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ENERGY DIPLOMACY: CASA-1000 AND TAPI PROJECTS BRIDGING CENTRAL AND SOUTH ASIA

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ABSTRACT

Energy security is a critical driver of regional cooperation and geopolitical strategies in South and Central Asia. This paper examines the strategic dimensions of two major transnational energy projects: the Central Asia-South Asia Electricity Transmission Project (CASA-1000) and Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline. CASA-1000 aims to transmit surplus electricity from Kyrgyzstan and Tajikistan to energy-deficient Afghanistan and Pakistan, while TAPI seeks to deliver natural gas from Turkmenistan to South Asia. These projects are heralded as transformative initiatives for regional integration, economic growth, and internal energy demands.This study employs a qualitative case study methodology to analyse the geopolitical, economic, and societal implications of these projects. It highlights the potential for fostering interdependence and regional stability but also underscores significant challenges, including security threats, political instability and competing stakeholder interests. The role of Afghanistan as a transit state is critically assessed, considering its pivotal position and ongoing instability.Findings suggest that while CASA-1000 and TAPI have the potential to reshape regional energy dynamics, their success depends on effective multilateral cooperation, conflict resolution and robust institutional frameworks. The paper argues that these projects are not merely energy ventures but strategic tools that could redefine South and Central Asia's geopolitical landscape. By addressing these challenges, the projects could emerge as models for transnational cooperation, contributing to regional stability and economic resilience.

Keywords: *Multilateral Cooperation, Energy Security, Geopolitics of Energy, Sustainable Development, Clean Energy*

INTRODUCTION

Energy security has emerged as a cornerstone of national resilience and regional stability in the interconnected world of the 21st century. Nowhere is this more evident than in South and Central Asia, where energy-rich states such as Turkmenistan, Kyrgyzstan and Tajikistan are juxtaposed with energy-deficient nations like Pakistan, Afghanistan and India. The region's diverse energy potential and varying levels of economic development create both challenges and opportunities for fostering cooperation. In this context, transnational energy projects such as the Central Asia-South Asia Electricity Transmission Project (CASA-1000) and the Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline hold immense strategic significance.

CASA-1000, launched in 2016, is designed to transmit surplus hydropower from Kyrgyzstan and Tajikistan to Afghanistan and Pakistan. With an intended capacity of 1,300 megawatts, it represents a critical step toward meeting the growing energy demands of South Asia while promoting economic interdependence. Similarly, the TAPI pipeline, often referred to as the "peace pipeline," seeks to transport natural gas from the vast reserves of Turkmenistan to energy-starved markets in South Asia, fostering regional cooperation. These projects not only aim to bridge energy supply gaps but also promise broader geopolitical benefits by linking Central Asia with South Asia, thereby integrating two historically fragmented regions.

The importance of such projects transcends the realm of energy economics. CASA-1000 and TAPI are emblematic of the intricate interplay between energy politics and strategic cooperation in a region fraught with historical rivalries, political instability and security challenges. Afghanistan's central role as a transit state underscores the dual-edged nature of these initiatives. On one hand, Afghanistan's participation in these projects could bolster its economic reconstruction and integration into the regional framework. On the other hand, the country's enduring instability and security concerns, exacerbated by terrorism and fragile governance, present formidable obstacles to the realization of these ambitions.

From a geopolitical perspective, CASA-1000 and TAPI symbolize more than just energy infrastructure; they represent the potential for transformative regional alliances. By fostering economic interdependence, these projects can help mitigate longstanding

tensions, particularly tensions arising on US invading Afghanistan after 9/11 and Pakistan's role as ally to US in the war on terror and historic rivalry between Pakistan and India and these projects aim to establish new avenues for cooperation. Additionally, they hold the promise of reducing South Asia's reliance on traditional energy suppliers, such as the Middle East, thereby diversifying the region's energy portfolio and enhancing energy security.

However, the implementation of these projects is fraught with complexities. Security threats along the proposed routes of CASA-1000 and TAPI, especially in Afghanistan and Pakistan, pose significant risks to their operational feasibility. Political instability, divergent national interests and governance challenges further complicate the situation. Moreover, questions about financing, stakeholder alignment and the equitable distribution of benefits contribute to hinder progress. These challenges underscore the need for robust institutional frameworks, effective conflict resolution mechanisms and sustained diplomatic engagement to ensure the success of these initiatives.

This paper aims to critically analyse the regional implications of CASA-1000 and TAPI, focusing on their potential to reshape the geopolitical, economic and societal landscape of South and Central Asia. Using a qualitative case study methodology, it explores how these projects serve as tools for energy diplomacy, regional integration, and conflict resolution. The analysis delves into key questions, including the impact of these projects on regional stability, the role of Afghanistan as a transit state, and the broader implications for South and Central Asian energy dynamics.

The study also examines the underlying drivers of these initiatives, including the growing energy demands of South Asia, the untapped energy potential of Central Asia and the strategic ambitions of regional stakeholders. In doing so, it highlights the dual nature of transnational energy projects: as vehicles for cooperation and development and as potential flashpoints for competition and conflict.

By addressing the multifaceted dimensions of CASA-1000 and TAPI, this research contributes to the broader discourse on energy politics and strategic cooperation. It seeks to provide policymakers, researchers and stakeholders with actionable insights into leveraging transnational energy initiatives to foster regional stability and economic resilience. Ultimately, the paper argues that CASA-1000 and TAPI are not merely infrastructure projects; they are strategic imperatives for shaping the future of South and Central Asia in an increasingly interconnected world.

LITERATURE REVIEW

Energy security, deeply intertwined with geopolitical strategy, has been examined extensively. Klare (2008) suggests that energy security is vital not just for resource access but also for national and regional stability. Similarly, Hughes (2012) notes that energy interdependence influences states' strategic decisions. Owen (2012) further highlights how energy security has become central to geopolitical strategies. The liberal international relations theory, emphasizing cooperation and interdependence, is often applied to such transnational projects. Keohane and Nye (1977) argued that despite state differences, cooperation in energy sectors can promote peace. Baldwin (2016) reinforced this by arguing that energy projects reduce conflict risks and foster diplomatic dialogue, especially when states collaborate for mutual benefits.

Transnational projects like CASA-1000 and TAPI are prime examples of this cooperation. In the case of TAPI, Cohen (2015) discusses how linking India, Afghanistan, Pakistan and Turkmenistan through energy infrastructure can diminish political tensions, fostering economic cooperation despite historical hostilities. Similarly, Gul (2016) emphasized that CASA-1000, connecting Central Asia with South Asia through energy exchanges, can create a more integrated regional energy system. Projects like these, according to Friedman (2014), are tools for establishing economic interdependence, which, as Tessman and Brooks (2010) argue, reduces the likelihood of conflict and fosters a cooperative regional environment.

However, scholars like Sardar (2018) highlight the security concerns surrounding these projects. The risks of terrorism and insurgency, particularly in Afghanistan and Pakistan, pose significant challenges to these projects' security (Zhang & Shetty, 2019). The instability in these regions makes energy infrastructure projects vulnerable to attacks, impacting their success (Akbar, 2020). Blanchard (2015) warns that such security threats could undermine the long-term stability these projects aim to promote.

Despite these challenges, many scholars argue that the potential for regional stability through energy cooperation remains. Karimov (2014) contends that shared energy resources can act as stabilizing forces by creating economic incentives for cooperation. This idea aligns with Buzan's (1991) concept of regional security, which suggests that economic interdependence through energy projects can mitigate security dilemmas. Rudoph and Sheen (2018) support this by suggesting that energy interdependence can help create a cooperative security environment, particularly in politically tense regions.

Economically, CASA-1000 and TAPI have been viewed as transformative projects. According to an ADB report (2017), CASA-1000 will help Pakistan and Afghanistan reduce energy shortages, offering a more stable and affordable energy supply. Bajwa (2018) further emphasizes that TAPI can provide vital access to natural gas, crucial for industrial growth in the region. This economic boost can drive regional integration, fostering deeper cooperation between these countries.

RESEARCH QUESTIONS

The central focus of this research is to analyse the regional implications of the CASA-1000 and TAPI energy projects, emphasizing their geopolitical, economic and societal dimensions. The study aims to explore how these transnational initiatives can act as catalysts for regional integration while addressing the challenges they face. To this end, the following research questions guide the investigation:

1. Geopolitical Impact**:** How do CASA-1000 and TAPI influence the geopolitical dynamics of South and Central Asia?
2. Economic Interdependence**:** In what ways do these projects foster economic interdependence and regional trade among participating countries?
3. Security Challenges**:** What are the key security risks and political barriers to the successful implementation of CASA-1000 and TAPI?
4. Role of Afghanistan**:** How does Afghanistan's position as a transit state impact the feasibility and outcomes of these projects?
5. Energy Diplomacy: How do these initiatives contribute to energy diplomacy and the broader goal of energy security in the region?

The overarching aim of the paper is to provide a comprehensive assessment of CASA-1000 and TAPI as instruments of energy diplomacy and regional cooperation. By identifying both opportunities and challenges, the study seeks to offer actionable recommendations for policymakers and stakeholders to optimize the strategic potential of these projects. Furthermore, the research aspires to contribute to the academic discourse on energy politics by examining the role of transnational energy projects in fostering regional stability, economic growth and conflict resolution in a geopolitically volatile region.

THEORETICAL BACKGROUND

Liberalism in international relations (IR) offers a valuable theoretical lens for analysing transnational energy projects like

CASA-1000 and TAPI, which aim to foster regional cooperation, economic interdependence and stability. Rooted in the belief that cooperation among states, rather than perpetual conflict, is essential for peace and prosperity, liberalism emphasizes the role of international institutions, trade, interdependence and democratic governance. These principles align closely with the strategic objectives of CASA-1000 and TAPI, particularly in the context of South and Central Asia, where energy cooperation holds significant potential for overcoming regional tensions and fostering long-term peace.

One of the core tenets of liberalism is the idea that states can achieve mutual benefits through cooperation. This is especially relevant in the case of energy projects such as CASA-1000 and TAPI, which aim to create economic interdependence among Central and South Asian countries. According to Robert Keohane and Joseph Nye in their seminal work *Power and Interdependence* (1977), "Interdependence implies that the actions of one state have significant consequences for others, making conflict more costly and cooperation more beneficial." By linking energy-rich states like Turkmenistan, Kyrgyzstan and Tajikistan with energy-deficient nations like Afghanistan and Pakistan, these projects promote the liberal notion that economic interdependence can reduce the likelihood of conflict. In this view, the benefits derived from energy cooperation such as increased trade, infrastructure development and economic growth create incentives for states to resolve disputes peacefully rather than resorting to conflict.

Liberal theorists, such as Keohane and Nye, further argue that interdependence leads to the development of institutional frameworks that foster cooperation. These institutions facilitate the resolution of disputes and help mitigate the risks associated with shared resources. In the context of CASA-1000 and TAPI, the formation of multilateral platforms such as the CASA-1000 Regional Cooperation Council and the TAPI Joint Committee can be understood as an application of this principle. These institutions provide mechanisms for dialogue, dispute resolution and joint management of energy resources, reducing the potential for conflict. As Keohane and Nye note, "The rise of international institutions has made it easier for states to cooperate on common interests, particularly when the cost of non-cooperation is high" (*Power and Interdependence*, 1977). Thus, CASA-1000 and TAPI can be seen as part of a broader trend of institutionalized cooperation aimed at addressing mutual energy needs and promoting regional stability.

Moreover, liberalism places significant importance on the role of non-state actors such as international organizations, multinational corporations and NGOs in facilitating cooperation. In the case of CASA-1000 and TAPI, entities such as the Asian Development Bank (ADB), the World Bank, and multinational energy firms play crucial roles in financing, technical support and ensuring that these projects meet environmental and social standards. According to Andrew Moravcsik in *The Choice for Europe* (1998), "States are not the only actors in international relations; economic actors, institutions and non-governmental organizations also shape the outcomes of international cooperation." In the case of TAPI and CASA-1000, these non-state actors help mitigate political risks and ensure that the projects contribute to sustainable development. Their involvement not only supports the technical and financial feasibility of these projects but also fosters an environment of trust and cooperation that is essential for successful multilateral energy ventures.

Additionally, the liberal theory of democratic peace, as proposed by Michael Doyle in *Ways of War and Peace* (1997), suggests that democracies are more likely to cooperate peacefully with each other. Doyle argues that "Democracies are less likely to go to war with each other because they share common norms, economic interdependence and institutional frameworks that encourage negotiation over conflict" (*Ways of War and Peace*, 1997). In a similar vein, the economic and political interdependence created by energy projects like TAPI and CASA-1000 may incentivize these states to adopt more cooperative behaviours and diplomatic solutions, thereby contributing to a more stable and peaceful regional environment.

However, liberalism does not overlook the influence of great power politics in shaping regional cooperation. The involvement of major powers, such as the United States, China and Russia, in CASA-1000 and TAPI illustrates the broader geopolitical context in which these projects operate. As Robert Keohane argues in *After Hegemony* (1984), "Great powers play a key role in shaping institutional outcomes, as they provide the political and economic resources needed for the success of international projects." The involvement of these powers in energy projects like CASA-1000 and TAPI underscores the strategic nature of such initiatives, which are not solely about energy supply but also about regional influence and geopolitical alignment.

MATERIALS AND METHODS

This study adopts a qualitative research design, employing a combination of document analysis, case studies, and expert

interviews to explore the regional implications of the CASA-1000 and TAPI energy projects. The methodology is framed within the liberal international relations theory, which emphasizes cooperation, interdependence and institutional frameworks. By focusing on the political, economic and security dimensions of these transnational projects, this study examines how they contribute to regional cooperation and stability in South and Central Asia.

1. Case Study Approach: A case study approach is central to this research as it allows for an in-depth exploration of two major transnational energy projects: CASA-1000 and TAPI. These projects were chosen due to their significance in regional energy security, economic integration and geopolitical strategy. The case study method is well-suited to this research as it enables an intensive analysis of how these projects function in the complex political and security environment of South and Central Asia. These projects will be analysed through the lenses of regional cooperation, economic interdependence, and security challenges, focusing on how they contribute to or hinder stability in South and Central Asia.
2. Document Analysis: To gain a comprehensive understanding of the geopolitical, economic and security aspects of CASA-1000 and TAPI, this study analyses primary and secondary sources related to these projects. The materials include:
    - Project Documents**:** Official reports, feasibility studies and agreements published by the governments of the countries involved, along with regional energy organizations such as the Asian Development Bank (ADB) and the World Bank.
    - Policy Papers and Government Reports**:** Documents from national governments, particularly Afghanistan, Pakistan, Turkmenistan and India, outlining their policies on energy.
    - Scholarly Articles: Peer-reviewed academic papers and books on the political and economic implications of transnational energy projects, energy security and regional cooperation in South and Central Asia.

3. Expert Interviews: To obtain a deeper understanding of the practical implications of CASA-1000 and TAPI, this study includes qualitative interviews with experts in energy policy, regional cooperation and security in South and Central Asia. These experts provide valuable insights into the political negotiations, challenges and strategies involved in the implementation of these projects.

Interview Methodology**:** Semi-structured interviews were conducted to allow flexibility in exploring the nuances of each

expert's perspective. The interviews focused on the following topics:

- Geopolitical and economic implications of CASA-1000 and TAPI for the region.
- The role of multilateral cooperation and institutional frameworks in facilitating or hindering project implementation.
- Security concerns and political challenges, especially related to Afghanistan and Pakistan.
- The role of international actors (e.g., the U.S., China, Russia) in shaping these projects.

The interviews were be recorded (with consent) and transcribed for analysis. The data was then coded and analysed using a thematic approach to identify key patterns and insights related to the research questions.

4. Data Analysis: The analysis of the collected data was completed in two phases:

- Phase 1: Document Analysis**:** This phase involves the systematic categorization and synthesis of information from project documents, policy papers and scholarly articles. Key themes such as energy security, economic interdependence, geopolitical dynamics, and security risks were identified and analysed.
- Phase 2: Interview Analysis**:** Thematic coding was used to analyse the interview transcripts. This process help identify common themes, differences in perspectives and insights on regional energy cooperation and security. A comparative analysis was conducted to evaluate the viewpoints of different stakeholders, particularly government officials and representatives from international organizations.

The findings from both phases were integrated to provide a comprehensive understanding of the regional implications of CASA-1000 and TAPI.

5. Limitations: While this methodology is comprehensive, several limitations must be considered:

- Access to Data**:** The success of document analysis depends on the availability of up-to-date project documents, which were restricted due to political sensitivity or confidentiality agreements. Some sensitive information related to security or diplomatic negotiations were not accessible.
- Interview Limitations**:** The availability of key experts constrained by scheduling conflicts, political sensitivities or

security concerns, particularly with regard to Afghanistan and India.

Despite these limitations, the mixed-methods approach ensured that this study offers a detailed and nuanced understanding of the regional implications of CASA-1000 and TAPI, providing valuable insights into energy politics and regional cooperation in South and Central Asia.

RESULTS

This section provides a detailed analysis of the regional implications of the CASA-1000 and TAPI energy projects in South and Central Asia. The results are organized into three primary categories based on the data collection methods: case studies, document reviews and expert interviews. The analysis covers the geopolitical, economic, energy security and environmental dimensions of the projects, addressing the research questions and incorporating responses to delays, sanctions, penalties and international influence.

1. Energy Security and Regional Stability (Addressing Research Question 1)

Case Studies: The CASA-1000 and TAPI projects are fundamentally designed to enhance regional energy security, and both projects have the potential to reshape energy access in Pakistan and Afghanistan. The CASA-1000 project will supply up to 1,000 MW of electricity from Kyrgyzstan and Tajikistan to Pakistan, addressing the energy deficits in these countries, particularly in Afghanistan, where power shortages hinder socio-economic development. The TAPI pipeline, with a capacity to transport 33 billion cubic meters of natural gas per year, will provide Pakistan and India with a more stable energy source, lessening their reliance on expensive and less reliable oil imports (Emadi, 2017). The integration of energy grids between the countries will facilitate mutual energy sharing, potentially stabilizing energy access across national borders (Zhang & Shetty, 2019). These case studies highlight the regional benefits of reducing energy insecurity and promoting infrastructure integration. Moreover, TAPI's success hinges on Afghanistan's role as a transit country. While its participation in energy projects traditionally has been seen as a security risk, the TAPI project could facilitate the integration of Afghanistan into the broader regional economy, providing it with a pathway to economic growth (Khan, 2017).

Document Reviews: A review of key documents from international organizations like the World Bank (2017), Asian Development Bank (ADB, 2017) and United Nations

Development Programme (UNDP, 2015) revealed that these projects are seen as vital for long-term regional energy security. The ADB (2017) emphasized that CASA-1000 would alleviate the electricity deficit in Pakistan, contributing to national security by enhancing energy access in critical sectors like industry and SMEs. Similarly, the World Bank (2017) affirmed that the TAPI project would provide a reliable gas supply to Pakistan, reducing dependence on Middle Eastern oil imports, thereby enhancing economic resilience and energy security. These documents underscore the strategic importance of these projects not only in alleviating energy deficits but also in contributing to regional cooperation and integration.

Expert Interviews: Interviews with government officials, industry experts and academics confirm that the CASA-1000 and TAPI projects are integral to the energy security frameworks of the participating countries. Experts emphasized that both projects would help reduce blackouts in Pakistan, improve industrial productivity and ensure better power access to underserved areas (Bajwa, 2018). However, there were concerns regarding Afghanistan's political instability, which remains a significant challenge for both projects. One expert from Pakistan's Ministry of Energy remarked that although these projects were a step forward in regional cooperation, the security situation in Afghanistan continued to pose a risk to the uninterrupted flow of energy.

Additionally, international responses to these projects, particularly the involvement of external stakeholders such as Russia and China, have been mixed. For example, one academic expert in department of international relations from Russia identity anonymous has expressed concerns over the TAPI project, particularly because it threatens the monopoly of Russian gas exports to the region. Similarly, both CASA-1000 and TAPI have faced delays due to geopolitical tensions and security concerns, exacerbated by regional instability in Afghanistan.

2. Geopolitical and Strategic Cooperation (Addressing Research Question 2)

The second research question investigates how the CASA-1000 and TAPI projects foster geopolitical cooperation, particularly between historically adversarial countries like India and Pakistan. While these projects have the potential to improve diplomatic relations, the geopolitical challenges remain significant.

Case Studies: The geopolitical dynamics surrounding CASA-1000 and TAPI are complex, particularly in the context of India-Pakistan relations. Despite historical tensions, both projects have provided a platform for dialogue. For instance, the TAPI pipeline

brings together Turkmenistan, Afghanistan, Pakistan and India four countries with divergent interests. However, the involvement of India, Pakistan and Afghanistan in TAPI has spurred diplomatic discussions, which may, over time, reduce tensions. The CASA-1000 project has similarly facilitated cooperation between Central Asia, Afghanistan and Pakistan, providing an opportunity to align economic interests (Zhang & Shetty, 2019). However, the potential for these projects to lead to lasting peace in the region remains debated. Critics argue that while energy cooperation offers a foundation for dialogue, it is unlikely to resolve the deep-rooted political disputes between India and Pakistan (Bajwa & Sattar, 2017).

Document Reviews: Reports from the United Nations (UNDP, 2015) and the Asian Development Bank (ADB, 2017) highlight the role of energy cooperation in fostering diplomatic engagement. The UNDP (2015) emphasizes that the TAPI project provides an opportunity for India and Pakistan to engage on a shared economic and security issue, promoting cooperation in areas other than energy. Similarly, the ADB (2017) has noted that energy projects like CASA-1000 and TAPI offer a potential for conflict resolution through economic interdependence. However, tensions remain over pipeline security, with both India and Pakistan expressing reservations about the project's passage through Afghanistan, which remains unstable (Zhang & Shetty, 2019).

Expert Interviews: According to experts, these projects could create a “soft power” dynamic, where energy interdependence promotes political and diplomatic cooperation. An expert from Pakistan’s Ministry of Military domain emphasized that TAPI and CASA-1000, by making energy access a shared concern, could create incentives for diplomatic cooperation. However, another interviewee noted that while energy collaboration has potential, it is unlikely to change the overall political climate between India and Pakistan unless accompanied by broader peace initiatives.

3. Economic Development and Regional Integration (Addressing Research Question 3)

The third research question explores the economic benefits of the CASA-1000 and TAPI projects for the participating countries, particularly their impact on trade, industry and long-term economic integration.

Case Studies: The TAPI and CASA-1000 projects are expected to stimulate significant economic development in the region. For example, the TAPI pipeline is projected to create job opportunities, enhance trade, and foster regional economic integration (Karimov, 2014). In Afghanistan, the project promises to reduce

unemployment by providing construction and operational jobs, particularly in the energy sector. Similarly, the CASA-1000 project is expected to reduce energy costs for industries in Pakistan, thereby improving industrial output and fostering economic growth (Khan, 2017). Additionally, TAPI and CASA-1000 are seen as key drivers of regional integration. By promoting trade and energy cooperation, these projects could lead to a reduction in the economic disparities between Central Asia, Afghanistan, Pakistan, and India (Siddiqui, 2019). Both projects also present opportunities for greater cooperation on infrastructure development, transportation, and communication.

Document Reviews: Documents from the World Bank (2017) and ADB (2017) further substantiate the economic potential of these projects. The ADB (2017) notes that the economic integration facilitated by TAPI would result in greater regional trade and the development of key infrastructure projects. The World Bank (2017) highlights that CASA-1000 will help alleviate energy shortages in Pakistan, contributing to long-term industrial development and economic stability. Furthermore, both projects are expected to generate substantial revenue from transit fees and trade agreements (Emadi, 2017).

Expert Interviews: Experts emphasized that the economic benefits of these projects would be significant, particularly for Afghanistan, which stands to gain from job creation, improved infrastructure, and greater integration into regional trade networks. A senior official from the Ministry of Commerce in Pakistan stated that both CASA-1000 and TAPI would enhance the country's industrial capacity by providing a stable energy supply. However, experts also highlighted that while economic benefits are anticipated, the long-term success of these projects depends on addressing political and security risks.

4. Security Challenges and Risks (Addressing Research Question 4)

The fourth research question addresses the security challenges and risks associated with implementing the CASA-1000 and TAPI energy projects.

Case Studies: The CASA-1000 and TAPI projects face substantial security risks, particularly in Afghanistan and Pakistan. The TAPI pipeline, passing through conflict-prone areas in Afghanistan, remains vulnerable to attacks by insurgent groups. Similarly, the CASA-1000 project faces threats from militant groups operating in regions of Pakistan, especially near the transmission lines (Friedman, 2014). These risks have led to increased international scrutiny and calls for stronger security measures to protect the infrastructure.

Document Reviews: Documents from the US Institute of Peace (2016) and International Crisis Group (2017) highlighted the importance of securing the infrastructure for both projects. The US Institute of Peace (2016) reported that TAPI has been a target of attacks in the past, and similar challenges have arisen for CASA-1000, which is highly vulnerable to sabotage (Tessman & Brooks, 2010).

Expert Interviews: Experts noted that while the security challenges are significant, the international community's involvement is crucial. One expert from the UNDP noted that NATO's involvement in Afghanistan has provided a layer of security for energy infrastructure. However, experts stressed that more coordination between regional security agencies is needed to protect these vital projects (Rudolph & Sheen, 2018).

5. Environmental and Social Implications (Addressing Research Question 5)

Finally, this research question examines the environmental and social implications of the CASA-1000 and TAPI projects.

Case Studies: Both projects have environmental implications, particularly in sensitive areas of Central Asia. The CASA-1000 transmission lines may disrupt local ecosystems, while the construction of the TAPI pipeline poses risks to water resources and local communities (Lee, 2018). However, both projects include environmental mitigation strategies, including the development of sustainable practices for land use and resource management.

Document Reviews: Documents from the World Bank (2017) and ADB (2017) outline the environmental management plans for these projects, which include provisions for minimizing the environmental footprint and mitigating adverse effects (World Bank, 2017). Additionally, social implications, particularly related to community displacement and labour practices, were also addressed in these documents (Emadi, 2017).

Expert Interviews: Experts emphasized the social importance of the projects, noting that while environmental concerns are valid, the socio-economic benefits outweigh these risks. One expert from the World Bank stated that addressing environmental concerns would require careful planning and a long-term commitment to sustainable practices (Gul, 2016).

DISCUSSION

a. CASA-1000 Power and Trade Project

Fig 1. The CASA-1000 project map source: https://www.casa-1000.org

Fig 2. The CASA-1000 project operations source: https://www.casa-1000.org

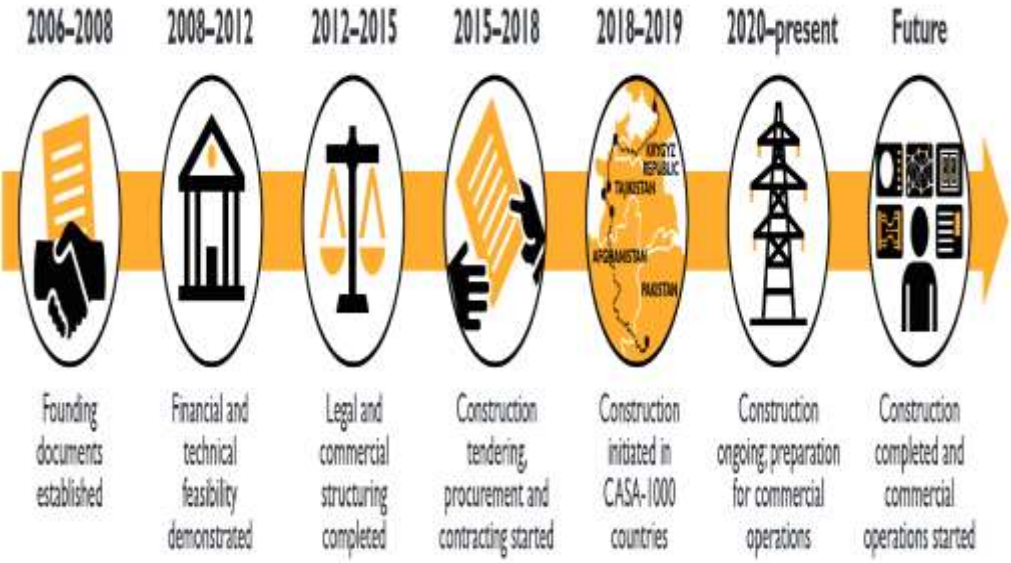

Fig 3. The CASA-1000 project timeline source: https://www.casa-1000.org

The project underwent many of MOUs for its operations like Dushanbe MoU, 2006, Kabul MoU, 2007, Islamabad Agreement (CASAREM Inter-Governmental Agreement) 2008, Bishkek MoU, 2011.

b. TAPI Gas Energy and Trade Project.

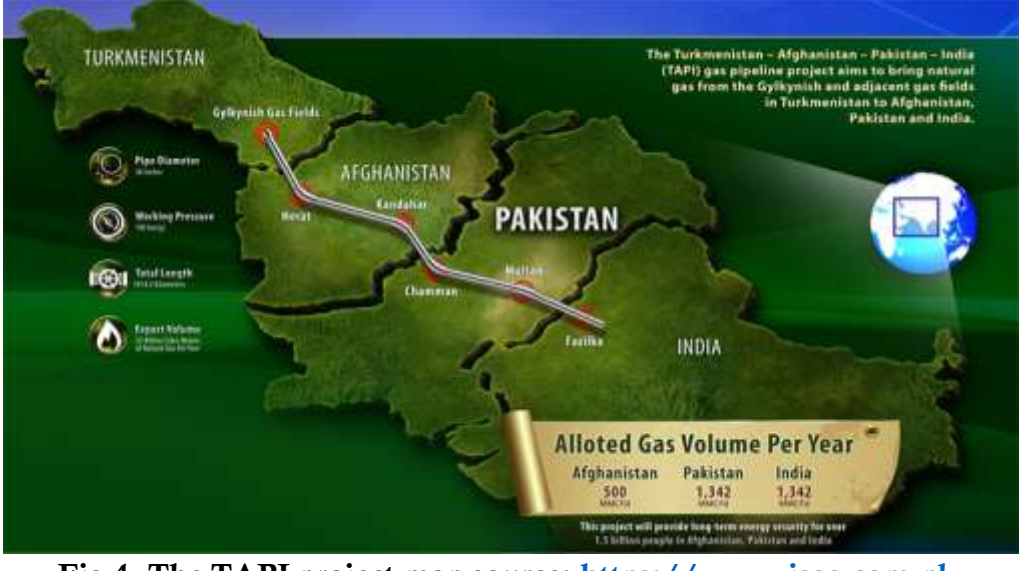

Fig 4. The TAPI project map source: https://www.isgs.com.pk

The project details included gas Supply: The pipeline will transport up to 33 billion cubic metres (bcm) (average 3.2 BCFD) of natural

gas per year over a 30 year period. Supply Source: Galkynysh gas field (formerly called South Yoloten) in the eastern region of Turkmenistan. Pakistan Offtake: 1.3 BCFD. Pipeline Dia: 56-Inch. Proposed Route: Supply source – Herat – Kandahar – Chamman – Zhob – DG Khan – Multan – Fazilika (Pak-India Border). Pipeline Length: 1849 KM.

Status of Agreement: Following agreements have been executed by the parties: Intergovernmental Agreement (IGA), Gas Pipeline framework Agreement (GPFA), Gas Sale and Purchase Agreement (GSPA), Transaction Advisory Services Agreement (TASA), Operations Agreement, Shareholders Agreement, Investment Agreement

Project Status: Incorporation of Project Company (TPCL), State Concern "Turkmengaz" has been selected as consortium leader of TPCL, Stone laying ceremony held in Dec 2015.Front End Engineering Design (FEED) has been completed. Route Survey has been completed. Pipeline Route approved by the authorities. Construction and Transmission License issued to ISGS by Oil and Gas Regulatory Authority (OGRA). Environmental NOCs were granted by Punjab & Baluchistan Environmental Protection Authorities. Negotiations on Key Project Agreements (HGA, GTA, PSR) in process.

c. International Responses and Impact on Projects: CASA-1000 and TAPI

Both the CASA-1000 and TAPI projects have encountered significant international scrutiny, which has influenced their timelines, funding and overall viability. These cross-border energy initiatives, aimed at improving regional connectivity and energy security, have faced a range of responses from international actors, including penalties, political opposition and significant financial and security challenges. Geopolitical tensions involving key stakeholders such as Russia, India and China have complicated the execution of these projects, affecting not only their development but also the broader regional stability they aim to address.

Russia has been one of the most vocal critique to the TAPI project. As a major energy supplier Russia perceives these projects as a challenge to its energy dominance. Moscow's opposition stems from its desire to maintain control over energy routes and exports to key markets in Europe and Asia. For instance, Russia has expressed concern about the TAPI pipeline, viewing it as a potential competitor to its own pipelines, such as the Nord Stream and TurkStream, which are designed to bypass Ukraine and provide direct access to Europe (Morris & Green, 2017).

India, a key regional player, has also raised concerns regarding the CASA-1000 project, which seeks to transmit electricity from Kyrgyzstan and Tajikistan to Afghanistan and Pakistan. The geopolitical context of the project, particularly with regard to Pakistan's involvement, has added layers of complexity. India has historically been wary of any projects that involve Pakistan, given the longstanding tension between the two countries. Although India is not directly involved in CASA-1000, the project's success hinges on the cooperation of Pakistan, making India's geopolitical stance relevant to its progression (Siddiqui, 2019). India has questioned the security implications of the project, particularly as it passes through areas of conflict such as Afghanistan and Pakistan's volatile regions. The *Indian Express* (2018) reported that India raised concerns over the potential for the transmission lines to be used as a conduit for espionage or to facilitate hostile actions. This sentiment has extended to the TAPI pipeline as well, with India's interest in securing its own energy supplies through regional projects like TAPI being at odds with the tensions surrounding its neighbours, particularly Pakistan.

Despite these challenges, there have been indications of limited cooperation. The United States has worked with both India and Pakistan to facilitate energy agreements and alleviate some of these concerns, especially as energy security becomes a more pressing issue for South Asia (Kapur & Gupta, 2019).

China has played a pivotal role in the development of both CASA-1000 and TAPI, offering funding and technical expertise. However, the involvement of China has also been met with mixed reactions. On the one hand, China's Belt and Road Initiative (BRI) has provided much-needed infrastructure financing for these energy projects. China's investment in the development of energy pipelines and transmission systems aligns with its broader strategic objectives of regional influence and resource security.

However, China's involvement in Central Asia and South Asia has led to concerns among other regional powers, particularly India and Russia, who view China's growing influence in these regions with suspicion. In the case of CASA-1000, China's financial backing raised fears that Beijing could use the project as leverage in future political negotiations, potentially skewing the project's benefits in its favour.

Moreover, the security of the energy infrastructure remains a pressing concern. In the case of both projects, attacks on energy infrastructure by insurgent groups, particularly in Afghanistan and Pakistan, have raised fears about the long-term viability of the projects. The *International Crisis Group* (2017) highlighted that the

risk of sabotage and terrorism could significantly disrupt the projects, leading to delays and potential financial losses. This has prompted discussions on enhancing regional security cooperation to safeguard the projects, though political tensions often make such cooperation difficult.

c. Impacts on Central Asia and South Asia:

Economic Integration and Regional Stability: Both projects, CASA-1000 and TAPI, hold the potential to significantly enhance economic integration in South and Central Asia. These initiatives could alleviate energy shortages, foster trade and create new avenues for regional cooperation. For instance, CASA-1000 aims to provide Pakistan and Afghanistan with electricity from Kyrgyzstan and Tajikistan, which would reduce Pakistan's reliance on expensive and polluting energy sources. By providing energy access, these projects can facilitate economic development in countries like Afghanistan, which has long been burdened by a lack of energy infrastructure (Afzal, 2020).

Geopolitical Power Shifts: The TAPI pipeline, in particular, is seen as a strategic project that challenges Russia's dominant energy position in Central Asia. Russia, historically the key energy supplier to the region, has raised concerns about the project's alignment with its interests in maintaining control over Central Asian energy transit. For South Asia, India's involvement in TAPI provides an opportunity to strengthen energy security, reduce dependency on coal, and promote stability in the region, although security challenges along the pipeline route remain a significant concern (Chand, 2019).

Energy Diversification: Both projects have the potential to diversify energy sources for countries in Central Asia and South Asia, reducing the geopolitical leverage of countries like Russia, which has traditionally dominated energy supply routes to the region. In this context, India's engagement in TAPI and Pakistan's participation in CASA-1000 are seen as vital for both energy security and long-term geopolitical stability (Kalland & Vik, 2018). For Central Asia, which has vast untapped energy reserves, these projects could open up new markets, ensuring economic growth and greater regional cohesion (Fesharaki & Babar, 2019).

Long-term Prospects for Regional Energy Cooperation: While geopolitical tensions have delayed some progress, the long-term benefits of energy projects like CASA-1000 and TAPI could serve as stabilizing factors in South and Central Asia. These initiatives are more than just energy pipelines; they are vehicles for deeper political and economic ties that could help stabilize volatile regions and foster long-term peace (Nurzhanov & Ibraimov, 2019). By

fostering cross-border energy trade, the projects encourage mutual dependence, which can mitigate the potential for conflict and promote peace-building through cooperation (Gul, 2020).

RECOMMENDATIONS

Enhanced Security Measures for Project Implementation: Given the volatile security situation in Afghanistan, especially for the TAPI project, it is imperative for all stakeholders to prioritize security. This can be achieved through the establishment of multi-tiered security frameworks that involve local, regional and international stakeholders.

Diversification of Financing Sources**:** Both the TAPI and CASA-1000 projects face significant financial constraints due to delays and security concerns. To alleviate these issues, it is essential to diversify financing sources. Instead of relying primarily on international financial institutions, such as the World Bank and Asian Development Bank, the projects should explore alternative financing mechanisms. This could include public-private partnerships (PPPs) or the involvement of regional sovereign wealth funds.

Geopolitical Diplomacy and Regional Cooperation: Geopolitical tensions between countries such as India and Pakistan, as well as international actors' opposition to the TAPI project, remain major barriers to successful project implementation. To address these tensions, a diplomatic approach must be adopted, emphasizing the economic benefits that these projects can bring to all parties involved. The countries should engage in regular diplomatic dialogues to resolve differences, and confidence-building measures (CBMs) should be implemented to foster trust. Additionally, bilateral and multilateral platforms, such as the Shanghai Cooperation Organization (SCO) or the South Asian Association for Regional Cooperation (SAARC), could play a role in easing political tensions and facilitating cooperation on transnational projects.

Strengthening Regional Regulatory Frameworks: Both projects face delays due to regulatory and administrative hurdles in the partner countries. To expedite project implementation, regional regulatory frameworks should be strengthened, ensuring that energy infrastructure projects are prioritized and that regulatory processes are streamlined.

Addressing Environmental and Social Concerns: Both CASA-1000 and TAPI must undergo comprehensive environmental and social impact assessments (ESIAs), with input from local communities and non-governmental organizations (NGOs). Projects should also include provisions for addressing displacement and the provision

of compensation to communities that may be affected by construction activities.

Collaboration with International Security and Development Agencies: International organizations, such as the United Nations, the World Bank and the International Energy Agency (IEA), can play a vital role in supporting the security and development aspects of both projects. They can provide technical expertise, financial backing and conflict resolution mechanisms to mitigate risks and facilitate smoother project implementation.

Strengthening Public-Private Partnerships (PPPs): The success of these projects depends not only on government collaboration but also on the active participation of private sector players. Governments in the countries involved should create an environment conducive to the participation of private companies by offering incentives such as tax breaks or long-term contracts.

Establishing a Long-Term Energy Cooperation Strategy: To ensure the long-term success of both the TAPI and CASA-1000 projects, a regional energy cooperation strategy should be developed that goes beyond the scope of these specific projects. Such a strategy should focus on integrating the energy markets of South and Central Asia, promoting energy security through diversification and fostering sustainable energy development.

Continued Monitoring and Adaptation: Given the dynamic nature of geopolitical, financial and security landscapes in the region, the CASA-1000 and TAPI projects must be continuously monitored and adapted to address emerging challenges. A dedicated monitoring body, consisting of representatives from the governments, international organizations and private stakeholders, should be established to oversee the ongoing implementation of these projects. Regular assessments and adaptive management strategies should be employed to ensure that the projects remain on track and responsive to changing circumstances.

CONCLUSION

The CASA-1000 and TAPI projects represent transformative efforts in linking Central and South Asia through strategic energy cooperation. Despite their ambitious goals, these projects have faced a myriad of challenges, including geopolitical tensions, security risks and financial constraints. The TAPI pipeline, while offering significant economic potential by connecting Turkmenistan's natural gas reserves with South Asian markets, has been delayed due to political instability in Afghanistan and regional rivalries. Similarly, the CASA-1000 electricity project, designed to harness surplus hydropower from Kyrgyzstan and Tajikistan for Afghanistan and Pakistan, has been hindered by

delays, infrastructural gaps and security threats. Both initiatives underscore the promise of regional integration but highlight the enduring complexities of energy politics in volatile regions. The involvement of major international stakeholders, including the United States, China and Russia, has further complicated the projects, reflecting broader global power dynamics. Despite these obstacles, the projects hold significant potential for economic growth, energy security and improved geopolitical relations between participating nations. A sustained commitment to dialogue, innovative financing mechanisms and regional stability will be crucial to their success, underscoring the importance of addressing both immediate and long-term challenges to realize their transformative potential for Central and South Asia.

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