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THE ROLE OF THE CHINA-PAKISTAN ECONOMIC CORRIDOR IN THE DIVERSIFICATION OF CENTRAL ASIA'S MARITIME ACCESS

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Abstract. This study aims to examine whether China-Pakistan Economic Corridor (CPEC), can enhance Central Asian countries' trade opportunities and provide Central Asian countries with alternative routes to the Indian Ocean. The research compares three different southbound transportation options, including the Western Caspian route through Iran, the Trans-Afghan corridor, and the CPEC route through its northern expansion via Xinjiang. The objective of the research is to examine each of these corridors for trade between Kazakhstan, Uzbekistan, and Pakistan based upon their transport design feasibility, risks, and strategic value. The study employs a structured comparative analysis of each corridor's infrastructure quality and connectivity, exposure to geopolitical risk, investment models, and vulnerability to disruptions; in addition, trade compatibility is assessed for economic effectiveness among the shortlisted countries. While the Western Caspian Corridor is fairly developed, it is also subject to significant sanction-related risks; the Trans-Afghan Corridor is associated with significant challenges regarding continuity and stability; and lastly, despite congestion constraints, the CPEC Alignment has more opportunities for integrated multimodal connectivity than the others. The analysis indicates that CPEC continues developing a much broader function than just a direct linear transit corridor into being a true multi-vector connectivity platform for increased strategic flexibility and decreased vulnerability on account of geopolitical disruption. The contribution to the field of research regarding developing corridors in Eurasia is positioning CPEC toward a more strategically connected transportation system while diminishing its focus from that of a bilateral infrastructure project to that of a connectivity system. For Central Asian states seeking diversified resilient maritime access routes, this research provides valuable guidance.

Keywords: Central Asia, China-Pakistan economic corridor, maritime access options, Eurasian corridors, transit vulnerability, multivector connection, trade route configuration, infrastructure condition

Introduction

The Central Asian landlocked republics have long been impeded by severe structural limitations when attempting to access global markets. Historic geographic isolation has simultaneously raised the cost of transporting goods to markets located abroad, reduced the possibility of diversifying exports, and increased reliance upon external powers for use of transit corridors [1]. In such

a context, access to tidal waters has not only become a logistical hurdle, but has evolved into a strategic consideration intertwined with economic sovereignty, trade resilience and geopolitical independence.

Recent geopolitical developments have escalated debate concerning the need for those goods remaining as trade routes dependent on traditional northern corridors into Western Europe and their exposure to vulnerability created by any disruption of a political nature (i.e., international sanctions). As such, as argued by Yermekbayev from the Kazakhstan perspective, access to alternate modes of transportation has increasingly become an important factor concerning questions of both economic security, energy logistics, and diplomatic flexibility; therefore, rather than simply representing technical infrastructure; corridors can now be viewed as tools of strategic positioning [2].

Within this dynamic environment, the China-Pakistan Economic Corridor (CPEC), as a flagship element of China's Belt and Road Initiative (BRI), represents an additional, potential southern maritime access route for the Central Asian republics. Through the development of a multimodal land-sea corridor between Xinjiang in China and Gwadar Port in Pakistan located on the Arabian Sea, CPEC seeks to provide access to the Indian Ocean while avoiding reliance on traditional northern Eurasian transit intermittently subjected to political disruption [3], approximately 60 km from the state of India, CPEC would provide access to maritime transportation avenues unique to Central Asian republics, through Gwadar, and thereby have deep impact upon the regional economies that rely upon sea-based trade through the Arabian Sea.

Fourth, it evaluates the security risks and geopolitical uncertainties that may constrain the long-term viability of the CPEC Alignment (Northern Extension through Xinjiang), thereby affecting its sustained impact on regional trade patterns.

This study contributes to the literature by introducing a structural-functional framework for evaluating corridor diversification in landlocked regions, moving beyond geopolitically centered interpretations of CPEC.

While the strategic significance of Gwadar, in conjunction with the Straits of Hormuz, concerning the energy security of China and transformation of the economy of Pakistan, has become an increasingly popular topic of discussion [4] with respect to how Gwadar improves the energy security and economic transformation of China and Pakistan, there has yet to be any analysis of the impact that Gwadar has had upon third party transit entities; considering that most Central Asian republics are structurally constrained by geography and therefore maritime transit systems via the Arabian Sea are not traditionally used by logistics providers.

Simultaneously, a transit route that connects Asia to Europe by crossing the Caspian Sea, known as the Trans-Caspian International Transport Route (TITR), more commonly referred to as the "Middle Corridor," is emerging as a viable alternative east-west corridor for transporting goods from China to Europe. However, numerous studies confirm that TITR will require extensive

upgrading of existing infrastructure, as well as improvements in multimodal coordination [2]; empirical assessments of the railway capacity supporting TITR further demonstrate that throughput efficiency and transit reliability is hindered by single-track sections and limited-siding capacity [5]. Thus, these studies indicate should a corridor offer the potential for alternative transit arrangements, operationally viable implementation across transit modes will not necessarily be consistent through use of given corridors.

In this context, this research evaluates whether the CPEC Alignment (Northern Extension through Xinjiang) offers Central Asian republics a credible alternative for diversifying access to the maritime transport system and provide an alternative method of routing goods presently transported via the northern transit corridor into Western Europe. This research is unique, in that, previous research has addressed CPEC primarily through use of Geographical Information Systems (GIS) and/or quantitative data, as viewed from either the perspectives of the People's Republic of China and/or the Islamic Republic of Pakistan, whereas this study measures the structural impact of CPEC on Central Asia's trade configuration through a comparative corridor framework.

Specifically, this research seeks to achieve the following objectives:

1. Provide an analysis of the strategic position of the CPEC Alignment (Northern Extension through Xinjiang) within the context of Central Asia's Maritime Access System and whether access via the CPEC Alignment is anticipated to materially impact the spatial configuration of current exporting routes utilized by Central Asian Republics.

2. Provide a comparative analysis between the CPEC Alignment (Northern Extension through Xinjiang) and other potential southern-corridor access routes to the Indian Ocean (through Iran); evaluating the transport efficiency, institutional/regulatory stability, infrastructure compatibility and operational reliability between CPEC Alignment (Northern Extension through Xinjiang) and other southern corridors.

3. Assess export structure and compatibility of commodities including exploring corridor dependency.

4. As well, the research also analyzed security risks and geopolitical uncertainties that could hinder the long-term sustainability of the CPEC Alignment (Northern Extension through Xinjiang) and thus affect the sustainability of its impact upon regional patrns of trade.

This study adds to the academic literature by proposing a structural-functional perspective for assessing corridor diversification in landlocked areas of northwestern China, as this represents a departure from current interpretations of the CPEC that focus on geopolitical factors alone.

Literature Review

Currently, scholars are concentrating on both the CPEC's geopolitical rationale in conjunction with the CPEC within the Emirates' Belt and Road Initiative [5]. As the literature focuses on China's desire to diminish its

dependence on vulnerable maritime chokepoints (e.g. the Malacca Strait), and seeks to position Gwadar port as an alternative means of providing energy security and/or shortening distance/m by using the CPEC through/from China, this China-centric perspective fails to evaluate in any significant way how the CPEC may impact its third party geopolitical actors (e.g. the landlocked nations of central Asia) [6]. The recent geopolitical changes associated with the Russia-Ukraine conflict have further exacerbated the need for corridor diversification efforts and the need for resilience in supply chain management efforts [7]. The Trans-Caspian International Transport Route has been of renewed focus and attention since the above conflict as a potential alternative to the traditional northern routes via Russia. According to Yermekbayev et al.'s analysis of the TITR from Kazakhstan's perspective; the multimodal coordination challenges, the lack of capacity at ports, and an inadequate associated infrastructure prevents the feasibility of this corridor [2]. Therefore, it would appear that while corridor diversification is politically attractive, its operational barriers are substantial.

At a broader level, Kazakh scholar Augan contend that international transport corridors serve as both economic infrastructures and as instruments of geopolitical positioning and national security. For example, in the case of landlocked states dependent on transit routes, alternatives to traditional transit routes may mitigate their vulnerability to external shocks, as well as enhance their strategic autonomy [8]. In this way, the realities of corridor diversification correlate directly with economic stability and resilience of free trade.

While a growing body of literature exists regarding the Trans-Caspian International Transport Route as well as corridor competition; few studies systematically examine whether the CPEC Alignment (Northern Extension through Xinjiang) provides a realistic means for Central Asia to diversify its maritime access. Most published works focus almost exclusively on the geopolitical symbolism of corridor alignment and/or China's energy strategy rather than how the new corridors may be changing/affecting Central Asia's trade structure and export geography.

This research fills the gap by examining the CPEC Alignment (Northern Extension through Xinjiang)-Gwadar corridor within the overall context of Eurasian corridor competition and assesses its implications for Central Asia in terms of its potential to provide for the diversification of Central Asia's maritime access and the restructuring of the region's trade. Consequently, while there is a substantial body of literature on the geopolitics of corridors, there is a relative dearth of literature assessing the interrelationship of trade structure and the feasibility of infrastructure required to support the trade corridors.

Description of Materials and Methods

The study evaluates the study's feasibility of the CPEC Aligment Northern extension through Xinjiang as a southbound maritime access route for Central Asia by employing a comparative analysis of the three southbound corridors to the Indian Ocean.

Examined methodological sources

For empirical purposes, the information was classified into three main categories.

First, transport development plans and corridor policy documents (2015-2025) pertaining to infrastructure developments were reviewed in evaluating whether how infrastructures will be developed in Xinjiang [9], CPEC action plan [10], National Transport Strategies assimilating Kazakhstan [11] and Central Asian countries [12] were taken into consideration and whether these official documents were available.

Second, the trade statistical data on Kazakhstan and Uzbekistan were compiled and analyzed [13, 14]. The major export categories included energy/ resources, metals, minerals, and agricultural products. Therefore, the structure of Pakistan's importation was analyzed to reflect on structural compatibility between Central Asian exports corresponding to demand from Pakistan [15] .

Third, the infrastructure-related data associated with the way rail and highway services linked Central Asia and China, conditions of transportation in Afghanistan and Iran, and every port integration capability of Bandar Abbas, Karachi, and Gwadar were compiled.

Each of the above empirical materials contributes to the basis of comparing each corridor.

Analytical Framework

The analysis is constructed in a structured comparative corridor methodology across four specific dimensions:

- Infrastructure connectivity: Assessment of connection between rail, road, and ports along the entire corridor and the connectedness to sources of supply and the operational status of their networks.

- Risk and constraint structure: Assessments of exposure to security risks, the potential of sanctions occurring, financial constraints, and conditions of implementation that are subject to the corridor's utility.

- Investment/stakeholder configuration: Identifying the type of construction (either modernization of existing facilities or creating a new facility), identifying the major investors, and establishing the current state of these developments.

- Compatibility of trade structures: Performing comparative analyses of the exports of Kazakhstan and Uzbekistan and the imports into Pakistan to judge the relationship between commodities through the corridor.

On this basis, a Transit Vulnerability Benchmarking framework has been developed to assess how factors affecting corridor resilience such as route concentration risk, exposure to sanctions, risk of conflict, port reliability, and disruptions to infrastructure play a role.

Methodological Approach

A systemic analytical perspective identifies the broader network of corridor development as a part of Eurasia's changing trade structure and geopolitical uncertainty.

The analysis was performed through comparative analysis across three defined southbound corridors of transportation:

1. Western Caspian (Iran)
2. Trans- Afghan
3. CPEC (Northern Extension through Xinjiang).

Descriptive structural comparisons are established to derive differences between the infrastructures connected to each corridor, the profile of constraints within each corridor, and the compatibility of exchange of trade materials in the respective corridors.

This analysis has not modeled quantitative freight flow distributions but is based on a structural feasibility and difference in vulnerability to the current geopolitical climate.

Results

Identification of Three Southbound Corridors to the Indian Ocean

As shown in Figures-1, 2 and 3, three major North-South transport configurations linking Eurasian landlocked economies to the Indian Ocean can be identified.

1. Russia-Azerbaijan-Iran corridor (Western Caspian alignment / International North south Transportation Corridor (INSTC) type)
2. Russia-Kazakhstan-Uzbekistan-Afghanistan-Pakistan corridor (Trans-Afghan alignment)
3. CPEC Alignment (Northern Extension through Xinjiang)

Figure-1: International North South Transportation Corridor (INSTC)
Source: [16]

The three corridors differ in infrastructural continuity, geopolitical exposure, and commodity transport structure. Variations are observed in route stability, transit integration, and port connectivity.

Figure-2: International Transport Corridor

Source: [17]

Infrastructure Continuity: Rail, Road, and Port Conditions

1.Western Caspian Alignment (Russia-Azerbaijan-Iran)Rail Infrastructure: Rail continuity from Russia to Iran is largely operational, although bottlenecks remain in specific Iranian segments. Electrification levels are uneven, and modernization efforts are ongoing.

Road Infrastructure: The road network is relatively developed and functionally integrated with rail systems.

Port Access: Southern Iranian ports, particularly Bandar Abbas, are operational and connected to established maritime networks.

Rail and port systems are operational along the Russia-Iran segment.

Figure-3: Railways and Highways of Iran

Source: [18]

2. Trans-Afghan Alignment (Russia-Kazakhstan-Uzbekistan-Afghanistan-Pakistan)

Rail Infrastructure: Rail networks in Russia, Kazakhstan, and Uzbekistan are well-developed. However, substantial discontinuities exist within Afghanistan. A continuous north-south railway connection has not yet been fully realized.

Road Infrastructure: The route traverses mountainous terrain, creating seasonal vulnerability and operational constraints.

Port Access: The corridor potentially connects to Karachi and Gwadar ports, but functional reliability depends heavily on the Afghan segment.

This alignment exhibits the highest degree of infrastructural fragmentation.

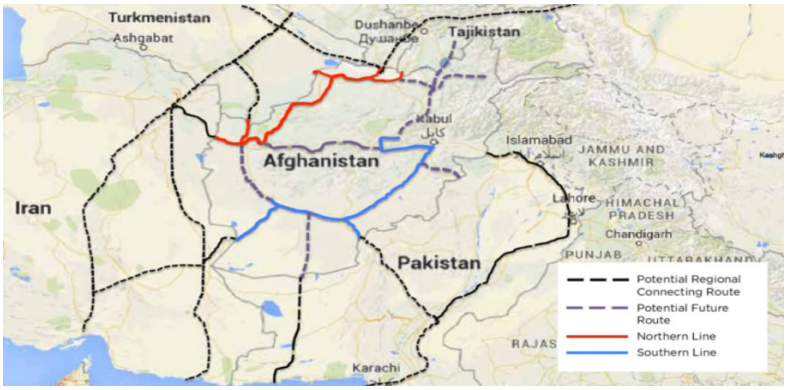

Figure-4: The Trans-Afghan Transport Corridor

Source: [19]

3. CPEC Alignment (Northern Extension through Xinjiang)

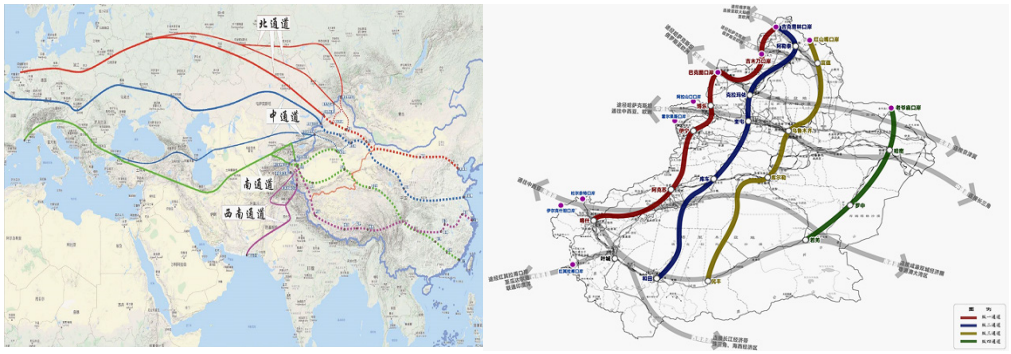

Figure-5: Xinjiang Transportation Construction Planning

Source: [20]

The CPEC Alignment (Northern Extension via the China-Pakistan Economic Corridor) connects Central Asia through Xinjiang in China to Central Asia. This corridor links China to Kazakhstan via two key river crossings, Dostyk Alashankou,& Khorgos, and extends to the main ports of Pakistan.

Rail Network: The railway border crossings at Dostyk/Alashankou and Khorgos are in service and serve as primary transit gateways connecting Kazakhstan with China. The weight of the cargo is a significant barrier between the rail gauge system from Kazakhstan (1520mm) to China's railway system (1435mm), therefore transshipment of the cargo will be necessary at the two border crossings listed above. Xinjiang is served by an extensive rail network, including an extensive network of west and east-traveling trunk lines and north/south trunk connections incorporated into the centrally located rail network. Some of these lines are electrified. As a result, this provides a seamless supply corridor by rail transport from the Kazakhstan border to the border of Pakistan between China and Pakistan.

Kazakhstan presently has direct railway access to China via current railway links that cross borders. On top of what are currently the main railway routes between China and Kazakhstan, plans and feasibility studies are being conducted for alternate rail routes linking the two countries. In addition, the construction of a railway that will connect China, Kyrgyzstan, and Uzbekistan has started. These projects result in multiple rail connections between the two nations, rather than relying on one single means of transport.Railway in Pakistan is utilized, but railways are below capacity. The incremental sections of the CPEC upgrades in the northern part of Pakistan have demonstrated improvements concerning the state of the infrastructure. However, southern portions continue to demonstrate improvements regarding freight efficiency.

Road Network: Xinjiang provides regional-to-national connectivity via the roadway system through the same borders of Pakistan. The main roadway connecting both countries is called the Karakoram Highway. Various upgrades to the road system will be performed throughout this entire route.

The mountainous landscape of northern Pakistan has a strong influence on road transportation. Road transportation will be offered as a mode of transportation along with rail transportation.

Access to Ports (Pipelines): The Gwadar Port is being utilized and is functioning as a gateway in a maritime outlet of the CPEC. Refrigerated cargo is currently in the process of being developed to support movement of freight through the port. Karachi Port is still in service and accommodates the largest freight volumes of the two ports listed.

Corridor: The northern route (central Asia and China) provides functioning rail and roadway systems, while the southern route (Pakistan) provides some form of operational infrastructure, albeit at varying degrees.

Risk and Constraint Hierarchy

The southbound corridor of CPEC connects through three separate corridors that exhibit two things: distinctive risk exposure profiles and types of financing of the corridor and implementation conditions. The differences among these corridors have also been summarized as stated.

Table 1. Transit Vulnerability Assessment Framework

Dimension	**Western Caspian (Russia-Azerbaijan-Iran)**	**Trans-Afghan (Russia-Central Asia-Afghanistan-Pakistan)**	**CPEC Alignment (Northern Extension through Xinjiang)**
Infrastructure Continuity	Largely continuous rail system	Discontinuous within Afghanistan	Continuous in Central Asia-China; capacity limits in Pakistan
Construction Type	Mostly modernization and upgrades	Predominantly new construction	Operational north segment;partial upgrades south
Security Risk	Low-Moderate	High	Moderate
Political Stability Exposure	Sanctions-related exposure	Domestic political instability risk	Bilateral coordination dependent
Financial / Sanctions Risk	High (Iran sanctions)	Moderate (financing uncertainty)	Moderate
Estimated Investment Scale	Incremental upgrades	USD 4.8 billion (rail construction)	Multi-stage investments under CPEC framework
Major Investors / Stakeholders	Russia, Azerbaijan, Iran	Uzbekistan, Afghanistan, Pakistan; potential regional partners	China, Pakistan; Central Asian transit states
Implementation Status	Operational with bottlenecks	Feasibility and phased construction	Operational north; upgrading south
Port Integration	Bandar Abbas operational	Karachi / Gwadar (conditional on Afghan segment)	Gwadar operational; capacity expanding
Primary Constraint Type	Financial and sanctions-related	Security and construction continuity	Downstream transport capacity

(Compiled by the author)

Investment Structure Overview

• Western Caspian Alignment: Primarily based on state-led modernization of existing rail corridors. Investment concentrated on electrification, track doubling, and port integration.

• Trans-Afghan Alignment: Large-scale greenfield rail construction requiring external financing. High capital intensity relative to current operational capacity.

• CPEC Alignment (Northern Extension through Xinjiang): Mixed structure: operational cross-border rail infrastructure between Central Asia and China; staged infrastructure investment in Pakistan under CPEC-related programs.

Constraint Classification

The corridor constraints can be categorized into three principal types:

−Financial-Sanctions Constraints (Western Caspian)

−Security-Continuity Constraints (Trans-Afghan)

−Capacity-Integration Constraints (Eastern Alignment)

Trade Structure Compatibility: Export-Import Dynamics

To assess structural feasibility from a trade perspective, the export compositions of Kazakhstan and Uzbekistan were compared with Pakistan's

import structure. The comparison examines major commodity categories, including energy resources, metals, agricultural goods, and manufactured products, to identify areas of structural complementarity. Based on this export-import comparison, Table 2 summarizes the degree of trade compatibility across the three economies.

Table 2. Commodity Structure Compatibility

Crude oil / Oil products	Major export	Limited	Major import	High (KZ–PK)
Natural gas	Minor	Major	Major	High (UZ–PK)
Uranium	Major	Limited	Not major import	Low
Copper	Significant	Major	Industrial input demand	Moderate–High
Ferrous metals / Ferroalloys	Major	Moderate	Iron & steel imports	High (KZ–PK)
Gold	Limited	Major	Not structural import	Low
Cotton / Textiles	Limited	Major	Textile machinery import, not raw cotton focus	Moderate
Grain / Wheat	Major	Moderate	Periodic import during shortages	Conditional match
Machinery	Limited	Limited	Major import	Weak (CA supply gap)
Chemicals	Moderate	Moderate	Major import	Moderate

(Compiled by the author)

Discussion

Research has demonstrated that the CPEC Alignment (the Northern Extension through Xinjiang), while being a new mode of transport, will also gradually alter the manner by which all of Central Asia accesses the sea. Unlike other north-west routes that will be replaced by the development of an additional east route, this route is merging into the previously concentrated transit channels, creating a third modal option. As such, the CPEC Alignment is a bilateral project between China and Pakistan and is structurally broadening south to support the integration of Central Asia into the Arabian Sea maritime system. The result of the development of transport corridors is a reduction in concentration risk in transport systems and a growth of optionality in the Central Asian trade system.

As part of this broader alignment, the prospective completion of the China-Kyrgyzstan-Uzbekistan (CKU) railway would further reinforce southbound diversification by strengthening Central Asia's connectivity with China and Asia-Pacific economies, while simultaneously accelerating trade flows toward South Asia and the Middle East. In parallel, the Trans-Caspian International Transport Corridor provides a complementary westbound alternative toward Europe. Together, these routes illustrate that corridor expansion in Eurasia is not directional replacement, but multi-vector restructuring [21].

Conversely, while transport corridors are less dependent upon the distance

between points, they are more dependent upon how the constraints associated with the movement of goods are structured. For instance, the western corridor of the Caspian Sea has a more mature infrastructure base but is exposed to considerable financial and sanction-based risk. Though long anticipated as a viable strategic alternative option for strategic route usage, together with opposing development of the corridor, there continue to be many restrictions under way limiting completion of future planned routes. For example, one of the most serious restrictions relates to different levels of infrastructure development found in various countries around the world that participate in the corridor system. To further complicate the successful long-term development of the corridor, outside influences from sanctions against both Russia and Iran continue to restrict the ability to develop capital for road transportation projects; these restrictions make it particularly difficult to secure financing and increase risks associated with transaction/money transfer. An International North South Transportation Corridor Roundtable which discussed "Issues Relative to the Development of the International North South Transportation Corridor" on November 28, 2022 at The Russian Federation Council, described the INSTC as an instrument to improve both Russia's logistics-related and geopolitical independence; however, it was also stressed that the INSTC is a long-term, capital-intensive, international logistics system that will ultimately require implementing both time and coordination. In addition to the financial constraints affecting the future development of the INSTC, the conflicting political edges of the various countries making up the overall group of countries have also created further restrictions on the connecting corridor(s) for the internationally-roaming trucks of the various participating countries. For example, the recent conflict between Iran and Azerbaijan have redirected Iranian interest from using the Azerbaijan corridor to using the Armenian corridor and as a result demonstrates how political rivalries can change the physical layout/configuration of transportation corridors. In addition, the ongoing and unresolved strategic mistrust between Russia and Iran have created additional uncertainties concerning the proposed structure of the INSTC [17]. Overall, the combined influence of political and institutional factors on the successful development of the INSTC implies that both existing infrastructure capacity and level of inter-state relations among each of the countries associated with the INSTC have a significant effect on the necessary projects required to develop a satisfactory amount of usable infrastructure capacity located between participating countries toward completion of the INSTC.

Additionally, although the theoretical rationale for the Trans-Afghan corridor provides for the reduction of the physical distance to the sea, significant challenges exist for the provision of secure and reliable service for the high volume of freight that will need to be transported. These challenges are not merely operational but structural. The project faces substantial financial uncertainty, as the estimated multi-billion-dollar investment requires external funding in a high-risk political environment. Persistent security volatility, including militant activity

and institutional fragility, raises concerns regarding long-term service reliability. Furthermore, the absence of internationally recognized legal guarantees and the broader context of great-power competition may discourage sustained capital commitment. Taken together, these constraints suggest that, while the Trans-Afghan corridor reduces geographical distance, its implementation probability remains comparatively low in the short to medium term [22].

The CPEC Alignment (Northern Extension through Xinjiang) is less vulnerable to conflict and has superior upstream rail continuity, but has an overall structural limitation related to the amount of freight that can be moved from China to Pakistan by rail.

Each country's compatibility with the distinct structuring of the trade corridors between Kazakhstan, Uzbekistan, and Pakistan provides a useful illustration of how transportation corridors will meet the needs of the three countries. Kazakhstan has a dominant export model that is based upon transporting bulk commodities through a heavy rail and high-volume transport network, whereas Uzbekistan is more diversified in its exporting activities but relies on the stable operation of institutions and the efficient transport of goods across borders. Lastly, while Pakistan provides limited value as an end market for goods, it is of considerable value as a maritime gateway to international markets, and the ability to create a physical link to hinterland areas from the ports will ultimately define how effective Pakistan acts as a facilitator for the other two countries.

The most accurate method for interpreting corridor politics in Eurasia is through a structural-functional framework, rather than a strictly geopolitical one. The corridors in terms of transportation are both an economic infrastructure and a risk management system with regards to strategic risk, and therefore, for Central Asian landlocked nations, a transportation policy that creates non-confining corridor options does not eliminate their risk of vulnerability, but rather increases their diversion of risk (i.e., exposure) across multiple dimensions (i.e., security, sanctions, limited capacity, and administrative coordination).

In conclusion, while the CPEC Alignment (Northern Extension through Xinjiang) will not immediately re-shape current volumes of trade along the new route, it will help to create a more resilient transportation system by further pluralizing existing routes.

Conclusion

The current study assessed whether CPEC Alignment (Northern Extension through Xinjiang), when used as a means of diversifying maritime access and redesigning trade routes among Central Asia, is feasible.

Three separate southward-oriented corridors leading to the Indian Ocean were identified as exhibiting distinct economic, geopolitical and infrastructural characteristics. The Western Caspian Alignment has reached operational maturity but experiences significant obstacles due to current sanctions. The Trans-Afghan Alignment remains security-sensitive and structurally fragmented. The CPEC

Alignment (Northern Extension through Xinjiang) is the most evenly balanced of the three correlations and achieves both operational continuity for rail in the Central Asia-China segment and moderate geopolitical exposure coupled with increasing port integration within Pakistan.

From a trade-structural standpoint, compatibility of countries and commodities varies widely. The export structure of Kazakhstan's bulk orientation is a better fit for wheat with the rail corridors supporting large throughput capacity than for the more diversely exporting Uzbekistan which requires institutional stability and a variety of modes for transporting freight. Pakistan's function as a maritime outlet emphasises the necessity for increased port capacity and connectivity downstream for freight transportation.

The CPEC Alignment (Northern Extension through Xinjiang) will not serve to replace existing transit systems; rather, it plays a role in transitioning from linear dependency to multivectoral connectivity. Its importance is in providing greater strategic flexibility while diminishing concentrated transit vulnerability within contemporary geopolitical uncertainty.

Future investigations may use quantitative freight modelling and dynamic simulations of trade flows to better assess both long-term throughput capacity/ sequenio-based resilience across competing continents (Eurasia).

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ОРТАЛЫҚ АЗИЯДАҒЫ ТЕҢІЗГЕ ҚОЛ ЖЕТКІЗУДІ ӘРТАРАПТАНДЫРУДАҒЫ ҚЫТАЙ-ПӘКІСТАН ЭКОНОМИКАЛЫҚ ДӘЛІЗІНІҢ РӨЛІ

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Аңдатпа. Бұл зерттеудің мақсаты Қытай-Пәкістан экономикалық дәлізі (ҚПЭД) Орталық Азия елдерінің сауда мүмкіндіктерін кеңейтіп, Орталық Азия елдеріне Үнді мұхитына балама бағыттар бере алатынын зерттеу болып табылады. Зерттеу оңтүстік бағытта тасымалдаудың үш түрлі нұсқасын салыстырады, соның ішінде Иран арқылы Батыс Каспий бағыты, Трансауған дәлізі және Шыңжаң арқылы солтүстікке қарай созылып жатқан ҚПЭД бағыты. Зерттеудің мақсаты Қазақстан, Өзбекстан және Пәкістан арасындағы осы сауда дәліздерінің әрқайсысын олардың көліктік орындылығы, тәуекелдері мен стратегиялық құндылығы негізінде зерделеу болып табылады. Зерттеу әр дәліздің инфрақұрылым сапасы мен байланыстылығына, геосаяси тәуекелдерге ұшырауына, инвестициялық модельдерге және ақауларға осалдығына құрылымдық салыстырмалы талдауды қолданады; сонымен қатар, қысқа тізімге енгізілген елдердің экономикалық тиімділігі бағаланады. Батыс Каспий дәлізі жеткілікті дамыған болса да, ол санкциялармен байланысты елеулі тәуекелдерге бейім; Трансауған дәлізі тұтастық пен тұрақтылыққа қатысты көптеген мәселелермен үйлесуде; сайып келгенде, шамадан тыс жүктемелерге

қарамастан, ҚПЭД бағыты басқаларға қарағанда интеграцияланған мультимодальды байланыс үшін көбірек мүмкіндіктерге ие. Талдау көрсететіндей, ҚПЭД жай ғана төте тасымал дәлізі рөлінен әлдеқайда кең функцияларды атқаруда, геосаяси дүрбелеңдер салдарынан туындаған стратегиялық икемділікті арттыру және осалдықты азайту үшін нақты көптармақты байланыс платформасына айналуда. Еуразиядағы дәліздерді дамытуға қатысты зерттеу саласына қосқан үлесі - ҚПЭД өзін екіжақты инфрақұрылымдық жобадан байланыс жүйесіне баса назар аудара отырып, өзін неғұрлым стратегиялық байланысты көлік жүйесі ретінде көрсетеді. Бұл зерттеу сенімді теңіз қатынау жолдарын әртараптандыруға ұмтылатын Орталық Азия мемлекеттері үшін құнды нұсқаулық болып табылады.

Тірек сөздер: Орталық Азия, Қытай-Пәкістан экономикалық дәлізі, теңізге қол жеткізу нұсқалары, Еуразиялық дәліздер, транзиттік осалдық, көптармақты байланыс, сауда бағыттарының конфигурациясы, инфрақұрылым жағдайы

РОЛЬ КИТАЙСКО-ПАКИСТАНСКОГО ЭКОНОМИЧЕСКОГО КОРИДОРА В ДИВЕРСИФИКАЦИИ ДОСТУПА К МОРЮ В ЦЕНТРАЛЬНОЙ АЗИИ

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Аннотация. Целью данного исследования является изучение того, может ли Китайско-Пакистанский экономический коридор (CPEC) расширить торговые возможности стран Центральной Азии и предоставить странам Центральной Азии альтернативные маршруты к Индийскому океану. В исследовании сравниваются три различных варианта транспортировки в южном направлении, включая Западно-Каспийский маршрут через Иран, Трансафганский коридор и маршрут CPEC, расширяющийся на север через Синьцзян. Целью исследования является изучение каждого из этих торговых коридоров между Казахстаном, Узбекистаном и Пакистаном на основе их транспортной осуществимости, рисков и стратегической ценности. В исследовании используется структурированный сравнительный анализ качества инфраструктуры и связности каждого коридора, подверженности геополитическим рискам, инвестиционных моделей и уязвимости к сбоям в работе; кроме того, оценивается экономическая эффективность стран, включенных в короткий список. Несмотря на то, что Западно-Каспийский коридор достаточно развит, он также подвержен значительным рискам, связанным с санкциями; Трансафганский коридор сопряжен со значительными проблемами в отношении непрерывности и стабильности; и, наконец, несмотря на перегрузки, трасса CPEC имеет больше возможностей для

интегрированного мультимодального сообщения, чем другие. Анализ показывает, что CPEC продолжает выполнять гораздо более широкие функции, чем просто прямой линейный транзитный коридор, превращаясь в настоящую платформу многовекторной связи для повышения стратегической гибкости и снижения уязвимости из-за геополитических потрясений. Вклад в область исследований, касающихся развития коридоров в Евразии, заключается в том, что CPEC позиционирует себя как более стратегически связанную транспортную систему, в то же время смещая акцент с двустороннего инфраструктурного проекта на систему связи. Это исследование является ценным руководством для государств Центральной Азии, стремящихся к диверсификации надежных морских путей доступа.

Ключевые слова: Центральная Азия, Китайско-Пакистанский экономический коридор, варианты морского доступа, Евразийские коридоры, транзитная уязвимость, многовекторная связь, конфигурация торговых маршрутов, состояние инфраструктуры

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