the very beginning. It is imperative to safeguard the project against financial mismanagement by stipulating a clear allocation of responsibilities among the contracting parties and creating a fund that can guarantee the maintenance of a suitable financial solution for project advancement, thereby preventing financial obstacles from further delaying the plan in the future (Saeed, 2016). Since the initiative is being carried out with the financial assistance of foreign donors, it will lose attraction in the event that there are uncertainties over its long-term viability. The IFIs and four participant nations would be in a situation of ambiguity, resulting in project delays (Abbas et al., 2019).

CONCLUSION

In order to strengthen collaboration between Pakistan and Tajikistan and solidify their regional alliance, tangible measures to achieve an energy corridor must be undertaken. CASA-1000 would contribute to positive regionalism, connectedness, spur trade, and provide a complementary energy environment for new opportunities in multiple domains. Despite the fact that Pakistan and Afghanistan are not currently benefiting from electricity imports under CASA-1000, the location of these countries may transform them into energy hubs. If more energy-starved regional states join CASA-1000 and similar projects in the future, their proximity will facilitate their connection. This would again foster regional collaboration, economic growth and ingenuity in Pakistan and Afghanistan.

CASA-1000 is not just about moving electricity, it can also strengthen collaboration between participating governments—bilaterally and multilaterally. Participant nations will see progress in terms of electrical infrastructure and the expansion of regional commerce as a result of their cooperation under CASA-1000. It will also make it easier for neighboring states to develop regional unity. This trans-border initiative provides an opportunity to negotiate shared concerns, creating a foundation for future collaborative endeavors. It will push the involved nations to convene and engage in diplomatic discussions to address and resolve border disputes for durable peace and prosperity in the region.

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