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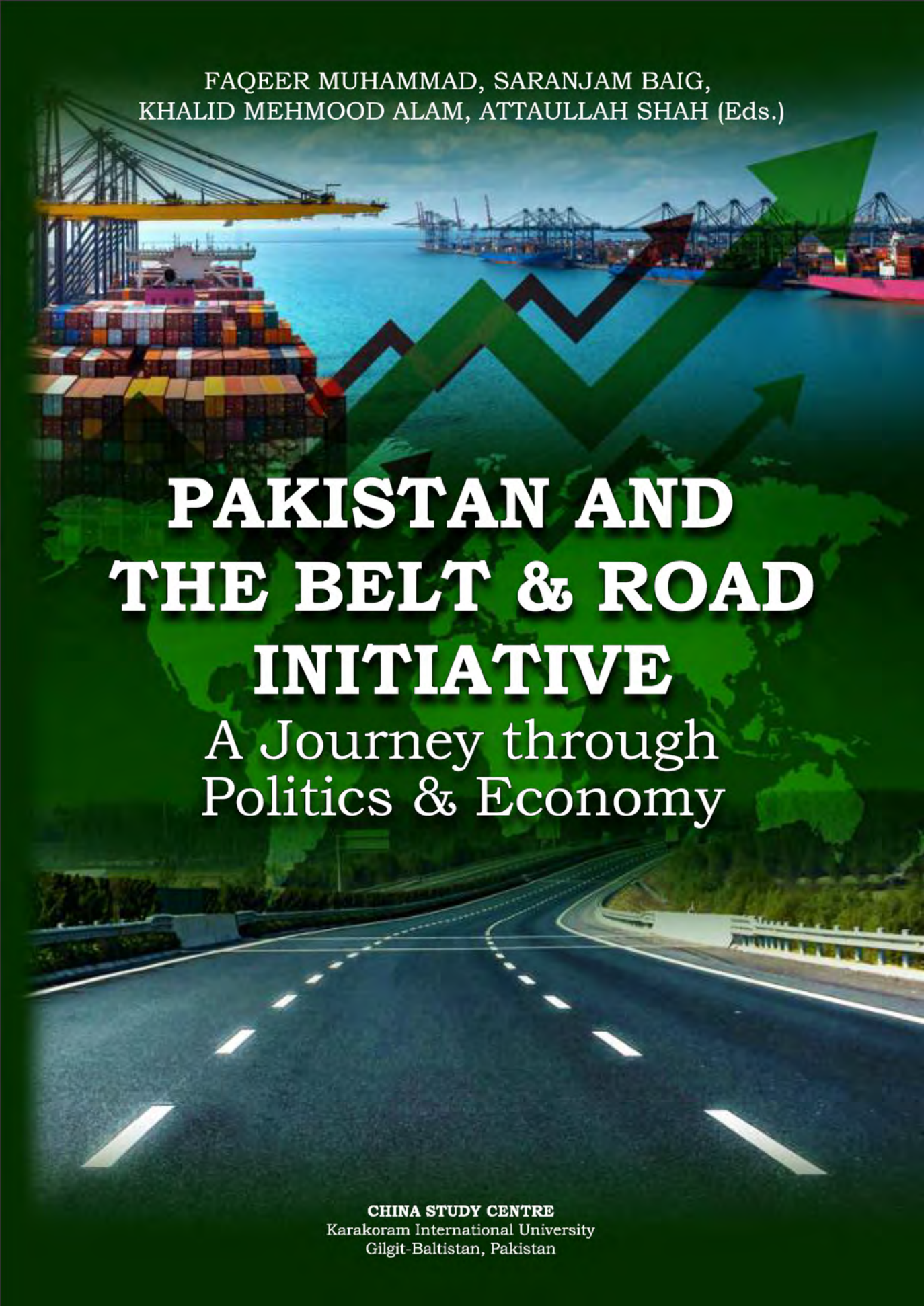

PAKISTAN AND THE BELT & ROAD INITIATIVE

A Journey through Politics & Economy

CHINA STUDY CENTRE
Karakoram International University
Gilgit-Baltistan, Pakistan

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A Journey through Politics & Economy

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Foreword

The Chinese President Xi Jinping launched the most important, most ambitions and a centerpiece of his foreign policy project under the title of the Belt and Road Initiative (BRI) in 2013. It has been described as the 'Project of the Century' with the potential of reshaping the economic landscape of many countries around the world. The main objective of the BRI has been to address infrastructure bottlenecks around the world and accelerate economic growth, development and prosperity for all. The BRI has emerged as a highly successful project and its success can be judged by the fact that more than 150 countries and some 40 International Institutions are now participating in this Initiative.

The development strategy of the BRI builds on connectivity and cooperation through the six corridors, including the China – Pakistan Economic Corridor (CPEC) – the only bilateral corridor between the two brotherly countries. The CPEC is considered Central to Pakistan – China relations and is part of the national security of the two countries. CPEC is considered as the lynchpin or flagship project of the BRI. With almost one decade of its launch in Pakistan, the CPEC has performed strongly and contributed positively to its socio-economic development. It has transformed Pakistan's economic landscape by removing infrastructure bottlenecks, transforming Pakistan from an energy deficit to energy surplus country by adding 8000 MW of generational capacity, built 800km of highways and created 286,000 jobs.

Pakistan and China are entering into the second phase of the CPEC. The book entitled "Pakistan and the Belt and Road Initiative: A Journey through Politics & Economics" is a timely publication. I congratulate the editors and the chapter contributors for undertaking painstaking and rigorous work covering different aspects of the CPEC and BRI. This will also be considered as an excellent addition to the body of literature on this topic.

The book is divided into three parts, that is, regional, national and local, and hence allows readers to gain a holistic understanding of the contribution of the CPEC. The regional chapters explore the geopolitical implications and the potential for regional cooperation, while the national chapters delve into the economic, social, and environmental aspects of CPEC's development. The local perspectives from Gilgit-Baltistan provide valuable insights into the real-life experiences of communities directly affected by the Corridor. As we look ahead to the second decade of CPEC, this book serves as a timely and essential resource for policymakers, researchers, and the public at large.

It offers a nuanced understanding of the challenges and opportunities that lie ahead, emphasizing the need for effective management, stakeholder collaboration, and a focus on sustainable development. I commend the editors and contributors for their rigorous research and insightful analysis. This book is a testament to the importance of academic discourse in shaping the future of CPEC and the BRI. I am confident that it will contribute significantly to the ongoing dialogue on regional connectivity and economic cooperation.

Dr. Ashfaque Hasan Khan
Director General
National Institute of Policy Studies (NIPS)
National University of Sciences and Technology (NUST),
Islamabad

Preface

In the last 10 years, much has been written about the Belt and Road Initiative (BRI) and its flagship project the China-Pakistan Economic Corridor (CPEC). The scale of the Initiative and the controversies associated have garnered ongoing scrutiny among academics and researchers. This is the third book of the series initiated by the China Study Centre at the Karakoram International University, Gilgit Pakistan. The previous two books explored the political and economic implications of the CPEC. This book goes beyond the CPEC by including the regional perspectives on BRI and CPEC.

The China-Pakistan Economic Corridor (CPE) has entered its second phase, building upon the foundations laid during its first phase primarily focused on infrastructure development, energy projects, and transportation networks. The second phase aims to expand and diversify the scope of the corridor, emphasizing industrial cooperation, socio-economic development, agriculture modernization, and the integration of technology. CPEC's second phase represents a comprehensive effort to enhance Pakistan's economic landscape, leveraging Chinese investment. The success of this phase will largely depend on effective management, addressing security and environmental concerns, and ensuring that the benefits are equitably distributed across different regions and communities. However, there have been concerns about the continuation of the CPEC 2.O.

With a multidisciplinary focus, we invited 20 senior and budding academics and researchers to critically scrutinize BRI and CPEC. However, we were constrained to include 13 chapters only. The book has been divided into three parts. The first part of the book includes essays and perspectives on regional political economy. National perspectives have been included in part two. Since the Centre is based in Gilgit-Baltistan, we decided to include essays and perspectives on the local economy in the last part.

Introducing CPEC 2.0., the first chapter sheds light on the positives and negatives of the first phase of CPEC while also addressing its challenges in its second decade. It suggests that despite that the Chinese academia and diplomats have reservations about implementing mega projects under CPEC, they remain committed to working with the Government and people of Pakistan to overcome any obstacles. The success of CPEC in its second decade (2024-2033) is contingent on Pakistan's economic and political stability.

In the second chapter, the authors emphasize the importance of BRI for the development of the western region in China. They suggest the Silk Road Economic Belt presents unprecedented prospects for Xinjiang, necessitating a comprehensive understanding of its strategic significance as it addresses

challenges such as economic underdevelopment, resource integration, and the shortage of skilled professionals in Xinjiang, proposing a roadmap for developing Xinjiang as a core area of the Silk Road Economic Belt to capitalize on the new opportunities for high-quality growth presented by the Belt and Road Initiative.

China has introduced a dual circulation policy that aims at reforming the domestic market in tandem with external market cooperation, particularly with neighboring economies. The third chapter explores the rationale behind the dual circulation policy and its role in bolstering China's status as an independent, developed, and consumer-driven market both domestically and globally. The chapter examines the DC policy as an integrated framework for China's development within the Belt and Road Initiative (BRI) and China-Pakistan Economic Corridor (CPEC).

Since the China-Pakistan Economic Corridor (CPEC) promises all-encompassing social and economic benefits not only to China and Pakistan but also to communities in Afghanistan, the next chapter examines CPEC's dual role as a 'catalyst for regional economic prosperity and as a springboard for geopolitical shifts from traditional geopolitics to geo-economics'. However, it warns about the complex security landscape of CPEC's expansion into Afghanistan. Further, this chapter sheds light on the nexus between various terrorist groups that threaten regional stability. The chapter suggests the need for a robust, collaborative security strategy to harness CPEC's full potential and mitigate the persistent threats.

Chapter five discusses the "China development model" which refers to a combination of state-led development, export-oriented growth, and infrastructure development. The authors delve into the reasons behind China's involvement in promoting peace in Afghanistan and Pakistan and highlight China's contribution to the political and economic stability of its Western neighbor countries through initiatives such as the Belt and Road Initiative (BRI) and China-Pakistan Economic Corridor (CPEC).

The incredible success and profound progress made by China in various sectors, especially in trade & commerce, technology, and the industrial field, has enormous opportunities to learn. The next chapter examines opinions and perceptions from the masses and the experts on economic development and prosperity. It aims to provide an understanding of the nuances of development in China.

Examining CPEC without considering the projects and investments in power generation will remain incomplete as the energy projects carry the major share among the CPEC projects. It has been noted that access to energy services in

many countries worldwide falls short of the necessary goals for human development. Affordable and clean energy access is not only a global objective, but it is also at the core of the sustainable development agenda for 2030. SDG-7 emphasizes the essential role that energy plays in supporting all other goals across sectors. CPEC projects are intertwined with the SDGs for accessible and clean energy. Chapter seven focuses on four sectors - socioeconomic, business, industry, and agriculture - to evaluate affordability, while coal, hydel, solar, and wind is the focus of the analysis of clean energy. It argues that the CPEC energy is a catalyst for socioeconomic development, as energy affordability and economic progress are interdependent, and will provide opportunities for foreign investment inflow and will benefit the common man.

Yet another issue worth investigating is related to agriculture in Pakistan. Chapter eight examines the relationship between the growth of Pakistan's agriculture industry, food security, and the progress of the China-Pakistan Economic Corridor (CPEC) and Sustainable Development Goals (SDGs). This chapter has analyzed the interconnected progress that contributes to achieving SDGs, ensuring a more food-secure, economically stable, and sustainable future for Pakistan It also assesses the effects of these advancements on the environment and society through stakeholder analysis to identify national and international players that can work together to maximize the benefits of CPEC on agriculture as strategic utilization of CPEC can assist Pakistan in achieving SDG targets and goals related to food security.

Given that climate change has the potential to reshape our world in the next 75 years, it is crucial to examine the interconnections between climate change and freshwater reservoirs. In chapter nine, the authors examine the Indus Basin Irrigation System (IBIS) and suggest that the freshwater resources are crucial for food security, domestic and industrial use, and power generation along China- reservoirs Pakistan Economic Corridor (CPEC). However, they are susceptible to the impacts of climatic variability, socio-economic factors, and transboundary issues. As the existing storage capacity is insufficient to accommodate the projected increase in discharge water (inflow), there is a necessity for the construction of 2 to 3 large reservoirs or proposed dams upstream or downstream within the Indus River system, the chapter argues.

Likewise, the next chapter focuses on how mega projects may lead to environmental damages like cutting down of forests, loss of natural habitat of wildlife, effluent, and GHG emissions. The unlimited exposure to toxic effluent and GHG emissions in the environment is due to the huge industries and energy sector of CPEC. The chapter argues that if the issues are not

addressed on time, the region might observe worse consequences of environmental degradation.

The last part of the book includes three chapters on the local economy of Gilgit-Baltistan. The first chapter in this part investigates the socio-economic implications of the China-Pakistan Economic Corridor. It focuses on investigating the residents' support for the development of the China-Pakistan Economic Corridor (CPEC) and the perceived impacts and personal benefits of the CPEC project in Gilgit-Baltistan. The study breaks down subjective well-being into five distinct domains: Health, Material, Community, Emotional, and Educational Well-being. It reports a significant positive relationship between the perceived subjective well-being of residents and support for the CPEC project. The results validate Material Well-being, Community Well-being, Educational Well-being, Health Well-being, and Emotional Well-being, demonstrating that each dimension significantly influences support for the CPEC project.

While highlighting the importance of the second phase of CPEC, the second last chapter of the book emphasizes the need for industrialization in Gilgit-Baltistan to address poverty, unemployment, and regional inequalities. Likewise, it has been argued that the issues with Special Economic Zones (SEZs), such as the one in Maqpoondass, need resolution. Among many important issues, the chapter suggests resolving security, political, and geopolitical challenges and inter-provincial disagreements are essential for the success of CPEC.

Finally, the last chapter of the book examines an important and emergent issue, i.e., Gilgit-Baltistan's susceptibility to Fifth Generation Warfare (5GW), particularly in the context of the China-Pakistan Economic Corridor (CPEC). It has been argued by the author that the novel technologies have altered how wars were waged in the past; now, states confront each other by using soft power and disseminating disinformation to achieve their desired goals. He suggests that major fault lines ignite 5GW in G-B, including disputed constitutional status, sectarian conflicts, ethnic divisions, separatist tendencies, and geostrategic significance. The chapter proposes a comprehensive strategy to inculcate media literacy campaigns to mitigate the adverse repercussions of 5GW. It also provides original insights into the importance of understanding local perceptions and national narratives in the region and calls for regional stability and cooperation to counter external exploitation. The study concludes that Gilgit-Baltistan's instability has significant implications for regional and global stability and emphasizes the urgent need for proactive measures to address these challenges.

The discussions in these thirteen chapters delve into various aspects of the Belt and Road Initiative (BRI) and the China-Pakistan Economic Corridor (CPEC), underscoring the intricate interplay between foreign policies and the significance of economic interdependence among regional countries. The contributors adeptly navigate Pakistan's decade-long journey through its political and economic landscape since the inception of the BRI, providing insightful analysis and perspectives.

This book promises to be a valuable resource for a diverse audience, including readers, researchers, academics, policymakers, and practitioners. Its comprehensive coverage and in-depth exploration of the BRI and CPEC offer a nuanced understanding of their impact on regional dynamics and Pakistan's development trajectory.

1

Second Decade of China-Pakistan Economic Corridor (CPEC-2.0): Introduction, Apprehensions, and Concerns

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Abstract

This chapter results from extensive discussions with intellectuals from various diplomatic and research institutions in Pakistan and China. These deliberations occurred during my visit with a delegation of diplomatic and academic experts from Pakistan, led by Ambassador Sohail Mahmood, Former Foreign Secretary of Pakistan and Director General of the Institute of Strategic Studies Islamabad (ISSI), in August 2023. The delegation included representatives from universities, diplomats, and media personnel. The chapter primarily focuses on the positive achievements of CPEC in its first decade while also addressing its challenges in its second decade. It was noted that the Chinese academia and diplomats have reservations about implementing mega projects under CPEC but remain committed to working with the Government and people of Pakistan to overcome any obstacles. Overall, the success of CPEC in its second decade (2024-2033) is contingent on Pakistan's economic and political stability.

The Unfortunate Incident of Besham (Dassu) Pakistan and the Immediate Response of the Chinese Ministry of Foreign Affairs

During my travels to China in March 2024 for a series of meetings, I was informed of a distressing incident involving a gruesome suicide attack on a Chinese convoy of staff working at the Diamer Bhasha and Dassu dams at Besham. This unfortunate event resulted in the death of five innocent Chinese individuals. Both nations have strongly condemned this incident and expressed their determination to work together toward the peace and prosperity of the region. The statement the Chinese Foreign Ministry Spokesperson issued is provided below.

"*China strongly condemns this terrorist attack. We express deep condolences over the lives lost and extend sincere sympathies to the bereaved families. China asks Pakistan to thoroughly investigate the incident as soon as possible, hunt down the perpetrators, and bring them to justice. Meanwhile, we ask*

Pakistan to take effective measures to protect the safety and security of Chinese nationals, institutions, and projects in Pakistan. China is working with Pakistan on the follow-up work with an all-out effort. The Chinese Embassy in Pakistan has reminded Chinese citizens and businesses in Pakistan to closely follow the local security situation, take extra safety precautions, strengthen security measures, and do their best to guard against terrorist attacks.

That afternoon, Pakistani Prime Minister Shahbaz Sharif visited the Chinese Embassy in Pakistan to convey condolences and sympathies to the bereaved families and the Chinese government. He strongly condemned the terrorist attack and said that terrorists' attempt to harm Pakistan-China friendship will never succeed. On the same day, Pakistani President Asif Ali Zardari, the Foreign Minister, the Interior Minister, and several other political figures strongly condemned the attack and expressed condolences over the lives lost.

China and Pakistan are all-weather strategic cooperative partners and iron-clad brothers, and the China-Pakistan Economic Corridor (CPEC) greatly contributes to Pakistan's socioeconomic development. No attempt to undermine China-Pakistan cooperation will succeed. China opposes all forms of terrorism and firmly supports Pakistan in fighting terrorism. China will work with Pakistan with an even stronger commitment to do everything possible to protect the safety and security of Chinese personnel, projects, and institutions in Pakistan.

Significant Achievements of the CPEC in the First Decade (2013-23)

As the China-Pakistan Economic Corridor (CPEC) advances, it is worth noting that the dividends of the mega projects are becoming more apparent despite the increasing resistance from that hostile towards the country. Before discussing the deliberations of the think tanks of the two countries, it is essential to highlight the significant achievements of CPEC in the past decade (Javed & Ismail, 2021). These achievements can be viewed from four perspectives: the Energy sector, Infrastructure and Development projects, the reinforcement of the Gwadar Port, and the establishment of Special Economic Zones (SEZs) for industrial collaboration between the two nations. We will elaborate on each perspective.

Energy projects

Energy is the lifeline for the CPEC projects and development of Pakistan. In the first decade, fourteen energy projects have been completed, adding 10,000 MW to the national energy grid (Ul-Haq et al., 2021). The details of these projects are given in Table 1.

Table 1 Energy projects completed under CPEC in phase 1 (2013-2023)

S.NO	Project Title	Completion Cost (Million US$)	Jobs Created	Financing	Supervising Agency
1	1320MW Sahiwal Coal-fired Power Plant	1912.2	1683	IPP	PPIB
2	1320MW Coal-fired Power Plant at Port Qasim Karachi	1912.2	1270	IPP	PPIB
3	320MW China Hub Coal Power Project, Hub Baluchistan	1912.2	1722	IPP	PPIB
4	660MW Engro Thar Coal Power Project Sind	995.4 (July 2029)	2500	IPP	PPIB
5	1000MW Quaid-e-Azam Solar Park (Bahawalpur) 400/600	520/780 (Aug 2016) 600 MW in prog.	231	IPP	PPDB/AEDB
6	50 MW Hydro China Dawood Wind Farm, Gharo, Thatta	112.65	28	IPP	AEDB
7	100MW UEP Wind Farm, Jhimpir, Thatta Sindh	250	54	IPP	AEDB
8	100MW Three Gorges Second and Third Wind Power Project	150	180	IPP	AEDB
9	Matiari to Lahore ±660 KV HVDC Transmission Line Project	1658.34	2212*	ITC	NTDC
10	720MW Karot Hydropower Project, AJK/Punjab	1720	4870*	IPP	PPIB
11	50MW Sachal Wind Farm ,Jhimpir, Thatta	134	25	IPP	PPIB
12	330MW HUBCO Thar Coal PowerProject (Thar Energy)	497.7	805*	IPP	PPIB
13	1320MW SSRL Thar Coal Block-I 7.8 mtpa & Power Plant - 2×660MW	1912.12	2000*	IPP	PPIB
14	330MW HUBCO ThalNova Thar Coal Power Project				

Source: CPEC Updates 2024

Infrastructure projects

Infrastructure development is a vital aspect of the China-Pakistan Economic Corridor (CPEC), which aims to facilitate the transport of goods and services (Alam et al., 2023). Six major projects have been completed in the first phase of CPEC, and five more are currently under construction. You can find more information about these projects in Table 2.

Table 2. Details of Infrastructure projects completed/ongoing under CPEC in Phase 1

S.NO	Project Title	Completion Cost (Million US$)	Jobs Created	Financing	Supervising Agency
1	120km-KKH Phase II (Havelian – Thakot)	1315	5500	GCL	MoComm.
2	292 km-Peshawar-Karachi Motorway (Multan-Sukkur Section)	2889	28000	GCL	MoComm.
3	27 km-Orange Line Metro Train - Lahore	1626		GCL	MoComm
4	820 km-Cross Border Optical Fiber Cable (Khunjrab – Rawalpindi)	44	1100		
5	Pilot Project of Digital Terrestrial Multimedia Broadcast (DTMB)	4			
6	297km-Hakla DI Khan Highway	122.181	6700		MoComm/NHA
	In Progress Projects				
1	305 km Zhob - Quetta (Kuchlak) (N-50)	66.833			

2	106km-Khuzdar-Basima Road (N-30)	PKR 19.19 billion			
3	146 km-Hoshab - Awaran Road Section (M-8)	PKR 26 billion			
4	153 km-KKH Alternate Route Shandur - Chitral Road	PKR 16 billion			
5	103 km-Nokundi-Mashkhel Road	PKR 7 billion			

Gwadar Port projects

One of the major components of the CPEC is the improvement of the Gwadar port to international standards (Asif, 2018). The port has been leased out to China and various mega projects have been completed in the first phase as shown in Table 3.

Table 3. Details of projects completed at Gwadar port under CPEC phase-1 (2013-23)

S.NO	Project Title	Completion Cost (Million US$)	Jobs Created	Financing	Supervising Agency
1	Development of Port and Free Zone	300	240	GoPak	MoMaritime
2	Gwadar Smart Port City Master Plan	4	90		
3	Pak-China Technical and Vocational Institute at Gwadar	10	249	Chinese Govt. Grant	GPA/MoMaritime
4	Pak-China Technical and Vocational Institute At Gwadar	10	250	Chinese Govt. Grant	GPA/MoMaritime

5	Gwadar Eastbay Expressway	179	2000*	GoP loan	MoMaritime
6	Pak China Friendship Hospital	100	40	Chinese Govt. Grant	P&D Deptt
7	1.2 million Gallon per Day desalination plant	12.7		Chinese Govt. Grant	
	Under Construction Projects				
1	Gwadar International Airport	230	3000	Chinese Govt. Grant	CAA
2	Necessary facilities of freshwater treatment, water supply and distribution	PKR 11.39 billion	1600	PSDP	GDA/P&D
3	300MW Coal-Fired Power Project at Gwadar	542.32	1000	China Comm Con Co, (CCCC)	PPIB
4	5MGD Water desalination Plan	PKR 5 billion		PSDP/ADP	GoB/GDA

Special Economic Zones (SEZs) and Industrial Cooperation

Out of the thirteen Special Economic Zones (SEZs) in Pakistan, four are currently in the process of development. These include Rashakai SEZ in Khyber Pakhtunkhwa, Allama Iqbal Industrial City in Punjab, Dhabeji Economic Zone in Sindh, and Bostan Special Economic Zone in Baluchistan. Additionally, nine more SEZs are in the pipeline, including the ICT Model Industrial Zone, an Industrial Park on Pakistan Steel Mills land, the Mirpur Industrial Zone, Mohmand Marble City, and Maqpondass SEZ in Gilgit (Batool, Baig, Khalid, & Alam, 2024).

Deliberations of the Think Tanks in China and Pakistan on the CPEC

Part 1: China-Pakistan Relations in International Dynamics: Pakistan Study Centre Institute of South Asian Studies Fudan University Shanghai

a. *Lecture by Prof. Lin Ming Wang*[1]*, Assistant Dean and Director of Institute of International Studies Fudan University.*

China and US competition for expanding their influence and trade worldwide is enhancing. China's dream for the world and South Asia through the expansion of its relations and trade is one of the essential components of President Xi's policy. The Belt and Road Initiative (BRI) is the precursor for China's dream of becoming a global trade leader and creating global goods, which can lead to a prosperous and peaceful world. For creating a prosperous, peaceful, and culturally intact world, his approach is manifested in his three major initiatives, i.e., the Global Development Initiative (GDI), the Global Security Initiative (GSI), and the Global Civilization Initiative (GCI). The Global Development Initiative calls for involving diverse nations and communities worldwide in his dream for global prosperity. Unfortunately, the world's development agenda is mainly concentrated in the already developed nations, and the various economic and financial institutions have no equity in the development approach. Global Security Initiatives make the security and integrity of all countries, smaller or larger, the most important for a peaceful world. Today, with the advanced countries' acquisition of weapons and other deterrence, the security of the smaller countries has become vulnerable. The Global Civilization and Culture Initiative has focused on respecting and conserving the nation's diverse cultures locally, regionally, and globally. These initiatives are focused on global peace and prosperity as a common global interest. China's emerging solutions are aimed at global goods. Under the evolving global dynamics, the relationship between Pakistan and China must become stronger with clear priorities and objectives. Pakistan and China must play an influential role in regional stability, peace, and prosperity. It was emphasized that this would require effective strategies for harnessing the mutual benefits.

b. *Prof. Zhang Jiadong*[2]*: Pakistan's Development Model and CPEC.*

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[1] Lin Minwang is professor and assistant dean at the Institute of International Studies at Fudan University China. His main research areas include international relations in South Asia, with a focus on China-India relations, and China's foreign policy. He is the author of two books, Choosing War, and The BRI and Geopolitics in South Asia

[2] PhD and Professor of international relations, Dean of BRI Institute of Strategy and International Security, Director of Centre for South Asia Studies, senior researcher in Centre for American Studies, Fudan University, in Shanghai, China. He is a former diplomat in China's Embassy in India(2013-2015)

Pakistan enjoys a large youth population, rich human and natural resources, good relations with global powers, attraction for Chinese investment, and a strong South Asian economy until 2006. It remained ahead of India regarding Per Capita income, GDP growth rate, poverty alleviation, etc. However, the situation reversed since then due to the non-continuity of the political governments and policies. While commenting on the positive aspects of CPEC, he underscored the investment in infrastructure but showed his concerns over the underutilization of resources, instability of governments, and financial crisis. Increasing debt service liabilities, decrease in multilateral foreign investment, etc., including Foreign Direct Investment (FDI), are some of the major concerns. He recommended stable political governments dominated by experts and technocrats, their continuity, and stronger collaboration with all parts of the world. The comments from both senior analysts revealed that China is highly optimistic about its approach towards a peaceful and prosperous future for the world and region. Pakistan, an important regional partner of China, must restore political, economic, and social stability.

c. *Ambassador Babar Mir*[3]*: Pakistan's Approach to regional integration as a partner of China:*

Pakistan strongly supports the vision of President Xi and his three development initiatives. In a situation where the United States leads the Western Countries, this overwhelming support from Pakistan has been highly instrumental for China. The United States, under different Quadrilateral (Quads) agreements with the support of Western allies in the Indo-Pacific region, is trying to contain the expansion of China's trade and commerce. Under these challenges, Pakistan's role is very important. However, due to its geostrategic position, Pakistan must continue its warm relations with the US. Pakistan can also bring the world powers China and the United States together to tackle global challenges.

d. *Prof. Guo Xeutang*[4] *-"India's New Challenges to China-Pakistan relations and regional stability:*

The Indian approach to neighborhood diplomacy is always based on hegemony and coercion. Externally, India has transboundary disputes with all neighbors on various issues. Instead of resolving these issues, India is adamant about the use of force and coercion. This approach poses serious challenges to regional stability as well. Internally, India has been dealing with its minorities

[3] Former ambassador of Pakistan in Afghanistan and China

[4] Deputy Director, Shanghai University of Political Science and Law and deputy director of the Centre for Strategic and International Studies at Shanghai University of Political Science and Law.

with a highly discriminative approach. Their approach towards India's Illegally Occupied Kashmir (IIOK) has been the worst violation of the UN resolutions, which guaranteed the right of self-determination to the people of IIOK. Indians changed the disputed status of Kashmir and allowed people, mostly Hindus, to migrate from other parts of India to settle and buy property. These changes will jeopardize the demography of the IIOK, and gradually, the Muslim majority will become the minority in the region. For containing Indian atrocities and hegemonic desires of expansion, the role of Pakistan is vital. This necessitates economic and political stability and peace in Pakistan. With the rising tensions between China and India over border disputes, the role of Pakistan in this triangle is always balanced with a tilt towards China. Hence, peace and stability in Pakistan are inevitable for prosperous South Asia and the region.

e. Ambassador Sohail Mehmood; Challenges and opportunities for CPEC-2.0

The world has been facing significant challenges due to the pandemic, climate impacts, extreme poverty, and political disengagement. The war between Russia and Ukraine and, more recently, the Gaza war have further threatened the stability of the world. The weaponization of the countries has created an arms race once again. The unregulated use of artificial intelligence (AI) and other technologies, as well as their use in war and development in the Indo-Pacific region, has made the region a flashpoint for global conflicts.

Some of the hopes and lights beyond the tunnel include the recovery of humanity from the worst pandemic and the allocation of sizable budgets for the Climate Fund, 15th March was declared as Islamophobia Day by the UN. For the success of BRI projects, China will need to develop positive engagement with all important global stakeholders, including the US and India. The Sino-U.S. relations must be restored on common global issues such as climate, Afghanistan, and SDGs with narrow differences. The two countries' friendship remained time-tested, strategic, and linked to mutual interests. Pakistan has strongly supported *The One China* policy on the question of Taiwan. Pakistan deeply appreciates President Xi's people-centered policies and dream for a better world and South Asia, as manifested in his three development initiatives. These initiatives are very positive precursors for the success of CPEC in its new decade as a source of further strengthening bilateral relations, advancing the region's economic growth through the commercial use of Gwadar port, and initiating new energy and infrastructure projects. Despite all regional challenges, its extension to improve regional connectivity and peace is required. The open and inclusive nature of CPEC for third parties will improve its acceptability in the region.

Both countries would need to strengthen their collaboration and exchange of secret information to counter terrorism in the region. On the concerns over the nefarious designs of India as a regional power, he dispelled the impression, as comparatively, the Chinese development model and growth philosophy is inherently indigenous. In contrast, the Indian design of acquiring regional hegemony is prompted by external forces led by the US, which cannot be achieved in the short and long run. Internally, society has been divided into a robust Caste System, strong bureaucracy, and widespread corruption. Religious extremism in the form of Hindutva is another significant challenge for India's national integrity. In this background, Pakistan needs to strengthen its national and global outlook through better political and economic governance and strategic partnership with all the global powers, keeping China at the top.

Part2: Third China Pakistan Think Tank Forum: Decade of CPEC-Review and Outlook"- at China Institute of Contemporary International Relations (CICIR) Beijing

In the second part of the forum, a detailed discussion was held about the decadal review and outlook for the next decade, which Ambassador Sohail Mahmood led[5]. After one decade, the early harvest projects have given dividends to the people in the form of physical infrastructure, energy, SEZs, and job creation to more than 200,000 directly and indirectly (Shahzad, 2022). For the next decade, it will be imperative to take the following actions:

i. Expedite the development of SEZs,
ii. Resolution of the issues of IPPs,
iii. Finalize the location of industries,
iv. Curb negative propaganda through effective coordination and people connectivity,
v. Starting the railway projects ML-1,
vi. Improve the capacity of the people,
vii. Extension of CPEC for regional integration and creating global goods through three initiatives of President Xi, GDI, GSI, and GCI.

[5] Ambassador Sohail Mahmood is serving as the Director General of the Institute of Strategic Studies, Islamabad (ISSI). Ambassador Sohail Mahmood has been a career Foreign Service officer with diplomatic experience spanning 37 years that included various assignments at the Ministry of Foreign Affairs as well as Pakistan's Missions Abroad in both bilateral and multilateral arenas.

Prof. Wang Honggnag[6]*, Director CICR Beijing: Pakistan Socio-Political and Economic Programs and CPEC:*

He deliberated on the CPEC under the following challenges of Pakistan.

i. *Pakistan's Political Challenges*, reflected in the international political struggle for power, political power-sharing controversy, and military intervention, directly impact the CPEC.
ii. *Pakistan's economic crisis*, caused by structural imbalance, trade deficit, and balance-of-payment issues, has pushed the country into a vicious circle of low income, growing inflation, and poverty, which has also led to social unrest.
iii. *Liquidity issues, such as depleting foreign exchange reserves, have made international trade and payment of external liabilities extremely difficult for the country.*
iv. At the same time, the region has become a focus for power games to contain the expansion of China. Cross-border security risks are increasing, and Chinese nationals are significant targets, unfortunately.

On the positive side, he expressed satisfaction that the China-Pakistan friendship is continuing and strengthening despite all these challenges. However, internal political and economic instability challenges this friendship. He stressed the need for advocacy and high trust in CPEC. Pakistan needs to develop short-term and long-term priorities to resolve its internal conflicts.

Dr. Wang Shida[7] covered three significant aspects in his speech.

1. *Leverage of China on Pakistan*:
   He proposed rationalizing the restrictions on production policies, reducing the import tariffs, and giving export subsidies to encourage investors to move to Pakistan.
2. *Security-related Challenges:*
   He also emphasized over-integrated efforts to improve the security of the Chinese, which requires the sharing of intelligence information periodically, and a wide range of contact channels may be used to this effect.
3. *Geopolitical Challenges*

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[6] Dr. Wang Honggang, Research Professor, is Vice President of China Institutes of Contemporary International Relations (CICIR) and concurrently Director of the CICIR Institute of American Studies. Previously, he served as the Deputy Director of American Studies (2009-2014) and Director of World Politics Studies (2015-2018)

[7] Dr. Wang Shida, Research Professor, is Deputy Director of the Institute for South Asian Studies at the China Institutes of Contemporary International Relations (CICIR) Beijing China.

He explained the obstacles created by India for CPEC through malicious propaganda, which can be mitigated by extending relations with other countries by Pakistan and China to dispel India's negativity. He also stressed the role of Pakistan in bringing the two important countries of the region, Iran and Saudi Arabia, together by playing the role of linking pin.

In his concluding remarks, Ambassador Sohail Mahmood appreciated the better understanding between the two partners on regional and global issues. He shared that besides the Chinese, Pakistanis are also targeted in terrorist acts to jeopardize the CPEC and its advancement. Joint measures are required to curb these nefarious designs. He hoped that after the elections in Pakistan, the new government would prioritize the economic agenda for the country's prosperity. Structural reforms are inevitable to strengthen the country's economy, requiring strong political and social will. Pakistan has been supporting Afghanistan for many decades, and this support will continue to create regional peace and stability. He emphasized that Pakistan has repositioned itself with more tilt toward China in the new emerging geo-economics scenarios in the region. To mitigate the threats from QUADs, he recommended the following measures:

i. Supportive statements for CPEC from the leaders from both sides, showing their firm resolve to continue with all the challenges, must be issued.
ii. China's and Pakistan's trade relations need to be balanced, as they are more tilted toward China at present. This would require China to import some products from Pakistan.
iii. China will need to invest backward and integrate with Pakistani producers to improve the quality of raw materials and products exported from Pakistan to China. This will also progressively require the Transfer of Technology.

The extension of CPEC to Afghanistan is a good decision, but the modalities must be further deliberated. Its further extension to Iran and Central Asia will improve regional integration, peace, and economic conditions.

The embassies of China and Pakistan must arrange seminars and workshops about CPEC in other countries to improve its image for global and regional prosperity and peace. The Think Tanks of both countries must work for a shared vision in the next 25 years at the Centennial celebrations in 2047/2048.

Conclusion

This chapter discusses two main parts of the question of the way forward for CPEC in its second decade (CEPC-2.0), i.e., the Sino-Pakistan relations in the global dynamics and outlook of the CPEC. Based on the deliberations of foreign policy experts and diplomats, the following significant conclusions are drawn:

1. China dreams of global peace, stability, and prosperity for common public goods, as reflected in the Belt and Road Initiatives (BRI). This, further superimposed by GDI, GSI, and GCI by President Xi, is faced with overwhelming resistance from the US. The various quadrilateral agreements formed in the Asia Pacific region by the US attempt to constrain China in the region. China, on the other hand, is pursuing a peaceful, non-conflicting approach.
2. China and Pakistan have had a strategic relationship for over seven decades. Pakistan needs to harness its natural and human resources through political and economic stability to play an influential role in the successful implementation of CPEC-2.0. China will always support a prosperous, stable, and peaceful Pakistan, which is inevitable for the region.
3. India plays a significant role in restraining China from continuing with the BRI for regional prosperity. Their hegemonic neighbourhood approach is creating challenges of instability in the region. In such situations, the latter can be a balancing force in this triangle because of India's conflicting approach towards China and Pakistan.
4. The world has faced unprecedented challenges like pandemics, wars, extreme poverty, climate impacts, and regional and global instability. China's approach to global prosperity and common goods is highly commendable.
5. Pakistan has already harvested the early dividends of CPEC in the form of better infrastructure, energy security, employment for youth, and China's commercial use of Gwadar port. Hence, the second decade of CPEC will usher in a new era of industrialization if both countries engage with the other stakeholders and include other regional countries like Iran, Saudi Arabia, and Afghanistan.
6. The Indian dream of regional hegemony cannot be exhibited due to internal and external conflicts and challenges. The Chinese development model, on the other hand, is indigenous and inherent, and it has been tested for more than five decades since the economy's openness.

7. For the next decade of successful implementation of CPEC, fundamental decisions on the SEZs, location of industry, curbing negative propaganda against CPEC, and capacity building of human resources will be required. Production policies with reduced import tariffs to encourage cross-border trade are also required.
8. To improve the security of the CPEC projects, intelligence information may be shared in real-time, and a wide range of contact channels may be established so that counteraction is taken in time.
9. Pakistan and China may also improve their bilateral relations with other countries in the region so that the projects can also engage them.
10. Pakistan will continue to support the ***One China Policy*** in line with China's apprehensions and support its extension of the CPEC to other countries. In this context, Pakistan can play a pivotal role in bringing together various regional nations.
11. The leaders of both countries should make bold and supportive statements, showing their firm resolve to continue with the CPEC.
12. The trade balance between China and Pakistan is more tilted towards China, and there are grievances from Pakistani traders. China must encourage the import of products and services from Pakistan. At the regional level, the cross-border trade between Gilgit Baltistan and Xinjiang provinces may be encouraged. Better facilities for customs clearance and quarantines may be provided.
13. The embassies of China and Pakistan must arrange seminars and workshops about CPEC in other countries to improve their image for global and regional prosperity and peace.
14. The Think Tanks on both sides may work together for 100 years between China and Pakistan (2047/2048) to decide their priorities.

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Part I

Regional Perspectives

2

Xinjiang: Strategic Nexus of the Silk Road Economic Belt – Opportunities and Challenges in the Belt and Road Initiative

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Abstract

The year 2023 commemorates the 10th anniversary of the Belt and Road Initiative, signifying the commencement of a new phase in China's modernization efforts. Over the past decade, the Initiative has evolved into a pivotal platform for fostering a shared vision for humanity and ushering in a new era of collaboration between China and the global economy. As the cornerstone of the Silk Road Economic Belt, the Initiative presents unprecedented prospects for Xinjiang, necessitating a comprehensive understanding of its strategic significance. This article, building upon the strategic directives of the Party Central Committee, elucidates Xinjiang's geographical location, natural resources, and cultural environment within the context of the Silk Road Economic Belt. Additionally, it addresses challenges such as economic underdevelopment, resource integration, and the shortage of skilled professionals in Xinjiang, proposing a roadmap for developing Xinjiang as a core area of the Silk Road Economic Belt to capitalize on the new opportunities for high-quality growth presented by the Belt and Road Initiative.

Introduction

The year 2023 commemorates the 10th anniversary of the Belt and Road Initiative, signifying the commencement of a new phase in China's modernization efforts. Over the past decade, the Initiative has evolved into a pivotal platform for fostering a shared vision for humanity and ushering in a new era of collaboration between China and the global economy. As the cornerstone of the Silk Road Economic Belt, the Initiative presents unprecedented prospects for Xinjiang, necessitating a comprehensive

understanding of its strategic significance. This article, building upon the strategic directives of the Party Central Committee, elucidates Xinjiang's geographical location, natural resources, and cultural environment within the Silk Road Economic Belt context. Additionally, it addresses challenges such as economic underdevelopment, resource integration, and the shortage of skilled professionals in Xinjiang, proposing a roadmap for developing Xinjiang as a core area of the Silk Road Economic Belt to capitalize on the new opportunities for high-quality growth presented by the Belt and Road Initiative

In July 2022, President Xi emphasized the importance of advancing the construction of the core area of the Silk Road Economic Belt during his visit to the Urumqi International Land Port Area. He stressed the need to integrate Xinjiang's regional opening strategy into the broader framework of the country's westward opening and actively participate in and align with the new development paradigm. Over the years, Xinjiang's challenging natural environment and underdeveloped infrastructure have hindered its economic progress, particularly in integrating with the global economy, making it a relatively weak point compared to most other regions.

The Belt and Road Initiative proposal has created new opportunities for Xinjiang's economic transformation and development (何文政, 2019). Following the transformation and liberalization, the number of foreign economic investments in Xinjiang has steadily increased. However, the region lags far behind the national average due to its remote location and limited capacity to attract foreign investment. Introducing the "Belt and Road" Initiative has presented opportunities for Xinjiang's social development. Guided by this initiative, Xinjiang has recognized the significance and vast potential of developing its surrounding economy. By leveraging its development experience, combining it with policy support, and actively promoting the local regional economy and foreign trade industry, Xinjiang has undergone a remarkable transformation in just a few years (王运运, 2015).

Since the 18th National Congress, the Party Central Committee has consistently emphasized the significance of the "Belt and Road" initiative for economic development and reform. President Xi has repeatedly underscored the importance of this initiative in public statements. The instructions regarding the construction of the "Belt and Road" serve as a guiding force for the development and structure of the Silk Road core economic belt in the new era. This has played a crucial role in driving the development of Xinjiang, leading to the upgrade of the economic system and the transformation and advancement of industries in the region. The primary goals of this construction

include "one port," "two zones," "five centers," and "port Economic Belt," marking a significant step forward in the development of the core area of the Silk Road. As a pioneer and successful example of Silk Road construction, Xinjiang holds great strategic significance due to its geographical advantages, long-standing trade relationships with countries along the route, and it's potential to become an important transportation, trade, and economic hub connecting Europe and Asia. Leveraging Xinjiang's resources and developing local industries is crucial in achieving a qualitative leap from "made in Xinjiang" to "make in Xinjiang of high quality". As the core area of the Silk Road construction, Xinjiang shoulders a significant historical mission.

The Central Committee's Strategic Positioning and Important Arrangements for Xinjiang

As a significant achievement of China's modern era of opening up, the "Belt and Road" initiative has captured both the public's and the world's attention. This initiative represents a milestone in advancing the cause of social justice with distinct Chinese characteristics to a new level. China aims to establish a comprehensive blueprint for opening up more methodically and transparently, fostering swift exchanges and cooperation with neighboring countries. Concrete actions will be taken to uphold the unwavering commitment of nations to support the Belt and Road Initiative. In this process, Xinjiang, as the pivotal hub for strategic development and the core area of the Silk Road Economic Belt, plays a crucial role in advancing Xinjiang enterprises and products onto the global market, effectively stimulating the region's social and economic development.

The Belt and Road Initiative is a strategic maneuver to reshape the external landscape under the current circumstances. Xinjiang, the essential region of the Silk Road Economic Belt, is intrinsically linked to it as the sole location and primary route of the ancient Silk Road. Various local factors such as economic, political, cultural, geographical, and ethnic elements have left an indelible mark on the formation and evolution of the ancient Silk Road. Consequently, the extensive implementation of the "Belt and Road" initiative necessitates positioning Xinjiang as a central hub, leveraging its multifaceted roles in political, economic, and cultural development, devising comprehensive and meticulous plans, and propelling the external economic growth of Xinjiang and other regions within the country.

Core Area of the Silk Road Economic Belt

Xinjiang is intricately linked with the "Belt and Road" Initiative and serves as the central region of the Silk Road Economic Belt. Consequently, guided by

the "Belt and Road" initiative, Xinjiang has experienced a significant leap in its economic development. The economy has grown exponentially in just a few years, and the tertiary industry has expanded rapidly. This indicates a gradual shift in Xinjiang's economic development from an extensive to a high-quality economy.

Historically, Xinjiang was situated in a remote area with limited transportation access, leading to challenges in marketing local products and hindering economic growth. However, with introducing the "Belt and Road Initiative," relevant state departments collaborated with the regional government to launch the Xinjiang-Central Asia e-commerce train, the nation's first international postal and telecommunications train. This initiative effectively addressed the transportation challenges in Xinjiang.

Furthermore, following the implementation of the "Belt and Road" Initiative, the government prioritized the development of the core economic belt of the Silk Road, establishing concentrated industries such as the "three routes" and "three bases." These efforts have significantly enhanced Xinjiang's external economic infrastructure and facilitated stable and sustained local economic growth in recent years (孔德进, 2018).

Major Strategic and National Security Areas

The Belt and Road Initiative has not only spurred the economic development of Xinjiang but has also contributed to local stability and served a maintenance function. By implementing the Belt and Road Initiative in Xinjiang, the Silk Road Spirit can be implemented, and ethnic unity can be promoted. Xinjiang is a diverse region with significant variations among different races, cultures, ethnicities, and religions. With the guidance of the mutually beneficial policy of the Belt and Road Initiative, all ethnic groups have embraced a development concept of seeking common ground while preserving differences, uniting local people of different races and beliefs to collectively contribute to the security and stability of Xinjiang. It is evident that the "Belt and Road" strategy can play a role in consolidating strength.

The Heritage and Culture of the Chinese Nation

Culture is the cornerstone of a nation's advancement and an essential spiritual pillar for national progress. The introduction of the "Belt and Road Initiative" can potentially enhance the development of Xinjiang's cultural industry. Over time, Xinjiang has served as a pivotal location along the historic Silk Road, contributing to cultural growth. However, it has also faced challenges in cultural development, stemming from its diverse ethnicities and cultural

disparities, as well as the influence of neighboring nations. Implementing the Belt and Road Initiative has laid the groundwork for local development and established a platform for establishing a cultural community in Xinjiang. Furthermore, it can instill core socialist values across all ethnic groups in Xinjiang, guiding individuals to embrace a collective cultural consciousness and fostering the healthy evolution of social culture (张风丽, 2016).

Ecological Civilization Demonstration Zone in Arid Region

Enhance the overall layout of territorial space with a focus on security and accessibility, while strictly adhering to ecological standards. Optimize the allocation of resources to establish a comprehensive pattern for territorial development and protection, including "three barrier systems, two circles, four districts, and multiple areas," and coordinate the delineation of "three districts and three lines" (refer to Figure 1).

Figure 1: Overall pattern of territorial space

Source: Territorial Spatial Plan of Xinjiang Uygur Autonomous Region (2021-2035)

"Three barrier systems, two circles" protection pattern. "Three barrier systems" refers to the three main mountain barriers of the Altai Mountain, the Tianshan Mountain, the Kunlun Mountain, and the Alshan Mountain in Xinjiang, which have shaped the basic ecological framework of Xinjiang and are an important ecological security barrier to maintaining the functional stability of Xinjiang's ecosystem. "Two circles" refers to two oasis ecological circles distributed along the Tarim Basin and Junggar Basin, which are

important positions to prevent desert expansion and maintain oasis stability and security.

The development pattern of "four districts and multiple areas." The "four districts" refers to the development area of the north slope of Tianshan Mountain, the development area of the south slope of Tianshan Mountain, the border port economic zone, and the development area of Southern Xinjiang, which is the spatial leader of Xinjiang's high-quality development and plays the role of overall development and security. "Multiple areas" refers to the Urumqi metropolitan area, seven integrated development areas, and five urban groups, which is the main region of Xinjiang's economic and social development and plays a strategic fulcrum role in coordinating new industrialization, urbanization, agriculture, and animal husbandry modernization and information technology.

Opportunities and Challenges for the Construction of the Core Area of the Silk Road Economic Belt

The "Belt and Road" initiative has brought about development opportunities for Xinjiang. As a result, the CPC Central Committee has explicitly stated that Xinjiang is the core area of the Silk Road Economic Belt and will emerge as a significant business center, logistics hub, and comprehensive service site for the Belt. Building upon this foundation, it is imperative to assess the opportunities and challenges of Xinjiang's development, leverage diverse resources, address weaknesses, and propel economic growth in the region (Baig, Hussain, & Yenigun, 2021).

The construction of the Belt and Road aims to facilitate the orderly flow of economic factors, efficient allocation of resources, and deep integration with the Central Asian market. It strives to establish an inclusive, balanced, and open regional economic cooperation system. This entails progressively aligning industrial and economic policies of countries along the Belt and Road and fostering deeper regional cooperation. Simultaneously, it seeks to invigorate the regional market, boost consumption, promote direct investment, and generate more job opportunities. Furthermore, this initiative will enhance cultural exchanges and collaborative development among the countries along the route.

Opportunities for Social Development in Xinjiang

As the core region of the ancient Silk Road, Xinjiang has accumulated many unique advantages in historical development, such as mineral resources, cash crops and geographical advantages. Currently, the "Belt and Road" Initiative

proposal has built a good platform for Xinjiang. To this end, Xinjiang should seize the opportunity, take advantage of its resources, develop new drivers, and push Xinjiang's economy to a new level.

The initial stage of construction and operation of the Silk Road Economic Belt will involve China and Central Asian countries, and in the future, it will gradually cover and radiate a wider region such as Central and Eastern Europe, Western Europe, West Asia, and North Africa (Zuokui, 2014). As the core area of the overland Silk Road Economic Belt, Xinjiang is facing unprecedented opportunities. Because of its superior geographical location, Xinjiang connects Central Asia and other countries along the route, becoming an important gateway to open international economic, trade, cultural, institutional, and other exchanges.

Under the new opportunities, Xinjiang, as a key construction city on the Silk Road, should carry out in-depth cooperation and exchanges with cities along the route, rely on the development and construction of key "economic and trade industrial parks," and join hands to create international economic cooperation corridors including China-Mongolia-Russia, China-Indo-China Peninsula, the new Eurasian Land Bridge, and China-Central Asia-West Asia. The construction and development of the Maritime Silk Road, which is an important channel for maritime trade and exchanges, should take the construction of important ports in the countries along the road as the primary goal so as to form a safe, smooth, and efficient maritime transport channel (Alam, Xuemei, et al., 2023). It is worth noting that the two economic corridors of Bangladesh, India, Myanmar, China, and Pakistan have a very important strategic position in the process of the establishment of the "Belt and Road," so we should deepen economic cooperation and exchanges and strive for more extensive and in-depth connectivity.

Excellent Geographical Location

A major feature of Xinjiang is its unique geographical location. Located in the central belt of the Eurasian continent, Xinjiang is the largest province and region of neighboring countries in China, which provides geographical support for the expansion of the Belt and Road Initiative. Moreover, regarding import and export trade and international finance, Xinjiang is closely connected with countries along the "Belt and Road". It has good competitive advantages, which can be an important hub for China to exchange with the Central Asian market. In addition, geographically, Xinjiang is adjacent to Central Asian countries and regions, which can reduce the transportation cost of goods (Baig & Zehra, 2020). Moreover, the two regions are very similar of language, living customs, and commodity demand. Therefore, Xinjiang has

the advantage of having a good geographical position and a better understanding of the market economy development of neighboring countries. It will certainly play a geographical advantage role in the completion of the "Belt and Road" Initiative (娜迪热, 2018).

Abundant Resources

Xinjiang is situated in the western region, relatively remote, yet abundant in resources. For instance, mineral resources play a crucial role in Xinjiang's economy. Over 100 minerals have been developed in the region, with several well-known minerals such as Muscovite, feldspar, oil, and natural gas ranking among the country's top resources. These minerals are vital for sustaining the local economy. Historical data indicates that Xinjiang has been rich in resources with significant development potential for centuries, particularly with the presence of major oil and gas basins like Junggar, Tarim, and Turpan, which provide energy for nearly half of China's population and contribute to the "west-east gas transmission" initiative. Furthermore, Xinjiang boasts abundant water resources sourced from the melting snow and glaciers in its mountains, which give rise to numerous rivers and sustain the local oases. Notable examples include the Tarim River and the Irtysh River, both major waterways in the region. The convergence of many rivers in the oases creates a rich and beautiful landscape characterized by abundant water and vegetation. Additionally, Xinjiang is blessed with valuable land and forest resources, all essential in nurturing generations of Xinjiang residents.

Suitable Cultural Environment

Xinjiang has always been a region where multiple ethnic groups and cultures coexist. Through long-term exchanges and integration, various ethnic cultures have thrived on Chinese soil and gradually formed an integral part of Chinese culture. Members of various ethnic groups in Xinjiang live and study together and interact and integrate with each other in social life, such as language, diet, customs, and clothing, which is a concrete manifestation of Xinjiang's favorable cultural environment. Moreover, since ancient times, Xinjiang has been adjacent to Central Asian countries and has had close economic and cultural exchanges. Ethnic groups from Central Asian countries have settled in Xinjiang, which has greatly enhanced ethnic interoperability and provided a cultural advocate for the construction of the Belt and Road Initiative.

Challenges to Xinjiang's Social Development

Xinjiang, a large province in western China, has a unique set of resource advantages that have contributed to its development. The Belt and Road

Initiative has brought opportunities for Xinjiang's economic growth. However, the region also faces challenges in its economic development approach.

The Overall Level of Economic Development

The realization of the "Belt and Road Initiative" has provided a place for Xinjiang's rich resources to play a role, which can enhance Xinjiang's economic strength. In recent years, although Xinjiang's economic aggregate has been improved for a long time, its per capita GDP level is still relatively backward, and its economic aggregate accounts for a smaller proportion than that of other regions. The reasons are as follows: First of all, Xinjiang is rich in land resources. Xinjiang occupies 1/6 of the national area and is the largest province in China. In addition, there is a large difference in population distribution density in Xinjiang. 95% of the people gather in the oasis of 3.5% of Xinjiang's area, and the population distribution is extremely uneven, which makes large-scale economic construction impossible to carry out according to local conditions fully. Secondly, although Xinjiang has rich resources, due to its remote location and inconvenient transportation, it is difficult for Xinjiang to get actual economic contact with the central and eastern regions, resulting in economic chain break (王燕, 2016).

There is a Contradiction Between Supply and Demand in Infrastructure Construction and Social Development

The strategy of developing the western region has been implemented for many years. of any technologies, talents, and other resources have been transported from the central and eastern regions to the western regions, providing support for transportation, telecommunications, and water conservancy. However, Xinjiang's economic foundation is relatively backward; there are many loopholes in development, and there are still deficiencies in various aspects of construction. Xinjiang plays a crucial role as a hub province in the "Belt and Road" Initiative. However, the region faces challenges such as low overall traffic construction density, particularly affecting its economic development. Additionally, the areas where Xinjiang connects with neighboring countries are at high altitudes with steep mountain depressions, leading to poor road conditions and low safety performance. As a result, the transportation of goods is mainly reliant on air and a few land ports, leading to increased product costs (Alam, Baig, & Muhammad, 2023) .

Insufficient Ability to Integrate Resources

With the deepening of the "Belt and Road" Initiative, Xinjiang has gradually shown a lack of resource integration in its external development, resulting in local characteristics and advantages being unable to play their role fully. The main reason is that Xinjiang has been affected by factors such as low productivity, weak capital and technology, and inconvenient transportation for a long time. As a result, the development of local products, agriculture and animal husbandry, energy, and mineral resources in Xinjiang is insufficient, the supporting capacity of the industrial chain is insufficient, and the phenomenon of resource waste is obvious. Additionally, many enterprises in Central Asian countries recognize the development potential of Xinjiang and are eager to establish cooperative relations through the "Belt and Road" platform. However, Xinjiang has historically focused on building connections with central and eastern regions, overlooking opportunities for external development. As a result, the current situation of external economic development is not ideal.

Professional and Technical Talents are Scarce

For a long time, no matter whether in Xinjiang or other areas, there has been a shortage of talent in foreign economic development. Even if it has the support of national policies, its hematopoietic function is not perfect, and it can only play the role of "raising the soup to stop the boiling." There are two main reasons for the shortage of talent in Xinjiang. First, regarding natural conditions, Xinjiang is relatively high in altitude and remote in geographical location, which cannot attract college graduates and most social talents to work here. Secondly, Xinjiang is a province with a large number of ethnic minorities living in concentrated communities, and there are great differences between Xinjiang and the central and eastern regions in terms of cultural environment and social customs, making it difficult to attract professional and technical talents to develop their ambitions here (汪怡杉, 2017).

The Core Area of the Silk Road Economic Belt

In implementing the "Belt and Road" Initiative, Xinjiang has both opportunities and challenges, and the continuous rise of Xinjiang's economic level shows that the strategic decision is correct and proves that Xinjiang has great development potential. To this end, consider making efforts from the following four aspects: constantly exploring paths for foreign economic development, constantly exploring new paths for foreign economic development, exploring new paths for foreign economic development, and

providing effective impetus for effectively promoting the construction of the "Belt and Road".

Change the Concept of Development

Strengthen Policy Communication to Ensure Policy Fairness

It is important developing a multi-level macro policy communication and exchange mechanism to enhance cooperation and alignment of economic development strategies and countermeasures among countries along the Belt and Road. This includes strengthening information disclosure and ensuring policy equity. With the ongoing development of the social economy, there has been a gradual increase in public awareness and participation in the "Belt and Road" initiative, making foreign economic development a prevailing trend. Enhancing the public's ability and awareness to participate and improving the social oversight mechanism are crucial aspects of the "Belt and Road" initiative. To this end, relevant authorities should enhance the information disclosure system, facilitate the smooth implementation of "Belt and Road" related policies, and ensure timely and accurate dissemination of local resource consumption, industrial development, and other pertinent information. The government and relevant departments can regularly release online and offline bulletins and public announcements, and utilize television, radio, and video broadcasts to communicate "Belt and Road" construction information to the public. Concurrently, relevant departments should bolster their efforts in handling correspondences and visits, regularly organize hearings and other engagements, solicit feedback and suggestions from the public, deeply integrate oversight efforts with the "Belt and Road" construction, and guarantee policy fairness and information transparency (Khan, Baig, & Muhammad, 2020).

Seize the Historical Opportunities

The "Belt and Road" Initiative aims to develop Xinjiang as a pilot zone, and its success would demonstrate the viability of the policy for broader implementation. Given Xinjiang's historically slow economic development, it is crucial for all stakeholders, from the government to the citizens, to embrace a new approach to economic development and strategically plan for the region's future. This may involve promoting the principles of the "Belt and Road" initiative at the provincial level, fostering an understanding of the "Silk Road spirit" among the public, and encouraging innovation and entrepreneurship. Additionally, widespread dissemination of information through posters, documentaries, and news broadcasts is essential to ensure

widespread understanding, participation, and support for the strategy's implementation.

Integrate Multilateral Resources

Since the Belt and Road Initiative was proposed, Xinjiang has been pushed to the forefront, becoming a region where development challenges and opportunities coexist. Therefore, local enterprises in Xinjiang should seize the opportunity to innovate and diversify the development mode on the traditional enterprise operation mode and create conditions for constructing the "Belt and Road" in Xinjiang. For example, we can learn from the development careers of other regions, set up a Silk Road industrial park in Xinjiang as a development pilot, and then turn Xinjiang's industrial park into a base for in-depth cooperation with neighbouring countries and regions so as to expand Xinjiang's development channels. At the same time, Xinjiang has rich resource advantages. Therefore, enterprises can integrate local and surrounding resource advantages to build a sound enterprise development plan. For example, local enterprises can use cantaloupe, grapes, and other agricultural products to build an integrated industrial chain of agricultural products and create a special investment field for foreign enterprises to drive enterprise development through investment.

Infrastructure Development, Infrastructure Construction Planning and Technical Standard Systems

The first step is to address the missing and bottleneck sections, gradually establish a unified transportation coordination mechanism, strengthen port infrastructure construction, and further streamline land and water transport channels. We should continuously promote port cooperation, increase sea routes and frequency, and consider establishing a platform and mechanism for widespread civil aviation cooperation to enhance aviation infrastructure. It is also important to strengthen cooperation in energy infrastructure connectivity and to work together to promote the construction of cross-border communication trunk lines such as optical cables and improve satellite information channels.

Furthermore, it is essential to further enhance infrastructure construction and improve the market environment. In implementing the Belt and Road Initiative, the government should take a leading role, deepen infrastructure construction efforts in Xinjiang, and create a favourable development environment. The government should first clearly define its position, vigorously reform transportation construction, accelerate the construction of railway and road network transport channels in Xinjiang and neighbouring

Central Asian countries and regions, and focus on the dredging and construction of mail channels and optical cable fields. This will gradually establish Xinjiang as the center and expand the transportation and communication network system. Additionally, the government can utilize the Internet, artificial intelligence, and other information technologies to open online policy service channels and provide the public with real-time updates on the "Belt and Road" construction, ensuring a deep integration of online and offline economic development channels in Xinjiang.

The Comprehensiveness of Resources and the Layout of Development

Promote Rural Revitalization and Optimize the Layout of Agricultural Development

Focusing on ensuring security, supply, ecology, and income, we will strengthen the two major agricultural production belts on the north and south slopes of the Tianshan Mountains and strengthen their leading role in the whole of Xinjiang. We will develop eight comprehensive agricultural development zones, namely, the Irtys-Ulungu River basin, the Ta 'ei Basin, the Ili River Valley, the Hami Basin, the Aksu River Basin, the Kashgar River-Yerqiang River basin, the Hotan River-Niya River basin, and the Cherchen River Basin, to promote the large-scale and modern development of agriculture. By 2035, we will strive to build 45 advantageous areas for distinctive agricultural products.

Build Beautiful Villages and Promote Intensive Land Use

The radiative driving role of oasis town groups should be utilized to guide the centralized layout of villages in oasis agricultural areas. Settlement and ecological relocation projects should be promoted based on local conditions, and the layout of residential areas in animal husbandry areas will be optimized. Actions should be vigorously implemented to upgrade infrastructure, improve public services, integrate urban and rural development, improve the rural living environment, and enhance social governance. The aim is to promote the development of beautiful villages, enhance the quality of liveable and pleasant villages, and promote intensive land use.

High-Quality Consolidation and Expansion of Poverty Alleviation Achievements

It is important to understand the dual aspects of monitoring and support, comprehend the key elements of industry and employment, acknowledge the significance of national rural revitalization key counties and resettlement

areas, recognize the importance of the new rural collective economy and poverty alleviation project assets, and firmly commit to preventing a large-scale return to poverty through collaborative efforts.

Strengthen Mutually Beneficial Cooperation to Ensure Unimpeded Trade

Countries along the Belt and Road are encouraged to strengthen cooperation among customs, and as well as bipartite or even multilateral cooperation in inspection and quarantine, certification and accreditation, standard measurement, statistical information, etc. There should be efforts to promote the mutual search of inspection and quarantine certificates on the Internet, and to carry out the mutual recognition of "certified operator" (AEO). Additionally, efforts should be made to reduce non-tariff barriers, develop cross-border e-commerce and other new business forms, quicken up the process of investment facilitation, and eliminate investment barriers. Bilateral investment protection agreements should be continuously strengthened, and double taxation treaty negotiations should be avoided as far as possible. The areas of mutual investment between countries should be expanded, and cooperation in clean and renewable energy should be promoted. Furthermore, countries along the Belt and Road should deepen close cooperation in emerging industries such as next-generation information technology, biology, new energy, and new materials. Cooperation in the construction of overseas economic and trade cooperation zones, as well as cross-border economic cooperation zones and other industrial parks, should also be promoted.

Strengthen Financial Cooperation to Achieve Financial Integration

We suggest strengthening financial cooperation and promoting the construction of an Asian currency stability system, improving the investment financing system and credit system. Continuously expanding the scope and scale of bilateral currency swaps and settlement among countries along the Belt and Road seems important too; Furthermore, we aim to encourage the opening and development of Asian bond markets. Additionally, we will support the preparation of the Asian Infrastructure Investment Bank and the BRICS Development Bank. Countries along the Belt and Road will also engage in consultations regarding the establishment of a financing institution of the Shanghai Cooperation Organization. We are committed to expediting the establishment and operation of the Silk Road Fund. Moreover, we will strive to provide increased support to governments of Belt and Road countries, as well as enterprises and financial institutions with strong credit ratings, in issuing bonds in China. Eligible financial institutions and enterprises in China will have the opportunity to issue RMB bonds and foreign currency bonds

overseas. We will also work towards promoting the signing of a memorandum of understanding on bilateral regulatory cooperation. Our efforts will focus on guiding commercial equity investment funds and social funds to participate in the construction of key projects under the Belt and Road Initiative.

Strategies to Promote Support for Talent

The criterion of economic development of a region depends not only on the local ability to attract foreign investment but also on the quality of local talents. In recent years, the state attaches great importance to talent education and training, hoping to grasp the market advantage through talent competition and occupy a place in the international market. As the core region of "The Belt and Road," Xinjiang needs the local government to deeply understand the importance of talent strategy, increase talent training efforts, and thoroughly implement the strategic decision of strengthening the country through talent. The government should expand the channels of vocational education with the talents needed for the development of the "Belt and Road", establish a deep cooperation mechanism between the government, enterprises, and universities, create special funds and policy support projects for personnel training, and encourage colleges and universities to train high-quality talents. At the same time, the government should also actively contact the governments and enterprises in other regions, formulate a sound talent reward policy and promotion mechanism, encourage, and attract outside talents to participate in Xinjiang's foreign economic construction.

With the deepening of China's opening, the development of the western region, and the joint construction of the Belt and Road Initiative, Xinjiang's geographical conditions and strategic position are becoming more prominent. The inland hinterland is accelerating its transformation into the forefront of opening-up, and its unique geographical advantages are accelerating into development advantages, ushering in an important period of strategic opportunities for high-quality development. Xinjiang's regional opening-up strategy and the construction of the core area of the Silk Road Economic Belt should give full play to its regional advantages of connecting the East with the West and drawing from the West to the East, building an open highland along the border, transforming Xinjiang's regional advantages into a connecting belt and a matching belt for foreign regional cooperation, and carry out embedded regional cooperation and deeply integrated development with neighbouring countries and regions.

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China's Dual Circulation Policy: Navigating Domestic Reform and Global Integration

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Abstract

This paper seeks to contribute to academia by providing an in-depth analysis of China's "Dual Circulation" policy from various perspectives. Through qualitative research, this study aims to illustrate how China is achieving its objectives under the dual circulation policy by reforming the domestic market in tandem with external market cooperation, particularly with neighboring economies. By thoroughly examining existing literature, this article also aims to elucidate the rationale behind the dual circulation policy and its role in bolstering China's status as an independent, developed, and consumer-driven market both domestically and globally. Additionally, the DC policy is an integrated framework for China's development. Furthermore, this paper will explore the Belt and Road Initiative (BRI) and China-Pakistan Economic Corridor (CPEC) within the context of China's Dual Circulation policy and propose strategies for Pakistan to capitalize on this opportunity and attract more foreign investments.

Introduction

The last four decades of China's opening-up and deft economic development do not reveal that China only focuses on consistent economic growth; however, it is also considered to provide a promising atmosphere to regional and global economies. China has been developing its industries through technological transformation, drawing from developed economies, and bolstering its product supply. China has consistently met global demand by aligning with its comparative advantage and the global market environment. Opening its domestic niche market to a larger scale has been a transformative move. In response to financial crises, international market crashes, trade disputes, and the COVID-19 pandemic, China has adjusted its policies to reduce dependence on international circulation, which had previously led to a decline in economic development. While international circulation had facilitated substantial foreign direct investment, international trade, and cross-border transactions, China's exceptional growth was also driven by domestic circulation, characterized by significant savings, substantial private sector investment, extensive infrastructure development, a skilled workforce, and a development-friendly political system.

The Chinese government introduced the dual circulation policy in 2020, is a strategic economic initiative designed to bolster China's global economic standing while fostering domestic economic growth. President Xi Jinping has succinctly outlined the concept as having two dimensions: internal circulation and external circulation, as well as the management of sources for demand, both internal and external. President Xi has underscored the significance of harnessing domestic resources to drive technological innovation and achieve self-sufficiency in critical sectors for China. Embedded within China's long-term economic plan, the dual circulation strategy was officially incorporated into the 14th Five-Year Plan during the second meeting session on March 4, 2021, solidifying its pivotal role in China's economic blueprint. This policy relies on internal and external circulation, with internal circulation focusing on boosting domestic consumption and production through investment in infrastructure and innovation. In contrast, external circulation opens up the market to foreign investments and trade relations. The objective is to create a more sustainable Chinese economy less reliant on external sources. The Chinese leadership is planning to set up a "dual circulation" policy to enhance China's development by protecting the domestic market from the global supply bottleneck that China faced during the epidemic, and the USA trade war, especially in the technology sector (García-Herrero, 2021). The Chinese government has implemented this policy to strengthen the Chinese economy against external shocks and to leverage the domestic market in order to achieve

global leadership in contemporary technologies (Grieger, 2020). According to (Prasad, 2009), the dual circulation framework represents a strategic balance between internal and external economic processes, allowing China to adapt to both threats and opportunities on a global scale. If the international community shows little interest in engaging with China, the country will shift its focus to internal resources to sustain its progress. Sheng also emphasizes the significance of the United States and China as global powers and the necessity for them to collaborate under the dual circulation policy to accomplish common objectives. He further suggests that only time will reveal which nation can better adapt to changing circumstances. The "dual circulation" policy aims to bolster China's domestic economy and reduce its reliance on the global market. In addition, while previous efforts focused on decreasing China's dependence on exports, the dual-circulation strategy seeks to lessen its reliance on imports and challenge the dominance of the United States. This approach highlights the central importance of domestic economic circulation, with international economic circulation supporting and enhancing domestic development. While the Belt and Road Initiative (BRI) remains a key part of China's international development and cooperation strategy, the implementation of the Dual Circulation Development Paradigm represents a strategic response to evolving challenges and the current economic environment in China (Huang, 2016; Yifu & Wang, 2022).

China Dual Circulation Policy and the World

After the announcement of China's dual circulation policy, there was a lively debate among global economists and academic experts. Some expressed concerns about the potential decoupling from the world that could result from this strategy, while others lauded and carefully analyzed China's long-term 2025 "Made in China" policy. They also highlighted China's gradual journey toward economic success since its opening up, emphasizing China's win-win policy.

President Xi also emphasized the importance of promoting a large-scale and seamless domestic economic circulation to attract global resources, meet domestic needs, advance industrial and technological development, and cultivate new advantages in global economic cooperation and competition. He summarized the strategy as a combination of the 'external circulation' of global demand with the 'internal circulation' of domestic demand. Additionally, China's five-year Dual Circulation plan indicates a potential increase in competition with the United States for dominance in future technologies.

Through this strategy, China suggests that we are entering a period where international connections and relations will be more focused on enhancing global power rather than collaboration for economic efficiency.

The dual circulation policy has sparked significant interest among economists and researchers. Some countries perceive it as a potential threat to their economies, expressing concerns about diminished global trade opportunities and increased protectionism (García-Herrero, 2021). Critics contend that the policy could further solidify China's dominance in specific industries, potentially creating imbalances and barriers to fair competition. Professor Lawrence J. Lau, a respected figure in the field, also argues that complete isolation and total self-sufficiency for China through this policy are impractical and unwise. He believes that distancing from international cooperation and trade would likely lead to limited access to essential resources, technology, and markets, resulting in a significant decline in China's real standard of living. However, Professor Lawrence also anticipates that China will be able to effectively navigate the dual circulation policy over time through a combination of structural reforms, technological advancements, and strategic investments.

Countries have varied responses to China's dual circulation policy. While some view it as a means to enhance economic cooperation and trade opportunities with China, others are cautious. Those interested in expanding their market access to China's growing domestic consumption see the potential for mutually beneficial partnerships. For instance, countries in the Association of Southeast Asian Nations (ASEAN) are keen on strengthening economic ties with China. The global response to China's dual circulation policy is multifaceted, contingent upon the perspectives and interests of different countries and regions. The long-term implications of this policy on global trade dynamics continue to evolve and warrant further observation.

China Dual Circulation Policy Outcomes

The core projected outcome of this strategy lies in prioritizing domestic production, innovation, and self-sufficiency (Collins, 2021). It seeks to transform China into an advanced manufacturing hub, establish China-centric global production networks that multinational corporations depend on, develop an international financial network based on the Yuan, and potentially evolve China into a military-technological powerhouse. Similarly, (Yifu & Wang, 2022), documented that the objective of the paradigm is to enable a substantial advancement in industrial upgrading, leading to an enhanced

domestic circulation of superior quality and an elevated level of international circulation.

Before implementing China's dual circulation policy, the country's economic development model was primarily focused on export-led growth and attracting foreign direct investment. China relied heavily on exports to drive its economic growth, which led to a strong manufacturing sector and trade surplus with other countries. However, the global economic slowdown and trade tensions with the United States highlighted the vulnerability of this export-oriented model. China realized the need to rebalance its economy and reduce its reliance on external demand. In response, China introduced the dual circulation policy in 2020. This policy aims to shift the focus towards domestic consumption and innovation as the main drivers of economic growth while maintaining a certain level of openness to the global market. The dual circulation policy represents a strategic shift in China's economic development model, aiming for balanced and sustainable growth with a greater focus on domestic demand, innovation, and self-reliance.

At present, it remains premature to conclusively evaluate whether China has attained all the objectives of its dual circulation policy. The policy was announced in 2020, and its implementation is an ongoing process, not an overnight change. However, some notable developments and progress have been made in certain areas. Efforts to boost domestic consumption include income tax cuts, incentives for household spending, and support for e-commerce platforms. Domestic supply chains have been strengthened by promoting domestic manufacturing and reducing dependence on foreign imports, especially in the technology and automotive sectors. China's focus on technological innovation has led to significant advancements in areas like AI, 5G, 6G (According to Liu Liehong, the chairman of China Unicom, the company plans to finish technical research and explore early application scenarios for 6G technology by 2025.), electric vehicles, and renewable energy (Yuan, Zhao, Zong, & Parolari, 2020).

This text does not provide specific trading fact figures for China after the dual circulation policy. It gives deep insight by exploring pertinent literature that China has been actively pursuing trade diversification strategies, such as expanding trade ties with other Asian economies, strengthening economic partnerships through initiatives like the Regional Comprehensive Economic Partnership (RCEP), and exploring new markets in Africa and Latin America. However, the full impact of the policy will take time to materialize and depend on sustained efforts, external factors, and ongoing adjustments. Comprehensive assessment requires longer-term monitoring and analysis.

Dual Circulation Policy and BRI

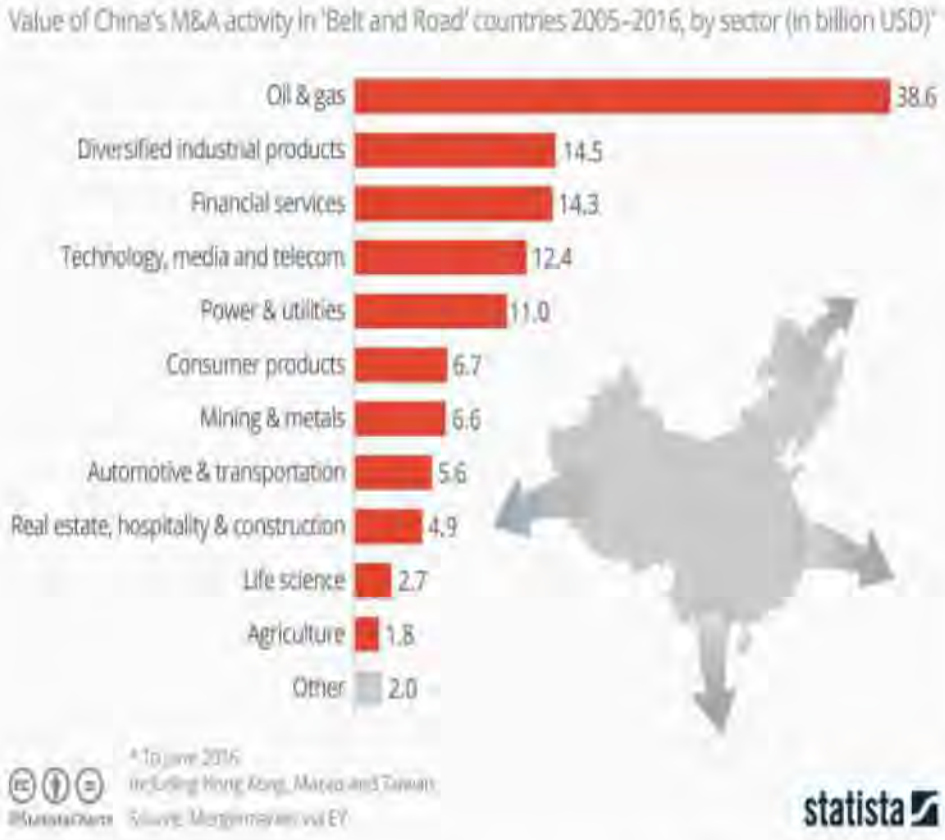
The BRI, initially launched in 2013, is an ambitious development strategy focused on connectivity and cooperation among various countries across Asia, Europe, Africa, and the Middle East. The initiative promotes infrastructure development, trade, and cultural exchanges, among other areas of cooperation. China has tapped into its abundant domestic resources to fuel the pursuit of its international objectives under the Belt and Road Initiative (BRI). By leveraging its vast reserves of capital, manpower, technology, and raw materials, China has supported the extensive infrastructure development, connectivity projects, and investments across participating countries. This strategic utilization of domestic resources has facilitated China's ability to drive economic growth, enhance regional connectivity, and strengthen its geopolitical influence through the BRI (Jamali, Westcott, & Verma, 2024). The Belt and Road Initiative is a strategic endeavor to foster cooperation among countries along the route and achieve shared development and prosperity. It encompasses a comprehensive and adaptable strategy, demonstrating its wide-ranging capacity for strategic planning and successful execution (Liang & Zhang, 2019). Inline, The Organization for Economic Co-operation and Development (OECD) also documented that the BRI has significantly impacted the global landscape of trade, investment, and finance, creating notable changes and opportunities in these domains.

The dual circulation strategy is a part of China's overall plan for self-sustainability in resources, technology, and demand. It aims to leverage the vast domestic market of China and third-world economic markets as facilitated by the Belt and Road Initiative. The "dual circulation" policy is anticipated to boost external demand, particularly in the event of Western restraint. The Belt and Road Initiative (BRI) is expected to gain greater significance as it plays a crucial role in expanding external demand and facilitating the establishment of open markets in emerging nations (García-Herrero, 2021). Moreover, the implementation of China's "Dual Circulation Strategy" will likely have consequences for the direction of Belt and Road Initiative (BRI) projects (Tan, 2022). Further, the BRI mainly focused on shifting infrastructure to three vital areas-digital technology, public health, and environment-friendly energy development. Similarly, the United Nations (UN) also emphasized China's improvement in ecological equipment and reported that the top five exporters of green goods collectively contributed to more than half of global green goods exports. China ranked as the leading exporter, with a market share of 23% percent, followed by Germany at 14%, the United States at 8%, Japan at 6%, and Italy at 4% (UN, 2022). The dual circulation strategy aims to support China's domestic demand and upgrade the supply chain through inward

foreign direct investment (FDI) and technology improvements. It seeks to strengthen China's ecosystem and export markets by diversifying imports from developed to emerging economies. Belt and Road Initiative investments and the development of China's digital commercial capabilities facilitate the strategy. In October 2023, "One Belt One Road" BRI (Belt and Road Initiative) China's Foreign Policy strategic project completed 10 years, and Chinese President Xi initiated a new chapter of the Belt and Road Initiative (BRI), China's significant global infrastructure and development project, aimed at boosting the country's economic integration and global influence. More than 150 countries gathered in Beijing to sign BRI agreements with China, and Chinese investors already invested around one trillion US Dollars in the last 10 years. China launched this project for mutual prosperity as China said, "China can only do well when the world is doing well. When China does well, the world gets even better" (Ali, 2020).

The Belt and Road Initiative (BRI) is Chinese President Xi Jinping's signature foreign policy project aimed at strengthening China's global connectivity. It combines new and existing projects, covers an expansive geographic scope, and includes efforts to improve physical and societal infrastructure alongside fostering meaningful connections from people to people (Shahriar & Luong, 2023). As of October 2023, the plan spans 151 countries with a combined gross domestic product of $41 trillion and impacts approximately 5.1 billion individuals. So, China is enhancing trading partners and investments around the globe; recent figures are below (Zeng, 2019).

China is actively pursuing collaborating with its Belt and Road Initiative (BRI) partner countries in the aerospace and aviation sectors. Through the BRI, China aims to enhance cooperation and exchanges in these industries, fostering the development of global aerospace and aviation capabilities (Chan & Song, 2020). China seeks partnerships to jointly develop cutting-edge technologies in aerospace and improve aircraft production and air traffic management. This mutually beneficial cooperation offers advanced technologies and expertise to participating countries while boosting economic development and promoting innovation. China's focus on aerospace and aviation aligns with its broader goals of connectivity and economic integration among BRI partner countries, working together to overcome challenges and promote sustainable development. The following chart also illustrates the sector-wise value chain of China's M&A (mergers and acquisitions) activity in countries involved in the 'Belt and Road' initiative from 2005 to 2016.



Furthermore, according to a recent white paper issued by China's State Council Information Office, China has signed bilateral air transport agreements with 104 Belt and Road Initiative (BRI) partner countries (Costa, 2020). Additionally, the country has established direct flights with 57 partner

countries to facilitate seamless cross-border transport. These agreements and direct flight connections are aimed at enhancing connectivity and promoting easier travel between China and its BRI partners, further contributing to the overall objectives of the initiative.

The 2023 Seminar for Agricultural and Rural Development Officials from Developing Countries has assembled officials from developing nations enthusiastic about applying the knowledge gained during the seminar to promote agricultural development in their regions (Petry, 2023). Pakistani representatives have also recognized the significant progress in their hometowns due to the positive influence of the Belt and Road Initiative. BRI aims to bring prosperity and modernization everywhere through Chinese neighborhood diplomacy. Lately, Yaseen Anwar, former governor of the State Bank of Pakistan, stated that China's financial sector is transforming towards fin-tech, green finance, and sustainability (Lai, Lin, & Sidaway, 2020). Anwar also commended the Belt and Road Initiative (BRI), highlighting its significance in providing financial access for emerging economies and the global south.

Dual Circulation Policy and CPEC

The CPEC (China-Pakistan Economic Corridor) is a significant infrastructure and development initiative designed to establish a connection between China's western region, specifically through the city of Kashgar, and the Gwadar Port in Pakistan's southwestern province of Baluchistan. This project is an integral part of China's Belt and Road Initiative (BRI) and is anticipated to have a transformative impact on Pakistan's infrastructure and economy. Notably, CPEC is viewed as a means for China to expand its economic influence in the region and enhance regional connectivity, thereby strengthening both domestic and international circulation. Given Pakistan's strategic partnership with "China's One Belt and One Road" and its involvement in the CPEC, the country stands to benefit from numerous opportunities to attract Chinese investment in digital technology and green energy (Mahmood, 2023). Chinese think tank experts have emphasized that China's approach to gaining power is both direct and sustainable. They have encouraged Pakistan to pursue a similar path, with a focus on reducing poverty, advancing state modernization, and uplifting its people. They have also pointed out that while the China-Pakistan Economic Corridor (CPEC) has primarily concentrated on connectivity, the future lies in IT and artificial intelligence (AI). They have highlighted that the US has imposed sanctions on China due to its progress in semiconductors, but the Chinese think tank has expressed confidence in Chinese companies' ability to produce semiconductors through persistent efforts. Additionally, they have stated that the updated version of CPEC will include IT development and

advanced technological collaboration. They have emphasized that the Belt and Road Initiative (BRI) has linked 150 countries based on China's principles of friendly relations, mutual benefits, inclusiveness, and neighborhood diplomacy. Furthermore, they have stressed the importance of modernization within this framework.

Dual Circulation Policy and Pakistan

The dual circulation policy aims to strengthen domestic consumption in China, which can create opportunities for Pakistani exports, which is vital for the Pakistani economy in the current situation. As China focuses on expanding its consumer market, there can be an increased demand for Pakistani goods and services, boosting Pakistan's export oriented. Further, this policy includes substantial investments in infrastructure projects through initiatives like the BRI and the CPEC. These projects can help Pakistan address its infrastructure deficit, improve connectivity, and enhance trade links with China and other regions. This, in turn, can attract foreign investment and promote economic growth. The investments under the dual circulation policy can generate employment opportunities for the Pakistani workforce. Infrastructure projects like the CPEC can create jobs in construction and related industries such as logistics, manufacturing, and services, which can contribute to overall economic development in Pakistan. It also underlines innovation-led growth and lures opportunities for Pakistan to collaborate more with Chinese companies and institutions in research and development, technology transfer, and knowledge sharing. Such collaborations can enhance Pakistan's technological capabilities and improve its economic competitiveness.

It is important to note that the benefits of China's dual circulation policy for Pakistan depend on several factors, such as effective implementation, policy coordination, addressing potential challenges, and ensuring equitable distribution of benefits. However, the potential for mutual economic cooperation and prosperity between China and Pakistan under this policy framework is significant.

It is important to note that Pakistan should realize these benefits need effective implementation, eradication of barriers such as security concerns, ensuring transparency, and equitable distribution of the benefits among different regions and communities within Pakistan; these are vital to eliminating to attract foreign investors. CPEC has potential. However, it also requires prideful passion for country economy to impact Pakistan's economy significantly. However, it also requires a prideful passion for the country's

economic growth, careful planning, coordination, and long-term sustainable development strategies.

Conclusion

The dual circulation policy in China is a part of President Xi Jinping's vision for economic and social development. It is seen as a way for Xi to leave his imprint on China's policy discourse and shape the direction of the country's growth for the next three decades. The policy highlights the importance of domestic consumption and innovation-driven growth alongside increased integration with the global economy. Xi Jinping aims to ensure China's long-term economic stability and reduce its dependence on external factors by emphasizing the need for a robust domestic market and self-reliance. This policy is significant in reflecting President Xi's leadership aspirations and desire to shape China's development trajectory in line with that of former Chinese leaders.

In conclusion, China's dual circulation policy and its Belt and Road Initiative (BRI) relationship are closely intertwined. The dual circulation strategy emphasizes enhancing domestic consumption and innovation-driven growth while maintaining integration with the global economy. This aligns with the objectives of the BRI, which seeks to promote economic connectivity and infrastructure development across partner countries. The dual circulation policy aims to boost domestic demand and reduce China's dependence on external factors, which aligns with the BRI's goal of creating more balanced and sustainable trade relationships. Through the BRI, China has signed bilateral air transport agreements and established direct flights with partner countries to facilitate cross-border transport and enhance connectivity. Both initiatives reflect China's aspirations for long-term economic stability and growth, positioning China as a global player in shaping the discourse on economic development. The dual circulation policy and the BRI further showcase China's determination to establish strong economic and trade ties with partner countries, contributing to the overall objective of building a community of shared future for mankind and global prosperity.

In conclusion, China's dual circulation policy, the China-Pakistan Economic Corridor (CPEC), and the Belt and Road Initiative (BRI) are interconnected in their goals and objectives. The dual circulation policy bolsters domestic consumption and innovation-led growth while maintaining integration with the global economy. This aligns with the CPEC, a major component of the BRI, which aims to enhance connectivity, infrastructure development, and economic cooperation between China and Pakistan.

The CPEC, as a flagship project of the BRI, plays a crucial role in fostering economic integration and development in the region. It includes infrastructure projects such as roads, railways, ports, and energy projects, which are vital for promoting trade, investment, and regional connectivity. The dual circulation policy, combined with the CPEC, facilitates economic linkages between China and Pakistan, promoting trade, investment, and exchanging ideas. It provides opportunities for both countries to strengthen their bilateral relationship and achieve shared prosperity. The BRI serves as a platform for China to expand its influence and shape the discourse on global economic development. It fosters a community of shared futures by promoting connectivity, trade, and collaboration among participating countries.

As part of the BRI, the dual circulation policy and the CPEC contribute to this objective by enhancing regional economic integration, creating jobs, and improving living standards. These initiatives underscore China's commitment to long-term economic stability, sustainable development, and engagement with its regional and global partners. They present opportunities for mutual benefits and contribute to the socio-economic progress of China, Pakistan, and other participating countries in the BRI.

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4

The Promise and Peril of CPEC: Navigating Security Challenges in Regional Connectivity

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Abstract

The China-Pakistan Economic Corridor (CPEC) stands as a cornerstone of regional connectivity, aiming to bridge Central and South Asia, facilitating economic recovery and development in these historically strife-torn regions. The corridor promises all-encompassing economic benefits not only to China but also to underserved communities in Afghanistan and Pakistan, including those in the historically isolated regions of Wakhan, Badakhshan, Chitral, and Ghizer. This chapter examines CPEC's dual role as a catalyst for regional economic prosperity and as a springboard for geopolitical shifts from traditional geopolitics to geo-economics. However, it also unpacks the complex security landscape that challenges this vision, primarily due to persistent terrorism threats from organizations like Tehrik-i-Taliban Pakistan (TTP), East Turkestan Islamic Movement (ETIM), and Islamic State Khorasan Province (ISKP) after the Taliban's reconquer of Kabul. Strategically, CPEC's expansion into Afghanistan presents a paradoxical scenario where economic ambitions are continuously threatened by the very instability caused by the terrorist operating under the shadows of Afghan Taliban. Further, this chapter delves into the nexus between various terrorist groups that jeopardize not only the economic potential of CPEC but also the broader regional stability under the patronage of Afghan Taliban. Additionally, it discusses the complex relationships and operational alliances between TTP, ETIM, and other separatist movements, which collectively pose significant security risks to the corridor's success. Also, the chapter highlights the geopolitical and socio-economic implications of integrating the historic Wakhan Corridor into CPEC, potentially transforming it into a vital link that could enhance regional connectivity and economic integration, despite the formidable challenges posed by the harsh terrain and persistent security threats. Through a comprehensive analysis, this chapter features the critical need for robust, collaborative security strategies to harness CPEC's full potential while mitigating the persistent threats that loom over this ambitious transnational project.

Introduction

The China-Pakistan Economic Corridor (CPEC) is the nucleus of regional connectivity. Through CPEC, the energy-rich Central Asian states would be connected to the energy-thirsty South Asian nations such as Pakistan and Afghanistan. This connection would not only amass economic benefits from China's colossal consuming market but also bestow its economic benefits upon historically underserved regions and communities. These include those residing in Wakhan, Badakhshan, Chitral, and Ghizer of Pakistan and Afghanistan, who have endured centuries of economic challenges due to the aloofness and unapproachability of mainstream metaled roads. CPEC promises to transform their lives and bring them economic prosperity. Yet the main hiccup in advancing the CPEC remains the security concerns in the region.

Economically, regional connectivity is the only way forward to attain economic prosperity for Central and South Asia's war-shattered states. In the former region, the decade of the 1990s was bloodied – civil wars wreaked havoc all across the region (Cooley, 2019). Now, CPEC offers an opportunity for the landlocked countries to access the navigational water that will ultimately allow them to connect with the outer world (Qaddos & Waheeda, 2023). In South Asia, Pakistan and Afghanistan remained mired in the vicious trap of terrorism for decades. As a result, the perpetual streak of terrorism and violence created a yawning gap between economic prosperity and human development. Considering history, it is justified that regional connectivity, using CPEC as a springboard, is the key to unlocking the doors of prosperity and progress in both regions. This is also tantamount to shifting the radar of policies from geopolitics to geo-economics on practical grounds.

Strategically, it is noteworthy that terrorism is the bane of regional connectivity. Terrorist organizations such as Tehrik-i-Taliban Pakistan (TTP), East Turkestan Islamic Movement (ETIM), and Islamic State Khorasan Province (ISKP), among others, are currently based in Afghanistan (Jan, 2022) and pose serious security threats to the CPEC. However, on May 6, 2023, during the fifth China-Pakistan-Afghanistan Foreign Ministers Dialogue held in Islamabad, a significant event occurred when it was announced (Helštýnová, 2023) that the CPEC would be extended into Afghanistan. This development creates a unique and complex conundrum because Afghanistan is a stronghold for the main strategic dangers to the CPEC and has expressed a strong desire to play a vital role in this paradigm-changing and transformational initiative. Therefore, it is fair to say that the Taliban must step out from the bubble of duplicity to harness the fate-changing benefits of CPEC.

Notably, regional connectivity spearheaded by CPEC involves time, resources, and patience testing for participating states. Above and beyond, the strategic challenges posed by the thick terrorist landscape of South and Central Asia are significant obstacles. Moreover, the terrorist organizations operating from Afghanistan are laced with the Balochistan separatist outfits (Khan, 2023) to target the Chinese to foil the multi-billion-dollar CPEC project. They do not operate independently; they cooperate and coordinate in ambushing their expected targets. Further, TTP, ISKP, ETIM, and Baloch separatist groups do not spare a chance to attack either Pakistan or China. The underlying collaboration among these four organizations orchestrates the actual security concerns in completing CPEC. Consequently, it is paramount to delve into the differing layers of nexus between ETIM and TTP, TTP and ISKP, and TTP and Baloch separatist organizations.

Wakhan Corridor – Bridging Regions Together

In the wake of regional connectivity, the historic Wakhan corridor has the potential to work as a fulcrum of enhancing regional connectedness. The strategic importance of the Wakhan corridor has been acknowledged for centuries, thus called the "Strategic Linchpin" (Ahmad & Jamil, 2023). Wakhan corridor is 350 KM and 16 KM wide. Geographically, it is extended to four countries: Pakistan, China, Afghanistan, and Tajikistan. Particularly, 300 km of the Wakhan corridor borders Pakistan, followed by 260 km with Tajikistan and 74 km with China (Munir & Shafiq, 2018).

Historically, the Wakhan corridor remained integral to the Silk Route for centuries (Malik, 2014). Later, it is believed that Marco Polo crossed this strip to reach China (Sparavigna, 2017). In addition, in the 19th century, Russia and the British made this location a buffer zone to avoid direct confrontation.

Particularly, the well-known Broghal Pass (Chitral), Pakistan's main entry point into the Wakhan Corridor, is vital. Since the Wakhan Corridor will offer a second or auxiliary route to the Arabian Sea in addition to the Karakoram Highway (KKH) through Pakistan, Afghanistan's geopolitical significance will rise with its opening.

Technically, it might be challenging and expensive to create infrastructure in the Wakhan due to the location of the Pamir Mountains. Nevertheless, numerous projects have been successfully finished in the region's comparable and much more complicated geographical terrains. The Pamir Mountains, where the Wakhan Corridor is located, and the Karakorum Mountains, into which the KKH was built (using 1960s and 1970s technology and taking 20 years to finish), are in the same region and have comparable topography.

Geopolitically, if the Wakhan Corridor project is successful in becoming operational, it will aid in thwarting India's intention to isolate Pakistan in the region. To accommodate its geopolitical situation, Pakistan can open all Hindu Kush Mountain range passages that provide access to the Wakhan Corridor, including the Ochhili Pass, Khun Pass, Broghal Pass, Darwaz Pass, and Karambar Pass. Nonetheless, opening these passes without strict security checks is cumbersome, providing that terrorists can sneak into Pakistan using these passes.

Socio-economically, the Wakhan Corridor is a need of the hour for local people living in and around the Wakhan Corridor. The people living in Wakhan need access to education and health, and food availability is also limited (Hassan, Khan, & Ismail, 2023). The infrastructure and the paucity of communication facilities push the people of Wakhan to ride on Yaks, Horses, and Donkeys. Additionally, connecting Wakhan Corridor to CPEC would not only bring socio-economic prosperity to the people living at Wakhan Corridor but also to the people living around its vicinity, such as the people of Chitral and people of Ghizer district of the Gilgit Baltistan. In Ghizer and Chitral, the remoteness and inaccessibility cause ascendance in the poverty pie. Inaccessibility and remoteness could be addressed in a single stroke with the construction of the Wakhan corridor and its connection with the mighty KKH.

In addition to Chitral and Ghizer, the miseries of the Chupursan valley of upper Hunza, connected to the Wakhan corridor through Irshad pass, would decrease as soon as the KKH and Wakhan corridor are linked. The Irshad Pass has been a trading artery between Hunza and Wakhan since the Silk Road (Rasheed & Ali, 2023). Demographically, it is to find people of the same ethnicity, language, and culture on both sides. This demographic homogeneity buttresses the possibility of the success of road construction between Upper Hunza and Wakhan. People would enjoy meeting each other by traversing through a black carpeted road instead of donkeys, horses, and yaks.

Notwithstanding, terrorism is the major obstacle to completing the Wakhan Corridor. In the presence of terrorist organizations in northern Afghanistan, it is an uphill battle for China and Pakistan to connect the Wakhan Corridor with the KKH. The Afghan Taliban are trying to brush aside the potential threat of terrorism to the Wakhan Corridor and CPEC, thus working against ISKP while TTP and ETIM are enjoying a honeymoon episode with the Afghan Taliban. So, without adequately apprehending and addressing the menace of terrorism, the Wakhan Corridor in general and CPEC in particular would remain a distant dream for all participating states.

Terrorists Nexus Threatening CPEC and China: A Complex Puzzle Unveiled

China and CPEC have not been spared from Islamic Jihad and have been diligently addressing the threats posed by religious-driven terrorist organizations, both within its territory and abroad, for many years. It is to note here that The ETIM and Turkistan Islamic Party (TIP) were initially the primary concerns. However, now the TTP, in partnership with ETIM, ISKP, and Baloch separatist groups, poses a significant danger to Chinese interests. Among these four organizations, three are dwelling in Afghanistan. Even ETIM and TTP are the ideologically closest organizations to the Afghan Taliban.

It bears mention that the Taliban's interest in pulling CPEC to its territory and using it as the springboard to beef up regional connectivity could be materialized if and only if it starts abandoning the internationally outlawed terrorist organizations such as TTP and ETIM. These two organizations are venomous for CPEC and regional connectivity in particular. Before the Taliban's reconquer of Afghanistan, Chinese and Pakistan officials collectively reiterated (Iqbal, Shoaib, & Bakhsh, 2024) that the Taliban must break its ties with the globally outlawed terrorist organizations such as ETIM and TTP, considering both the perilous for regional connectivity led prosperity and economic aggrandizement. Although, for the Taliban, it is not a long-hanging fruit to bottle up TTP and ETIM in a single wrap, the Taliban are not showing intentions in their pursuit to address TTP and ETIM's plight.

The TTP and ETIM alliance is not a novel development. For instance, according to (Rehman, 2014) Mufti Abu Zar al-Burmi said, "Let's disrupt China." Intriguingly, Al-Burmi has taught Qari Hussain Ahmad Mehsud (cousin of TTP leader Hakimullah Mehsud and responsible for leading the TTP's suicide bombing squad). The ETIM, officially established in 1997 (Xu, Fletcher, & Bajoria, 2014), is a separatist movement that aims to liberate Xinjiang from China's administration and establish the autonomous state of East Turkestan. Moreover, in April 2013, the ETIM propaganda outlet Islami Awazi release a video on social media showing young boys receiving training in North Waziristan, Pakistan, under the umbrella of the TTP. Previously, Hafiz Gul Bahadur, the TTP leader in North Waziristan, had allowed (Qazi, 2011) Uyghur militants to operate in the region. Once the TTP observed the ideological appeal of the ETIM, they kidnapped (Rehman Z. U., 2014) the Chinese tourist Hong Xu Dong from Dera Ismail Khan on May 19, 2014. Later that year, the TTP claimed (Syed, 2020) responsibility for the killing of a Chinese tourist and her interpreter in Peshawar, stating that it was a reprisal for the "atrocities" committed by Chinese security forces in Xinjiang. With the

help of historical untoward incidents, it is to understand that since its inception, the TTP has consistently embodied and embraced an inherent anti-China rhetoric that courses through the ideological veins of its adherents. Additionally, fast forward to 2021, when nine Chinese engineers were killed in a bomb blast at Dasu hydropower dam project. The joint Pakistan-China investigation revealed (Larres, 2022) that ETIM and TTP perpetrated the attack in unison under the supervision of TTP commander Tariq Swati.

Once the then DG ISPR has underscored (Mujahid, 2022) the supporting hands of anti-Pakistan terrorist organizations in the following words, "the leadership of all these [terrorist] networks are sitting across the border [in Afghanistan] and have the support of [India's spy agency] Research and Analysis Wing (RAW)." This statement is the testimony that the anti-CPEC terrorist organizations are backed by the intelligence agencies of rogue states, which fear losing their self-proclaimed regional hegemony when other regional states become economically prosperous.

TTP and ETIM after Taliban's Take Over of Kabul

Soon after the Taliban's reconquer of Kabul, both ETIM and TTP commenced their meetings in northern Afghanistan. According to the security experts (Personal Communication [Personal Interview], 2023) in the second week of November 2021, the ETIM and TTP held a series of meetings in Parun town, Nuristan province, Afghanistan, shortly after the Taliban's takeover of Kabul. Mullah Faqir Muhammad and Mufti Yasir led the TTP delegation, while Haji Furqan represented the ETIM. The two parties reached an agreement on the following points during these meetings:

- East Turkestan Islamic Movement and TTP will conduct joint operations.
- The TTP will assist the ETIM in the operations, and ETIM will assist TTP in the operations against Pakistan.
- The TTP will support the ETIM In operations against China and Pakistan joint projects.
- The TTP will assist ETIM in the current situation and shelter them.
- The TTP will provide arms to the ETIM.
- TTP and ETIM will share the spoils of any joint operations conducted.
- TTP will be the mediating party between the Baloch extremist groups and the ETIM. Resultantly, Baloch extremist groups, with the help of ETIM, will target CPEC projects and joint Pak-China ventures.

Further, to strengthen their operational ties, the ETIM and the TTP have undertaken efforts to foster interpersonal connections through matrimonial alliances. Intriguingly, members affiliated with the ETIM and TTP have been engaging in marital unions within the northern regions of Afghanistan. An illustrative instance occurred in April 2023, where a marriage ceremony was solemnized between individuals hailing from households associated with the TTP and ETIM, specifically in the Urdoj area of Badakhshan. When examining the historical and contemporary developments surrounding the complex interplay between the ETIM and the TTP, a revealing pattern emerges, underscoring that the TTP serves as a pivotal nucleus of multi-faceted threats. It becomes abundantly clear that the ramifications of TTP's actions extend far beyond the boundaries of Pakistan, further emphasizing its potential as a potent force capable of exerting its destabilizing influence on a broader scale. TTP's linkages and collaborations with the ISKP even double fold the threat spectrum.

Undoubtedly, the TTP, known as the mother organization, was pivotal in providing initial leaders and members for the ISKP. The very same ISKP mercilessly gunned down (Amin & Siddique, 2022) two Chinese teachers in Baluchistan in 2017. Moreover, Afghanistan has witnessed a surge in aggressive attacks and the dissemination of propaganda targeting China by the ISKP. A significant incident occurred on December 12, 2022, when ISKP specifically targeted (Verma, 2023) Chinese citizens within the vicinity of Kabul. In parallel with the kinetic means, the ISKP is active on a non-kinetic front through its propaganda apparatus. For instance, demonstrating their propaganda efforts, ISKP featured an article titled "China's Daydream of Imperialism" in their publication, the "Voice of Khorasan" magazine. Though the Afghan Taliban's iron-handed dealing with the ISKP has limited its threats, however, the TTP-ISKP relationship is still alive. In the latest issue (19) of the TTP magazine, Mujalla Taliban, features (Diary, 2023) a key article about the life of Sheikh Rahimullah Haqqani, an Afghan Taliban scholar who was killed by the ISKP in Kabul in 2022. This article shows that TTP has skillfully chosen not to denounce ISKP strategically. This discernible observation suggests that members of the TTP perceive the ISKP as a fallback option to be employed in situations where potential pressures arise from both the Afghan Taliban and the Pakistani authorities.

Concomitant with the presence of the ETIM and the ISKP, the TTP has emerged as yet another strategic threat for both Pakistan and China due to its growing proximity to Baloch insurgents. Notwithstanding the stark ideological disparities between the TTP and Baloch insurgents, with the former adhering to a religiously driven jihad and the latter representing a more liberal-oriented separatist entity or entities, they find common ground in their

shared adversaries: Pakistan and China. Consequently, from a strategic standpoint, aligning against these common foes is mutually advantageous. This convergence was succinctly highlighted when the TTP orchestrated an ambush (Mahmood & Shah, 2023) on Chinese nationals at the Serena hotels in Quetta, effectively showcasing its presence in Baluchistan and aversion towards Chinese interests.

Baloch insurgents, who were previously enjoying safe havens in Afghans have lost this privilege after the Taliban's resurgence to power in Kabul. Under such circumstances, it is a strategic exigency for the Baloch insurgents to maintain good relations with TTP. Driving by the need of the hour, the Baloch insurgents are giving space for the TTP to mushroom its influence in Baluchistan. For instance, since July 2022, the TTP has witnessed a notable expansion in its operational reach within Baluchistan, primarily attributed to the inclusion of four Baloch militant groups. These groups are spearheaded by Aslam Baloch, Mazar Baloch, Akram Baloch, and Asim Baloch, who were initially engaged (Sayed & Hamming, 2023) in combat against the U.S.-led NATO alliance in Afghanistan and have now aligned themselves with the TTP. This marks a significant development, as it represents the first known instance of the TTP establishing a presence in the ethnic Baloch regions of Baluchistan province. According to (Khan, 2023) TTP has established its organizational structure in 70 percent of Baluchistan province. Even some security analysts believe (Basit Khan, 2023) that the process of suicide bombing by Baloch insurgents is taught by the TTP fighters in Afghanistan.

Additionally, there has been a noticeable escalation in the frequency of attacks perpetrated by the TTP within the province of Baluchistan. In the initial three months of 2023, TTP claimed (Sayed & Hamming, 2023) 11 attacks in Baluchistan, whereas seven attacks were recorded in 2020, followed by 17 in 2021 and only 12 in 2022. Also, on the propaganda front, TTP produced (Sayed, 2023) its first-ever Balochi video in April 2021 to galvanize the support from the Baloch population. On January 26, 2023, Umar Media, TTP's propaganda mouthpiece (UmarMedia, 2023) released its inaugural propaganda documentary centered on Baluchistan, titled "A Glimpse of the Current Suppression of the Baloch People in Baluchistan." Reportedly, from 2015 to 2020, when both TTP and Baloch separatist groups were dwelling in Afghanistan, they came together and started cooperating (Bezhan & Khattak, 2021). Beyond technical cooperation, the TTP trained the Baloch insurgents in Afghanistan. Ultimately, this training made the Baloch separatists launch its bloodletting thread through suicide bombings.

The TTP's steady campaigns of ingress in already tenuous Baluchistan mount security problems for Pakistan's security apparatus. The TTP's confidence in

planting its feet in Baluchistan comes from the unwavering support of the Afghan Taliban.

TTP: The Hidden Danger for Regional Connectivity and CPEC in the Afghan Taliban's Shadow

Within hours of the Taliban capturing Kabul, the TTP was the first militant group to celebrate (Mir, 2022) the Taliban takeover publicly. The TTP hailed the Taliban's return to power as a major triumph for the jihadi project in a statement issued on August 17, 2021. In addition, with the release of hundreds (Mehlman & Hess, 2023) of TTP members who had been detained by American forces and the previous Afghan government from prisons throughout Kabul, the Taliban's takeover also gave the TTP an instant boost in power. This includes prominent leaders, including Maulawi Faqir Muhammad Bajauri, the TTP's founding deputy emir, and Mufti Khalid Balti, the group's former spokesperson, who were both apprehended in Afghanistan in 2013 and 2015, respectively. Bajauri was observed speaking (UmarMedia., 2021) sizable crowds of TTP fighters in the Kunar region, which is close to his own Bajaur tribal district in Pakistan. He emphasized throughout his speech that the anti-state terrorist battle in Pakistan was still ongoing and exhorted those in attendance to give the jihadi front in Pakistan their full attention. He praised the people's assistance and protection of the TTP and stated that his organization was now aiming for a similar win in Pakistan. According to Pakistan's premier Anwar ul Haq Kakar, since the Taliban's regain of power in Kabul, Pakistan has witnessed a 60% rise in terrorist attacks, a 500% ascendance in suicide bombings, and 2867 fatalities of innocent Pakistanis (Abbas, 2023).

Unfortunately, under the Afghan Taliban's full patronage, the TTP has extended its influence into the GB, the gateway of the CPEC. TTP announced (Mehsud, 2022) its shadow province in GB last week of December 2022. Later, On April 2023, the TTP's Spokesperson, Muhammad Khorasani, confirmed to a Russian media outlet, Nezavisimaya Gazeta, that the members of TTP are spared from the GB to Gwadar. Previously, TTP claimed (Ali, Ali, & Tassawar, 2024) responsibility for killing nine foreign tourists at Nanga Parbat. This time, the TTP thoroughly enjoys northern Afghanistan as its strategic depth from where it is easy to sneak into the GB cum Chitral and ambush the innocents. Shockingly, more recently, TTP claimed (SAMRI, 2023) responsibility for killing a police officer, Muhammad Alam, in the Bathret Nala Ghizer district. It is worth mentioning that the Ghizer district is connected to the Badakhshan province of Afghanistan. The TTP's attack on (Ahmad & Ahlawat, 2023) Chitral on 6 September 2023 succinctly orchestrates the vulnerability of the GB and Chitral as TTP is housing in northern Afghanistan.

Conclusion

The ship of hopes for the Taliban's practical actions to control the TTP is sinking with every second ambush on Pakistan soil. The appalling performance of the Taliban ostensibly caused strategic impediments in the completion and extension of CPEC. Economically, CPEC-led regional connectivity is the golden opportunity for Afghanistan to address its decades-long socio-economic plights. The extension of CPEC through the Wakhan corridor is not only a delicacy for the people of Pamir, Ghizer, and Chitral but also a long-awaited lucky break for the people of northern Afghanistan to get connected with the outer world and break the shackles of remoteness and inaccessibility.

Acquiring economic muscles for a landlocked state demands pragmatic and foresightedness in leadership. Practically, the CPEC has the potential to connect Afghanistan with China by land and with the rest of the world by the Arabian Sea. To pocket in the benefits, the Taliban has to control the rapidly mushrooming TTP. Currently, TTP enjoys technical-level cooperation with the Baloch separatists. The TTP provided its commanders and low-ranked fighters to the ISKP, resulting in unleashed bloodletting onslaughts by ISKP in Pakistan and Afghanistan. The thread of expanding TTP's allegiances did not stop there. Instead, it went to meetings with ETIM and ensured its assistance in its attacks against China. Therefore, this wave of cooperation and coordination driven by TTP is the most perilous security threat to CPEC and regional connectivity.

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China's Regional Engagement: Promoting Peace and Stability in Afghanistan and Pakistan through the Belt and Road Initiative

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Abstract

The "China development model" refers to the economic and political system China has implemented over the past few decades, which has resulted in significant economic growth and development in China. A combination of state-led development, export-oriented growth, and a focus on infrastructure development often characterizes the model. Under the China development model, the state plays a significant role in economic development. In this chapter, we will delve into the reasons behind China's involvement in promoting peace in Afghanistan and Pakistan. Additionally, we will explore the ways in which China is contributing to the political and economic stability of its western neighbor countries through initiatives such as the Belt and Road Initiative (BRI) and China-Pakistan Economic Corridor (CPEC). China is invested in bringing about positive change to the region and we will examine the various steps they are taking to achieve this goal.

Introduction

In October of 1949, China gained independence and became known as the People's Republic of China. For the next three decades, from 1949 to 1980, its economy was considered one of the weakest in the world. However, following

various reforms in 1980, China's economy was redirected towards a new direction. Today, China is the world's second-largest economy. While many scholars attribute China's development to its economic model, known as the "China model," it is important to note that there are multiple models within this framework. Some scholars contest the idea that there is a single economic model behind China's growth, arguing that the country's development model was copied from Europe. Western capital and technologies were utilized in capital-intensive industries such as mining, steel production, shipbuilding, spinning, railway transportation, and postal telecommunications. Others argue that China has adopted a neoliberal model, exploiting its vast pool of cheap labor, attracting foreign investment, and accelerating its transition to a liberal economy. However, China recognizes the importance of modernization for development and has shifted towards modernization in all spheres of society, unlike European modernization.

The modernization of China is founded upon the principles of peaceful development." The core interests of China align with peaceful growth. China urges the world to work together to create a society with a shared future for humanity by promoting peace, development, collaboration, and mutual benefits. In 2013, the Belt and Road Initiative (BRI), also known as the China Dream or the Chinese Development Model, a massive project, was launched by China that presented an alternative approach to development that significantly differed from the European model. Its significance extends to neighbouring countries, particularly Pakistan and Afghanistan, which have been grappling with security challenges for the past three decades. The stability and tranquillity of these countries are critical for regional cooperation and connectivity, making peace a top priority. A peaceful resolution in these countries could trigger political transition, transportation, and stability. Nonetheless, the current state of upheaval in these nations has thwarted efforts to establish peace and stability, despite the involvement of China and other local actors. CPEC and the West Asia Corridor are expected to link South Asia and West Asia, which could have significant potential for the BRI. Although the US and NATO members have endeavoured to maintain peace in Afghanistan, the Taliban has regained control of the country.

Historical Overview of China's Afghan Interests Since 2001

In the past, China has not shown significant interest in Afghanistan. However, China has become increasingly invested in the state in recent years for several reasons. Firstly, Beijing is worried about the rise of terrorist organizations such as ETIM and ISKP, as they pose a security risk to China (Weitz, 2010). Secondly, China has economic interests in Afghanistan due to its vast natural

resources, including 1.6 billion barrels of crude oil, 16 trillion cubic feet of gas, and 240 million tons of copper. The total value of these resources is almost a trillion dollars (Gartenstein-Ross, Trombly, & Barr, 2014). Thirdly, while China did not support America's prolonged presence in Afghanistan, it also opposed a hasty withdrawal without restoring peace, fearing that it could trigger a civil war in the region (Weitz, 2010). Lastly, China is concerned about the illegal drug trade in Afghanistan. Since 2001, China has actively contributed to the nation's Afghanistan's economic growth and recovery by offering assistance and support in several sectors. Regarding economic growth, security, and peace, Kabul turns to China for assistance and support (Hamdard, 2022). China nevertheless maintained a low presence in Afghanistan (Le Mière, Li, & Inkster, 2011). Contributions, particularly to the nation's economic development, are notable. More significantly, Hamid Karzai made five trips to Beijing during his presidency, showing the significance of China for Afghanistan and the growing appreciation of bilateral ties between the two nations. The "Kabul Declaration on Good Neighbourly Relations" was signed by the two nations in 2002, while the "Treaty of Bilateral Friendship and Cooperation" and the "Trade and Economy Cooperation" were inked in 2006. During Hamid Karzai's visit to China in 2010, of agreements were made that promised more collaboration in irrigation, mining, agriculture, infrastructure development, electricity generation, and resource exploration, as well as free access for some exports from Afghanistan to China (Paliwal, 2011).

Beginning in 2012, the two nations have worked diligently to strengthen their bonds of cooperation and collaboration (Yongbiao, 2018). In addition, they have provided mutual assistance in combating drug trafficking, organized crime, and terrorism. Their economic partnership has also flourished, with a focus on discovering natural resources, generating energy, constructing roads, revitalizing the agricultural sector, and advancing communications (Huasheng, 2012). Notably, Chinese telecom giants Huawei and ZTE converted Afghanistan's 200,000 analogy phone lines to digital. As a means of battling the three forces of evil—terrorism, extremism, and separatism—China also provided security cooperation and training for Afghan officials in a variety of disciplines. China also provided technical training to locals in several fields and more than 800 different Afghan authorities with human resources training (Norling, 2008). Hamid Karzai, the president of Afghanistan, and Hu Jintao, the president of China, agreed to elevate their bilateral ties to that of a strategic partnership in 2012. To better tackle the "three forces" of terrorism, separatism, and extremism as well as transnational crimes like drug trafficking, President Hu Jintao urged the two sides to strengthen their security cooperation (Raiphea, 2013). They now have stronger bilateral ties, helping to further the nation's peace and prosperity. The Afghan government has consistently expressed

gratitude to China for its support and help in promoting peace and reconstruction.

One of the major foreign investors in Afghanistan is China. The nation contains many untapped sources of thorium, cobalt, lithium, gold, cobalt, iron, and gas. China expressed interest in foreign direct investment following the opening of these sites to foreign investors. China has invested in various initiatives crucial to the reconstruction of this country ravaged by war. Currently, Afghanistan has received investments from twelve Chinese companies. China made a 425-million-dollar investment in the nation, and the total contract value of the projects it signed is 1.221 billion dollars (Yongbiao, 2018).

Beijing's Approach to the Taliban Government

In the years following the US withdrawal, China's stance on Afghanistan has mostly been influenced by its security and economic goals. Beijing has the potential to influence the situation in Afghanistan because the country is essentially sealed off from the rest of the world since the Taliban seized Kabul. China has maintained regular diplomatic connections with the new government in Kabul since the Taliban ousted the previous administration in August 2021. Like other Afghan neighbors, Beijing is cautiously in contact with the Taliban government without formally recognizing it. China has made various investment attempts in addition to allowing the Taliban to reopen the Afghanistan embassy in Beijing and restarting trade. China has collaborated with other nations to put pressure on the Taliban to implement reforms, such as the creation of an inclusive government and the defense of women's rights, particularly in the workplace and in education (Barrech, Chohan, & Naru, 2020).

China's principal worries in Afghanistan are political instability, bases for the ISKP and ETIM, power politics involving major nations, and insecurity. Through positive interaction with the Taliban, China hopes to ease these worries. Following the exit of the United States and NATO, China has maintained cordial ties with all significant Afghan stakeholders; as a result, her position in Afghan affairs is distinct. China is addressing the issues on both a bilateral and multinational level. The Shanghai Cooperation Organization (SCO) is a prospective international forum where China might cooperate with other neighbours of Afghanistan (Singh Roy, 2010). China has taken a reasoned approach to forging connections with the new administration in the post-withdrawal period. It is prepared to cooperate with it as it is in the best position to allay its legitimate concerns and defend national and regional interests. If Chinese security concerns are adequately addressed, Kabul will draw Chinese foreign direct investment and export resources, and it will boost

transport services. Beijing benefits from the improved transport options and the abundant natural riches Afghanistan offers. As a result, both parties are ready to take advantage of the chances they have for one another.

Post-Withdrawal China's Interests in Afghanistan

After a 20-year conflict, the US and NATO hastily withdrew their forces, leaving Kabul in an unsettling state and without any long-term resolution to the Afghan problem. The coalition's sole goal in signing the Doha Agreement with the Taliban was to save face following their defeat and provide a smooth exit strategy. Most of the billions of dollars spent by Washington to inflict death and ruin on the Afghan people went toward military expenses. Human rights activists paid little attention to reconstruction and rehabilitation. In addition to spending billions of dollars, Washington had to deal with the deaths of 2300 US soldiers and the injuries of 20,660 more (Jahanmal, 2018) without accomplishing any concrete objectives. The coalition led by the US had paid some attention to institution-building. As a result, the US-established system fell apart before the formal completion of the withdrawal, and the Taliban took control of Kabul in mid-August 2021. The fundamental cause was a lack of attention from the US and her allies to the establishment of strong government institutions and an army Afghanistan appears to have been invaded by the US and her allies in revenge for the 9/11 World Trade Centre attack, and they have remained there to further their geostrategic objectives there, particularly the containment of China. As a result, there was no genuine or clear aim behind this trip to promote national peace and stability. Due to its polarization and bias, the current US-led international system cannot respond to China's economic progress (Kaufman, 2010).

As a fast-rising economic power and the world's largest trader, China would never wish to disregard any potential security concern in her vicinity that could limit her commercial endeavors. China's GDP is currently 17 trillion dollars, its trade volume is 4 trillion dollars, and it has 4 trillion dollars in foreign exchange reserves (Callahan, 2016). China's interests in Afghanistan are geopolitical, economic, and security related.

Geopolitical Interests

Power struggles, political upheaval, or other dangers to its neighbours cannot be tolerated by China. China is also better positioned to make a big contribution to restoring peace and stability in Afghanistan because Beijing and Kabul don't have a rivalry. Chinese authorities have been forced to adopt a more assertive and comprehensive stance towards Afghanistan because of the withdrawal of the US and its allies from the country. Beijing received and hosted a Taliban delegation in July 2021, after which it released a formal

statement affirming that China respects Afghanistan's ability to choose its path. This makes Beijing's viewpoint clear, contending that the victory of the Taliban reflected popular will. China began to expand its diplomatic ties with the Taliban even before they took power in Kabul.

According to some analysts, China tends to regard the vacuum as an opportunity to seize both chances and challenges. Beijing wants to use Afghanistan as a regional link in the Belt and Road Initiative or the China-Pakistan Economic Corridor to earn economic benefits. Furthermore, since 2007, China has been trying to find a means to access Afghanistan's abundant mineral riches, which makes security and transportation infrastructure necessary. China is currently looking at the political situation in Afghanistan and how peace could benefit the nation because none of this is possible without a stable Afghanistan (Sakhi, 2022).

Engagement and Economic Interests

Afghanistan's frail economy was heavily dependent on US aid and donations from the West before to the pullout. If the Taliban run Afghanistan and does not promote extremism and militancy, China becomes an important ally. The Taliban Favor Chinese investment since it will bring in the much-needed funds at this crucial time, even though China is trying to resuscitate economic plans in Afghanistan. Following the US withdrawal, billions of state assets were frozen, millions of dollars' worth of foreign help to the previous government was halted, and financial sanctions nearly pushed Iran and Afghanistan's economies to ruin. In this situation, the Taliban government is actively soliciting Chinese investment, trade links, and economic backing. The Taliban will welcome any investment, particularly if it is not accompanied by lectures on human rights, according to Ian Johnson, an expert with the Council on Foreign Relations, who saw. He asserts that China's objective is likely to be at least equally political as it is economic (Johnson, 2021).

Taliban spokesman Sohail Shaheen frequently requested Chinese investment in his press briefings following the fall of the Ashraf Ghani government. China has granted 278 commodities duty-free access to export as one of Afghanistan's top trading partners since 2006 (Bashardost, 2019). Bilateral trade has significantly increased in size. The value of bilateral commerce increased and hit $523.45 million in 2021. Afghanistan was China's export market for 474 million dollars, and China was its import market for 49.53 million dollars (H. U. Khan, Dawar, & Khan, 2023). Beijing is dedicated to improving bilateral ties in several areas, including trade and the economy. To overcome the obstacles, China established an air corridor to encourage importing agricultural goods like pine nuts. Additionally, starting in 2022, China will allow 98% of Afghan imports into China to enter duty-free (Kumar,

2023). The Taliban administration wants to strengthen bilateral commercial relations during this important time as it attempts to rebuild the country's sanctions-damaged economy. Additionally, China's goods to Afghanistan are reasonably priced (Reeves, 2010). Beijing has always supported Kabul's participation in important projects, helping it to raise funds, increase local job opportunities, and expand its potential for economic growth. Afghanistan's socioeconomic development is essential for peace and security in the country and the region currently. Therefore, it is imperative to focus on economic growth, job creation, and business possibilities to put a stop to terrorism and militancy in the nation. The young people will be shielded from joining terrorist groups.

Exploring Afghanistan's mineral resources is one of China's primary objectives. The copper mine in Mes Aynak and the agreements for oil extraction in the provinces of Faryab and Sar-e-Pol represent China's main economic interests. The nation is rich in natural resources, much of which is undeveloped, including copper, iron, silver, lithium, chromite, diamonds, oil, and many others. The 30-year Aynak copper mining project, valued at 3.5 billion dollars and projected to have 3 trillion dollars' worth of copper reserves, is one of China's most significant investments aimed at stabilizing Afghanistan's economy (R. M. Khan, 2015), 4,000 direct jobs, 7,600 indirect jobs, and 62,500 induced jobs are anticipated to be produced (Iqbal, 2016) and once fully operationalized, it is anticipated to produce income equivalent to 45% of Afghanistan's overall budget (Bukhari, 2012) and the 25-year effort to explore gas and oil in the oil reserves of the Amu Darya River Basin. It is important to note that this was the first deal in Afghanistan's history that allowed any foreign nation to find petrol and oil there. This oil exploration contract was signed in 2011 by China National Petroleum Corporation. According to a report, these oil fields have oil reserves totaling roughly 87 million barrels. According to the contract, China will contribute $400 million to this project and give the Afghan government 20% of its revenue as taxes, 15% as royalties, and 70% as income. This project is scheduled to cost Afghanistan 304.35 million dollars a year, or $7 billion throughout the 25-year contract. It is anticipated to create 7,000 employees (Tahiri, 2017).

More recently, on January 5, 2022, the Taliban government and China agreed to work together to develop an oil field in the Sar-e Pul area and drill for oil in the Amu Darya basin. About $150 million will be invested annually by China, and over the following three years, that sum will increase to 540 million dollars (Briefing, 2021). Since the Taliban took over in 2021, this partnership marks the first big energy extraction agreement with an outside company. The Taliban government and a Chinese state-owned company are in talks about the mining operations at the MesAynak copper mine. It would follow a 3.5

billion dollar, 30-year pact that the previous Afghan administration inked in 2008. All these objectives and activities would substantially impact the war-torn nation of Afghanistan's economic development. Despite security worries, Chinese investors are nonetheless drawn to Afghanistan's immense natural wealth. Therefore, China is a more advantageous partner to work with as the Taliban avidly wants foreign investment and aid to support the nation's weak economy. Investment in the nation is now uncertain following the Taliban's capture of Kabul, but if a stable administration is established, local and global investments will continue.

To help the Afghan people survive the harsh winter of 2021, China sent 250 million Yuan in food, medicine, winter clothing, and other supplies to Afghanistan (Aria, Tayeb, & Zazai, 2023). China has also given an Afghan family impacted by the recent earthquake $8 million in humanitarian relief. China is willing to contribute to projects boosting regional infrastructure and connectivity. During the meeting on Afghanistan held in Tashkent on July 26, 2022, Yue Xiaoyong, China's special representative for Afghanistan, declared that China will finance the construction of a transnational railway crossing through Afghanistan. It is intended to connect Uzbekistan to the seaports of Pakistan (Shibasaki, Tanabe, & Kato, 2021). China sees Afghanistan as a link between South and Central Asia.

Beijing worries about the dangers of being unnecessarily involved in Afghanistan, which is viewed as a "strategic trap" and the "graveyard of empires." Afghanistan's participation in China's Belt and Road Initiative is particularly significant, including its linkages to the CPEC (China-Pakistan Economic Corridor). New economic obligations must, however, come after a period of stability. If the country's security and political climate were favorable, China would undoubtedly play a significant investment role. In other words, Beijing will proceed cautiously before becoming completely involved in the Afghan situation. While making sure that its issues are taken care of, China will gradually and methodically fill the void and fulfil the Taliban's wants and desires.

Security Interests

China has four security concerns in Afghanistan: first, it must ensure the security of its border; second, the Taliban must expel Uyghur militant groups operating in Afghanistan; and third, it must safeguard its current investment (Murtazashvili, 2022). Afghanistan is home to several anti-China militant groups that have directly threatened China's national security and unification. ETIM and ISKP are China's main security threats. The security prospects of other regional states, one of which is China, a country that is right next to Afghanistan, have been cast in doubt due to the growth of the ISKP, also

known as ISK, in Afghanistan, particularly after the withdrawal of the United States of America and the Taliban's takeover (Kapur, 2022). When analyzing China's predicaments, the actual circumstances paint a clear picture of the potential risks to China as a state and to its interests in the nearby foreign countries. The combination of the ETIM and ISKP represents a significant advancement in this regard. The United Nations has designated ETIM as a terrorist group with its headquarters in the Xinjiang area of north-eastern China. Combining forces with ISKP will not only give this Muslim organization asylum in Afghanistan, posing security risks for China, but it may also make China one of ISKP's targets considering the Uighur Muslim uprising there. It's important to note that the Taliban allowed Uyghur organizations to operate on Afghan land during their first administration, which lasted from 1996 to 2001, and they continue to have a sizable haven presence there.

The attack on Kunduz, which was carried out by an ethnic Uighur in 2021 and for which ISKP claimed responsibility, is a crucial fact that supports this viewpoint (Soliev, 2021). The Belt and Road Initiative was criticized by ISKP in September 2022, calling it the work of "red atheists whose hands are soaked with the blood of innocent Uyghur Muslims" (H. U. Khan et al., 2023). The ISKP's objectives against China are revealed in this alarming statement, which also urges its supporters to use force against China. In the September 2022 issue of Voice of Khorasan Magazine, ISKP describes China as an "Imperialist" and expresses scepticism about relations between Beijing and Kabul (H. U. Khan et al., 2023). The ISKP's threats to China's interests outside of China, particularly Chinese investments, are another implication. For instance, the Afghan security situation, which ISKP contests, is a condition of China's involvement in the MesAynak and Amu Darya Oil Projects and many other projects (H. U. Khan et al., 2023).

Taliban refuses to extradite the numerous multinational Jahidi groups operating throughout the nation, instead choosing to adopt clandestine measures to stifle or end their extraterritorial activity. Evidence suggests that the Afghan Taliban transferred Uyghur terrorists from China's border province of Badakhshan to assuage Beijing's security concerns (Clarke, 2016). ETIM is likewise trying to balance its hostility towards China and the Taliban hosts.

The Belt and Road Initiative (BRI)

The Belt and Road Initiative (BRI), also known as One Belt One Road (OBOR), is a worldwide infrastructure development strategy proposed by the Chinese government in 2013. The initiative aims to promote economic development and connectivity among countries in Asia, Europe, Africa, and other regions through the construction of physical infrastructure, such as ports,

roads, railways, and energy pipelines, as well as digital infrastructure, such as telecommunications networks. The Silk Road Economic Belt and the 21st Century Maritime Silk Road are the two main components of the BRI. The "Belt" refers to a network of land routes connecting China with Central Asia, Europe, and the Middle East, and the "Road" is a network of sea routes connecting China with Southeast Asia, South Asia, Africa, and Europe. The BRI will be the largest infrastructure project in history, requiring trillions of investments over the next decades. While some nations have welcomed the project with enthusiasm, others have voiced worries about its possible effects on the environment, society, economy, and geopolitical ramifications.

The Prospect of Afghan-China Economic Relationship

Afghanistan has a few viable business prospects, regardless of who the government is. We quickly cover each one here: The BRI's (Belt and Road Initiative) inclusion of Afghanistan. From East Asia through the Middle East, Africa, and Europe, BRI is essentially an infrastructural project. By signing a Memorandum of Understanding (MoU) with China, 142 nations had joined the BRI as of 2021 (Nedopil, 2022). Afghanistan was not included in the BRI's initial mapping because of the presidential election turmoil in 2013–2014; nonetheless, the two nations signed an MoU in 2016, and Afghanistan took part in the first BRI summit in China. If completely implemented, this will significantly improve Afghanistan's economic situation. Afghanistan might join the BRI via of several channels: Initially, via the Five Nations Railway Corridor (FNRC), a Tajikistani project started in 2014. The 2100-kilometer railway travels from China through Kyrgyzstan, Tajikistan, Afghanistan, and Iran before arriving in Iran. The distance between the provinces of Kunduz, Balkh, Jawzjan, Faryab, Badghis, and Heart in Afghanistan is over a thousand kilometers. The technical and economic survey for creating the international railway project was around 50% complete, the Afghanistan National Railway Authority (Routray & Haldar, 2018). With Iran's financial assistance, only 34% of the 225-kilometer railway line connecting Herat in Afghanistan to Khaf in Iran was finished in 2020. The project has not advanced further and is currently at a standstill. The first FNRC cargo train from Nantong, Jiangsu Province, China, landed in Hairatan Port as a test run with 84 containers on board. 2019 saw the departure from Hairatan port of a goods train carrying 41 containers and 1100 tons of talc for China (Starr & Kuchins, 2010).

Second, the China-Pakistan Economic Corridor (CPEC) offers viable connections between countries. This project was the BRI's flagship, with estimated disbursements of approximately $50 billion. Afghanistan may be connected to CPEC through five practical routes. In Rahimi and Hassani, these routes are fully reviewed (Taye & Ahmed, 2021). The Digital Silk Road,

another Chinese investment project that is currently inactive, offers a third option. Initially, China, Tajikistan, Afghanistan, and the Kyrgyz Republic signed the Silk Road Optical Fibre Cable System and Strategic Cooperation. From Wakhan Corridor to Faizabad city, the 480 km fiber optic project runs entirely within Afghan territory. The cost was predicted to be between $50 and $70 million, and the Chinese were expected to finance it over four years.

Taliban and Chinese Dynamics

The political climate in Afghanistan will determine the likelihood of future commercial ties between Afghanistan and China. With the Taliban back in control after the government's collapse in August 2021, Afghanistan entered a new chapter. Since 2013, the Taliban and the Chinese have had cordial relations, to put it mildly. The Taliban team in Doha was invited to Beijing, where they were offered rides on the bullet train between Beijing and Shanghai (Latifi, 2021). In 2014, the Taliban and Pakistani officials met to discuss the peace process after the Chinese special envoy to Afghanistan reportedly travelled to Pakistan to meet with Afghan Taliban representatives (Wong & Mashal, 2015). An envoy from Afghanistan and Taliban leaders met in China in 2015 to discuss the potential for formal Afghan peace talks. A high-level Taliban delegation then travelled to China in 2016 to discuss the Afghan peace process and counterterrorism issues (Seerat, 2015). In addition, after the Taliban carried out an attack in Kabul in September 2019 (Katzman & Thomas, 2017), The organization and the United States suspended their negotiations. China requested Taliban representatives to attend a two-day intra-Afghan conference in Beijing to fill the void (Thomas, 2018), but the gathering was postponed due to COVID-19 problems.

The Taliban declared that they would not permit any military to use Afghan soil as a base for assaults against China. They also hoped that China would contribute more to Afghanistan's economic growth and rehabilitation (Airan & Rahimi, 2022). Even though China has not officially recognized the Taliban government, it has donated $31 million worth of food, winter supplies, vaccines, and medications as a gesture of goodwill. The Taliban referred to China as their "most important partner" and said that it offered them "an extraordinary opportunity" since it was willing to invest in and restore their nation (Berman, Downey, Dakhama, Day, & Chu, 2018). Does this display of affection amount to any substantial economic prospect?

Some data suggests that China has not always made successful investment decisions in the past. When Chinese investors consider investing in the mining sector, they tend to give the political environment a high level of importance. A stable political environment offers more assurance for a guaranteed investment return because mining investments demand long-term

commitment (Xia, Jiang, Yang, & Wang, 2021). It's possible that Chinese businesses aren't yet prepared to invest in Afghanistan as much as the Taliban had hoped.

The absence of a cautious, wait-and-see approach on China's part in its interaction with the Taliban may be due to other underlying issues. These options include dealing with the Taliban directly or through an intermediary (such as Pakistan). There may be concerns regarding the impact of Pakistani involvement and the benefits it could offer. Direct interaction with an ideologically driven party with a track record of erratic foreign policy entails unknown hazards. For instance, the hardliners have been highly vocal over the Chinese government's detention and imprisonment of Muslim Uyghurs, while certain members of the Taliban leadership have remained silent. According to a UNSC report 2021, the organization has several hundred members and is still operating in Afghanistan's Badakhshan, Faryab, Kabul, and Nuristan regions. The organization, which predominantly supports Al-Qaida, wants to create a Uyghur state in China's Xinjiang region. Additionally, according to a UNSC report on Afghanistan's security report in 2021, 8,000 to 10,000 jihadist fighters from Pakistan, Central Asia, the Russian North Caucasus, and western China's Xinjiang region flooded Afghanistan months before American forces withdrew. The Faryab, Sar-e Pol, and Jawzjan Provinces are currently the Islamic Movement of Uzbekistan (IMU) headquarters. Afghanistan's northern areas are home to several populations with Central Asian ancestry. The stability of their relationship with the Taliban is now a concern for the Chinese.

The Flagship Project: China Pakistan Economic Corridor

The CPEC, a component of one belt, one road, contains features of shared prosperity and benefits, as well as complementary interests, teamwork, and collaboration. It is a widespread transportation route and cooperative industrial and commercial route between China and Pakistan, with the potential for inter- and intra-personal interaction and sources of cultural diffusion and exchange. CPEC also has the potential to grow politically, socially, and economically, bringing stability, prosperity, and security to the region (Jadoon, Khan, Khan, & Chi, 2017).

The CPEC stretches from the majority-Muslim province of Xinjiang Uygur in China to nearly all of Pakistan. Kashgar, Atushi, Tumshuq, Shule, Shufu, Akto, Tashkurgan Tajik, Gilgit, Peshawar, Dera Ismail Khan, Islamabad, Lahore, Multan, Quetta, Sukkur, Hyderabad, Karachi, and Gwadar are the principal regions through which CPEC travels. The CPEC will also have five functional zones, three tunnels, two axes, and one belt.

Peace, Prosperity, and Conflict Resolutions through CPEC

In a very limited sense, peace is described as the lack of reaction to wrongdoing and cruelty (Philpott, 2015). It may also be viewed as the total absence of war, which merely falls under the negative definition of peace. However, peace is founded on advancing society's political, social, and economic structures as well as the abolition of injustice and breaches of human rights (Ali, 2015). More specifically, peace concentrated on the liberal, postmodern, and modern definition of democracy, which is related to the deconstruction of the parochial society, snatching powers from one body, and sharing with the rest of the community, where popular democracy is witnessed. Where there is a prohibition on the abuse of authority and no exploitation of the individual (Ahmar, 2018). Gandhi and Bacha Khan's nonviolent philosophies are a component of positive peace in which there is no breaking of the law, no demanding of rights outside the reach of the law, and no use of force in demonstrations or strikes. Therefore, there is a potential for conflicts, violations, and war in this method. Violent demands for justice fall under the category of unproductive peace. Cooperation, communal action, comprises of the mutual consent against abusive and parochial power and compels those activities which are committed against them, was how Jonathan Schell helpfully characterized the dilemma of non-violence (Barash, 1991). Briefly said the think tanks are searching for easy ways to encourage collaboration, consensus, mediation, resolutions, and more efficient ways to settle conflicts and disagreements and transform the factors that lead to war into those that lead to peace. However, the word has multiple heads and tails and no clear end, but it is quite expressive.

Conflict exists despite the possibility of perpetual peace because of the world community's anarchy. Conflicts are caused by disagreements, unreasonable demands, denial, and counterclaims. Because war and conflict have higher costs, the international community has been increasingly interested in conflict prevention, mediation, management, and settlement. Numerous techniques are employed for dispute resolution, including good offices, arbitration, inquiries, negotiations, problem-solving sessions, second-track diplomacy, rapprochement, and judicial resolution (Butt & Butt, 2015). Conflict resolution, however, necessitates unequivocal assurance from all parties.

The Role of CPEC in Promoting Regional Integration, Economic Growth, and Peace

Conflict and violence are less likely in societies with political, social, and economic interconnectedness. Free trade and economic interdependence, according to liberal thinkers, promote peace and reduce the threat of militancy. The Economic Opportunity Cost Hypothesis looks at the idea that as nations

become more interdependent economically, peace will eventually break out. The threat of war will lessen (Chang & Khan, 2019). Economically fragile states, in contrast to economically shattered states, are typically strengthened in hostilities with one another. Therefore, the benefits of trade globalization are what reduce international conflict. Neo-Functionalism, a philosophy that examined the norms and ideals of European integration, emphasized the idea that cooperation and harmonization in one sector pave the way for it in other sectors (Cheema, 2020). When there is an increase in societal harmony because of the further extension of the chain of integration. Afghanistan, Iran, India, Pakistan, China, and other central Asian governments can regionally integrate through CPEC, much like European states do. The CPEC has the potential to foster unity, cooperation, and economic progress among the member governments in the region. The CPEC offers the chance for free commerce, economic dependency, transportation, and regional integration through functional collaboration in accordance with following Neo-functionalism's standards.

Due to militancy, conflicts, overpopulation, slow growth, lack of education, and the weapons race among states, South Asia is the world region most adversely affected. In addition to creating a security challenge, terrorism in the region (particularly in Afghanistan and Pakistan) exacerbated the dispute between Pakistan and India over Kashmir, which has long disrupted the region's economic system. Through geopolitics and geonomics, CPEC provided the best chance to end disputes and establish peace. Because of the functional cooperation based on shared interests and needs, this corridor can potentially foster regional integration and economic interdependence in the area (Chen & Naughton, 2017). Through economic trade, economic liberalization, free policies, and open membership, the CPEC network linked regional and extra regional extra-regional nations to expand trade and commerce on a global level and meet requirements and interests (Council, 2019). Across the "One Belt, One Road" initiative, CPEC travels across Asia before entering Europe (Laursen, 2008). The China-Pakistan-Iran-India-Afghanistan-Central-Asia-West Asia Corridor (CPEC), which is a part of the Belt and Road Initiative (BRI), has the potential to link China, Pakistan, Iran, India, Afghanistan, Central Asia, and West Asia. Additionally, there may be connections between India and other Central Asian nations. After crossing through Asia, CPEC penetrates Europe via the "One Belt, One Road" idea (Haq & Farooq, 2016).

Peace through Security in the Region

The issues of terrorism, militancy, Kashmir wars, crimes like piracy, human trafficking, and issues surrounding the Indian Ocean have caused tremendous

anxiety throughout the region regarding international trade and commerce, the collapse of the economy, and security threats. One of Pakistan and China's main priorities is to respond to these devastating challenges because they are also having a significant impact on Pakistan's security and economy. To promote peace and stability in the region and protect the CPEC from insecurity, China and Pakistan launched a collaborative effort for the fortification of their marine security (E. Hussain, 2019).

To maintain peace and security in the area, China and Pakistan worked together on security to increase the security of the CPEC and preserve regional peace. On a shared security plan for the area, the states have come to an understanding. As a serious concern in the area, terrorism in Pakistan and China's Xinjiang region poses a grave danger to regional peace (F. Hussain & Hussain, 2017). To safeguard the CPEC and Western regions, China raised enhanced security measures with Pakistan. As a result of the CPEC project, China and Pakistan are now in a position of greater security as both nations expand their military and naval activities and work closely together to combat maritime piracy (S. Hussain & Khan, 2017). The United States and India have close goals in the Indian Ocean to curb China's presence in the region. This is known as a power dominance game. To preserve South Asia from US-Indian supremacy, Sino-Pak has a close maritime agenda (Javed & Ismail, 2021). China and Pakistan are battling to turn Gwadar Port into a naval base shortly to establish a balance of power in the region.

The CPEC serves as the basis for China, Pakistan, and Russia's shared security and is considered a superpower triangle. A secret meeting between the head of Russia and Pakistan's high officials occurred on the deep-sea route Gwadar after China and Pakistan urged Russia to join. The meeting's key agenda items included enhancing their military and defense ties, sharing intelligence data, and demonstrating an interest in working together. Additionally, trade was discussed, and Russian authorities were made aware of the business potential associated with CPEC (Irshad, 2015). According to Global Times, China's top English-language news outlet, Russia's involvement in the CPEC will strengthen the security system and stop the international community, particularly India, from interfering needlessly and fretting about hazards to the project (Javaid, 2016). Russian participation in CPEC will thus increase the threats from the US and India while simultaneously signaling a break with India and the formation of an alliance with Pakistan and China.

In addition to using CPEC as a substitute for the South China Sea, China also imported oil from OPEC nations, including Iran, Iraq, and Saudi Arabia. China travels a long way to import oil; it travels through the Gulf and the Strait of Hormuz and enters the Arabian Sea. After traveling through the Indian and

Pacific oceans, the oil ships then pass through the Strait of Malacca and enter the South China Sea, where they eventually arrive in Honking. There is no other route available hence this one goes via the South China Sea. However, there are numerous issues because the South China Sea is home to several wealthy and resourceful islands, including Paracel Island, Spiritless Island, and Scarborough Shoal Island. States like Vietnam, Indonesia, Malaysia, the Philippines, Brunei, and Taiwan want to control this region (Jeong, 2017). China claimed ownership of the Nine Dash Line, but other nations disagreed. Therefore, UNCLOS (United Nations Convention on the Law of the Sea) divided the Nine Dash Line into numerous states to solve the problems and reject China's claim to the South China Sea. Additionally, China has a very lengthy route through the South China Sea. Therefore, CPEC is very beneficial for China's trade and keeps the country safe from all issues that arise in the South China Sea. CPEC is far closer than the South China Sea, and it will also help China develop the western half of the country, where only 6% of the population currently resides.

To eradicate extremism, radicalization, and terrorism, social, political, and economic stability is crucial. Terrorism, militancy, and insecurity are all fueled by poverty, unemployment, and illiteracy. Unfortunately, Pakistan suffers from a lack of tolerance, a lack of democracy, unemployment, bad living conditions, and poverty. As a result, there is militancy, extremism, terrorism, and radicalization. The result of the factors mentioned above is the terrorist organizations in the Federally Administered Tribal Areas (FATA) (now a part of Khyber Pakhtunkhwa), as well as the insurgency in Baluchistan. The eradication of extremism, radicalization, and terrorism depends on social, political, and economic stability. The root causes of terrorism, militancy, and insecurity are poverty, unemployment, and illiteracy. Sadly, Pakistan suffers from poverty, illiteracy, unemployment, a lack of tolerance, a lack of democracy, and bad living conditions, which has led to militancy, extremism, terrorism, and radicalization. The result of the causes is the insurgency in Baluchistan and the Federally Administered Tribal Areas (FATA), which are now part of Khyber Pakhtunkhwa (Marwat & Khan, 2016).

CPEC and Regional Conflict Resolution

Any political impasse, whether bilateral or international, may give rise to dangers on a local and regional level if it cannot be resolved. As a result, Pakistan's and South Asia's political histories are rife with political difficulties, whether they have to do with the Kashmir dispute, terrorism, ethnicity, wars, or other matters. These are very serious mistakes South Asian countries have made that prevent collaboration and peace in the region. Conflicts between Pakistan and India have frequently been sparked by the Kashmir dispute (Hadi,

Batool, & Mustafa, 2018), The ongoing dispute, coupled with the Uri Attack, India's pursuit of "surgical strikes," allegations of terrorism and counterterrorism, as well as the political and geostrategic interests in Afghanistan, including the recent terrorist attack at Pulwama, serve as the main catalysts for the conflicts between the two nations. These factors significantly impede collaboration and peace in South Asia. Furthermore, Pakistan's participation in the conflict with the Soviet Union in Afghanistan in 1979 bolstered the ISI (Inter Service Intelligence) and CIA (Central Intelligence Agency) in defeating the Soviets, which, in turn, hindered the development of a positive relationship between Pakistan and Russia. As for Pak-Afghan relations, historical fluctuations have seen both countries accusing each other of supporting insurgents and meddling in internal affairs, thus posing primary challenges in South and Central Asia that obstruct bilateral and multilateral interactions, as well as collaboration among the regional states. Being a landlocked nation, Afghanistan's ambition to join the CPEC is encouraging for Kabul because it would make it easier for Afghanistan to access the global market. Dr. Omer Zakhilwal, the ambassador of Afghanistan to Pakistan, stated in an interview with Dawn that the CPEC is a significant undertaking relevant to Pakistan and Afghanistan. He emphasized that anything that benefits Pakistan will also benefit the entire region (Ranjan, 2015). Furthermore, he expressed Afghanistan's keen interest in CPEC, highlighting its relevance to Afghanistan in multiple ways (Saud, 2018). The Afghan representative also emphasized that joining CPEC would aid Afghanistan in recovering from the long-term damage caused by the war on terrorism. Therefore, Afghanistan's involvement in CPEC presents a significant opportunity for growth and prosperity. Engaging in regional politics and the economy will not only help Afghanistan achieve peace but also ease tensions between Pakistan and Afghanistan. Given that CPEC is an economic corridor that fosters economic interdependence, mutual interest in the project's success will deter conflict. Moreover, CPEC will reduce Afghanistan's dependence on India, which is advantageous for Pakistan. Consequently, this will eventually lead to the resolution of border disputes between Pakistan and India, as well as between Pakistan and Afghanistan.

Conclusion

The "China development model" refers to the economic and political system China has implemented over the past few decades, which has resulted in significant economic growth and development in China. While China's economic and political system may have some positive effects on neighboring countries like Pakistan and Afghanistan, it is important to note that the extent to which it can bring peace and stability is not entirely clear.

China has been investing heavily in infrastructure projects in Pakistan and Afghanistan, which could potentially bring economic development and stability to these countries. For example, China is investing billions of dollars in the China-Pakistan Economic Corridor (CPEC), a network of roads, railways, and pipelines connecting China's western province of Xinjiang to the Pakistani port of Gwadar. This project could potentially boost Pakistan's economy and create jobs, leading to greater stability in the region.

Similarly, China has also been investing in infrastructure projects in Afghanistan, such as constructing a railway line connecting Afghanistan to China. These projects could bring economic development and stability to Afghanistan, which has been struggling with conflict and instability for decades.

However, it is important to note that while such investments may positively affect these countries' economic development, they may not necessarily bring about peace and stability. Political instability, corruption, and ongoing conflict can all hinder the positive effects of economic development. Additionally, the involvement of external powers such as China in the political affairs of these countries could potentially exacerbate existing tensions and conflicts.

In summary, while China's economic and political system may have some positive effects on neighboring countries like Pakistan and Afghanistan, the extent to which it can bring peace and stability to these countries is not entirely clear. The success of such investments will depend on various factors, including the political climate, the effectiveness of governance, and ongoing conflicts in the region.

China's investment in infrastructure projects such as the China-Pakistan Economic Corridor (CPEC) and the construction of a railway line connecting Afghanistan to China is part of its broader foreign policy strategy, the Belt and Road Initiative (BRI). The BRI aims to connect China with countries across Asia, Europe, and Africa through infrastructure development and investment.

In the case of Pakistan, the CPEC is expected to create thousands of jobs and bring economic development to some of Pakistan's most underdeveloped regions. The project includes the construction of highways, railways, and pipelines and the development of Gwadar port. Gwadar is strategically located near the Strait of Hormuz, through which a significant portion of the world's oil supply passes, giving it the potential to become a major trading hub. However, there are concerns about the impact of the CPEC on Pakistan's sovereignty, given that the project is largely funded and controlled by China.

Similarly, China's investment in infrastructure projects in Afghanistan could bring about economic development and stability. The proposed railway line connecting Afghanistan to China would pass through some of Afghanistan's most unstable regions, which could help to promote economic development and stability in these areas. However, the ongoing conflict in Afghanistan and the presence of various armed groups could pose significant challenges to the success of such projects.

It is also worth noting that China's involvement in the political affairs of these countries could potentially exacerbate existing tensions and conflicts. In the case of Pakistan, China's close relationship with Pakistan has been a source of tension with India, Pakistan's neighbor, and long-time rival. Similarly, China's involvement in Afghanistan could create tension with other regional powers, such as the United States and Russia.

Overall, while China's investment in infrastructure projects in Pakistan and Afghanistan could potentially bring about economic development and stability, there are also risks and challenges associated with such investments. The success of these projects will depend on various factors, including the political climate, the effectiveness of governance, and ongoing conflicts in the region.

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6

Beyond Numerical Data: A Qualitative Study of the Marvels of Economic Development in China

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Abstract

Economists believe that development is an evolutionary process of steady growth and progress. The recent economic growth and prosperity in the People's Republic of China (PRC), however, entails a different story. The robust growth and development in various sectors of the PRC negated the notion of gradual growth and development and ushered the Middle Kingdom into a new era. The incredible success and profound progress made in various sectors, especially in trade & commerce, technology, and industrial field, has enormous opportunities to learn. Acknowledging all other factors of progress, one dimension is particularly significant. It warrants huge acclaim in the efficient, productive, and meaningful utilization of a large workforce and effectively channeling their efforts, competencies, and skillsets in the right direction.

Economists are intrigued by the incredible development embraced by the PRC, and many people, especially foreigners, have been seen asking, "What is the underlying reason for such a robust development? How can all this development be achieved in a short span of three to four decades? Beyond the effective and intelligent governmental policies, what other factors have contributed to this miraculous development? Economists certainly have a better answer to it, and they can quantitatively prove their argument. But what

about the general public in PRC think. What's their take on the ongoing rapid development and transformative changes unfolding in their daily lives – from using a ride-hailing bike to the fast trains and subways spread across the cities to make a swift payment in seconds through their smartphones? This study attempts to answer some of these questions by getting opinions from a diverse array of people – from educated folks, professors, and students to laborers working tirelessly to construct buildings, roads, and other infrastructures.

This study gathers the thoughts of the common people in China about their perspectives on economic development and prosperity. The findings would help in better understanding the nuances of development in China. The study is expected to provide useful insights to researchers, academia, and the business community interested in exploring the underlying reasons behind China's miraculous development.

Introduction

"The nineteenth century belonged to the Great Britain, twentieth century belonged to the United States of America, while twenty-first century belongs to the People's Republic of China".

~ Anonymous

When examining human history, it becomes evident that economic, social, and technological advancements have consistently unfolded through a gradual and incremental process. Even the Industrial Revolution came in phases and spanned over more than a century. As (Nelson, 2016) posits, economic development is an evolutionary process. It involves the gradual improvement of a country's economic infrastructure, including changes in public policy, infrastructure, and social infrastructure, as well as the introduction of new technologies and industries.

All evolutionary theories in economics, as well as in science, indicate this slow transformation and evolution. Nonetheless, theories and assumptions could prove wrong as all theories and forecasts are generally based on current and past trends, whereas at times the future course could be beyond expectations. That's somewhat true of the economic development of the People's Republic of China (PRC), which has witnessed one of the fastest growth and economic development in human history. The phenomenal growth, progress, and technological and industrial advancement made by the PRC in the last three to four decades has amazed the rest of the world. Now the PRC is the economic powerhouse, and all the world's major economies, including the United States and Japan, are the major trading partners of the PRC. Undoubtedly, it's a

testimony of the pragmatic and viable policies and vibrant strategies spearheaded by the Chinese government.

It is reasonable to assert that one of the later extraordinary politico-economic events of the second half of the twentieth century is the rise of China to the global stage – not only to be recognized and attended to – but also concerned of its remarkable economic growth and prosperity and as a result confronting the once mighty western powers. China has been a mighty empire for centuries and has a culture, history, legacy, and civilizations that span more than five thousand years. Marco Polo, the famous conqueror, was reportedly amazed to see the mighty Chinese empire and its prowess in various trades on his visit to China in 1271.

The first half of the twentieth century saw a turbulent time of internal strife, civil war, and external invasions, which was finally abated in 1949 with the declaration of the People's Republic of China. In recent years, the world has witnessed a dramatic transformation, especially with the emergence of China as a global superpower and the second-largest economy in the world. China's rapid economic development has resulted from a series of comprehensive and far-reaching economic reforms implemented since 1978. Since the onset of reforms, China's GDP has grown at an average rate of 9.5% per year since 1978, when the first SEZ was established. This has contributed to a marked increase in China's economic development and prosperity, with the country now being the world's second-largest economy.

In terms of the size of the economy, China's economy is of significant magnitude, with individual provinces surpassing the size of certain countries in terms of economic output. The GDP growth of Guangdong province remained at 9.73 trillion ($1.4 tr.), which is almost close to South Korea, whose GDP growth rate remained at 1.53 trillion in 2017 (Jing Shuiyu, Xin Zhiming, China Daily, 2019, January 31, 2019). The second-largest economy in terms of GDP growth in 2018 was Jiangsu province, which touched 9.26 trillion yuan. According to the World Bank, the GDP of China reached $18 trillion, constituting 18.4% of the global economy,

Despite China's impressive overall economic progress, its per capita income still falls behind developed nations. Substantial improvements are necessary to meet the benchmark levels of developed countries. Realizing this gap, the Chinese government has implemented various reforms and opening-up policies to enhance citizens' quality of life. However, while making remarkable progress, China does not boast of being a fully developed nation, opting instead for the classification of a moderately developed country.

As the country's economic environment changes, so do its economic opportunities, leading to further economic development. In the case of PRC – is it simply the reason for being the most populous country on planet Earth or the size of the country (China ranks 2nd in terms of the area), or else? Beyond the economic data, what does it tell us about the socio-economic miracles of the country?

What do common people in China perceive about social and economic development? To give leeway and latitude to respondents to express their true feelings, we asked open-ended questions. Such as, *"In your opinion, other than the effective governmental economic policy, what were other reasons for the fast development of China? Compared to when you were a child, what changes came into being?* This article examines the socio-economic factors that contributed to the miraculous rise of China to the world stage. There is a plethora of literature and enormous quantitative data and economic indicators to explain the phenomenal growth and prosperity of China. However, this article takes a qualitative lens of unleashing the factors that have significantly contributed to the robust development and prosperity of China.

This modest effort endeavors to unleash some of the nuances of socio-economic factors that contributed to phenomenal growth, development, and prosperity in China. This study uses qualitative data collection techniques to explore the experiences, knowledge, and understanding of a diverse array of people – from educated people, professors, and students to laborers regarding their work and life. By gleaning primary data from a diverse stream of respondents, this study shed light on the reasons behind the phenomenal growth of China and the perceptions of the masses instead of economic data and numerical numbers to explain the argument.

This chapter analyzes the main factors behind China's fast economic development to ascertain the principal drivers of this remarkable growth.

Theories and Approaches of Development

Structuralist Approach

This approach emphasizes the role of government in actively intervening in and managing the economy, through investment in infrastructure, industrial policies, and the promotion of export-led growth. The structuralist approach to development is an economic theory that focuses on the role of structures, such as the state, institutions, and international organizations, in influencing economic growth. It emphasizes the role of the state as the main actor in supporting economic growth, as well as the importance of international organizations and institutions in promoting economic development. It is based

on the belief that development is the result of structural changes and not the result of individual behavior.

In the case of China, the structuralist approach has been applied to explain the country's rapid economic development during the past few decades. A major structural shift was the market liberalization, which played an important role in China's growth. The Chinese government has allowed foreign companies to enter the Chinese market, which has enabled businesses to benefit from the country's vast market potential (Nolan, 2001). This has enabled businesses to expand their operations and increase their profits. The Chinese government has implemented several policies and reforms that have improved the country's economic infrastructure, such as investments in infrastructure, education, healthcare, and technological advancement. The government has also pursued an export-oriented strategy that has enabled the country to benefit from increased foreign investment and access to international markets. All of these structural changes have been instrumental in driving China's rapid economic growth. Furthermore, China has also benefited from its strong institutions and international organizations, such as the World Bank, which have supported the country's development.

Institutionalist Approach

This approach focuses on the role of institutions in economic development. It emphasizes the importance of strong legal, political, and economic institutions in creating a conducive environment for economic growth.

Endogenous Growth Theory

This theory emphasizes the role of knowledge and technological advances in economic development. It argues that economic growth is driven by inventions, innovation, and technological advances rather than the accumulation of physical capital or labor.

Human Capital Theory

This theory emphasizes the importance of human capital in economic development. It explains that investments in human capital, such as education, training, and skill development, are essential for economic and social development. Improving education, research, and innovation culture has been a key factor in the development of China's economy. The Chinese government has invested in higher education, improving the workforce quality (Ozturgut, 2011). This has enabled businesses to tap into a highly skilled labor pool, allowing them to create innovative products and services.

In addition, technological advancement has been instrumental in China's growth. The PRC has poured huge sums into research and development, leading to the development of new technologies, such as mobile phones, the internet, and robotics (Naughton & Segal, 2001). These technologies have enabled businesses to operate more efficiently and have contributed to the country's economic growth.

Methodology

Based on the nature of this study and to glean and analyze the lived experiences of the respondents, this study adopts the qualitative deductive method of inquiry. A qualitative study is more appropriate for the study themes exploring the lived experience of subjects (Oktay, 2012) and phenomena that require deeper insights into the people experiencing the change in their lives (Haider, Bao, Larsen, & Draz, 2019). Adopting qualitative in-depth interviews and content analysis enabled us to collect a rich data set. Study respondents have been identified through purposive and snowball sampling. The study respondents include university professors, undergrad and graduate students at the university, and retirees who have seen the various phases of wax and wane and transformation in China. The respondents have also experienced a wave of reforms and. They were willing to share their thoughts about the development and prosperity in opening-up policies in their lifetime. They were willing to share their thoughts about the development and prosperity of the PRC.

to get a representative sample and see the variations in responses, two cities have been selected for data collection – Shanghai, which is a highly developed first-tiered metropolitan city in China, and Lanzhou which is a moderately developed third-tiered city in the Gansu province of China. In-depth interviews have been conducted with participants to understand the change and transformation undergone in the last three to four decades. Interviews will be semi-structured, allowing for flexibility in the order of questions and for additional topics to be explored. Some interviews have been conducted over the phone or online depending on the preferences and availability of the participants.

A native Chinese speaker has been arranged as an enumerator for data collection and translation of the interview guide into Chinese. The interview guide was first developed in English and translated into Chinese by the native enumerator. The translation has been cross-checked with the help of native Chinese classmates, who thoroughly checked the accuracy of the translation and suggested improvements. The refined interview guide is used to conduct semi-structured interviews with the respondents. The data collected from in-depth interviews have been analyzed using thematic analysis. Thick data has

been transcribed verbatim and cross-examined with the help of native Chinese speakers and enumerator to double-check the accuracy of the responses gathered in Chinese and later translated into English. Back-to-back, translation has been carried out to ensure the accuracy of the translation. The data has been coded and categorized into themes. These themes are further analyzed to draw meaningful insights.

Ethical considerations and principles have been followed throughout the research process, from data collection to writing the research report. The study participants have been informed about the purpose of the study, their rights, and the confidentiality of the data. Written consent has been obtained from all the participants before the interviews and focus group discussions.

Findings and Discussion

The success of the Chinese economy can be attributed to a combination of several internal and external factors. The Chinese government's commitment to economic reforms and its consequent liberalization of economic policies has been a key driver of economic growth. Since the late 1970s, the Chinese government has implemented reforms that have significantly reduced state intervention in the economy, liberalized market access for foreign companies, and encouraged private enterprise. These reforms have helped firms into the Chinese market. The Chinese government's proactive role in promoting economic growth has also been a major factor in the country's economic development. The government has implemented policies and has created institutions to encourage foreign direct investment (FDI) and provided a range of incentives to attract foreign investors. The government has also invested heavily in infrastructure development, innovation, and technology to support the growth of industries and facilitate the development of the Chinese economy.

China's rapid growth and development has been the topic of much discussion in recent years. According to one estimate, the country's economy grew at an average of 10.5% annually between 1978 and 2005 (Lardy & Subramanian, 2011). This impressive growth rate has been attributed to of variables, including policy reforms, increased investment, technological advancement, improved education, and market liberalization (Xiaodong Zhu, 2012). The Chinese government has implemented various policy reforms contributing to the country's growth. These include opening China's economy to foreign investment, introducing market-oriented reforms, and encouraging private ownership (Song, Yang, & Zhang, 2011). These reforms have created an environment in which businesses can flourish and economic activities can be generated. The Chinese government has also invested heavily in infrastructure and other areas that promote economic growth (Xiaodong Zhu, 2012).

An Ancient Civilization

China's historical prominence spans centuries and is characterized by a rich culture, history, and civilization that can be traced back over five thousand years (Ebrey, 1996). As a mighty empire in ancient times, China's cultural legacy and historical significance have left an indelible mark in world history. During his visit to China in the 13th century, Marco Polo was stunned to see the grandeur and might of the Chinese empire. Such historical encounters underscore the enduring impact of China's civilization on global perspectives.

China's historical significance extends beyond its contemporary geopolitical status, as it has long been acknowledged as a formidable global power in ancient times. In antiquity, China contributed significantly to technological innovation with renowned inventions such as gunpowder, paper, the printing machine, the compass, and silk (Needham, 1974). These inventions, particularly paper, the printing machine, and the compass have shaped subsequent human societal development (Elvin, 2004). The ancient Chinese abacus, often regarded as an early form of classical computing, is another testament to China's pioneering contributions in technological evolution (Needham, 1969). Such historical achievements continue to underscore China's enduring impact on the trajectory of global advancements.

A Seamless Drive of Reforms and Opening Up

The reforms and opening-up policy implemented by Chinese leader Deng Xiaoping in 1978 opened the economy to foreign investment, technology, and competition. This has allowed the Chinese market to become increasingly integrated with the global economy and enabled the country to benefit from globalization's advantages.

These conducive policies have been instrumental in helping China achieve its rapid growth and development over the past three decades. The reforms and opening-up policy of China have had a profound impact on the country's economic growth and development. It has created an environment of economic liberalization that has allowed for the growth of private sector businesses, foreign investment, and a more open market economy. This has contributed to increased exports, improved infrastructure, and increased access to capital. Additionally, the reforms and opening-up policy have fostered the development of the technology sector and created opportunities for Chinese citizens to travel and work abroad. This has helped to create a more globalized economy and has served as a major driver of economic growth and development in China.

The meticulous and carefully curated reforms and opening-up policies have ushered China from a centrally planned economy to a market-oriented one and have played a key role in reducing poverty and creating jobs. The policy liberalized the economy and opened up to the world, allowing China to access new markets, technologies, and capital. It also allowed for the introduction of market-based reforms to improve the functioning of the Chinese economy and create a more efficient, competitive, and dynamic environment. As a result, China has rapidly increased its GDP, expanded its trade, attracted foreign direct investment, and generated jobs. These reforms and the subsequent increase in economic growth and development have played a major role in lifting millions of Chinese out of poverty and transforming the country into the world's second-largest economy.

Sustained Supply of Trained Labor Force

The concentration of the population was traditionally confined to rural areas, and the main source of livelihood for people was agriculture and allied sectors. With industrialization and the increase in trade and business activities, cities became the centers of commerce and employment opportunities for youth. This migration has also helped in meeting the growing need for a labor force in metropolitan cities and industrial hubs.

The sustained supply of the labor force has been a major factor in the rapid growth of China's economy over the past few decades. The availability of a large, inexpensive labor force has allowed China to rapidly increase its production of goods and services, creating jobs, boosting wages, and driving economic growth. This has been especially true in the manufacturing sector, where China has been able to rapidly produce goods at a lower cost than other countries. In addition, the large population has also allowed China to develop a large market for its exports, which has been a major driver of economic growth.

The sustained supply of the labor force has helped to drive the Chinese economy in a number of ways. First, it has allowed the Chinese economy to expand rapidly, as the large labor force has enabled businesses to rapidly produce goods and services. Second, the large labor force has enabled the Chinese economy to remain competitive in the global market, as the abundance of labor has enabled China to keep labor costs low. Third, the large labor force has enabled China to become an attractive destination for foreign direct investment, as companies are attracted to the availability of a large, skilled labor force. Finally, the large labor force has allowed China to become a major exporter, as the availability of a large labor force has enabled Chinese businesses to produce goods at a lower cost than their foreign competitors.

Rapid Industrialization without Ignoring the Agriculture Sectors

Although China's industrial base has grown exponentially, followed by the drive for reforms and opening up, however, agriculture, which was a major sector of production, was not ignored at the cost of industrialization. Both industrialization and further development in the agriculture sector went hand in hand. This has provided a cushion to industrialization, as the sufficient supply of food items tremendously helped in poverty alleviation and readiness of the labor force.

Concerted efforts of governments and agriculture research helped modernize the farming sector and resultantly achieved better and improved yield in agriculture production (Smith & Brown, 2017). The farming sector has been modernized with increasing usage of machines and scientific methods of farming and harvesting (Jones & Wang, 2019). Moreover, the agriculture sector is among the most important contributors to the Chinese economy. It employs more than 40% of the Chinese population, contributes 20% of the GDP, and provides 60% of the total food consumed in the country (Zhao, Luo, Deng, & Yan, 2008). China's agricultural sector also plays a crucial role in providing raw materials for the country's manufacturing sector and food exports. China's agricultural industry also serves as an important source of foreign exchange earnings (Naughton & Lardy, 1996). The sector has also been a major player in the modernization of the Chinese economy, helping to reduce poverty and spur rural development (Zhao et al., 2008).

China Joining WTO

Another major turning point in Chinese economic development was the celebration of China's joining the WTO in 2001. It was a game-changing movement as it opened up a plethora of opportunities for Chinese enterprises to connect with the external world and reap the benefit of the international economic system. This accession to WTO made it possible for China to enter the club of world major economies officially and the trade and business with other countries has further streamlined. From 2001 to 2017, China's exports increased from US$266.1 billion to US$2263.37 billion, while imports increased from US$243.55 billion to US$1843.79 (Feenstra & Hong, 2007). According to the World Bank, China's GDP before joining the WTO in 2001 was USD 1.085 trillion. By 2018, China's GDP had increased to USD 13.37 trillion.

For enterprises within China, WTO accession increases orders and demands for its goods and services. It was a welcoming sign outside of China, as it has created tremendous opportunities for enterprises to do business with the WTO member countries – a sign of fair-trade deals and protection from unwarranted

governmental or regulatory hiccups. Joining the WTO has also enabled China to expand its global trade reach and increase its access to global markets. This has boosted Chinese exports and made China one of the world's biggest trading partners. WTO membership has also boosted investor confidence and encouraged foreign investment into China, allowing foreign companies to invest in Chinese businesses and take advantage of China's cheap labor and large consumer market. China's GDP growth rate has been one of the highest in the world since it joined the WTO in 2001. This has been attributed to increased foreign investments, improved technology, and increased access to global markets.

China's accession to the WTO has also improved its global standing, making it a more attractive and respected member of the international community, and also pushing the government for more reforms in the economy. This gives China a greater say in how global markets and economies are regulated and can help shape the future of global trade. China is now a global trading power, and this has resulted in increased trade with other WTO members and increased economic growth.

Special Economic Zones (SEZs) as Harbinger of Growth

Yet another remarkable initiative of the reforms drive of Deng Xiaoping was the establishment of Special Economic Zones (SEZs) in selected cities in China. These SEZs have tremendously helped China in groundbreaking the path to greater economic development and prosperity (Tao & Lu, 2018). As part of its economic reforms and policy of opening to the world, between 1978 and 1984, China established four SEZs – Shantou, Shenzhen, and Zhuhai in Guangdong Province and Xiamen in Fujian Province. The famous Hainan has also been declared as the special economic zone attracting substantial foreign investment to the country. SEZs not only attracted foreign and domestic investment but also created jobs, helped in technology transfer, and strengthened China's position as an indispensable global player in the production of goods.

The SEZs have a greater impact on China's economy as they acted as engines of growth for China's economy, stimulating foreign direct investment (FDI) and regional economic development. According to the World Bank (2020), SEZs account for more than 20% of China's total FDI and have helped to create more than 30 million jobs. SEZs have also encouraged the development of new industries and technologies, making China a major exporter of goods and services.

The remarkable success of SEZs experience has not only given confidence to the policymakers but also boosted both investor and public trust in initiatives

and reforms undertaken by the government. The positive outcomes of SEZs contribute to a favorable perception of government-led economic strategies and serve as a testament to the effectiveness of targeted policy interventions in fostering economic development and investor confidence (Batool, Baig, Khalid, & Alam, 2024).

A Decisive War against Poverty

One remarkable milestone the PRC has accomplished since the onset of reforms and opening up in 1978 is taking decisive measures against poverty and lifting more than 800 million people out of the poverty net (Xinkai Zhu & Peng, 2022).

Since 1978, when China began to open up and reform its economy, GDP growth has averaged almost 10 percent a year, and more than 800 million people have been lifted out of poverty. Over the same period, there have also been significant improvements in access to health, education, and other services.

Investment in Human Capital

The Chinese government has invested heavily in education and training, which has enabled the country to produce a highly skilled and educated labor force. This has been a major factor in the country's economic development. According to the World Bank, China spent 4.3% of its GDP on education in 2019, and the Chinese government has made a concerted effort to improve access to and quality of education for its citizens. Additionally, the government has invested heavily in vocational training, healthcare, and other social services to improve the quality of life for its citizens.

It is difficult to provide an exact number for how much China invests in developing human capital. According to the World Bank, China invested approximately 4.9% of its GDP in education in 2017.

Continuity and Political Stability

China has enjoyed more political stability than many other countries, enabling it to focus on long-term planning and development. Political stability and continuity have been instrumental in helping China spur economic growth. The Chinese government has maintained a strong commitment to economic reform, which has allowed the country to maintain a steady pace of development. This includes the implementation of market-oriented reforms, the opening up of trade and investment, and the promotion of an export-driven economy. Political stability has also allowed China to focus on long-term goals and objectives, such as improving its citizens' quality of life and

increasing its global competitiveness. This has helped create an environment in which businesses can thrive and foreign investment can flow. Additionally, by maintaining strong diplomatic and economic ties with other nations, China has taken advantage of global markets, enabling the country to benefit from high exports and international trade.

Political stability and continuity have also provided a consistent and predictable policy environment, allowing foreign and domestic investors to plan their investments with confidence and certainty. It has enabled the Chinese government to implement long-term economic reforms, such as privatization and the opening up of the economy to foreign investment. This has enabled China to benefit from foreign direct investment, which has helped spur economic growth. Stability and continuity have also allowed the Chinese government to implement macroeconomic policies such as monetary and fiscal policies effectively. This has enabled the government to combat inflation, maintain currency stability, and promote economic growth.

Finally, political stability and continuity have also allowed the Chinese government to focus on long-term development planning. This has enabled the government to plan and implement infrastructure projects and other investments that promote economic growth.

Optimizing Resource Utilization, Abundance of Raw Materials and Efficient Mining Infrastructure

The availability of raw materials in China has been an important factor in its growth and prosperity. The abundance of timber, minerals, and other resources has enabled the country to build infrastructure and manufacture goods for domestic and international markets. This has allowed China to become an economic powerhouse and a leader in global manufacturing. The availability of raw materials has also helped China to develop its own industries and become a major exporter of goods. By providing the necessary resources, China has created jobs, increased incomes, and improved living standards.

Moreover, efficient mining infrastructure and systems have helped China grow and prosper by providing a reliable source of materials for construction and manufacturing. This has allowed China to build infrastructure such as roads, bridges, factories, and other industrial facilities. It has also provided much-needed jobs and economic activity in more rural areas. In addition, efficient mining systems have allowed China to become one of the world's leading suppliers of minerals, metals, and other resources, which has helped fuel China's economic growth.

Diligence, Commitment, and Sense of Responsibility

Chinese people are well known for their dedication and commitment to work—often termed workaholics. They tend to take their responsibilities seriously and strive to fulfill them. They have a strong sense of loyalty and dedication to their families, friends, and work. Additionally, the concept of 'saving face' is very important in Chinese culture, encouraging people to take responsibility for their actions.

Hard work, diligence, and a sense of responsibility have been instrumental in China's phenomenal economic development. These qualities have enabled the Chinese people to create an economy that has grown to become the world's second-largest economy in a short period. Hard work, diligence, and a sense of responsibility have been essential in ensuring that China has continued to invest heavily in infrastructure and human capital and opening its markets to the global economy. Such qualities have helped create a strong business environment encouraging entrepreneurs and businesses to innovate and grow. Additionally, hard work, diligence, and a sense of responsibility have been key in helping the Chinese government to implement effective economic policies that have helped to strengthen the country's economic development.

The Chinese government has emphasized on the importance of hard work, encouraging citizens to take ownership of their success and pursue their dreams. This sense of responsibility has been a major factor in the country's remarkable economic expansion and accelerated growth.

Significant Contribution of Women in the Workforce

It is imperative to acknowledge that a society's sustainable growth and prosperity hinge upon the productive contributions and effective roles women play. Realizing this fact, the PRC has provided an enabling and conducive environment for women to play their role in all sectors of the economy (Whyte, 1995).

In China's manufacturing sector, more women work than in most other countries. In China, the difference between men and women at work doesn't hurt the economy as much as in the West. Together, this and the One-Child Policy have made it possible for many more people to work. The One-Child Policy also meant that women spent much less time raising children than in many other countries". The One-Child Policy has also led to a reduced time commitment for women in raising children, setting China apart from many other countries in terms of workforce engagement (Abrahamson, 2016).

Conclusion

The miraculous success embraced by China has a lot to learn from the world economies. Apart from many other contributory factors to success and progress in China, one of the critical factors is the unrivaled, seamless, and unflinching contribution of human capital—the power of people.

Even during the economic recession of 2008, while the rest of the world was experiencing economic downturn and slow growth, the PRC was still sailing smoothly and showing sustained growth and resilience against the economic meltdown. Moreover, the ensuing trade war between the U.S. and PRC has not affected Chinese economy much, rather transforming it to sustainable economic growth – thanks to the soaring domestic consumption and a shift from a heavy reliance on manufacturing to service sector, innovation, and high-end products.

Beyond any shadow of doubt, the extraordinary growth and progress are a strong and vivid testimony of the ability, acumen, and foresightedness of the Chinese leadership, both at the political and corporate levels.

In summary, far-reaching and viable governmental policy coupled with a conducive and enabling business environment and people's dedication and commitment to attaining the goal of nation building can be some of the major underlying factors that have contributed to the phenomenal growth and development of the country.

Suggested Citation

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Part II

National Perspectives

7

Powering Sustainable Futures: The Role of CPEC in Achieving Affordable and Clean Energy Access

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Abstract

Access to energy services in many countries worldwide falls short of the necessary goals for human development. Affordable and clean energy access is not only a global objective, but it is also at the core of the sustainable development agenda of 2030. S DG-7 emphasizes the essential role that energy plays in supporting all other goals across sectors. CPEC projects are intertwined with SDGs for accessible and clean energy. The study focuses on four sectors - socioeconomic, business, industry, and agriculture - to evaluate affordability, while coal, hydel, solar, and wind is the focus of the analysis of clean energy. CPEC energy is a catalyst for socioeconomic development, as energy affordability and economic progress are interdependent. It will provide opportunities for foreign investment inflow and will benefit the common man. CPEC is a strategic move, with the potential to meet the energy requirements of both states and improve the standard of living for their inhabitants.

Introduction

For years, in the energy sector, there has been a prevailing myth that it is difficult to moderate the structure of extremely poor nations cost-effectively. For such nations, the solution to the energy crisis through renewable energy resources is expensive. In most parts of the world, institutions still need affordable and clean energy access. For every state, affordable and clean energy is central to sustainable development. It stimulates social development and enhances productivity. Access to affordable and clean energy is a hard task for a state.

For a state, it is not only achieving sustainable development by gaining access to affordable, sustainable, and clean energy. In SGD-7, for human development, access to affordable and clean energy has tremendous importance. Here, three goals are interlinked: energy access, deployment of renewable energy and energy efficiency. These are essential for the extension

of the services of affordable and clean energy. Through SDG-7, access to energy by 2030 will require investments in sources of clean energy such as thermal, solar, and wind. In the sustainable development agenda 2030, SDG-7 is the backbone of all SDGs. It is only possible to achieve sustainable development by achieving sustainable development by gaining access to affordable and clean energy. For sustainable development, there are three dimensions of energy: economic, social, and environmental. According to SGD-7, access to affordable and clean energy is of tremendous importance to human development.

United Nations declared the 2014-2024 decade the decade of sustainable energy. Its purpose was to launch a global initiative to provide affordable and clean energy services by 2030. UN prioritized sustainable energy access to its member states to achieve this goal. For long-term energy security and sustainability, the government of Pakistan, through the government of Pakistan, through the energy component of CPEC, adopted strategies to fight the energy scarcity. Pakistan, through the CPEC energy component, linked itself with SDG-7 to find a sustainable solution to the energy crisis. SDG-7 is directly and connected with Chinese investment in CPEC energy. In the efforts to achieve the agenda goals of 2030, the CPEC energy component, if securely targeted, would serve as a supersonic vehicle on the path of sustainable energy. The parliament of Pakistan has adopted SDGs as an agenda for national development. It's because the self-sufficiency of the energy sector lies in CPEC energy through which Pakistan will shoot for SDG-7.

The SDG7: An Overview

The goal of SDG-7 is to ensure access to affordable and clean energy for all. It is necessary because the routine life of a common man deeply depends on and revolves around affordable and clean energy. The smooth functioning of human activities needs a well-established system of energy. It includes education, business, agriculture, communication, medicine, and infrastructure. For many years, functions of human life have been mainly based on the use of fossil fuels, oil, coal, and gas. The burning of fossil fuels causes harmful greenhouse gases. It not only becomes the cause of negative climatic changes but also adverse hurts the well-being of people and on the environment as well. On the globe, the use of energy is increasing rapidly. In a net shell, a smooth supply of clean energy is the essential requirement of every state to support its economy. Currently, more than 1 billion people are living without any access to energy. More than 3 billion people are suffering from bad health. The well-being of these people is badly affected by lack of access to clean energy and is becoming the cause of in-house air pollution. To switch to affordable and

clean energy, there is a need to increase investments in the infrastructure of energy from $400 billion to $1.25 trillion per annum till 2030.

To manage the problem, there will be a transition towards an affordable and clean energy system. States are required to invest in renewable energy and adopt technologies and infrastructure for clean and affordable energy. States can maintain their business by preserving and protecting the ecosystem. For this, there is the need to focus more on the production of energy through hydropower and renewable energy resources. It requires 100% commitment to produce energy by using renewable energy technologies (Nations, 2023).

Targets and Indicators of SDG-7

According to the United Nations, energy is the fundamental element behind every challenge the world faces today and every opportunity the world is gaining. In the coming decades, the transition of the world economy towards affordable and clean energy sources is one of the significant challenges. Sustainable energy is an opportunity that can transform the economies of the planet.

The objective of SDG-7 is to provide access to affordable and clean energy by the end of 2030. The agenda of 2030 has established sustainable development goal 7. For sustainable development, the significance of energy is recognized through this goal. It is the first ever universal goal of energy, which basically consists of five targets, which are access, efficiency, renewability, and implementation of means. A significant milestone has been represented in SGD-7 because, since 2000, MDGs have not been addressing any energy goal. For the first time in the UN system, energy is recognized as a vital component of the global sustainable development agenda. In many SDGs, the component of energy is interlinked because it is essential for human development.

Through the Inter-Agency and Expert Group on SGDs indicators, United Nations has developed a global indicator framework. SDG-7 has five targets and six indicators. Goals are specified in the targets, while indicators signify the metrics through which the world aims to track the achievement of these targets. The following table shows the targets and indicators of Goal-7 are:

Targets and Indicators of SDG-7

Sr. No	Targets	Sr. No	Indicators
7.1	First target focus on to ensure access to universal energy through affordable and clean energy means by 2030.	7.1.1	Ratio of population with energy access.
		7.1.2	Ratio of population with fundamental reliance on technology and clean fuels.
7.2	The focus of the second goal is on the substantive increase of renewable energy share in international energy mix by 2030.	7.2.1	The share of renewable energy in the total final consumption of energy.
7.3	By target third goal, double the global rate of improvement in energy efficiency by 2030.	7.3.1	The intensity of energy is measured on the basis of primary energy and GDP.
7.A	By 2030, increase global cooperation to facilitate access regarding research on affordable and clean energy. It includes renewable energy, efficiency of energy and advanced technology of cleaner-fossil fuel. Moreover, to promote investment in affordable and clean energy with improvement in energy infrastructure.	7.A.1	Mobilized amount of US dollar per annum starting in 2020 accountable towards the $ 100 billion commitment.
7.B	By 2030, upgrade technology and enhance infrastructure for delivering affordable and clean services of energy in developing countries for all. Particularly, less developed states, land-locked developing states and small island developing states, in accordance with respective program support.	7.B.1	For sustainable development services, investments in energy efficiency as a GDP percentage and amount of FDI in financial transfer for technology and infrastructure.

Source: Sustainable Development Goal 7, United Nations, Sustainable Development Knowledge Platform, Available at: https://sustainabledevelopment.un.org/sdg7 Access On 1-7-2023

The targets of SDG-7 coupled with its indicators is helping the world to eradicate poverty by providing affordable and clean energy by participating in global prosperity through sustainable development. This target of sustainable development goal is essential for achieving sustainable and reliable energy. The following graph explains the concept of affordable and clean energy

included in target 7.1. In contrast, the concept of sustainability is indirectly included in targets 7.2 and 7.3.

Target 7.1: Universal Access to Modern Energy

In all perspectives of sustainable growth, the target to gain universal access to sustainable services by 2030 is a key to all critical problems. Concerning social perspective, this target of SDG-7 is very vital. It is all because, for social inclusion, the element of energy is very important. This target of SDG is to focus on the poor segments of the globe, especially those with no energy access and who mainly live in undeveloped areas. However, energy access has no universally accepted definition. However, the International Energy Agency has defined modern energy as "a household having reliable and affordable access to clean cooking facilities, the first connection to energy and then an increasing level of energy consumption, over time, to reach regional average. The initial minimum level of energy for rural households is assumed to be 250 kilowatt-hours (kWh), which, for example, could be provided for the use of a floor fan, a mobile telephone, and two compact fluorescent lights- for five hours daily". In 7th SDG, the Target 7.1 emphasizes that energy access is a crucial variable for the development of society. This target aims to provide universally accessible services of reliable and affordable energy by 2030. This target identifies certain specific indicators such as the rate of change of energy, total population without any access to energy, and total population percentage relying on clean fuels (ESCAP, 2017).

Energy is the basic need to support necessities of human life such as health, education, and related social services, among others. There is a clear and unequivocal relationship between the availability of energy and the Human

Development Index (HDI). In this case, if the HDI levels are low, a short increase in the availability of energy ensures significant developmental growth. This is the reason why the availability of energy is considered very fundamental, particularly in developing states. Two indicators are considered very important regarding the evaluation of access to energy. The first indicator is to access energy, and the second is soiled fuels used for household activities like cooking and heating (Alloisio, Zucca, & Carrara, 2017).

Access to Energy and Sustainable Development Goals

Energy, as the first indicator, is crucial and valuable for sustainable development. It is clean and can convert into other energy forms with virtually 100 % efficiency. Different electric power may be distributed across extended distances among other forms of energy. Therefore, it is considered a significant factor for the development of the states. For the growth and prosperity of human beings, energy is recognized as a vital component. In 2015, adoption of UN Sustainable Development Goals is considered another level of political recognition for the importance of energy development. Access to energy is crucial for the achievement of the targets of SGDs. However, there are better ways to ensure the economic and social progress of a state than giving easy access to energy for household use. Reliable and affordable energy access for daily household use is not everything but must also be accessible for other income generation and public services. Modern and low-cost technologies give fresh opportunities, providing universal access to energy. Despite these efforts, universal energy access is still a challenge, particularly for providing access to sustainable energy at affordable prices for remote and poor household usage. In all the regions of the world, efforts to promote access to energy have had a positive impact, for it has improved the pace of progress in all the fields. In 2016, the total number of people without access to energy was somewhere near 1 billion. From 2000 to this date, almost 1.2 billion people have gained access to energy. In 2015, China announced a universal access of his people to energy, one of the historic and successful stories. Today, nine out of ten people have access to energy in the region. Based on contemporary strategies, trends are the same and even the region looks forward to having access to universal energy by the start of 2030.

Access to Clean Fuels and Modern Technologies

The second indicator is important because people with limited access to modern energy forms use soiled fuels like charcoal and biomass for cooking and heating purposes. Open devices are used for the burning of these fuels in houses, and from the viewpoint of energy, it is considered very much

insufficient. It is also considered very dangerous from the perspective of health because, among other things, it causes breathing problems (Alloisio et al., 2017).

In 2018, almost 3 million people had no access to clean cooking technologies. In 2016, access to clean fuels and cooking technologies improved gradually, reaching 59 % globally. Since 2010, it is ten percentage points. Despite this development, approximately 3 billion people are compelled to use polluted fuels or combinations of stoves for cooking. There is a need to increase the provision of clean energy for cooking purposes by an annual rate of 3% to get access to universal energy for clean cooking by 2030. If the same tendency continues, by 2030, globally, 2.3 billion people will be left without any way to use clean energy for cooking.

From 2014 to 2016, the success in the provision of energy for clean cooking purposes, despite the outpaced population growth outpaced growth of population in certain parts of Asia, is a great outstanding achievement. During the same period, the success rate was marginal in sub-Saharan Africa because the growth rate of the population of the region was four times more than the rate of gaining access to the technologies for clean cooking.

The speedy deployment of technologies of clean cooking fuels has not yet received the required political attention. The solution of clean cooking technologies requires low cost in comparison with electrification. There is a combination of factors which include consumer's lack of awareness regarding the benefits of clean cooking fuels, slow progress in clean cookstove innovation, high entry costs for solutions of clean cooking, and insufficient infrastructure for the production of fuel and its distribution. All these factors have kept widespread solutions out of reach for this challenge. (United Nations, 2018)

Target 7.2: Increase Global Percentage of Renewable Energy

Sustainable development through its three developments is influenced by the target of the share of the energy gained through renewable sources to be included, by 2030, in the total energy mix on a global level. In all parts of the globe, renewable energy technologies represent a substantial element in policies meant for greening economies. Renewable energy is also important in dealing with the changes that arise from climate change. There is a mutual consensus that renewable energy is considered an important factor in attaining low carbon and providing a sustainable energy mix. There is no doubt that the concept of sustainability is vast. Nevertheless, when energy technologies are being analyzed, the dimensions of carbon mitigation may be considered in the

most relevant terms. For example, a target set by the European Union is the European Union that the inclusion of 27% of energy produced by the utilization of renewable sources in overall and final energy consumed must be ensured by the start of the year 2030. If achieved, this could spur the provision of clean energy with a dimension of carbon mitigation on ideal grounds.

Renewable Energy

It is expected that renewable energy technologies like wind, solar, geothermal, tidal and waver power, biomass and hydropower will play an indispensable part in providing universal energy services. Through these technologies, the use of local resources is promoted, reducing the use of expensive oil and facilitating state economy. These technologies help states reduce dependency on imported fuel, improve trade balance, reduce national debt, and protect states from oil price fluctuations. Renewable energy is a carbon-free source of energy and also a climate-friendly solution. Over the last few decades, positive developments have been seen in cost reduction and improvement in the performance of such technologies. Due to the maturity of have moved consumers from niche to mainstream market (Bartlett, 2012).

The energy generation, produced by using energy generation, created by using renewable sources, is rapidly enhancing. But, to achieve Goal 7, there will be a need for much greater efforts. In 2018, in many places, with the support of the policies, the rapid fall of the cost has made the energy produced from wind and solar cost-competitive, for it is a source of conventional power generation. Currently, at the globe, such sources account for over 50 % of the annual energy production capacity of the globe.

It is evident that the energy required by the developed gadgets for cooling, heating and transportation is not being equaled by the renewable energy added in the total energy mix of the country. In various states of the world, significant progress regarding renewable energy has been noticed. In 2015, China alone accounted for 30% of its absolute growth in global production of renewable energy and its consumption. In all end uses of energy for cooling, heating and transport, Brazil stood among the top 20 largest energy-consuming countries, which substantially exceeded the average of global renewable energy share. In end uses, there will be the need of more efforts to produce energy to meet the demands such as cooling/heating and transport. In global energy consumption, a combination of both kinds' accounts for 80%. Where penetration of renewable energy in total energy mix is low and where unexplored potential exists: one opportunity would be to utilize renewable energy produced by the use solar, thermal, biomass or geothermal sources on district levels for cooling, heating, and other such purposes. As the energy

sector decarbonizes, relevant energy uses can be switched, increasingly. Moreover, for sustainable development of renewable energy sector, there will be a need of making additional efforts to grid issues of integration. It includes the incorporation of battery storage and technology of a smart grid to support the management of variable generation resources (Nation, 2018).

Target 7.3: Double the Improvement in Energy Efficiency

This target of SDG affects all economic sectors. It includes commercial, agricultural, transport, energy industry and household. The economic sector, including its sub-sectors, needs access to modern energy to support economic growth and industrial development. In almost all the states of the world, energy is required to support the economy, and providing this elemental energy for services is expensive. A considerable part of the state economy's revenue is spent on importing energy and its resources.

Efficiency of energy is based on the relationship that exists between energy input and its output. On the domestic front, opportunities regarding energy efficiency progress differently- mainly across states. Hence, there is a need to substantiate the target on domestic circumstances. In SGD-7, the targets of 7.1 and 7.2 may be associated generally with the concept of sustainability, particularly with the viewpoint of affordability. The concept of energy efficiency revolves around the object to provide not only energy services but to achieve high level of energy services with low input of energy. There are two advantages of energy efficiency; one is on supply side to provide energy services at low costs and second for energy consumers to grant them the opportunity to utilize efficient energy at cheaper cost. The concept of efficient energy may not be easily understood, which deals with the terms in general. Nevertheless, its evaluation could easily be calculated through the intensity of energy. The ratio between GDP of a country and the statistic of energy is a sure way to express it. For example, it could be defined as the amount of energy to generate an income from a single currency unit (Alloisio et al., 2017). With the current rate of development in the world, energy efficiency needs to be accelerated. From 2014 to 2015, in light of the intensity of world primary energy, energy efficiency measures fell by the rate of 2.8%, the fastest decline after 2010. Hence, as per need of energy intensity, the annual rate of fall of energy was calculated to be 2.2% per annum over 2016 to 2030, compared with an average rate per annum of 2.2 % over the five years from 2010 to 2015. It necessitates a vital ramp-up in combination with global policy (Nations, 2018).

Target 7-A: Promote Access to Research Technology and Investment in Clean Energy

The United Nations defines it as the expansion of global cooperation to promote accessibility towards clean energy research and technology. It includes efficiency of energy, renewable energy, clean and advanced technology of fossil fuel, and promotes investments in clean energy technology and energy and in infrastructure (Tracker, 2023).

Target 7-B: Expand and Upgrade Energy Services for Developing Countries

According to the United Nations, by 2030, upgrade technology and enhance infrastructure to provide sustainable and modern services and energy to the inhabitants of the countries that are under development. Especially landlocked developing states, developing states of islands, and the least developed states in special reference to their respective support programs (Tracker, 2023).

A sustainable supply of energy is compulsory for smooth economic development and swift running of the daily business of the state. Efficient Energy policies are compulsory for better energy management. There is a list of the states that have insufficient energy reserves, but they are managing their state affairs by fulfilling energy needs through efficient energy policies. On the other hand, there is another list of the states that are rich in terms of natural energy reserves. Still, due to poor and lame energy policies, they lack the energy required to run state affairs and are unable to fulfill energy requirements. Thus, it is evident that better and efficient energy policies hold the power to cover up the insufficiency of energy reserves. Still, efficient energy reserves cannot cover up the inefficiency of energy policies.

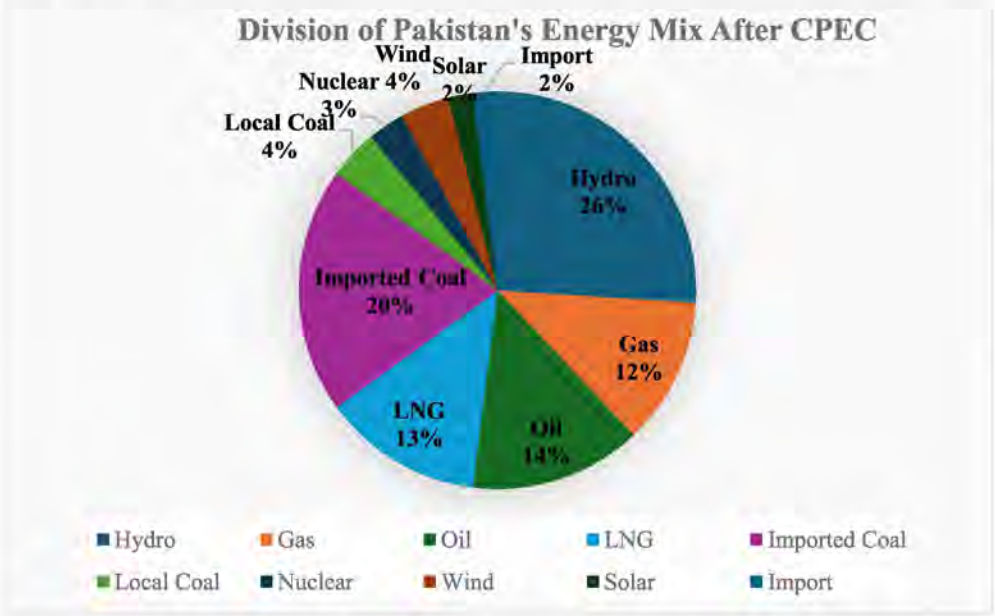
In Pakistan, CPEC has been touted as a gateway to sustainable development. CPEC has the potential to provide affordable and clean energy to Pakistan and lead the nation towards energy security. The lack of sustainable, affordable, and clean energy affects the industry and relevant commercial consumers. It becomes the cause of economic insecurity and puts national security in peril. There are enormous reasons for this scarcity, but political decisions are at the heart of problems.

CPEC opens new horizons of affordable and clean energy in a systematic way to support socio-economic activities in business, industry, and agriculture. The discussion over them goes:

The CPEC Perspectives on Affordable Energy

Energy projects of CPEC, through optimization of energy structure, would reduce dependence on expensive furnace oil for energy production. In 2013, solar and wind energy share in the total energy mix was 5%. In 2022, it will become 10%. Similarly, in 2013, gas and furnace oil provided 57% of total energy mix. In 2022, with the completion of CPEC-prioritized energy projects, it will fall to 25%. As expected, in the same period, the energy mix from indigenous coal will increase from 0.14% to 9.08%, and energy production through bagasse will also increase from 1% to 2%. (Jabri, 2018) In 2015, the energy mix of furnace oil was 39%. Soon, coal in the energy mix will rise to 24%, hydroelectric to 26%, liquefied natural gas to 13%, and non-hydroelectric renewable to 6% (Rafiq, 2017).

When all CPEC projects are operational, they will provide affordable energy to Pakistan. With the start of these energy projects, the share of hydro will reach 26%, followed by imported coal at 20%, furnace oil at 14%, LNG at 13%, Gas at 12%, local coal and wind at 4%, nuclear at 3% at, solar 2% and imported from Iran 2%. Following figure shows the perspective of Pakistan's energy mix, when once the energy prioritized projects of CPEC are duly completed.



Source: Division of Pakistan's Energy Mix After CPEC

To manage the energy crisis, there is a need for some concrete initiatives with the aim of achieving notable achievements in the energy sector. When energy projects of CPEC start to function, the composition of the energy mix of Pakistan will undergo notable changes. By the end of 2020, the renewable energy projects have given sufficient input to the system. Furthermore, Pakistan's energy mix will be tilt towards coal. Till now, the share of coal in the energy mix is negligible.

In CPEC-Energy Priority Projects, there are 15 projects with 11,110MW production capacity. Currently, seven projects are functioning while the remaining are under construction with 6910MW production capacity. Currently, Sahiwal Coal-fired power plant (2*660MW), Three Gorges second and third wind power plants, Zonergy Solar Park (300MW), Port Qasim Coal-fired power plant (2*660MW), Sachal wind farm (50MW), Jhimpir UEP wind power projects and Dawood Wind Farm (50MW) are functioning. Through these projects, 3240MW of energy has been added to the national grid. ("Latest Progress on the CPEC," 2018) These projects provide affordable energy to the national grid to support the socio-economic, business, industry, and agricultural sectors of the state.

In the contemporary arena, energy plays a pivotal role in every domain of human life, which includes socio-economic, business, industry, and agriculture. Energy has become a necessity because human daily life revolves around this. Indeed, energy is a fundamental element of the progress and development of a country because it has a huge impact on social and economic uplift. Many third-world nations are facing the problem of a severe energy crisis, including Pakistan. Pakistan is suffering from adverse effects of energy crises. Pakistan has plagued the manufacturing industry, falling agricultural yield, reducing exports, which is directly affecting the economy and the business community, and due to this, unemployment is increasing. The export of the country is declining in a constant manner continuously, thus creating a massive trade deficit. The balance of payment crisis is evident nowadays. Textile units in different parts of the country stopped working, and most of them have shifted abroad. It is safe to envisage this thing that our economy is becoming like a casino economy. The crisis is soaring poverty and has wrecked lower GDP growth and economic progress. It is very accurate to say that the contemporary energy problem is hampering the overall progress of the country discretely. It seems that the government is not serious about dealing with this problem because they have made no serious effort to counter it in the last two decades. As Ishrat Hussain, former state bank governor, calls these decades a lost decade in his recent book. Simultaneously, the demand for rapid growth, energy theft, and transmission losses due to poor infrastructure have worsened the adverse situation. But after these long-term woes, CPEC looks

like a ray of hope accomplished with various energy projects will help in a potential way to overcome these crises. Both countries, China and Pakistan, have made plans to produce new power plants. Desert Thar could generate almost quadrant of the state's conductivity. In the muddy and crumbly area of the Thar desert, Pakistan has started to scrape out the desert, which is full of mineral and natural resources. It is also considered muddy, dirty and inferior, which is not true. it is one of the biggest resources and a full desert which can generate advanced power plants that can boost the state finances. This task is very costly than the rest of the others, but as China is propping up Pakistan, so it has developed each one for $62 billion fiscal cooperation.

In the developmental life of a state, energy brings wealth, and wealth brings prosperity. The society of Pakistan is under a crisis caused by an energy crisis. Therefore, energy consumers- socio-economic, business, industry, and agriculture- pay high prices to deal with the energy crisis. However, considering the energy crisis's complexity, previous governments took certain measures to provide energy at affordable prices. They started CPEC projects, with the support of China, to manage the energy crisis. CPEC will provide sustainable energy at affordable prices to bear fruitful results in transforming their miseries. For developing nations like Pakistan, affordable energy is necessary for development. The affordability of CPEC energy and its relationship with development is discussed in the following sections.

CPEC, Energy and Socio-Economic Development

Globally, the prime concern of policymakers is to provide sustainable and affordable energy to many populations. Affordable and reliable energy plays an important role in the socio-economic progress of a nation. In Pakistan, to support socio-economic activities, CPEC is providing affordable energy in a diversified way. Energy affordability through CPEC is bringing numerous changes that give the common man a deep-seated benefit. Like many developing nations, to support socio-economic activities, Pakistan, through CPEC energy, is also struggling to provide affordable energy to society.

A sustainable and affordable energy supply brings economic uplifts and thus contributes to the socio-economic betterment of a nation. China's investment in energy infrastructure for socio-economic development is highly welcomed. The crisis of energy supply outstrips every year. This energy crisis frequently causes blackouts and power outages, which pose a 2% GDP loss per annum. The country's population, worsening the situation, is increasing at 2% per annum. The youth, almost half of the total population, is unemployed and lacks productivity. Due to no job or lack of job security, unemployment is

increasing and affecting the social and economic life of people (Markey & West, 2016).

For socio-economic development, CPEC energy is the lifeline. A sustainable supply of energy will improve the social sector and also bring sustainability to the economic sector. Experts believe that sustainable and affordable energy is essential for the success of a nation. An energy-self-sufficient state strongly supports the welfare of its masses. Affordable energy gives a strong foothold to a nation to improve the social and economic life of the common man. In a state where the economic condition of the masses is sound, the ratio of crime and robbery will be meek. Sound economic to conditions bring social awareness, which will ultimately benefit the national economy. Unfortunately, the socio-economic progress of Pakistan is stuck in an energy crisis. It also disturbs GNP and GDP. However, the affordability of CPEC energy will bring positive changes in the economic and industrial development of the nation. CPEC energy is a pedal ship for socio-economic development because energy affordability and economic development go hand in hand. It will provide opportunities for inflow of foreign investment and support the betterment of a common man (Khan, Ahmed, & Malik, 2013).

The supply of affordable energy will improve economic progress, which is hampered by a severe energy crisis. CPEC energy will help the economic sector in three ways.

1. Through various energy projects, trade flow will be increased and improve socio-economic condition of society.
2. Improved energy conditions will help industry to produce high-quality goods, and infrastructural projects of CPEC will reduce the transportation cost.
3. Road connectivity with other regions will improve regional economic integration, promoting trade opportunities and benefit local businessmen and common people. (Markey & West, 2016)

An affordable and sustainable supply of CPEC energy will provide various job opportunities. The International Labor Organization says that CPEC will provide about 40,000 job opportunities. Applied Economic Research Centre calculates that from 2015 to 2030, CPEC will provide 700,000 job opportunities to local people (Pakistan, 2016). Given another report, CPEC will employ 30,000 people in various fields. Infrastructural development will facilitate around 13,000 people by providing jobs, while the energy sector will facilitate only 16,000 people (News, 2017).

CPEC is a multi-billion-dollar project under which improved and affordable energy conditions will enhance the opportunities of employment and improve

the socio-economic condition of society. Completion of CPEC projects will lessen the ratio of unemployment and give benefit to local people. Better socio-economic conditions will create a society with a good lifestyle. CPEC will provide strong footholds to the economic sector and will bring prosperity to Pakistan.

CPEC, Energy and the Business Sector

Energy is an engine of economic development and a major factor in easing power outages and improving the business of millions of people. CPEC energy is a morale booster for the business sector, which has lagged other South Asian States, except Afghanistan. CPEC energy affordability for the business sector will bring stabilization, development, and prosperity. CPEC energy projects aim to bring advancement in the business sector and make them compete with the international business community. A representative of the Business Council in Pakistan argued that CPEC is primarily a geopolitical project, and economics is merely added to it. However, the business community does not hold this view. Some believe that, despite fragile economic conditions, CPEC may demonstrate useful impacts.

CPEC is more than trade routes and infrastructural projects. Infrastructure is important for long-term economic stability. Nevertheless, CPEC energy projects are assistance, providing affordable energy which is crucial for the development of the business sector, which is crucial for the development of the business sector development. The government's top priority through CPEC is to provide sustainable energy on affordable prices to facilitate business. It is because the success of the business sector eventually enhances the economic prosperity of a nation. Production of energy and its availability at affordable prices for business is the key to prosperous economic development.

CPEC will provide affordable energy to the national grid and will support millions of public and private businesses. An affordable and clean supply of energy will bring improvement and award ease to business. It will also increase prospects of higher business. The biggest issue with the energy sector is the production of expensive energy. In CPEC, the production of cheap, affordable, and sustainable energy will bring prosperity by supporting businesses and the business class.

CPEC, Energy and Industrial Development

Economic development of a country revolves around industrial production. The availability of sustainable and affordable energy for industrial development is the top priority of the government. It is a key to long-term

sustainable industrial development, as the industry needs sustainable supply at affordable prices. In 2013, under CPEC, it was planned to provide affordable energy to industrial estates with reduced power outages. It would support the GDP growth rate, which is expected to increase to 7.5% by 2030. It will provide millions of jobs, and unemployment will be reduced. In Pakistan, it is predicted that urbanization will increase by 50% to 60%, and the growth of GDP reach 8% by 2025. This GDP growth with rapid urbanization and industrial development will increase energy demand (Vision, 2014).

Thermal energy is 64% of the present energy mix. Furnace oil is the major source which is used to run thermal energy plants. The major ratio of this oil is imported. So, when oil prices increase in international markets, it also shocks the national economy. This imbalanced energy mix is highly vulnerable and burdens the economy. The reliance of CPEC energy on indigenous resources is expected to have positive impacts on industrial development and the balance of payments. The affordability of CPEC energy for the industrial sector will improve not only the capability of production but also the cost of production. Thus, the industrial sector will be relaxed and get rid of the present financial crunch (Mirza, Fatima, & Ullah, 2019).

The industry of Pakistan is facing a severe energy crisis. The rapid increase in economic activities due to CPEC connectivity projects with other regions will influence energy security and the economy as well. The establishment of Special Economic Zones (SEZs) under CPEC will be an additional burden on the energy sector. Therefore, energy projects' top priority is to provide affordable energy to industry. The successful completion of energy projects will satiate industrial energy demand. With the establishment of industrial zones, energy consumption is expected to grow at a higher pace. The affordability of CPEC energy will provide energy security to industries, which will strengthen the national economy (Mirza et al., 2019). For Pakistan, industrial development cannot be achieved without an affordable supply of CPEC energy.

Energy affordability will provide an opportunity for the industrial sector to increase its production at a lower cost. It will increase trade volume, giving the commons a direct benefit. Compatible prices of local industrial production will meet domestic needs and compete in international markets. Affordable energy will be a golden opportunity for the industrial sector, and products of local industries like garments, cotton, wheat, the industrial sector, and products of local industries like garments, cotton, wheat, and the like will compete in the international market (Perveen & Khalil, 2015). A sustainable and affordable supply of energy through CPEC will also have positive impacts on commerce and trade.

CPEC, Energy, and Agriculture

In low-income economies, agriculture always serves as the backbone for the state's economic growth. Generally, it is the source of employment and income in rural areas. During the last decade, the agriculture of Pakistan has been facing a downfall, which is the outcome of the energy crisis. Pakistan is an agrarian economy. Most people are affiliated with this sector and rely on it for their livelihood. The income of 65% of people is linked with agriculture, and it contributes to around 24% of the GDP. More than 43% of labour is related to agriculture and is a significant foreign exchange earnings source (Hafeez, 2018). Thus, this sector has become an important pillar of the economic life of the people of Pakistan. Despite its persuasive significance, it has failed to perform at its utmost capacity due to the energy crisis. Energy crises render farmers incapable of giving in-time crop yields, affecting agricultural goods' export.

Initially, in CPEC, the agriculture sector was completely ignored. Later, in the Long-Term Program of CPEC, agriculture appeared as the top priority. In ongoing energy projects of CPEC, this sector received great benefits as tube-wells benefits as tube wells, which were running on expensive diesel or WAPDA energy, are converted to cheap energy sources like solar energy (Ahmed & Mustafa, 2016). Tube-well irrigation is very expensive due to high energy tariffs ("CPEC- Prospects and Challenges for Agriculture in Pakistan (Vision-2025)," 2023). Renewable energy sources of CPEC are introducing new concepts of cheap energy production. Energy affordability, using efficient technology, is bringing positive changes.

This sector is a direct or indirect beneficiary of CPEC energy through the development by developing fresh ideas in energy production, which would open forward linkages. The affordability of CPEC Energy will uplift the agricultural sector and enhance the trade of agricultural products. In this sector, CPEC energy will bring stability. Affordable energy will boost the confidence of farmers' confidence, and better infrastructure will open avenues of export in the international market. Energy projects of CPEC will provide sustainable energy to local farmers, which will end up the problems caused by power outages. Energy affordability for the agricultural sector will bring economic stability to the country. Overall, economic benefits will also facilitate farmers (Energy, 2023).

It is expected that the successful completion of CPEC energy projects will not only provide affordable energy to agriculture, but it will also bring revolutionary changes in the growth of agricultural products.

In Pakistan, CPEC has been touted as a gateway to economic stability. CPEC has potential to solve Pakistan's energy crisis and lead the nation towards energy security (uddin Ahmed, Ali, Kumar, Malik, & Memon, 2019). Under CPEC, major focus is on energy production to manage chronic energy crisis of Pakistan. This energy scarcity and lack of reliable and affordable energy supply has affected industry and relevant commercial consumers. It has become the cause of economic insecurity, and it has put the state's national security in peril. There are enormous reasons of this scarcity, but political decisions are at the heart of the problem. Successive political governments failed to prioritize energy and the implementation of long-term energy development plans.

The energy production cost of CPEC coal-based energy projects is less than hydro, solar and wind. In terms of tariffs, coal-based projects will give direct benefits to consumers. There is immense pressure on the government to provide affordable and clean energy to consumers. CPEC, through its energy projects, is providing affordable and clean energy to energy consumers of Pakistan. Considering affordability, CPEC energy production, per unit cost will be cheap. The cost of imported coal based one unit will be Rs 8.5/U, followed by local coal Rs 8/U, LNG fuel RS 9.5/U, Solar Rs 5/U (Awan, 2018) and hydro Rs 5.17/U. (Rana, 2019) When CPEC energy projects will provide energy to national grid, there will be sharply decreased in tariff 16-18 rupees to around 8 rupees per unit. Through these plants, reliance of energy-mix on furnace oil and gas will also reduce (Asif, 2009). This affordability of CPEC energy will become a source of affordable energy through indigenous resources for developing the national economy.

SDG-7 and Clean Energy

The impacts of energy on systems of the environment include the local and global pollution from fuel combustion, the use of coal for different purposes and climate changes that affect the stability and reliability of various ecosystems. The actual impacts are based on the sources of primary energy, the location and size of the system, the technology of conversion, and other related factors. Energy is also a key factor behind human health problems, mainly due to air pollution caused by fuel consumption. In the United Nations Environment Program, it is believed that a sustainable supply of energy provides certain ways to transfigure and glorify the lives of the citizens and the economies of states, safeguarding the ecosystem of the planet. That is why, through SDG-13, the United Nations is working with the states to improve the efficiency of energy and to promote the increased use of energy produced by

the use of renewable energy sources. Through this goal, the UN is focusing on four areas of energy.

1. Improve the understanding of science, promoting the link between the environment and energy.
2. Provide some advice to governments on sound environmental policy.
3. For clean energy, catalyze private and public finances.
4. Support uptake of technologies related to clean energy.

Different partners of the UN are jointly working to improve the efficiency of energy in buildings, urbanization, transport, and appliance manufacture. They are working to strengthen the business case for energy efficiency, in emerging economies and developing states, which also includes the efforts made on city level. The work of the UN contributes to SDG-7 (Energy) and 13 (Climate Action) implementation and supports major processes of the UN like the UN Framework Convention on Climate Change (UNFCCC). It also includes sustainable energy for all initiatives. UN Environment, in partnership with the Copenhagen Centre on Energy Efficiency, the Government of Denmark and the Danish Technical University, established the hub of energy efficiency and sustainable energy for all. This Centre also functions as the secretariat of the Global Energy Efficiency Accelerator Platform (Nation, 2018).

CPEC Perspectives on Clean Energy

The optimized energy structure of Pakistan will ensure certainty of a clean energy supply. CPEC has twenty-one energy projects to meet rising energy demands. These projects are divided into three separate categories.

1. First, CPEC-Energy Priority Projects, has fifteen top priority-based projects. It has 7 Coal, 3 Wind, 3 Hydropower and 1 Solar based project for energy production. It also has a project with 2 transmission lines. They will not only provide a sufficient and clean supply of energy to the national grid but also support the rest of the CPEC projects.
2. Second, CPEC-Energy Activity Promoted Projects. It has 4 energy projects: 1 Coal, 2 Wind and 1 Hydro.
3. Third, CPEC-Potential Energy Projects. It has 2 hydel energy projects.

In CPEC energy, share of coal-based projects is high. In 7 coal-based projects 3 projects are Thar coal based and 4 are based on imported coal. However, hydropower comes on the second in the total energy mix. Three hydel power projects are installed on different rivers, as per technical feasibility. The share of solar energy is higher than wind. There is 1 solar project and 8 wind based projects. Though the share of renewable energy is not up to mark, yet it is a

bright spot for Pakistan. Following table shows sources of CPEC energy projects.

Sources of CPEC Energy Projects

Sr. No	Source	Share in Total
1	Coal	69%
2	Hydro-Power	21%
3	Solar	7%
4	Wind	3%

Source: China-Pakistan Economic Corridor 2017, http://cpec.gov.pk/

In CPEC energy projects, four key sources, coal, hydel, wind and solar are being used. Pakistan is also focusing on enhancing the share of renewable energy in energy mix. For a long time, Pakistan has been focusing on renewable energy resources. CPEC renewable energy projects are solely focusing on this dimension. These projects are environmentally friendly, and Pakistan has substantial renewable energy potential. This positive dimension of renewable energy technologies has increased the desire for China to invest broadly. By 2020, China invested $400 billion in renewable energy. By 2030, it desires to constitute 20% of its renewable energy mix. That is why. These technologies have central place in the energy projects of China is promoting renewable energy through CPEC. These technologies have a central place in the energy projects of the corridor. These projects will provide Pakistan with an opportunity to manage its energy insecurity. They can potentially reduce the level of energy insecurity while providing affordable and clean energy to energy mix. Based on various types of technologies, CPEC energy projects have great potential for the energy sector of Pakistan because this sector is struggling hard to cope with the energy crisis, and these crises are affecting the GDP of the country.

This massive investment in China will increase sustainability, certainty, and affordability in the energy sector of Pakistan. Through this $34 billion investment, CPEC energy projects will produce 1700MW of energy, which is sufficient not only to manage the current energy crisis but also to have surplus energy. This surplus energy will boost the industrial capacity of the nation and improve the socio-economic condition of people.

In CPEC, the key focus is on energy production, utilizing four technologies. CPEC energy production portfolio source A major source of the CPEC energy production portfolio is based on coal which will provide 9540MW, followed by hydropower 2919MW, solar power 1000MW and wind 347MW (Awan, 2018).

Green energy is at the heart of all ecological strategies. Green energy affects a state in social, economic and environment related areas. It is a sustainable energy which does not harm the environment. The process of production of green energy is clean and it basically participates in reduction of pollution. Sources of green energy are wind, solar, hydro, geothermal and etcetera.

Clean and Green CPEC Energy

In December 2020, during a meeting between the authorities of both sides agreed green initiative of CPEC. Special assistant of Prime Minister on climate change briefed a delegation headed by Chinese ambassador regarding Pakistan's initiative on 'Clean Green Pakistan'. In it, the major initiative was "Ten Billion Tree Tsunami program". The government of Pakistan has initiated "Ten Billion Tree Tsunami Program" with the cost of 125.1843 rupees. It is a four-year program (2019 to 2023) and is being implemented through the Ministry of Climate Change. According to the ministry plantation target of 430 million trees has been achieved and till 30 June 2021, the target of 1 billion plantation will be achieved (Coordination, 2023).

In 2020, Prime Minister Imran Khan, during his address before Climate Ambitions Summit, had expressed his desire that Pakistan will fulfil 60 percent of its energy needs through renewable energy resource at the end of 2030. To meet this target, the government has initiated tsunami tree plan, but this is not enough. There is a need of encouraging investments in renewable energy generation. It is also necessary to convert coal-based power plants to reduce CO^2 emission levels. According to Xinhua (News Agency), in CPEC, a few coal-based energy projects (i.e., Rahimyar Khan Imported Coal Power Plant) have been stopped and the government is planning to increase the share of renewable energy projects which is a good sign. To counter climate change threats on CPEC, there is the need of more attention i.e., increasing focus on renewable energy projects, instead of stopping coal-based energy projects. Under energy projects of CPEC, China is specially focusing on non-polluting sources of energy production (Amount Not Specified Yet). Both China and Pakistan are strengthening their bilateral cooperation in renewable energy production and CPEC is utilizing three sources of clean energy which include Hydel, Wind and Solar (Duan, Khurshid, Nazir, Khan, & Calin, 2022).

It is necessary for Pakistan to enhance its cooperation with China in getting environmentally friendly sustainable energy. In CPEC, Pakistan must give priority to renewable energy projects to address environmental challenges. Both China and Pakistan are required lot of work if they want to turn CPEC into a blueprint for greening the ambitious BRI. (Ali, 2021) There are certain

obstacles in greening the CPEC, but renewable energy projects provide opportunities for clean energy Investment in CPEC.

It is not easy to undo the CPEC energy provided so far. There are certain obstacles to ramping up this energy. When the idea of coal power plant was initiated before the CPEC, Pakistan was facing the problems of Sever power shortage, high generation cost and circular debt. In 2015, there was 5000MW to 7000MW of demand and supply gap and the nation was facing terrible energy crisis. So, coal became the solution of these crisis. Government of Pakistan wants to use coal to replace expensive oil and gas imported from overseas. When CPEC was initiated in 2015, it became an opportunity for Pakistan to use coal as window to achieve its power development goals. Pakistan has abounded coal reserves and it attracted foreign investors for coal-based power plants and facilitate them. Renewables were not comparative as coal in terms of the generation cost during that time. But now the situation is quite different there is the tendency of power surplus in Pakistan and coal power is losing advantage over renewables in terms of the cost. At present, the share of coal-based energy is very basic and it not easy to undo this energy. However, things can be managed by increasing the share of renewables. But it will increase the cost which cannot be determined yet and will also take time. There are also certain obstacles in greening the CPEC as:

1. State Owned Enterprises and government bodies driving decisions.
2. Access to finance
3. Preference for fossil fuels among policymakers in Pakistan
4. Reflects of BRI trends

Despite of above mentions hurdles, Pakistan is also making its new renewable targets. Now both sides are focusing on making the project greener and environmentally sustainable. They are also incorporating long term issues like climate change and ecological risks into the decision making. Greening BRI and CPEC is Chinese official project which is a positive step. It also shows how seriously things are being taken at the top level. China will also help Pakistan in green CPEC because there are strong moments in and outside China regarding the promotion of green energy. On CPEC, China's reputation as green leader is at stake.

CPEC renewable energy projects will be significant to improve environmental sustainability. Moreover, Chinese experience in renewable energy production will for benefit Pakistan's journey towards renewable energy. At present, expensive furnace oil is used for energy production. At the time of any critical situation, the country's reliance on furnace oil may lead to price shock and increase vulnerability in future.

Focusing on SDG-7, CPEC is directly related to achieving this SDG's targets in Pakistan. Like many other developing countries, around 30% of Pakistan is population lives without any energy access. Energy projects of CPEC are the key source of providing affordable and clean energy to support the energy sector of Pakistan. There are four major CPEC sources of energy production, and till now, the country has made considerable progress in getting the share of energy. Among 21 energy projects, 7seven projects have, and 7 started to function within three years of their groundbreaking ceremony in 2015. These seven projects are providing 2937MW of energy to the national grid. At the same time, construction of the remaining projects is in progress. The development of CPEC projects will improve Pakistan's energy sector.

Conclusion

All energy experts agree that CPEC will provide Pakistan with affordable energy. The cost of CPEC energy units will be very low, affecting the present high price of energy. Unanimously, CPEC energy will bring sustainability to the supply of energy supply which will ultimately benefit people, businesses, industry, and agriculture. On the side of clean energy, 13 experts agree that the environment will have no issue with CPEC energy projects. They also give their expert opinion that Pakistan is much lower in terms of carbon emission when and if compared with developed or other regional states. Four energy production sources of CPEC, the problem lies on the coal side, which can be controlled by using advanced and efficient technologies which the four energy production sources of CPEC; the problem lies on the coal side, which can be controlled by using advanced and efficient technologies that reduce CO_2 emission. However, in the opinion of two experts, CPEC coal-based energy projects will harm the environment. At the same time, other energy sources have no issue with the environment.

By of completing CPEC long-term energy projects, the energy mix of Pakistan will acquire a sustainable balance by 2030. Pakistan's energy security. Through CPEC energy, the current reliance of Pakistan on both expensive furnace oil and seasonal hydel power will be diversified towards renewable energy technologies. CPEC Energy will enable Pakistan to provide cheaper energy by 2030. CPEC energy will give a better chance to reduce the cost-tariff deficit. the energy system of Pakistan will be resolved by the reduction of the cost-tariff deficit. The reduction of the cost-tariff deficit will resolve the issue of circular debt in the energy system of Pakistan. The Utilization of cheaper and renewable energy will also reduce production costs, which will directly benefit end users.

The purpose of sustainable goals is to achieve sustainable development in each country. With the support of the United Nations, every country is trying to

these goals' objectives by 2030. In the network of sustainable development goals and their indicators, Pakistan, compared to other middle-income states, is doing better. The government of Pakistan, with the support of relevant stakeholders, adopted Pakistan Vision 2025. To manage the energy crisis, China is supporting Pakistan through CPEC. The major focus of CPEC is on energy, of which a sufficient amount has been fixed. The key purpose of CPEC energy for Pakistan is to gain energy independence. Energy independence will finally lead towards energy security. As CPEC energy mainly depends upon indigenous resources, through it, Pakistan will gain a realistic way of energy security. These energy projects will bring sustainable and durable energy to Pakistan to overcome its energy scarcity.

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8

Enhancing Food Security and Sustainable Development in Pakistan: Agricultural Advancements under CPEC

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Abstract

The growth of Pakistan's agriculture industry, food security, and progress of China-Pakistan Economic Corridor (CPEC) are intricately linked, driving progress towards achieving Sustainable Development Goals (SDGs). As agriculture growth enhances food availability and self-sufficiency by reducing hunger and malnutrition (SDG 2), alleviates poverty (SDG 1), and improves health and well-being (SDG 3). CPEC's infrastructure upgrades and facilitates agricultural trade, market access, and economic growth, creating jobs and increasing incomes (SDG 8), while promoting decent work and economic development (SDG 9). This chapter is an attempt to analyze the interconnected progress that contributes to achieving SDGs, ensuring a more food-secure, economically stable, and sustainable future for Pakistan by attempting to analyze the fact that, how value chains, market access, and farming methods may all be improved by CPEC investment. It also assesses the effects of these advancements on the environment and society through stakeholder analysis to identify national and international players that can work together to maximize the benefits of CPEC on agriculture as strategic utilization of CPEC can assist Pakistan in achieving SDG targets and goals related to food security.

Introduction

The agriculture sector/industry in Pakistan could experience significant effects from the China-Pakistan Economic Corridor (CPEC) infrastructure project. This study evaluates CPEC's potential benefits and drawbacks for Pakistan's agricultural industry and food security while considering the SDGs. Additionally, in tackling poverty and hunger, two primary SDG objectives, the study emphasizes the significance of Pakistan's agriculture industry. It looks at how value chains, market access, and farming methods may all be

improved by the CPEC investments. It also assesses the effects of these advancements on the environment and society. Also, stakeholder analysis is used in this study to identify national and international players that can work together to maximize the benefits of CPEC on agriculture. Strategically utilizing CPEC can assist Pakistan in achieving SDG targets and goals related to food security while providing insightful information to investors, development professionals, policymakers, and practitioners.

The Sustainable Development Goals (SDG 2) aim to eradicate hunger, ensure food security, improve nutrition, and promote sustainable agriculture worldwide by 2030. This goal is particularly crucial for Pakistan, a country grappling with food security issues, despite its abundant agricultural resources, and the China-Pakistan Economic Corridor (CPEC), an ambitious economic initiative provides the opportunity to address the bottlenecks.(Imran et al., 2022). The nation's capacity to provide food for all its residents has been put under strain by factors such as rapid population increase, the effects of climate change, water shortages, and antiquated farming techniques. In order to address these problems and improve Pakistan's food security, nutrition, and general well-being, SDG 2 must be achieved (Bibi & Raza, 2023).

The CPEC is revolutionary for Pakistan's economic growth. It includes many infrastructure projects, such as industrial zones, railroads, highways, and energy production. Although connectivity and trade are the main objectives of CPEC, SDG 2 would be significantly impacted. The CPEC has the power to transform Pakistan's farming industry completely. Modernized transportation, better logistics, and more connections may all help deliver agricultural products quickly from farms to markets (Anwar et al., 2022).

Moreover, CPEC investments in agriculture and technology have the potential to boost value chains, empower smallholder farmers, and increase agricultural yields. Reducing poverty is strongly related to SDG 2. People may escape poverty and have better access to food and nutrition because of the economic benefits of CPEC, which include employment opportunities and more significant economic activity. However, there are difficulties. The successful implementation of CPEC projects necessitates careful consideration of the possible environmental and social ramifications and alignment with sustainable development goals.

In summary, SDG 2 is closely related to the China-Pakistan Economic Corridor (CPEC). Enhancing economic circumstances, agriculture, and poverty might significantly alleviate Pakistan's food security issues. For CPEC to fully fulfill its potential and provide food security and a brighter future for

Pakistan, all stakeholders must work together to ensure that the project complies with sustainable development principles and advances the accomplishment of SDG (Anwar et al., 2022).

CPEC and Agriculture Sector of Pakistan

Overview of the CPEC

CPEC, a major multi-billion-dollar initiative, aims to connect Pakistan's Gwadar Port to China's western region, holding immense geopolitical and historical importance. Commencing in 2013 through a pact between China and Pakistan, it stands as a critical project within China's Belt and Road Initiative (BRI), focusing on enhancing global infrastructure and trade links (Bibi & Raza, 2023). The CPEC network encompasses vital developments like roads, railways, pipelines, and energy facilities, promising substantial improvements in Pakistan's energy and transportation sectors and fostering economic growth (Alam et al., 2023). By shortening the distance, the corridor provides China with a more convenient route to the Arabian Sea, bypassing the complexities of the South China Sea routes. Moreover, CPEC's significance lies in its transformative potential for Pakistan's economy, job creation, and regional connectivity enhancement (Bibi & Raza, 2023). However, it has also sparked worries about the geopolitical ramifications, sovereignty challenges, and debt sustainability. All the same, CPEC continues to be a representation of the deepening geopolitical and economic relations between China and Pakistan, with far-reaching consequences for both nations as well as the wider area (Alam et al., 2023).

Agricultural Sector in Pakistan

The Pakistani economy relies significantly on its agricultural sector, which engages a substantial segment of the labor force and plays a significant role in GDP. Nonetheless, it faces multiple hurdles, with the most urgent one being severe water scarcity intensified by the impacts of climate change and inefficient irrigation techniques. This is an essential risk to the agricultural sector, as irrigation from the Indus River system is crucial (Syed et al., 2022). Furthermore, soil erosion and fertility loss are significant contributors to decreased agricultural output, highlighting the ongoing issue of land degradation. Traditional and antiquated farming methods are still widely used, which prevents productivity gains, while contemporary agricultural technology is still not widely used. Inadequate storage facilities, inadequate market accessibility, and inadequate transportation infrastructure impede the effective distribution of agricultural products (Ashraf et al., 2022).

Despite these obstacles, noteworthy prospects are approaching. Pakistan may focus on high-value export crops like fruits and vegetables instead of growing traditional mainstays like rice and wheat. Another path to expansion is modernization, where productivity gains may be achieved via precision agriculture, contemporary agricultural methods, and technological advancements. Investments in irrigation systems and water management can allay concerns about water shortages. Pakistan's proximity to regional markets like the Middle East and Central Asia offers more export revenue (Abbas, 2022). Enhancing value addition through agribusiness and food processing may boost the sector's economic contribution and raise farmers' incomes.

In conclusion, Pakistan's agriculture sector is at a critical moment, juggling prospects and problems. Its stability and growth depend on overcoming water constraints, adopting contemporary technology, and supporting sustainable behaviors. Pakistan's economic growth and agricultural development may be fueled by utilizing its potential for regional commerce and expanding market access (Ashraf et al., 2022).

CPEC and Agriculture

Shafi et al. (2023) suggest that Pakistan's agricultural environment is changing due to the China-Pakistan Economic Corridor (CPEC), which presents both possibilities and problems. Better transportation infrastructure, which makes it possible for agricultural products to be moved to markets efficiently, is one clear way CPEC has benefited agriculture. Improving farmers' access to customers and lowering post-harvest losses might promote economic growth (Barrech et al., 2023). Furthermore, CPEC-related projects that address irrigation and water management concerns may resolve Pakistan's ongoing water shortage issue. This is important since sustainable farming methods depend heavily on water. Exports and farmer incomes might rise due to the China-Pakistan Economic Corridor's (CPEC) enhanced connectivity, which fortifies international economic ties and creates new markets for Pakistani agricultural goods, especially in China (Shahzad et al., 2023).

On the other hand, there are issues regarding how CPEC may affect agriculture. Procuring agricultural land due to extensive infrastructure development may uproot rural communities and harm food security. Environmental effects, including soil erosion and water resource loss, are potential problems that require cautious control (Barrech et al., 2023). Furthermore, the government's ability to fund agricultural development initiatives may be constrained by the debt taken on to finance CPEC projects. Moreover, the enhanced commerce

enabled by the CPEC may subject Pakistani farmers to rivalry with Chinese agricultural goods, influencing regional market dynamics (Shafi et al., 2023).

However, initiatives for policies and efficient administration are essential for handling these challenges. To fully realize the promise of the CPEC to support a solid and sustainable agriculture sector in Pakistan, it will be necessary to strike a balance between the advantages of increased market access and infrastructure and the issues of social fairness and environmental sustainability (Shahzad et al., 2023).

Technological Advancements

Modern farming methods might be introduced into Pakistan with the potential for technological improvements and agricultural innovation brought about by the CPEC. Precision agriculture, biotechnology, and agricultural gear are just a few of the innovations China has achieved in these fields, and through the CPEC, Pakistan will have access to these innovations. With the cooperation and information sharing made possible by CPEC, Pakistani farmers could transform their farming practices and acquire the equipment and know-how needed to do so (Bano et al., 2022). The future of agriculture seems quite promising. Increased yields and less resource waste may be achieved by implementing contemporary agricultural methods like precision farming powered by data and technology. Developing high-yielding, disease-resistant crop varieties by biotechnology can increase agricultural production and food security. With the CPEC, Pakistan's agricultural output may rise significantly by integrating data-driven decision-making with modern technology (Anwar et al., 2022). Automation may reduce labor-intensive employment, and data-driven decision-making can enhance crop management and resource allocation, increasing crop quality and yield (Bano et al., 2022).

However, there are obstacles to this vision's practical realization. It is critical to prioritize skill development, affordability, and resource accessibility, particularly for rural populations and smallholder farmers. Achieving the transformation of Pakistan's agricultural industry will depend on ensuring these players have the resources and skills to fully use technological breakthroughs (Gul et al., 2022). According to many experts, Pakistan has the opportunity to modernize its agriculture, increase productivity, address food security issues, and support economic development through the role of CPEC in promoting technology transfer and agricultural innovation. (Anwar et al., 2022).

Economic Impacts of CPEC in Pakistan

The CPEC significantly impacts the earnings and means of subsistence of Pakistani farmers, resulting in notable social and economic transformations in farming areas. In terms of the economy, the agricultural sector has benefited from CPEC. Farmers now have access to broader markets, lower post-harvest losses, and more competitive pricing for their goods because of the improved roads and connections in the transportation infrastructure (Gul et al., 2022). In addition, farmers' earnings have grown due to greater agricultural output brought about by the adoption of contemporary farming techniques and technology made possible by CPEC (Anwar et al., 2022). Furthermore, it is notable that the livelihoods have become more varied. People in rural villages now have new sources of income because of the CPEC's opportunities for employment, especially in industries like construction, transportation, and services. For many households, the increased financial stability brought about by this diversification has also lessened their economic vulnerability (Bano et al., 2022).

In addition to its economic benefits, CPEC has raised rural residents' quality of living. Improved energy accessibility, better roads, and clean water are a few examples of infrastructural development that has raised living standards overall and increased agricultural productivity in certain regions (Barrech et al., 2023). Despite this, it is essential to acknowledge that disparities and inequalities exist. Specific farmers and communities may profit more than others because of unequal access to CPEC-related opportunities, resources, and knowledge. For policymakers and stakeholders, resolving these discrepancies and guaranteeing a fair sharing of the benefits of CPEC continue to be significant challenges (Shafi et al., 2023). CPEC is changing how people who work in agriculture make a living, improving living standards, diversifying sources of income, and generating economic advantages. However, it also brings attention to implementing the project with equity and inclusion (Gul et al., 2022).

CPEC and Food Security in Pakistan

Economic Impact of CPEC on Food Security

According to research, the cost and affordability of food for Pakistan's general populace are directly impacted by the massive economic effects of the CPEC. The massive infrastructure development of CPEC, which includes energy projects, is one of its most important economic features (Baig et al., 2023). Moving food from fields to markets may become more affordable due to this infrastructure development's potential to lower transportation costs.

Enhancing the energy supply can help lower production costs in the agricultural sector. This might lead to people being able to purchase food at a lower cost because lower manufacturing and transportation expenses can help keep prices stable (Cao et al., 2022). In addition, it is anticipated that CPEC would propel Pakistan's economy as a whole, raising household incomes and standards of life. People typically have more money available to them as the economy expands, which may help them buy food. Another critical factor is the job prospects created by CPEC-related projects. Creating jobs in transportation, building, and related industries immediately raises earnings, increasing the population's purchasing power and facilitating better access to food (Shafi et al., 2023).

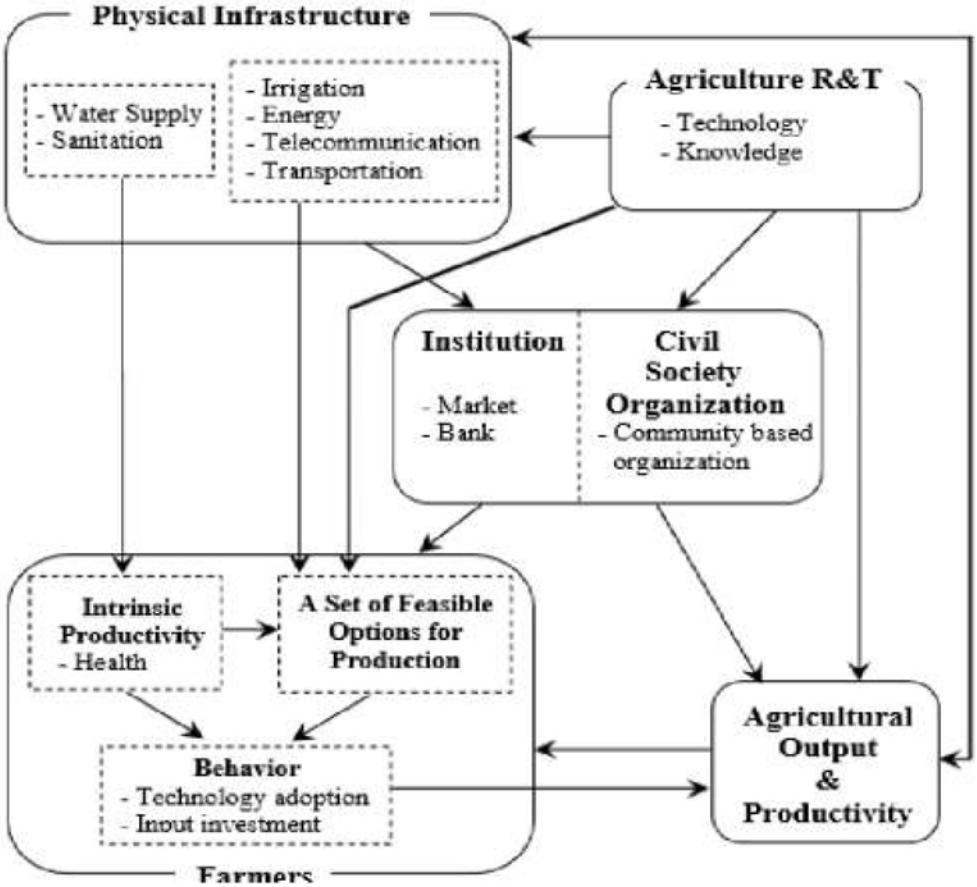

Figure 1: Flow Chart of Agricultural Output Versus Productivity

However, it is critical to recognize the possibility of economic disparity. Although the economic advantages of CPEC appear suitable, questions about how these gains will be distributed relatively still need to be answered. There is a chance that wealth will not be spread equally, which might result in

differences in access to food supplies and income (Cao et al., 2022). Because of this, officials must guarantee that everyone benefits from CPEC. Pakistan may also be able to export agricultural goods more effectively because of the CPEC's enhanced transportation infrastructure. This can affect food affordability in local and foreign markets, boosting the agriculture industry and giving farmers additional options (Ali et al., 2022).

In conclusion, the economic components of the CPEC may significantly impact the general Pakistani population's access to and cost of food. Employment creation, economic expansion, and infrastructural development may make food more widely available and reasonably priced. To make the changes more inclusive and long-lasting, it is imperative to address income inequality and guarantee a fair distribution of these advantages (Shafi et al., 2023).

Infrastructure Development

Ali et al. (2022). Stated that CPEC is an umbrella term for several infrastructure projects that have the potential to significantly impact Pakistan's food supply chain, especially in terms of storage and transportation. A key element of CPEC is the vast infrastructure development in transportation, including railroads and highways. These improvements are anticipated to lower transportation costs, improve logistical effectiveness, and expedite the distribution of food goods from manufacturing facilities to retail outlets. The result is a food supply chain that is more effective, affordable, and trustworthy, which not only eases customer financial strain but also guarantees the timely availability of fresh produce (Shafi et al., 2023). The construction of the Gwadar Port in Baluchistan, which can drastically alter food import and export, is another essential component of the CPEC. The deep-sea port's enhanced capabilities will lead to more affordable and adequate food transportation and receiving. This might assist Pakistani consumers by lowering food prices and increasing the variety of food options accessible, improving food accessibility (Cao et al., 2022).

Additionally, cold storage facilities are part of the CPEC, and these investments are essential for maintaining perishable foods, including fruits, vegetables, and dairy goods. A more reliable and readily available food supply may be achieved by extending the shelf life of products and reducing food waste through improved cold storage facilities (Shah, 2023). By making markets more accessible, road network expansion—particularly in rural areas—is critical in strengthening the food supply chain. Farmers may more efficiently deliver their goods to towns and cities, growing their consumer base

and improving the chain's overall performance. Moreover, this helps make food more accessible and affordable for rural and underdeveloped areas (Cao et al., 2022).

The economic growth and job creation connected with CPEC projects can further stimulate the food supply chain due to increased wages and employment possibilities. Nonetheless, it is imperative to tackle possible inequalities in the availability of these enhanced amenities and guarantee a just allocation of advantages throughout the nation. Furthermore, to optimize these infrastructure projects' beneficial effects on Pakistan's food supply chain, they must be managed effectively and sustainably (Shah, 2023).

CPEC and Agricultural Productivity

CPEC has drastically altered Pakistan's agricultural environment, potentially impacting food security significantly. Positively, the construction of roads and railroads due to CPEC has lowered transportation costs and increased the effectiveness of food transit from fields to markets (Shafi et al., 2023). In addition to lowering post-harvest losses, this improvement in market accessibility has allowed people to purchase a wider variety of food goods at more reasonable costs. Furthermore, using cutting-edge farming methods and technology made possible by CPEC, such as biotechnology and precision agriculture, can transform agricultural productivity and raise yields and food production (Saqib et al., 2023). By lowering reliance on a narrow range of staples, crop diversification—especially with an emphasis on high-value fruits and vegetables for export has improved the variety of products available and given farmers additional avenues for revenue. This has improved food security. However, there are also issues, such as wealth inequality, which might limit vulnerable populations' access to CPEC benefits and, in turn, their food security. Furthermore, as sustainable land and water usage are essential for long-term food security, the fast modernization of agriculture presents environmental problems (Imran et al., 2022).

The fair distribution of economic gains, environmental sustainability, and the involvement of smallholder farmers and disadvantaged people in the development process must be prioritized in policy efforts for CPEC to catalyze better food security in Pakistan. To maximize CPEC's potential for improving food security and guaranteeing that a more extensive range of people benefit from the economic and agricultural changes this large-scale project brings, it will be imperative to address these obstacles (Saqib et al., 2023).

Trade Relations with China and Food Imports

Pakistan's food security is significantly impacted by the CPEC, which presents both trade opportunities and concerns. CPEC positively expands Pakistan's potential for commerce, particularly regarding agricultural goods. Agricultural products movement is streamlined, and the upgraded transportation infrastructure, including the Gwadar Port building significantly increases export potential. This makes it possible for Pakistani food products, especially perishables like fruits and vegetables, to enter foreign markets more successfully and affordably, opening up new business prospects (Zhan, 2022). Additionally, by diversifying exports, CPEC lessens the reliance on conventional goods like textiles and grains. This diversification increases the agricultural sector's resilience and can improve food security by increasing the variety of available exportable products (Bozsik et al., 2022). Moreover, Pakistan's food security may be improved by the increased regional commerce made possible by the CPEC, especially with nearby nations like China, the Middle East, and Central Asia. It increases access to a wider variety of food sources by expanding the country's market reach and reducing reliance on a small number of trading partners (Liang et al., 2022).

However, this expanded trade is not without its difficulties. Food security may be impacted by the CPEC-facilitated flood of Chinese agricultural goods, which might challenge indigenous farmers' ability to compete. It could also influence local prices and market dynamics (Bozsik et al., 2022). To maintain food security, the supply chain's infrastructure development rate, including food distribution and storage facilities, must also keep up with the increased trade opportunities. Lastly, economic disparities may prevent some groups of people from accessing various wholesome foods. Improving overall food security requires ensuring that the advantages of increasing agricultural exports under CPEC are spread fairly (Imran et al., 2022).

In conclusion, the CPEC has the potential to change the agricultural trade environment in Pakistan, posing both possibilities and problems for food security. Authorities must tackle these obstacles while concentrating on inclusive and sustainable approaches to guarantee that the advantages of CPEC lead to improved food security for every demographic (Liang et al., 2022).

Governmental Policies and Food Security

Food security in the context of the CPEC primarily depends on government laws and regulations. Even though CPEC has many chances for enhanced commerce and economic expansion, it also presents risks that might impact

the country's food supply (Imran et al., 2022). A balance between encouraging trade and safeguarding domestic agriculture is crucial for the government regarding trade policies. To stop the massive flood of Chinese agricultural products and keep the domestic market strong entails imposing taxes, quotas, and standards (Shafi et al., 2023).

Investment policies related to infrastructure are equally significant. To guarantee effective supply chains, government investment and assistance are essential for CPEC's focus on infrastructure development, including transportation and storage facilities. Ensuring timely access to food goods and limiting food loss depend heavily on a well-regulated infrastructure (Zhan, 2022). Another essential component is addressing economic inequality. The government should enact laws that guarantee the benefits are shared relatively as CPEC propels economic growth. Social safety nets, income redistribution programs, and assistance for smallholder farmers can help reduce inequality and increase access to food resources, increasing food security (Ali et al., 2022).

Moreover, rules about the environment are also crucial. Concerns of sustainable land and water use are raised by the CPEC's fast upgrading of agriculture. To safeguard the natural resources necessary for long-term food security, government laws must establish and enforce guidelines for pesticide usage, land management, and water conservation (Bano et al., 2022). Strict enforcement of food safety and quality standards is also necessary to protect customers and foster trust in the food supply. Strict guidelines are necessary for food safety, labeling, and quality requirements (Shahzad et al., 2023). Lastly, resilience planning is essential to handle possible supply chain weaknesses brought on by interruptions connected to CPEC or natural calamities. Plans for creating strategic food reserves and backup plans should be part of government policy to reduce risks and preserve food security (Ali et al., 2022).

Challenges and Barriers

Despite Pakistan's economic gains from the CPEC, the nation's food security and agriculture sectors face serious challenges.

CPEC and Infrastructure Challenges

For Pakistan's economy to flourish, the CPEC is an essential project. However, difficulties associated with infrastructure development, including incomplete project schedules, poor connectivity, and logistical roadblocks, impede the smooth execution of CPEC projects. These roadblocks impede the corridor's

overall development and, in turn, jeopardize Pakistan's financial stability (Imran et al., 2022).

Food Security Concerns

Pakistan confronts several obstacles in maintaining food security because of scarce water supplies, shifting weather patterns, and antiquated farming methods. Farmers find it challenging to produce enough food to fulfill the population's expanding demands since unpredictable weather patterns impact agricultural production. This problem causes food insecurity for millions of Pakistanis, worsened by inefficient food distribution systems and post-harvest losses (Shafi et al., 2023).

Agricultural Constraints

Pakistan's economy is based mainly on agriculture, yet it faces several challenges. A lack of modern irrigation infrastructure, outdated farming methods, and restricted technological access hinder agricultural production. , who sometimes lack the necessary resources and skills. Further impeding large-scale agricultural growth are the prevalence of land fragmentation and the lack of efficient land consolidation strategies (Imran et al., 2022).

Economic Impacts on Pakistan

Pakistan's economy is significantly impacted by the issues with CPEC, food security, and agriculture. Inadequate development of CPEC projects restricts employment possibilities and overall economic development by impeding industrial expansion and economic diversification. Furthermore, malnutrition brought on by food poverty impacts worker productivity and health. The limitations imposed by agriculture cause rural economies to stagnate, prolonging poverty and inequality (Zhan, 2022).

Policy Reforms and International Cooperation

Combining significant policy changes with international collaboration is essential to address these issues. Pakistan has to commit to modernizing its agricultural industry by giving farmers access to cutting-edge equipment, premium seeds, and effective irrigation systems. Improving agricultural output and lessening the effects of climate change require investing in higher-level agricultural research and adopting sustainable farming practices. In addition, the effective implementation of CPEC projects may be ensured by reinforcing the legal framework, encouraging private sector participation, and

promoting international partnerships. This will assist infrastructure development and seamless connectivity (Shafi et al., 2023).

In conclusion, Pakistan's sustained growth depends on resolving the issues and obstacles surrounding CPEC, food security, and agriculture. Through strategic policy reforms, technology investments, and international cooperation, Pakistan can optimize its agricultural potential, augment food security, and leverage the CPEC's advantages. This will ultimately result in the country's economic growth and raise the standard of living for its populace (Zhan, 2022).

Stakeholder Analysis

These stakeholders' active participation and coordination are crucial in CPEC, food security, agriculture, and Pakistan to guarantee that CPEC projects favorably impact food security, sustainable agriculture, and Pakistan's overall growth. 60% of Pakistanis live in food insecure conditions, which are made worse by inadequate research, weak supply chains, inadequate planning, and a lack of industry best practices. With $46 billion initial investments, the (CPEC) presents promise for a better future (Ali et al., 2022).

Government of Pakistan's Role in CPEC

The execution of CPEC projects is significantly dependent on the involvement of the Pakistani government. It must guarantee that CPEC aligns with the nation's agricultural growth and food security objectives. This entails developing legislation that makes it easier for agricultural goods to be transported efficiently, enhancing infrastructure, and encouraging sustainable farming methods ().

Chinese Investments and CPEC

China is a significant investor and shareholder in the CPEC. Chinese investments may directly affect Pakistan's agricultural industry by advancing farming methods and fostering agribusiness growth. Cooperation between the two nations is essential to guaranteeing that Pakistan's agriculture and food security will profit from CPEC (Zhan, 2022).

Pakistani Farmers and Agriculture

Pakistan's agriculture economy is centered on its farmers. To improve food security, their adoption of cutting-edge, sustainable agricultural techniques is essential. To fully benefit from CPEC-related advancements, they require

assistance with training, technological access, and effective irrigation techniques (Shahzad et al., 2023).

International Organizations and Food Security

International organizations like the World Bank and the UN must ensure food security and sustainable development in Pakistan. They may offer Pakistan financial support, technical aid, and knowledge to help it meet SDG 2 and fully realize the promise of CPEC (Ali et al., 2022).

Private Sector and Agribusiness

Businesses in the private sector, especially agro-sector ones, are crucial. They can invest in cold storage facilities, food processing, and value chains—all crucial elements of food security. Partnerships between the public and commercial sectors can boost agricultural productivity and increase food security (Imran et al., 2022).

Academia and Research Institutions

Research groups and academic institutions can help create novel agricultural techniques, tools, and regulations that improve agricultural sustainability and food security. Research results must be implemented with farmers and government authorities (Shahzad et al., 2023).

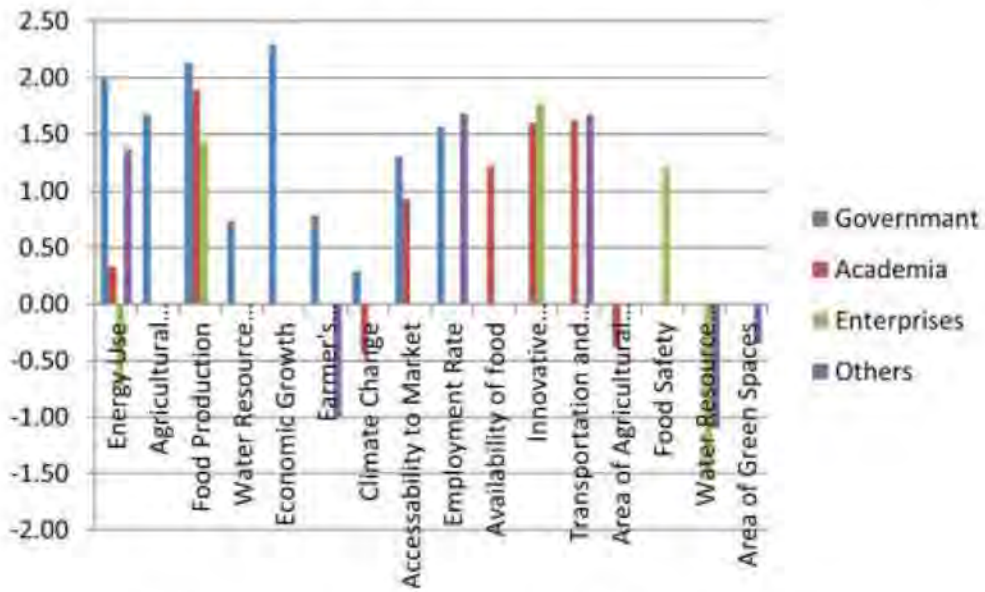

Figure 2: Stakeholder's Viewpoint about CPEC Development

Figure 2 illustrates the stakeholder viewpoints regarding topics such as water use. Government and business concerns coincide as they expect better results from resource management, such as stronger laws and more efficient water use for agriculture due to CPEC developments (Baig et al., 2023).

Table 1: Growth of the Agricultural Sector in Pakistan

Sector	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22 P
Agriculture	**2.22**	**3.88**	**0.94**	**3.91**	**3.48**	**4.40**
1. Crops (i+ii+iii)	1.37	4.61	-4.38	6.32	5.96	6.58
i) Important Crops	2.68	4.27	-8.59	5.24	5.83	7.34
ii) Other Crops	-1.24	4.65	3.62	9.21	8.27	5.44
iii) Cotton Ginning	5.24	8.27	-11.23	-4.06	-13.08	9.19
2. Livestock	2.89	3.59	3.65	2.89	2.38	3.26
3. Forestry	-2.92	2.24	7.22	3.36	-0.45	6.13
4. Fishing	1.22	1.57	0.78	0.63	0.73	0.35

According to Table 1, China's investments in Pakistani joint ventures and agricultural projects led to a significant 4.4% rise, above the 3.5% forecast in 2022 (Zulfiqar, 2023).

Conclusion and Recommendations

This research shows a close relationship between the CPEC, food security, Pakistan's agriculture industry, and the Sustainable Development Goals (SDGs). The research highlights how vital Pakistan's agriculture sector is to reaching SDG goals. It evaluates how CPEC investments may improve farming practices, market access, value chains, and their environmental and societal effects. In order to find essential participants who can work together to optimize the advantages of CPEC for agriculture, a stakeholder analysis is utilized. Pakistan's agriculture industry also stands to gain a great deal from the innovative CPEC infrastructure project. Above all, it offers a chance to modernize the logistics and transportation system, allowing farmers to deliver their goods to markets effectively. One of the main concerns in Pakistan's agriculture sector is post-harvest losses, which may be decreased with improved transportation. Additionally, by expanding Pakistani agricultural goods' access to new domestic and international markets, the CPEC can improve farmers' income and living standards.

Furthermore, modernization and innovation in agricultural methods can be stimulated by CPEC investments in agriculture, leading to higher crop yields

and productivity. Pakistan may help achieve SDG objectives for climate change mitigation and environmental protection by encouraging sustainable farming practices. Even while CPEC has a lot of potential benefits, it is essential to recognize and deal with the difficulties and adverse effects as well.

Therefore, Pakistan should ensure that all facets of the populace, especially small-scale farmers, profit from CPEC agricultural investments. Necessary first measures include implementing land tenure changes and developing fair benefit-sharing arrangements. Similarly, CPEC investments promote the adoption of climate-resilient and sustainable agriculture methods. Encourage this field's research and development to increase agricultural yields while protecting the environment. Pakistan should prioritize building roads, storage facilities, and irrigation systems in rural areas to improve farmers' access to markets and lower losses after harvest.

Moreover, trade agreements and international collaborations should be strengthened to increase the market for Pakistani agricultural goods. As a result, farmers will earn more money, and food security will increase. Also, establish a strict monitoring and assessment system to ensure that CPEC agricultural investments support Pakistan's SDGs and advance the industry. Additionally, Pakistan should promote sustainable livestock farming methods, such as improved feed production, effective waste management, and animal health supervision. Livestock farming is vital to rural economies and may increase food security since it generates meat, milk, and other dairy products.

In order to expand upon the results of this investigation and enhance policy recommendations, future research may investigate certain domains. Firstly, perform comprehensive analyses to assess the socioeconomic impacts of CPEC's agricultural investments on nearby areas, emphasizing the creation of jobs, income distribution, and poverty alleviation. Similarly, future researchers should examine how CPEC-driven agricultural growth affects the environment, mainly how it affects biodiversity, water resources, and land. Additionally, it provides thorough measures to evaluate food security in the context of agricultural development led by CPEC. Examine variables affecting nutrition and dietary variety, such as availability, access, usage, and stability.

Further research should examine how well government structures and policies match Pakistan's agriculture and SDG goals with CPEC funding. Examine how institutions, regulatory frameworks, and decision-making procedures contribute to achieving desired results. Lastly, the intricate relationships between CPEC, agriculture, and the Sustainable Development Goals in Pakistan may be better understood by policymakers, academics, and

development practitioners by concentrating on these study topics. This information will support the development of sustainable agriculture, support evidence-based policy choices, and advance the country's transition to a more prosperous and just future.

Suggested Citation

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9

Sustainability of Water Resources along CPEC: Assessing Current Supply and Projecting Future Demand

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Abstract

The Indus Basin Irrigation System (IBIS), encompassing the primary water storage reservoirs of Tarbela on the Indus and Mangla on the Jhelum, along with numerous barrages, headworks, and canal networks, stands as the world's largest integrated irrigation system. A substantial portion of water for these reservoirs is derived from the melting of snow and glaciers in the Himalaya-Karakoram-Hindukush (HKH) mountain ranges. At the same time, the remainder is contributed by monsoon precipitation and groundwater sources. The freshwater resources supporting these reservoirs, crucial for food security, domestic and industrial use, and power generation along the China-Pakistan Economic Corridor (CPEC), are susceptible to the impacts of climatic variability, socio-economic factors, and transboundary issues. Anticipated population growth in the country will likely elevate future water demand for irrigation and urban purposes. Although climate change scenarios indicate an increase in streamflow from all tributaries and rivers of the Upper Indus Basin (UIB), the existing storage capacity is insufficient to accommodate the projected increase in discharge water (inflow). The future poses challenges such as environmental degradation of river basins and the rapid reduction of storage capacities due to sedimentation and mismanagement of available resources. Addressing these challenges is critical, as there is also a need to augment the average volume of river flow and manage variability and seasonal changes. Failure to do so may lead to downstream flooding during high inflow periods in summer and water shortages for winter and summer crops, including wheat, gram, rapeseed, barley, and mustard. Considering these factors, it is imperative and timely to conduct an in-depth study evaluating the necessity for the construction of 2 to 3 large reservoirs or proposed dams upstream or downstream within the Indus River system.

Introduction

Pakistan is an agriculture-based country, with a significant portion of its economy reliant on available water resources in the Himalaya, Karakorum, and Hindukush (HKH) region—a hub for ten (10) major river systems of Asia. This region provides water for approximately 1.9 billion people downstream for various daily needs, including agriculture, power generation, and drinking (Molden et al., 2022).

The agricultural sector not only meets the demands of the country's growing population but also serves as a source of raw materials for industries. Water from the high-altitude freshwater resources of the Upper Indus Basin (UIB) in Pakistan is stored in Tarbela Dam, one of the country's largest water reservoirs. This dam plays a crucial role in regulating water supply through the Indus Basin Irrigation System (IBIS) for the fertile agricultural lands of Pakistan (Archer, Forsythe, Fowler, & Shah, 2010; K. Garee, Chen, Bao, Wang, & Meng, 2017b).

IBIS, recognized as the world's largest irrigation system (Archer et al., 2010), includes Tarbela and Mangla on the Indus and Jhelum rivers, respectively, along with a combination of barrages and canals (Figure 1). Most of this system originates from high-altitude snow/ice and glaciers in the HKH region. Another significant water contribution to IBIS comes from summer monsoon rainfall during the monsoon season, from June to September each year.

The dryness index of the Upper Indus River Basin varies from arid to semi-arid, with an annual precipitation of 200mm in lower elevations (less than 2500m) (Archer et al., 2010). According to Archer and Fowler (2004), the annual maximum precipitation occurs during the summer monsoon season, reaching up to 1800mm on the southern slopes of the Himalayan region.

Significant agricultural lands are in Pakistan's Punjab and Sindh provinces (K. Garee et al., 2017b; Tahir, Chevallier, Arnaud, Neppel, & Ahmad, 2011a). During the winter season, the agricultural lands in these two provinces relied on water distributed from the Tarbela and Mangla reservoirs via IBIS (Figure 1). These reservoirs also store water from summer snow and glacier melting and collect monsoon rainfall, playing a crucial role in mitigating downstream flood impacts. Pakistan's total cultivable land, approximately 23 million hectares, sees irrigation on 18 million hectares (78%) through IBIS (FAO, 2021-22). IBIS utilizes 60% of the available stored water for irrigation, as indicated by Peña-Arancibia, Yu, Stewart, Podger, and Kirby (2021), while the remaining land is irrigated through groundwater replenished by river and canal systems (A. S. Qureshi, 2020).

Any minor alterations in the existing water resources of the Upper Indus Basin (UIB) due to socio-economic factors, international regulations, or variations in climate change could significantly affect Pakistan's food security and environmental conditions. The country's water resources are currently strained in terms of per-capita water availability and withdrawals compared to runoff, as highlighted by (A. S. Qureshi, 2020). The situation is expected to worsen in the future with the projected population changes outlined by (Abel, Barakat, Kc, & Lutz, 2016).

Numerous studies, such as those conducted by (Archer et al., 2010; K. Garee et al., 2017b; Tahir, Chevallier, Arnaud, Neppel, & Ahmad, 2011b), have highlighted a significant concern: the diminishing storage capacity of water in reservoirs, particularly in Tarbela, due to substantial sedimentation. Unfortunately, no mechanisms were implemented during construction to address sedimentation removal from the reservoir. The potential consequences of reduced reservoir storage include heightened waterlogging and salinity, an increase in groundwater levels, and the necessity for reallocations to address environmental concerns in the Indus Delta or fulfill domestic demands—all of which contribute to a decrease in overall water availability for irrigation.

In the future, the demand for water in urban and agricultural sectors is anticipated to rise, reducing the likelihood of increased available water supplies from the Indus River system and its tributaries. This challenge is further compounded by potential mismanagement of water resources, degradation of river basins, encroachments, inefficient water utilization, and the adverse impacts of climate change, exacerbated by rapid development and industrialization.

The hydrology of numerous major rivers worldwide has undergone significant changes, primarily due to the escalating extraction of ground and surface water for agricultural, industrial, and urban purposes (Laghari, Vanham, & Rauch, 2012). The Indus River basin, comprising multiple river basins, faces a compelling shortage of storage capacity and is strained by the increasing daily water demand (Archer et al., 2010; Laghari et al., 2012). It is one of the most pressured basins globally, and it has been characterized by a nearly complete absence of ecological streams (environmental flows) in recent years (Sharma et al., 2013). Over the past few years, water has reached the sea during the flooding season (2010-2015) due to a lack of storage capacity. However, in the upcoming years, the Arabian Sea may not receive additional water due to the high demand for water usage. Therefore, it is imperative to conduct thorough studies and formulate policies to effectively manage and utilize the water resources of the Upper Indus Basin (UIB) and Indus Basin Irrigation System (IBIS) in response to current water demand scenarios and future

climate perspectives, considering socio-economic factors, to ensure the sustainability of water resources and their efficient management.

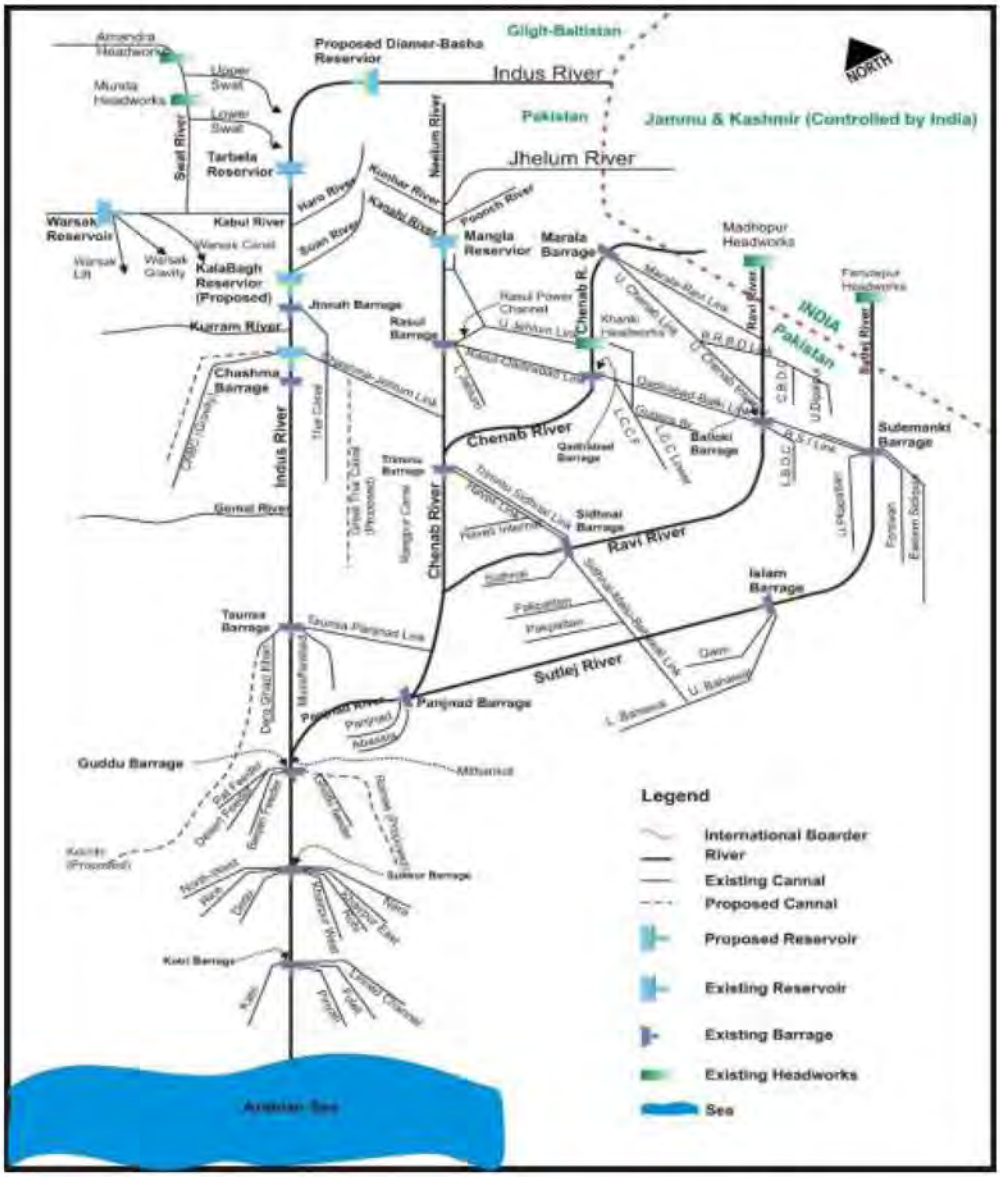

Figure 1. Indus Basin Irrigation System diagram (Source: WAPDA)

Impact of Climate Change

Climate change variability poses a significant challenge to the available water resources, particularly those sourced from snow and glaciers in the Indus River

system. The SWAT model has simulated this impact for the Hunza River basin.

Increasing Gap in Water Supply and Demand

A widening disparity between water supply and demand is anticipated, driven by elevated needs for domestic and industrial purposes. Population growth (Figure 2), urbanization, and industrial expansion contribute to higher water demands, affecting food security and energy production (Abel et al., 2016; Archer et al., 2010).

Low Water Storage Capacity

The IBIS faces limited water storage capacity, constituting only 15% of the total annual river flow. This issue arises from sedimentation and unmanaged and inadequate irrigation infrastructures (Dougherty & Hall, 1995; Janjua, Hassan, Muhammad, Ahmed, & Ahmed, 2021).

Degradation of Water Resources and Unsustainable Groundwater Use

Due to groundwater scarcity for agricultural purposes, the shift from surface water to groundwater depletes groundwater resources. It increases salinization, threatening the sustainability of water resources.

Transboundary Water Issues

Challenges related to transboundary water management exist, involving the sharing of water resources between India and Pakistan since 1960 and negotiations with Afghanistan regarding the utilization of the Kabul River (Archer et al., 2010).

Current Water Status and their Demand for Power Generation and Agriculture

The Pakistani economy relies heavily on agriculture, with 90% of this sector depending on the water supply from the Indus River System. Tarbela Dam, depicted in Figure 1, prioritizes water supply for agriculture, with 95% of its water used to irrigate 60-80% of cultivable land in the downstream areas of Punjab and Sindh. The remaining 5% serves domestic and industrial purposes. Since the construction of Tarbela and Mangla Dams, there has been a notable increase in irrigated cultivable land, ranging from 15-20%, leading to a significant boost in crop production (Archer et al., 2010; Tahir et al., 2011b).

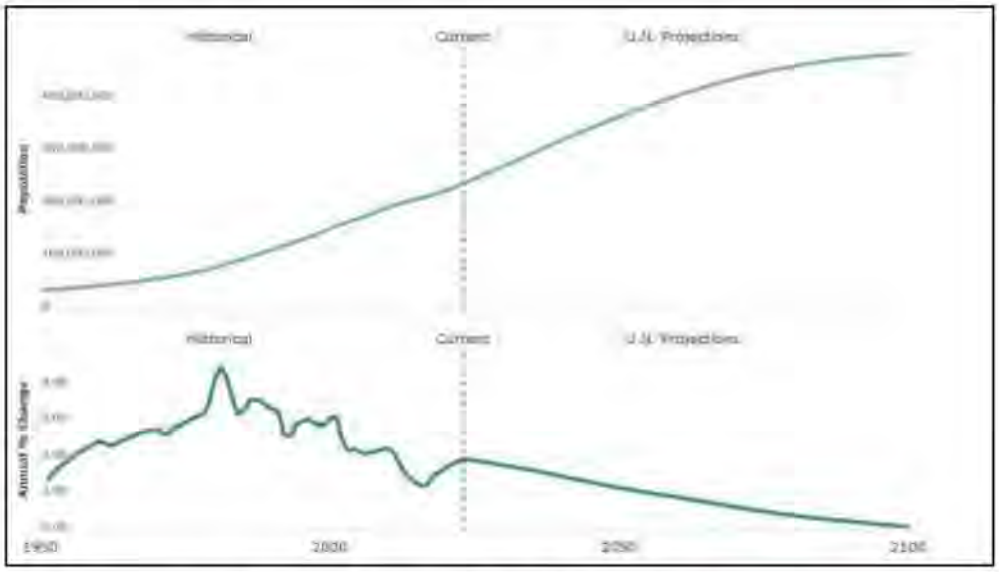

Figure 2. Population Trend with Annual % Change
Source: https://www.macrotrends.net/countries/PAK/pakistan/populatio
Original data source: United Nations - World Population Prospects.

Additionally, the dams facilitate water from the summer (Kharif season) to the spring (Rabi season). Wheat, a staple food for a portion of the population, is the main crop during the Rabi season. The total net irrigation demand in 2010 was 113 billion m3. Tarbela Dam caters to a substantial portion (60-70%) of this demand, with the remainder met by other water sources and groundwater extraction (Edwards & Prosser, 1999; Hussain, 2004; K. A. Khan, 2022). However, the capacity of Tarbela Dam is diminishing due to sedimentation, with reports suggesting a decline of up to 30% (11,600 Mm^3) in its initial capacity (Tahir et al., 2011b).

The rivers of the Upper Indus Basin and their tributaries carry a significant amount of sediment, with an annual suspended sediment load reaching 200 million tons (Ul Hussan, Khurram Shahzad, Seidel, Costa, & Nestmann, 2020). Researchers such as (K. A. Khan, 2022; N. M. Khan & Tingsanchali, 2009; Ul Hussan et al., 2020) have highlighted the adverse impact of sedimentation, leading to a reduction in the reservoir's initial capacity by 30% (11,600 Mm^3), as depicted in Figure 6 and mean monthly inflow at Besham Qila for the period 2008–2020 Figure 5 (Munir et al., 2022). Considering the future water demand and food security challenges posed by the growing population and the declining reservoir capacity due to sedimentation, there is a pressing need for new water storage infrastructure in the Upper Basin region of Pakistan. Diamer-Basha Dam received approval in 2006 following a

detailed feasibility study of the site selection (Figure 1), It is situated on the Indus River in Diamer, District of Gilgit-Baltistan.

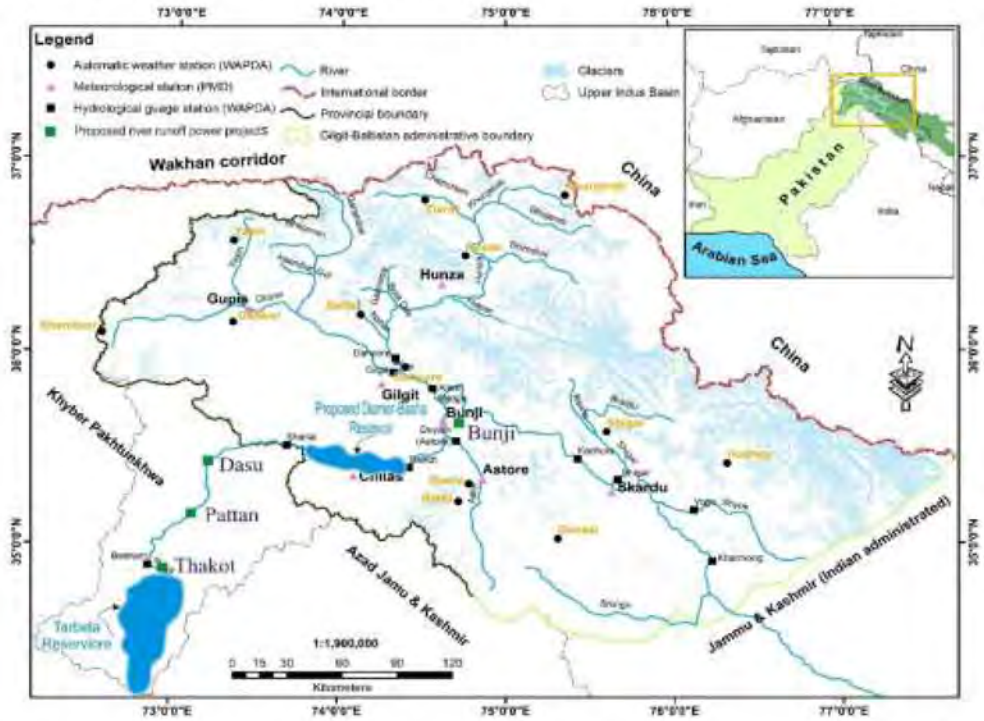

Figure 2. Location Map Gilgit-Baltistan with Basha-Diamer (under construction) and Tarbela DAM on the Indus River (Khan Garee, 2017a)

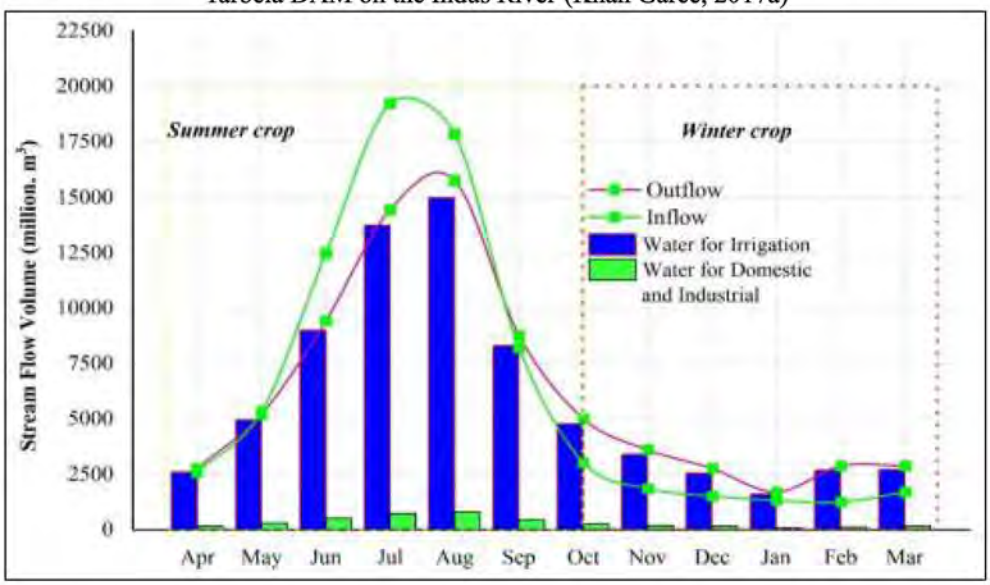

Figure 3. Average monthly flow on Diamer-Basha and inflow into Tarbela DAMs and average water released for Seasonal crops (Data source: WAPDA).

Future Water Demand for Drinking, Power Generation, and Agriculture (Perspectives of Diamer-Basha Dam)

Agriculture is Pakistan's economic backbone. Pakistan has a population of over 193 million. Due to the loss of reservoir storage capacity, the country is already facing serious water scarcity in terms of food security. If the trend continues, Pakistan will become one of the food deficit countries. Therefore, new storage needs to be constructed for expanding agriculture production (Data source: WAPDA).

The Diamer-Basha Dam is a significant hydroelectric and water storage project located in Gilgit-Baltistan, Pakistan. The government of Pakistan made the decision to construct this dam in 2006, aiming to address various water-related challenges in the region. The project involves the construction of a multipurpose gravity dam on the Indus River.

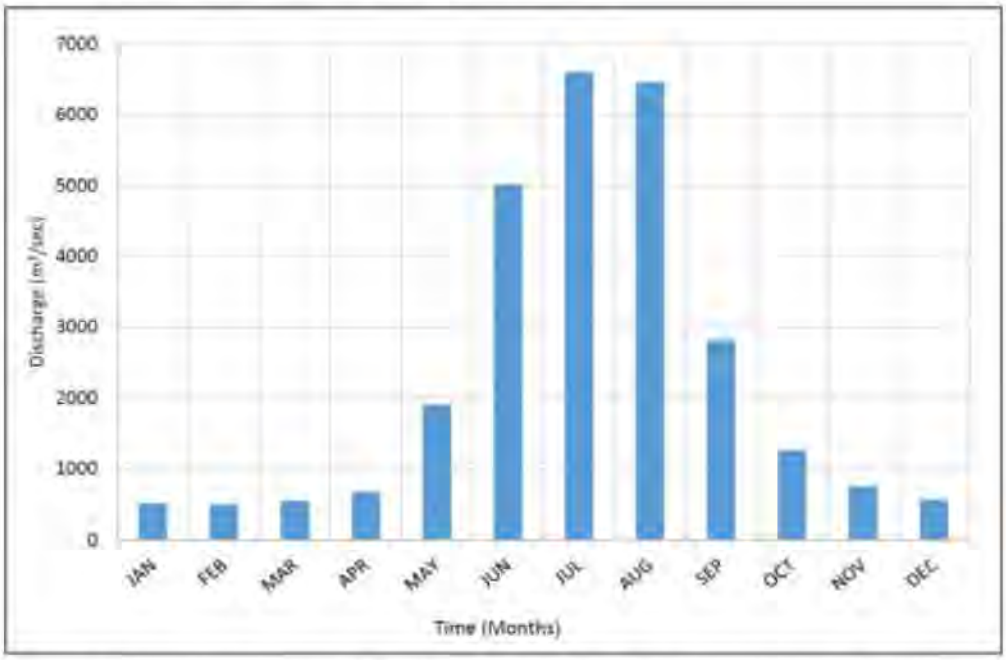

Figure 5. Mean Monthly runoff at Besham Qila from 2008 to 2020 (Munir et al., 2022)

The government of Pakistan decided in 2006 to construct five multipurpose reservoirs within the country over 10-12 years, and the Diamer-Basha Dam was part of this initiative. The process of dam construction is divided into phases. The first phase was completed in 2016, but the project experienced a three-year delay. Final completion was expected in 2019. However, due to the political situation in Pakistan, the project was continuously delayed, and it will be completed in 2029.

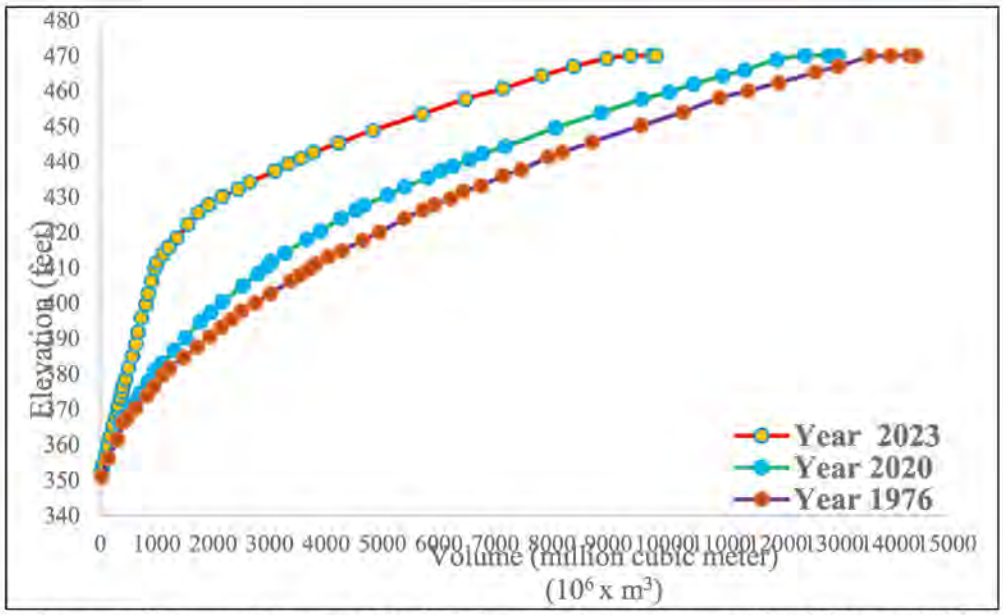

Figure 6. The capacity curve of the Tarbela reservoir in the years 1976, 2020, and 2023 (Data source: WAPDA

The Diamer-Basha Dam serves various purposes, including storing summer inflow, controlling sediment in the Indus River system, meeting the winter water shortage requirements of the Indus Irrigation, enhancing power generation capacity, controlling floods, and providing water for domestic and industrial use. The dam is situated in Gilgit-Baltistan, 165 km downstream of Gilgit city and 315 km upstream of Tarbela Dam. The dam structure has a maximum height of 270 meters above sea level (ASL) and covers an area of 75,000-acre feet (9.25x10^9 m^3). The storage volume of the dam exceeds 7.89×10^9 m^3 (6,400,000-acre feet). The project site covers an area of 110 km2 and extends 100 km upstream to the Raikot bridge on the Karakoram Highway (KKH) at the dam site (Data source: WAPDA).

The Diamer-Basha Dam is a crucial infrastructure project that aims to address water scarcity, provide hydroelectric power, and support various water-related needs in the region, and its capacity curve is represented in Figure 7. The dam's completion is expected to significantly impact water resource management and energy generation in Pakistan (Data source: WAPDA).

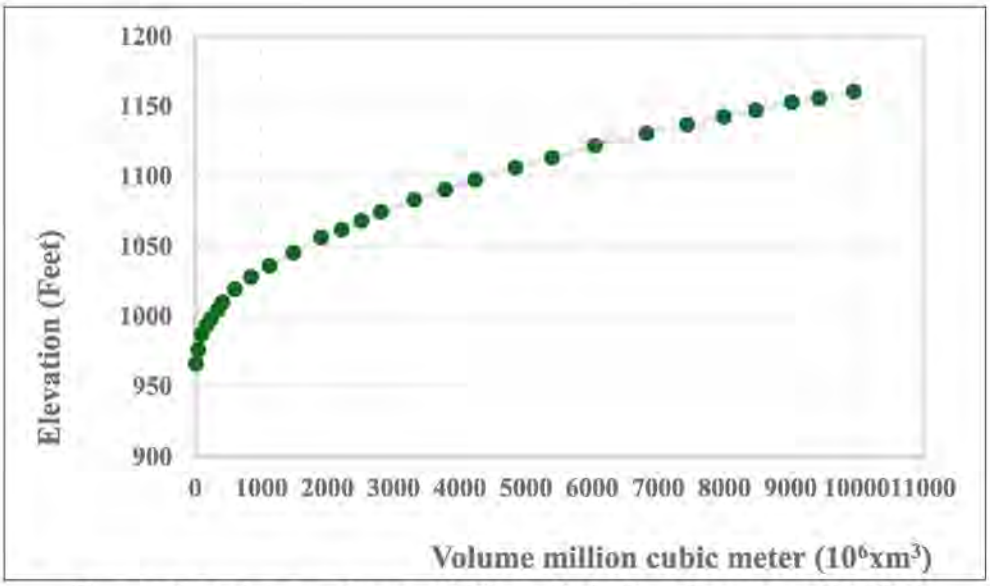

Figure 7. Capacity cure of proposed Diamer-Basha Dam (Data source WAPDA)

Distribution of Water for Domestic and Irrigation Use from the Proposed Diamer-Basha Dam (DBD)

The distribution of water for domestic and irrigation purposes from the proposed Diamer-Basha dam is illustrated in Figure 7. Given the country's escalating demand for water supply, particularly for irrigation and food security, attributed to a continuous increase in population with a fertility rate of 3.65 in 2016 (Chellaney, 2011), the allocation of water from the planned Diamer-Basha reservoir is recommended. This recommendation is based on analyzing available data on maximum, minimum, and average stream flows and flood routing through Dimer Basha DAM, as depicted in Table 1. The irrigation water supplied by Diamer-Basha, when integrated into IBIS, is intended to address future water needs and bridge the shortfall during summer and winter crop seasons, as per information from WAPDA.

Table 1: Maximum, minimum, and average stream flows estimated from the discharge data of the proposed dam site (source: WAPDA).

Period	**Max ($x10^9$ m^3)**	**Min ($x10^9$ m^3)**	**Average ($x10^9$ m^3)**
October-March	9.3 (1990-91)	6.9 (1984-85)	8.1 (1963-2010)
April-September	75.4 (1972-73)	38.5 (1964-65)	53.7 (1963-2010)
Annual	83.0 (1972-73)	47.8 (1964-65)	61.8 (1963-2010)

Table 2. Summary of Flood Routings Through Diamer Basha Dam Reservoir (Tarar, 2011).

Flood Event	Peak Inflow	Starting Reservoir Level	14 Spillway Gates (11.5 × 17.5 m) Operative		One Spillway Gate Inoperative		14 Spillway Gates along with 5 RFOs & 2 LLOs Operative	
			Peak Outflow	Maximum Reservoir Level	Peak Outflow	Maximum Reservoir Level	Peak Outflow	Maximum Reservoir Level
	(m^3/s)	(m asl)	(m^3/s)	(m asl)	(m^3/s)	(m asl)	(m^3/s)	(m asl)
Basic Desig Flood-1 (1 i 10,000 years)	20,170	1160.00	18,859.56	1160.36 970.73 *	18,412.19	1160.85 970.40 *	-	-
Basic Design Flood-2 (SHYOK GLOF)	23,710	1160.00	19,957.62	1160.90 971.43 *	19,144.59	1161.23 970.92 *	-	-
Safety Check Flood-1 (SHYOK GLOF + 1 in 100 years)	32,690	1160.00	25,293.60	1163.37 974.60 *	24,640.79	1163.94 974.20 *	29590.8	1160.55 976.90 *
Safety Check Flood-3 (BIAFO GLOF / PMF)	49,410	1160.00	35,689.61	1167.71 979.80 *	34,920.64	1168.49 979.50 *	37710.4	1164.23 980.80 *

According to Briscoe, Qamar, Contijoch, Amir, and Blackmore (2007), ,water demand for domestic and industrial purposes is anticipated to increase by 4% to 15% in the next 20 years. The future escalation in water demand is attributed to the projected population growth in downstream areas/basins, with a concurrent increase in industrialization and urbanization, and an improvement in people's living standards. Consequently, the water allocation from the Diamer-Basha dam for domestic and industrial use is set at 10%. Figure 8 April -September and October- March from the average expected inflow and outflow for the period of April -September and October- March from the Diamer-Basha reservoir in 2025.

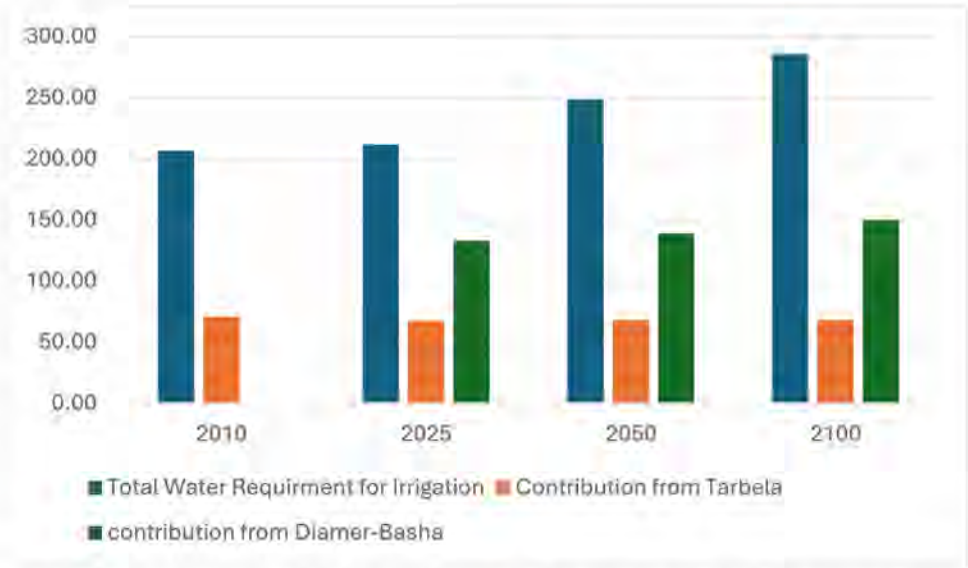

Figure 8. Average expected inflow to Diamer-Basha reservoir in 2025 and average water release for April-September and October-March (Khan Garee, 2017a)

The Diamer-Basha Dam (BDD) plays a crucial role in managing sedimentation. It is a large-scale dam project located on the Indus River in Pakistan. The dam is designed to be situated near Chilas in the Diamer District of Gilgit-Baltistan. Once completed, it is expected to be one of the highest dams in the world, with a height of around 272 meters.

The primary purposes of the Diamer-Basha Dam include water storage, flood control, and hydroelectric power generation. The dam is strategically positioned to harness the water resources from the Himalayan and Karakoram Mountain ranges, particularly the snow/ice and glaciers in the HKH (Hindu Kush Himalaya) region. The dam's storage capacity is crucial for mitigating water scarcity issues and managing the flow of the Indus River.

One of the notable features of the Diamer-Basha Dam is its contribution to sedimentation control, particularly about the Tarbela Dam. By impeding the flow of sediment-laden water, the Diamer-Basha Dam is expected to extend the lifespan and enhance the storage efficiency of the Tarbela Dam, a significant reservoir downstream of the Indus River.

The construction of the Diamer-Basha Dam is a significant infrastructure project for Pakistan, with the potential to address water management challenges, provide flood protection, and contribute to the country's energy needs through hydroelectric power generation. The project is expected to have

far-reaching impacts on the region's water resources and energy sustainability once it is completed.

The anticipated completion of the proposed Diamer-Basha Dam (expected post-2029) is poised to alleviate sedimentation in the Tarbela Dam by impeding the flow of sediment-laden water. According to the findings presented in Table 3, the Diamer-Basha Dam contributes to an increased lifespan and enhanced storage efficiency of the Tarbela Dam. By effectively controlling sedimentation upstream of the Tarbela Dam, the Diamer-Basha Dam is forecasted to extend its lifespan by 36% until 2070, as illustrated in the projected results in Table 3 (source WAPDA).

Table 3. Storage capacity of Tarbela (pre and post-Diamer-Basha) and Diamer-Basha dam in 2020 and 2070

Reservoir	**Operation Scenario**	**Storage Volume (Million.m^3)**			
		Initial (2020)		**After 50 Years (2070)**	
		Gross	**Live**	**Gross**	**Live**
Tarbela	Alone	8548.155	8326.125	2269.64	2269.64
	In Conjunction With Diamer-Basha	8548.155	8326.125	6389.53	6278.515
Diamer-Basha	In Conjunction with Tarbela	9991.35	7882.065	3688.165	3564.815

Power Generation Capacity (DBD) and its Impact on the Economy of the Country

Historically, Pakistan has been an energy-deficient country in the world. The persistent energy crisis has consistently impeded economic progress in Pakistan. This challenge primarily stems from inadequate management, policy shortcomings, and a lack of emphasis on non-conventional energy sources. The country's existing energy generation capacity is around 14,000–16,000 MW, encompassing hydro, thermal, and nuclear sources. However, the demand for energy ranges between 20,000–22,000 MW, creating a substantial deficit of 4,000–6,000 MW (Ali, Mahar, & Sheerazi, 2019; Durrani, Khan, & Ahmad, 2021). Projections indicate that this shortfall is expected to worsen with the rising demand for power supply.

Pakistan is fortunate to possess abundant freshwater resources, presenting numerous opportunities for power generation. Figure 9 represents that the current hydropower contribution to the national grid is only 11% of the total power generation of Pakistan (F. Qureshi & Akintug, 2014). It is estimated that Pakistan has a hydropower potential of about 60,000 MW , but only 11% of it is utilized to produce electricity , with a significant portion, around 99%, situated in the Upper Indus Basin (UIB) (Rasheed & Ahmad, 2023). The proposed Diamer Basha Dam (DBD) is among the identified hydropower potential projects, boasting a proposed capacity of 4,500 MW to be added to the national grid in the future (http://www.diamerbhasha.com). This, in turn, is expected to alleviate the energy shortfall in the country substantially.

The Diamer-Basha Dam is envisioned as a large structure on the Indus River in Pakistan, intended primarily for water storage to support irrigation, flood control, and hydroelectric power generation. Upon completion, the dam is expected to progress significantly impact the country's economy, after the completion of a few new under-progressed projects (Table 4).

One of the primary benefits of the Diamer-Basha Dam is its potential to generate a substantial amount of hydroelectric power (Figure 9), recognized as a clean and renewable energy source that could significantly contribute to Pakistan's energy mix. With the increase in power generation capacity, the country may witness a reduction in load shedding, thereby establishing a more stable and reliable electricity supply. This improvement can positively affect various sectors of the economy, including industry and commerce.

A reliable and increased power supply has the potential to stimulate economic development by attracting investments, fostering industrial growth, and creating job opportunities. Industries that rely on a consistent and ample power supply, such as manufacturing, could benefit significantly from the dam's contribution to the energy sector.

The dam's water storage capacity is critical for irrigation, ensuring a more dependable water supply for agriculture. Improved irrigation has the potential to increase agricultural productivity and contributing to food security.

Additionally, the dam's capacity for flood control can mitigate the impact of floods (Table 2) in downstream areas, protecting lives and property (Figure 9). This, in turn, can have indirect economic benefits by preventing losses due to flooding. It's important to note that large infrastructure projects like dams often involve complex environmental, social, and geopolitical considerations. Environmental impact assessments, resettlement plans, and community

engagement require careful attention throughout the planning and implementation phases.

Table 4. Development of hydropower projects downstream of DBD after its completion (Source: WPDA).

S.No	Project	Installing Capacity (MW)	Remarks
1	**DBD Project**	4,500	Multi-purpose Storage
2	**Downstream Projects**		
	Dasu	4,320	Basically, Run-off River Projects to Be Firmed up Through Storage releases from DBD
	Patan	2,800	
	Thakot	2,800	
	Sub Total (2)	**9,920**	
3	**Total (1+2)**	**14,420**	

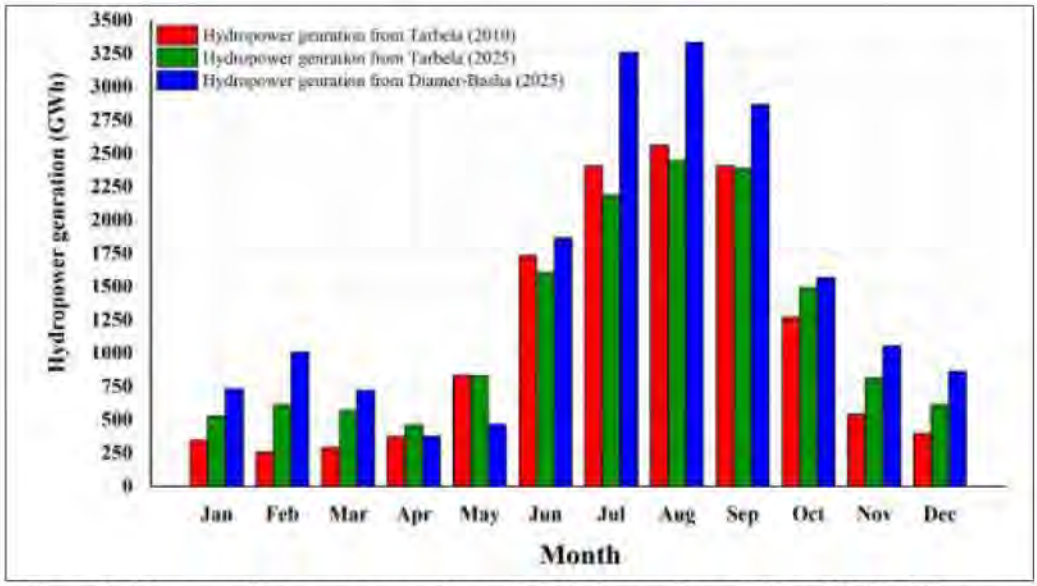

Figure 9. Mean monthly power generation at Tarbela (pre and post DB) and DBD (Khan Garee, 2017a)

Water Availability in the Indus River System: Present and Future Climate Changes

The Indus River System is a vital water source for Pakistan and parts of India. It primarily relies on snowmelt from the Himalayan glaciers and precipitation in the upper reaches. Water availability in the system is crucial for agriculture, hydropower generation, and overall socio-economic development in the region.

Climate change poses several challenges to water availability in the Indus River System. Key factors include Glacier melting, Shifts in Precipitation patterns, Increased evaporation, Extreme weather events and Future projections.

The Himalayan glaciers contribute significantly to the river's flow and are sensitive to temperature changes. Rising temperatures can accelerate glacial melting, potentially leading to increased water availability in the short term due to the release of stored water. However, this effect is not sustainable in the long run as glaciers shrink. On the other hand, climate change can alter precipitation patterns, affecting the timing and amount of rainfall. Similarly, changes in monsoon patterns may impact the river's water inflow, leading to variability in water availability. Higher temperatures can increase evaporation rates from rivers, reservoirs, and agricultural fields, reducing overall water availability. Moreover, climate change is associated with increased frequency and intensity of extreme weather events, such as floods and droughts. These events can disrupt water availability and infrastructure. According to many recent research and studies, there has been an attempt to project future water availability in the Indus River System, but predictions vary. Some models suggest increased water availability due to accelerated glacier melting, while others anticipate a decline as glaciers recede. It's crucial to note that the complex interactions between climate, hydrology, and human activities make precise predictions challenging. Moreover, socioeconomic factors, water management practices, and policies play a significant role in determining the overall impact on water availability.

Impacts of Environmental Changes on the Diamer-Basha Dam

The potential challenges to water storage capacity, particularly for the proposed Diamer-Basha Dam (DBD) and Tarbela Dam (TD), are influenced by global climate change, including variations in temperature and precipitation, a growing population, and an increasing sedimentation load in reservoirs. Projections from the SWAT model indicate a challenging future for water storage capacities in the country. The Raikot and Besham Qila stream flow gauge stations are key sources for measuring inflow water to DBD and TD, respectively (Figure 3).

Considering rising mean temperatures and expanded snow cover areas, the simulation results reveal an increasing trend in stream inflow at Raikot and Besham Qila gauge stations, nearly doubling by 2100 (Figures 10 & 11). This upward trend in water discharge and glacier melting carries a substantial

sediment load, potentially reducing the capacity of these UIB storage reservoirs.

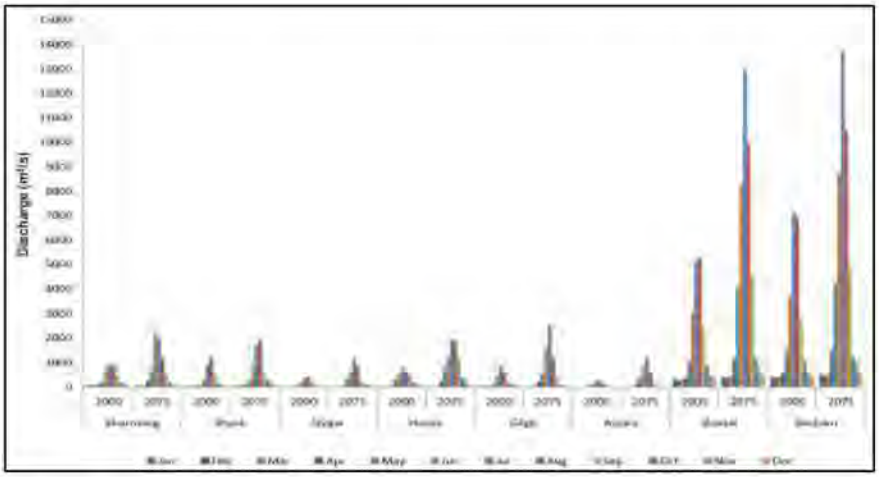

Figure 10. Present and future simulated discharge in the Upper Indus River and its tributaries (Khan Garee, 2017a)

An additional concern is the country's alarming rate of population increase putting pressure on existing and proposed reservoirs to meet food security and domestic and power demand requirements. Following the completion of the DBD project, IBIS's water demand is anticipated to rise by almost 50% in 2025 based on available UIB River water for irrigation (Figure 12). Despite an expected constant or reduced availability of water from these reservoirs (DBD and TD) in the future, there is a projected increase in discharge from UIB Rivers by the end of the century.

However, the projected increased volume of water during summers may not be effectively stored due to the challenges as mentioned above or deficiencies in storage capacity, potentially resulting in severe floods in low-lying areas of the Indus River system, similar to the events in 2010 (Mustafa & Wrathall, 2011).

Both present and past studies on future water demand and supply under various climatic conditions in the region recommend the construction of new water reservoirs and increasing storage capacities to meet future needs. Freshwater resources in the UIB region are gradually decreasing, particularly in spring. The construction of new and larger reservoirs along the river Indus is deemed necessary to address this issue. Siltation in rivers and reservoirs may also limit the current ability to generate hydroelectric power to meet the growing demand for domestic and industrial energy. In the future, the

proposed DBD is expected to play a significant role in satisfying a substantial portion of irrigation and electricity demand.

The reliance on alternative water sources (such as groundwater) for Rabi (spring) crops may lead to a rapid decline in groundwater tables, making tube well usage impractical (Archer et al., 2010). Therefore, a comprehensive study of the UIB hydrological regimes is essential, along with examining the potential construction of 3-4 new reservoirs in the up and downstream areas of the Indus River system, considering all social and environmental impacts.

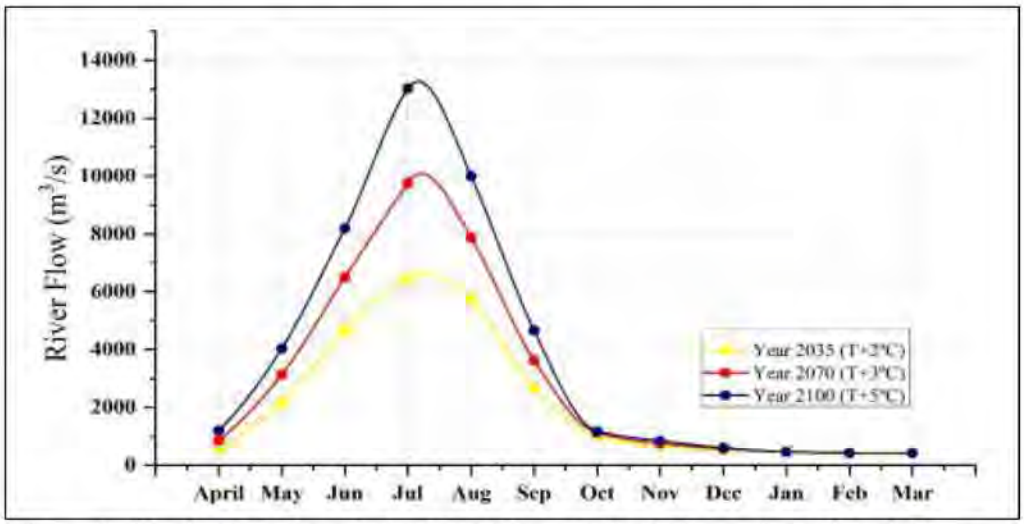

Figure 11. Simulated discharge in the Indus River at Raikot bridge under projected climate change scenarios for years 2035, 2070 and 2100

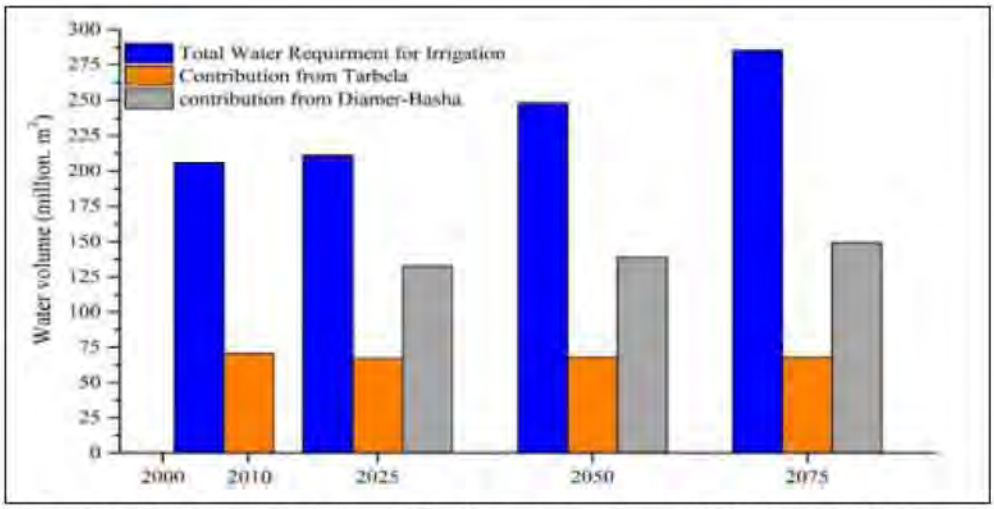

Figure 42. Total present and future irrigation water requirement in Pakistan and the water available from Tarbela and Diamer-Basha reservoirs to satisfy this demand (Khan Garee, 2007).

Conclusion

The Indus Basin Irrigation System (IBIS), which encompasses the vast Tarbela and Mangla reservoirs, is a testament to human engineering on a grand scale, representing the world's largest integrated irrigation network. Originating primarily from the formidable Hindu Kush Himalaya (HKH) mountain ranges, the system's reliance on climate-sensitive water sources underscores its water resources' vulnerability, significantly impacting regional food security and diverse water-related applications. As global climate variations intensify, the Indus Basin faces increasing challenges in sustaining its irrigation system. The delicate balance of water availability is continually disrupted, necessitating a comprehensive strategy to address emerging issues. One of the pivotal challenges is the escalating demand for water, propelled by a burgeoning population. This demand stresses the IBIS more, amplifying issues such as insufficient storage capacity, sedimentation concerns, and mismanagement of vital resources. To fortify the resilience of the Indus Basin Irrigation System, there is an urgent need to explore solutions beyond the existing infrastructure. The proposition of new reservoirs emerges as a critical consideration in adapting to the heightened variability in water availability. Among the proposed projects, the Diamer-Basha and Kalabagh Dams hold particular significance. However, their implementation necessitates thorough environmental assessments and due consideration of local factors to mitigate potential ecological and societal impacts. In pursuing sustainable water resource management, it becomes imperative to adopt a proactive approach that involves regularly monitoring glaciated areas. This entails leveraging advanced technologies and establishing comprehensive data-sharing mechanisms to enhance scientific understanding and facilitate informed decision-making. The dissemination of knowledge about the changing dynamics of the glaciated regions contributes to a more robust understanding of the Indus Basin's hydrological complexities. Even though a substantial portion, 74% to be precise of the river flows is dedicated to irrigation, the existing canal system operates with notable inefficiencies, leading to significant water losses. Addressing this inefficiency becomes a crucial aspect of any strategy to optimize water use within the IBIS. Decision-makers must prioritize establishing a long-term water management plan that incorporates modern techniques such as the Water Evaluation and Planning (WEAP) system. Proven effective globally, WEAP offers a sophisticated modeling approach that can enhance decision-making processes specific to the Upper Indus River Basin.

In conclusion, the Indus Basin Irrigation System, a engineering marvel, faces multifaceted challenges that demand a holistic and forward-thinking approach.

As population growth and climate variations continue to strain water resources, it is imperative to explore innovative solutions, including the construction of new reservoirs, thorough environmental assessments, and the adoption of modern water management techniques like WEAP, proven effective globally and beneficial for the Upper Indus River Basin. Only through a determined effort can the Indus Basin adapt and thrive in the face of evolving climatic and demographic pressures.

Suggested Citation

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10

Sustainable Development in the Region: Environmental Risks Related to SEZs-CPEC

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Abstract

A budget approximately of $46 billion, China Pakistan Economic Corridor (CPEC), till date is one of the biggest projects that focuses on the economic, socio economic, and industrial development of Pakistan, especially the special Economic Zones. The project is a strategy to ensure intercity and interlinked country trade between China and Pakistan and also connecting both with central Asia. Although CPEC is a great idea, Special Economic Zones (SEZs) are those projects that ensure to bring in more trade and foreign investments in the country. But, where the project was such a big investment for industrialization, economic development, and growth of Pakistan, it also had some serious concerns which is related with environmental degradation. This chapter focuses on how mega projects may lead to environmental damages like cutting down of forests, loss of natural habitat of wildlife, effluent and GHGs emissions. The unlimited exposure of toxic effluent and GHGs emission in the environment is due to huge industries and power energy sector of CPEC, focusing on use of the natural reservoir, coal, to produce energy for Pakistan. If the issues are not addressed on time, the region might will observe worse consequences of environmental degradation, so that proper concerns to be made, and policies of environmental protection method of production be introduced in order to minimize the effects of environmental degradation and proceed in accordance with sustainable development in the region.

Introduction

Global warming and climate change are among humans' most critical challenges. Human activities such as burning fossil fuels, deforestation, and

industrial operations have caused a significant increase in greenhouse gas emissions, raising global temperatures. This has resulted in various adverse effects, including more frequent and severe natural disasters, rising sea levels, melting ice caps, and shifts in weather patterns. The Sustainable Development Goal (SDG) 13, which focuses on Climate Action, emphasizes the urgent need for countries and industries to take decisive steps to mitigate the impacts of climate change. The goal highlights the gravity of the situation by issuing a CODE RED Warning and calling for immediate action to combat climate change and its consequences. The impacts of climate change are being felt globally, affecting people in every corner of the world. From extreme weather events to rising sea levels, the consequences of climate change are becoming increasingly evident. Every person, country, and continent will be impacted in some way by the changing climate. Climate change poses a serious threat to our world, and despite the warnings from scientists and experts, many are still not taking the necessary steps to address this issue. This lack of action has paved the way for a climate cataclysm that could have devastating effects on both the environment and human society.

Amongst the major contributors to climate change is the burning of fossil fuels for energy production, transportation, and industrial activities. This releases carbon dioxide and other greenhouse gases into the atmosphere, trapping heat and leading to global warming. Deforestation is another key factor, as trees play a crucial role in absorbing carbon dioxide from the air. As a result of these human activities, the Earth's climate is changing at an alarming rate. Climate change is a pressing issue that has the potential to undo years of development progress and cause significant disruptions to communities around the world. Without urgent action, the consequences of climate change could be devastating, leading to mass migrations, instability, and even conflicts. Another profound impact of climate change is its influence on food security and water availability. Changes in weather patterns, such as prolonged droughts and extreme rainfall events, can result in crop failures, food shortages, and water scarcity. This can lead to increased competition for resources, exacerbating inequalities and triggering social unrest.

Additionally, rising sea levels and more frequent extreme weather events, such as hurricanes and wildfires, pose a significant threat to infrastructure, livelihoods, and human lives (Aslam, 2021). Climate change is affecting everyone on the planet. There is a climatic apocalypse impending, but no one is ready to deal with it, even though it threatens life on Earth. The GHG emission is unexpectedly faster than anticipated, which is incorporating human damage on earth. To reduce global warming to reach 1.5°C above pre-industrial levels, there is a need to control emissions to approximately 50% by

2023, which is supposed to be an imaginary condition yet. Immediate efforts are required to avoid catastrophic risks and achieve a sustainable future for generations to come (The sustainable development goals 2023).

This chapter delves into SDG 13 by examining the CPEC projects, with a particular focus on its SEZ that have the potential environmental effects such as deforestation, loss of natural wildlife habitats, and the release of effluent and GHGs. The significant release of toxic effluent and GHGs into the environment is associated with the large industries and power sector of CPEC, which heavily relies on coal as a natural resource for energy production in Pakistan. Without timely intervention, the region may experience severe consequences of environmental degradation. It is imperative to address these issues promptly and implement environmental protection policies and sustainable production methods to minimize the effects of environmental degradation and uphold sustainable development in the region. In various matters concerning China's interests such as Tibet, Xinjiang, and other issues, Pakistan has consistently maintained a strong stance in support of China. China stands to benefit considerably from the China-Pakistan Economic Corridor (CPEC), particularly through the usage of the Gwadar port. This port will enable China to transport oil and gas from the Gulf nations via a much shorter route, as compared to the through the Malacca Straits. The intensity of mutual associations between Pakistan and China has become a permanent global virtue. Priory, they have been unusual friends, one being a socialist nation and the opposite being a Muslim-majority state. The two nations have formed a close connection based on shared common interests. This connection has resulted in a strong and trustworthy relationship, built on equality, brotherhood, and collaboration between China and Pakistan (Iqbal, 2017).

The relationship between Pakistan and China has always been built on mutual respect. They collaborate by leveraging their respective strengths in various areas. Despite their cultural differences, the primary reason for their alliance has been military cooperation, aimed at deterring their common adversaries. It is crucial to analyze the evolving dynamics of their relationship, as well as the factors contributing to its enduring strength and increasing potency over time (Tiezzi, 2015).

CPEC-Special Economic Zone (SEZs) & Sustainability

The investment from Chinese investors is attracted through establishment of the SEZ in Pakistan. Special Economic Zone (SEZ) is a particular area in a state that is expected for diverse financial protocols and other reasons in the same territory. The financial framework of Special Zones (SEZs) inclines to

be favorable to enhance foreign direct investment (FDI) from overseas (Moin & Qadri, 2020).

Table 1. The link between Pakistan's Vision 2025 and SDGs

	Pillar	Links with SDGs
1	**People First:** Developing social and human capital and empowering women	SDGS 1 (poverty), 3, (health) 4 (education), and 5 (gender)
2	**Growth:** Sustained, indigenous, and inclusive growth	The target is virtually identical to SDG 8, and also to SDGs 10, 12, 13, 14, 15
3	**Governance:** Democratic governance: institutional reform and modernization of the public sector	Again, the language is similar to that of SDG 16
4	**Security:** Energy, water, and food security	Linked to SDG 2 (zero hunger), 6 (water security), 7 (energy security), and 11 (urban)
5	**Entrepreneurship:** Private Sector and entrepreneurship-led growth	This is linked to SDG 9 (foster innovation)
6	**Knowledge Economy:** Developing a competitive knowledge economy through value addition	SDG 9 (innovation), and 4 (education)
7	**Connectivity**: Modernizing transport infrastructure and regional connectivity	SDG 9 (infrastructure), and 17 (global partnership)

Source: Pakistan Vision 2025 One Nation-One Vision

Special Economic Zones (SEZs) are characteristically created with a purpose to make certain rapid economic boom by way of indulging tax incentives to enhance overseas investment and stimulus technical development. Out of the many nations that taken into consideration using Special Economic Zones (SEZs), China needs to be the highly successful one in the use of Special Economic Zones (SEZs) to bring in more international capital. These SEZs (special economic Zones) are normally built so that it will allow rapid economic increase in definite terrestrial areas (Akinci & Crittle, 2008).

Sustainable development and infrastructure-led advances are indicators of global progress. Sustainable development is expansion that meets the requirements of the existing, without compromising the capability of future generations to fulfill their very desires. The thinking has added attention over issues for social and ecological concerns attributable to the special consciousness on economic expansion. The CPEC has the potential to serve as an environmental corridor to oversee the development of local renewable energy trade, and connect Pakistan with China’s national carbon market, which is currently an international concern, thereby establishing a local marketplace (Butt, 2021). CPEC projects are expected to overcome the

Pakistan's energy issues and contributing to improve the standard of living of the people. The CPEC will connect Pakistani and Chinese industry and customers with 50 countries across the world (Ministry of Finance, 2017). Further, the benefit of the different projects (energy, railways tracks, roads) of CPEC additionally have social and environmental influences on the Pakistan (Hassan et al., 2022). The project's vision is to improve the quality of life for people in both China and Pakistan. Its aim is to create a gateway that fosters connectivity, mutual cooperation, investment opportunities, trade, economic growth, and interaction between the people and investors of both regions (CPEC Authority). In essence, the China-Pakistan Economic Corridor (CPEC) is a collection of infrastructural projects designed to bridge the trade gap between the two nations.

A Special Purpose Vehicle (SPV), or a subsidiary agency of the two companies i.e., Rashakai Special Economic Zone Development and Operations Company has come into being to implement and work for Special Economic Zone Projects of CPEC for Pakistan (Moin et al., 2022).

One of the predominant initiatives of CPEC is the establishment of the Economic Zone with aimed to developed industrial relationships and collaboration between China and Pakistan. China Pakistan financial corridor has a delegated framework that entirely helps and works for CPEC special economic Zone. The project is unfolded over 1000 Acres of land, and this will be evolved through CRBC in joint venture with KPEZDMC.

Special economic zones (SEZs) or industrial parks may be an effective instrument to enhance industrialization if applied properly inside the proper context, as proven in several of the emerging countries, particularly those in East Asia. Further, countries have begun to put in force this tool for their industrialization system, particularly as a way of attracting foreign direct investment (FDI) mainly in the manufacturing sector, developing jobs opportunities, enhancing exports and foreign exchange, and so forth (Zeng, 2015). A leverage of first-time exemption from paying the custom obligations and taxes for all the capital and commodities imported into the nation, Pakistan, for the advantage, operations, and proceedings of a special economic region (it consists of both, the developer in addition to for the zone manufacturers). Except for all taxes imposed on the income for a duration of just about ten years. Special economic zones (SEZs) are to ensure the undertaking of applications which might be acquired from buyers to the FBI (Federal Board of investment), or in addition as to be the secretary to the Board of Approval and the Approval committee.

Source: Adapted by authors from the Report on Fostering Sustainable Development through Chinese Overseas Economic and Trade Cooperation Zones along the Belt and Road (2019).

Even as the primary aim of CPEC is to make Pakistan develop economically, but the venture has a drawback too. The facet effects of CPEC which is one of the main elements, is environment. Notwithstanding being a developing nation, on the road of growth, Pakistan is ranked on tenth in the list of worst countries to reside in terms of climatic situations. The excessive use of fossil fuels has accelerated the emission of Carbon dioxide inside the environment, making things worse. In this sort of scenario, when the nation is already suffering environmentally, and is liable to climatic damages, this huge project is not completely favorable completely. China Pakistan financial corridor (CPEC) is a huge 2-sided substructure which has a purpose to revolutionize Pakistan's financial side. But if checked out factually, environmental factors have no longer been a priority for the project. The regular exploitation of natural assets for energy sector, is alarming for local communities, and land attainment for creation has brought on trouble for the already degrading weather of Pakistan. The corridor lacks implementation of safety for climatic, social, and cultural

elements. CPEC is a matter of land connectivity. China and it is a part of Silk Road economic Belt for monetary incorporation of Eurasia.

Pakistan Economic Survey 2020-21

Table 1: Special Economic Zones established across Pakistan

Year	Name of SEZ	Developer	Area (Acres)
	Value Addition City (VAC), Faisalabad, Punjab	FIEDMC	214
FY2019	Oil Village SEZ (OVSEZ), Rawalpindi, Punjab	FOC-1	105
	Rachna Industrial Park (RIP), Sheikhupura, Punjab	NIP	215
	Rahimyar Khan Industrial Estate (RIE), Rahim Yar Khan, Punjab	PIEDMC	456
	Rashakai Special Economic Zone (RSEZ), Nowshera, KP	KPEZDMC	1,000
	Vehari Industrial Estate (VIE), Vehari, Punjab	PIEDMC	277
	Bhalwal Industrial Estate (BIE), Sargodha, Punjab	PIEDMC	427
	Bostan Special Economic Zone (BSEZ), Pishin, Balochistan	Industries Depart. Bal.	200
	Hub Special Economic Zone (HUBSEZ), Lasbela, Balochistan	LIEDA	406
	Naushero Feroz Industrial Park (NFIP), Naushahro Feroze, Sindh	NIP	80
FY2021	Allama Iqbal Industrial City (AIIC), Faisalabad, Punjab	FIEDMC	2,800
	National Science and Technology Park (NSTP), Islamabad, ICT	NUST	58
	JW-SEZ China-Pakistan SEZ (JWSEZ), Lahore, Punjab	JWSEZ Group	231
	Quaid-e-Azam Business Park (QABP), Sheikhupura, Punjab	PIEDMC	1,536
	Service Long March Tyres SESEZ, Jamshoro, Sindh	SLM	50
	Siddiqsons Tinplate SESEZ, Lasbela, Balochistan	STPL	71
Total	**21**		**14,212**

Source: Board of Investment

Ecology, Economy & Corridor

The improvement in CPEC have ease the accesses of people to the Gilgit-Baltistan but it has adverse influence on the environment for example traffic congestion in emissions of gases. Moreover, these problems are expected to increase in future with completion of the under-construction projects under CPEC. The improvement in roads and construction of tunnels have has created many business opportunities (Goel et al., 2012). It is expected that, the Karakorum Highway alone is supposed to carry as much as 7000 trucks per day due to which rise in gaseous emissions in the air. Discharge of many harmful gases including Carbon Dioxide in the climate will deteriorate the air and causes global warming. The SEZ under CPEC are useful for the economy while need to undertake protective steps and measures to limit the environmental effects.

To counteract typical weather interchange, Pakistan is at the forefront and has implemented strategies in the direction of energy efficiency, renewable energy, and a reduction in CO2eq emissions (National Climate Change Policy, 2012). In Pakistan, weather affects agricultural manufacturing, raised unpredictability of water availability, raised up coastal loss, seawater spread, and elevated incidence of risky climate happenings (Pakistan Economic

Survey, 2019). In 2019, the Pakistan authorities ensure the goal of at least 20% on-grid renewable power generation ability by 2025 and at least 30% by 2030 (Ministry of Energy, 2019). To acquire the climate and energy performance goals, the expression "on-grid" entails mini-macro grids. As per the international climate chance Index document (2020), Pakistan has lost 0.53% per unit GDP, suffered US$3792.52 million and witnessed 152 dangerous climate activities over the last 2 decades. Improving renewable energy from the Pakistani way is a prominent step acts in four fields: forestry, biodiversity, energy efficiency, and environmental policies, which are started through Government. These rules have been looked over underneath the power and climate change scheme concerning the goal of 2030. The electric energy generation sector of Pakistan particularly is based on fossil fuels. As of 2020, natural fuel and oil account for 33.1% and 22.56% of all primary industrial energy supply (MALIK, 2022).

With the help of CPEC Pakistan has set national energy and climate change strategies, such as renewable energy (Raza & Cucculelli, 2024; Vision 2025, 2014; Vision 2035, 2014). The aim is to be responsible for long-run decarbonization policies, as the Government of Pakistan has at this time espoused Ten Billion Tree Tsunami Programmer (amount of 7.5 billion rupees) to deal with the negative effects of global warming (Pakistan Economic Survey, 2019) (Pakistan Economic Survey, 2019).The world's leading sources of greenhouse gas releases from human doings are the burning of fossil fuels for electricity, agriculture, industry, heat, and transportation (Environmental Protection Agency (EPA)-United States, 2022).

As there is an increase in threats related to climate changes globally, Pakistan has taken initiatives and recent policies and frameworks have been introduced that commands and tells the importance of the need to transform and shift to use clean energy resources. The government has introduced a program of "Clean and Green Pakistan" that revolves around the idea of planting 10 billion Trees, use advanced tools for green financing, and restore eco-system funds. Furthermore, China has also stated that it has been refocusing on cleaner and beneficial to the environment projects. However, over the period, the use of coal, oil, and fuel has decreased as compared to the beginning, but still, there is a long way to go to ensure environmental sustainability.

Despite all the economic and social benefits of CPEC, there are still some disadvantages of the project, which must be discussed openly, as they are a threat to a better tomorrow. Pakistan ranks 10^{th} in the list of most vulnerable to climatic changes. One of the biggest threats of CPEC is the road to end energy crises in Pakistan. The country is facing a lot of issues when it comes to energy production. To encounter this problem, CPEC has invested $33

Billion, and allotted 19 energy production projects. Out of these nineteen projects, three quarters are dependent on the oldest method of production: burning coal. The plants are in Sindh (Thar I and II), Baluchistan (Gwadar and Hub), and Punjab (Sahiwal and Salt Range), which means that every province is under the ultimate risk of global warming, due to increased CO2 emissions. The NEAP-SP, Green Industry Program, which was launched in the year 2006, by the Pakistan Environmental Protection Agency for the promotion of SMART program, with the assistance of the UNDP. The purpose of this step was to make the industries efficient enough to ensure systematic analysis and reporting of their environmental act. The main characteristic of this project must be the "countrywide reductions in the pollution levels" by the provision of flexibility to the corporations to select cost-effective environmental resolutions and promote pollution control actions by helping in the identification of governing and non- governing impairments. Many studies and research papers prove that CPEC envisions to upgrade Pakistan's economic growth by strengthening its construction sites, building new and modern transportation networks, introducing several projects that function on power energy, and Special Economic Zones. CPEC aims to build modern transportation networks that link seaports of Gwadar and Karachi to the Northern areas of Pakistan, and also extends to Western China and Central Asia. Pakistan Economic Corridor (CPEC) is a hope for better future of the region with peace, growth, and economic development. CPEC is working on 19 projects, and one of those projects is the Special Economic Zones (SEZs).

The global energy crisis is a major threat to whole world in general and third world nations such as Pakistan in particular, where the crisis has become hurdle for industrial and financial development. Most governments recognize that energy independence and self-reliance are vital to establishing and maintaining prosperity and sovereignty. To solve global concerns, the system must transition away from fossil fuels and toward renewable energy and energy-saving technologies. Pakistan has enormous potential for capturing renewable energy, and its percentage of the electrical mix must be raised to attain energy security. Security concerns and circular debt are two major difficulties that must be solved if on-grid renewable energy is to be promoted through the private sector. Generators use diesel and petrol, both of which are made from fossil resources that are rapidly decreasing, and they also release harmful chemicals which contribute to environmental pollution and many diseases in human beings. Environmental issues/problems like global warming and climate change are driving to increased penetration of distributed RES to the next generation of the electricity grid. Greenhouse gases such as carbon dioxide, nitrous oxide and methane are discharged when we use fossil fuels. One of the utmost popular means of generating electricity without

emissions or noise is through solar by transforming sunlight through PV system into electrical energy. Pakistan has huge prospect to produce wind and solar power and according to the World Bank, report the energy sectors is the main factor for the generation of greenhouse gases like CO_2 and methane.

Pakistan is currently confronting climate issues such as floods, droughts, and heat waves. No doubt CPEC projects have monetary benefits to Pakistan but it has serious environmental concerns for n Pakistan. New studies suggest and warn that the CPEC may have a direct and negative impact on Pakistan's water, air, and wildlife. These negative results likely to diminish the potential benefits that CPEC can provide. Also, a large number of the projects in CPEC are related to the energy sector which will deteriorate the environment as a result of the increase in energy consumption (Muhammad et al., 2020).

The China-Pakistan Economic Corridor (CPEC), which focuses on the special economic zone and industries, has a severe impact on the country's ecology due to widespread exposure and emissions of carbon dioxide. Currently, Pakistan is facing economic challenges and the environment degradation is new challenge and became a threat for sustainable development.

Another environmental risk of CPEC is deforestation. As a results of the CPEC infrastructure projects a massive cutting down of forests. In 2017, about 54,000 trees had been reduced in the district of Naushera, Abbottabad, Markanda, and Malakand with the intention to sustain the venture. A tree absorbs about 50 pounds of Carbon Dioxide per Anum, but with this degree deforestation, it'll affect weather negatively (Kouser et.al, 2020). The third enormous hazard is that Pakistan seashores are located inside the District of Gwadar, which is considered to be the greatest coastal area, and the mid-point of the China Pakistan Economic Corridor, which makes the beaches exposed to serious damages, since the largest coal-burning plant is located in Gwadar (Baloch, 2017).

Pakistan's climate is deteriorating with each passing day. Because of the dreadful climate circumstances, Pakistan is now recognized as one of the top 10 places to live. One of the most prominent causes of this horrible predicament is the massive emission of carbon dioxide into the environment.

The widespread use of fossil fuels in industry and energy production has polluted the air, exacerbating the situation. Pakistan is placed tenth in the list of the most prone to climatic changes, and this reality can readily be seen through the climate circumstances; unpredictable rainfall, floods, droughts, melting glaciers, and distributed heat waves (Ebrahim, 2021). The steady exploitation of natural resources is causing pollution, and if not taken care of

right now, it may lead to diminished environmental sustainability, diffusely effecting the economic growth. Substantially, China has invariably been the largest investor of the coal energy sector around the world; investing up to USD 21 to 38 billion the investments but lacks the attention regarding the environmental issues (Isaad, 2021).

Prominent Industries in the Plan

Textile Industry

Industry has been an issue for the water, all the wastage of chemicals and machines dumped into lakes, sea, and alike. According to an observation, textile firms are responsible for 20% of water pollutants, and around 0.5 million tons of synthetic waste is dumped into ocean yearly. A hundred and a hundred and fifty liters of water is required for producing one kilogram of fiber. There are 223 textile firms in Pakistan, which produce round 640,000 tons of fiber in an annum that consistent with textile firms produce 2,870 tons per year and 8 tons per day. For producing 8 tons of fiber, it required 1.6 million liters of drinking water each day in which 0.5 million tons of microfiber dump off into the sea per 12 months.

Chemical Industry

These industries automatically affect the environment by inflicting air pollution by emission of poisonous gases, dumping of chemicals into water, natural ponds, and lakes, and burying solid waste and dirty water undersoil, inflicting damage. The primary chemical compounds produced by using the 47 chemical industries in Pakistan include CO2, VOCs, and NOx and these 47 industries emit 220 million tons of poisonous gases into the air.

Agriculture and food processing Industry

These two industries have been depending on utilization and burning of fossil fuels, coal, fuel, and woods. The emission of gases into the environment with the use of burning these things is a main issue of trouble from these industries. Steel Industry: Burning and melting of iron and steel requires lots of energy production. Steel production calls for an ample amount of COKE (a kind of coal) which is extraordinarily damaging to the environment and emits naphthalene that is notably poisonous and the reason of cancer. With a view to burning these excessive great metals, lots of greenhouse gases are emitted into the environment yearly. Around 2.8 million tons of greenhouse gases are emitted through steel and iron industry.

Ceramic Industry

It's been concluded that the ceramic industry produces around 16Kgs of CO2 for each square meter of a ceramic tile, which then leads to enormous depletion of ozone layer. So, no longer only these industries are responsible for environmental risks within the country, but around the world.

Pharmaceutical Industry

There are 650 pharmaceutical companies in Pakistan which emits 250,000 tons of harmful gases into the air and 384,000 kg solid waste into the water in a year. Even though compared to other industries, those firms do not affect the environment to a very high extent, but still, they are dangerous. The dumping of expired or unused drugs do now not have a proper technique, because of this they're dumped into water bodies or undersoil causing poison to transmit slowly throughout.

Cement Industry

The cement industry is the third industry inflicting environmental pollutants through dumping around 450,000 tons of Carbon Monoxide, Sulfur Oxide, and Nitrogen in the surroundings. Paper industry: The preliminary system of creating paper consists of cutting down trees, and the actual system of manufacturing paper is liable for dumping carbon dioxide, nitrogen Dioxide, and Sulfur Oxide in the climate, which then leads to troubles including acidic rain and GHGs (greenhouse gases) emissions.

Measures taken by Industries in the Plan to Reduce Environmental Effects of SEZs

The China and Pakistan relations have been further strengthened by recent visit of Prime Minister to China and with initiation of CPEC Phase-11. However, to counter environmental issues related to the SEZ following measure are suggested

- Limit the amount of waste to be dumped annually by an industry.
- Developing strict regulations related to environment and ensuring implementation of the regulations.
- A ban on cutting of forests and new policy for plantation of trees in the project areas.
- To overcome the water pollution the seawater should be converted into drinkable water by desalination of water.
- The industries should bound to ensure to plant trees and provide conducive environment for workers.
- Encouraging industries for environmentally friendly production and discouraging pollutant industries through fees and fine.

Special Economic Zones (SEZs) are that meager part of the world economies which are exclusive. These zones are geologically bordered areas that are created for the benefits of the manufacturing sector, through monetary guidelines and actions. After a precise analysis of the darks side of these special Zones, many nations took measures to make sure that they no longer cause any greater destruction to the environment. Below stated are a few steps taken through a sure nation for you to cut out the negative element. Step taken by China to reduce environmental effect of SEZs is associated with sound control. Further most important steps taken by the world nations as well. Lots of countries paid the right interest to create a balance between industrialization and socio-economic improvement. After understanding that special economic zones are a challenge to surroundings, government bodies have made sure to take right measures to avoid greater problems. Environmental concerns are important for any economic tasks, and the China-Pakistan Economic corridor (CPEC) mission is no exception.

Climate Change Mitigation

The CPEC needs to contain processes to reduce greenhouse gas emissions and diminish the effects of climate change. This will consist of the usage of renewable energy resources, green technology, and carbon offset projects.

Water Management

Powerful water management practices should be included in the project to preserve water sources, lessen water pollution, and limit the effect of water-extensive activities to nearby communities.

Waste Management

Effective waste control practices should be used to decrease the impact of waste on surroundings. This would consist of the use of recycling, composting, and different sustainable waste control tactics.

Public Engagement

The giant project needs to involve local groups and different stakeholders in decisions to make sure that their concerns and wishes are taken into consideration. This can also assist to construct public trust in the project and its outcomes.

Monitoring and Evaluation

The venture should have a powerful monitoring and assessment mechanism in vicinity to keep watch on its environmental impacts and ensure sustainability

targets. This could additionally assist to pick out issues for adjustments as fundamental to economic developments.

Numerous modifications have been made on earth climate due to anthropogenic happenings even before the world industrial revolution and it is universally accepted that no nation can economically grow without taking in consideration the environmental damages associated with economic activities; therefore, the sustainable development is the core of economic expansion. It is significant to emphasize on economic integration, but also needs at the same time make environmental issue indispensable between China and Pakistan regarding CPEC via legal collaboration as an essential part of the national geopolitical policies to mark CPEC a long-lasting as well as a more harmless, protected, and sustainable project.

As China leads the coal production around the world which accounts for almost half of global consumption, and ultimately, observed as the major source of carbon emissions (EIA, 2014). And it is observed that coal has damaged the environment quality massively and causes threat to human health and future damages for the long-run; therefore, coal-based power projects in CPEC are intended to damage environment the long run.

Table 2: The 10 countries most affected from 2000 to 2019 (annual averages)

CRI 2000-2019 (1999 - 2018)	Country	CRI Score	Fatalities	Fatalities per 100000 inhabitants	Losses in million US$ PPP	Losses per unit GDP in %	Number of events (2000-2019)
1 (1)	Puerto Rico	7.17	149.85	4.12	4149.98	3.66	24
2 (2)	Myanmar	10	7056.45	14.35	1512.11	0.8	57
3 (3)	Haiti	13.67	274.05	2.78	392.54	2.3	80
4 (4)	Philippine	18.17	859.35	0.93	3179.12	0.54	317
5 (14)	Mozambique	25.83	125.4	0.52	303.03	1.33	57
6 (20)	The Bahamas	27.67	5.35	1.56	426.88	3.81	13
7 (7)	Bangladesh	28.33	572.5	0.38	1860.04	0.41	185
8 (5)	Pakistan	29	502.45	0.3	3771.91	0.52	173
9 (8)	Thailand	29.83	137.75	0.21	7719.15	0.82	146
10 (9)	Nepal	217.15	217.15	0.82	233.06	0.39	191

Source: Climate Risk Index of 2021.

According to Climate Risk Index of 2021 table above ranks of Pakistan stood 8th most affected among world's countries. China is moving away from coal

centered energy and is employing firmer pollution-control regulations, Pakistan is originating such schemes now, despite its global obligations, and that too without stringently undertaking environmental valuations or without having a very good history of applying its environmental safety laws. If Pakistan does not proceed suitable deed to confirm the prevention of environmental degradation, its people could undergo significantly due to the causing adverse effects to the environment; the consequence of which could also influence the rest of the world. The CPEC projects need to undertake sustainable development practices that balance monetary, social, and environmental desires. This could make sure that the mission benefits the local communities and the surroundings, whilst also contributing to the country's monetary expansion.

Addressing Climate Change: The Urgent Need for Increased Global Ambition

Climate change is a pressing issue that is affecting the world in numerous ways. With average global temperatures expected to rise beyond 3°C, the consequences for our planet and all its ecosystems are becoming increasingly dire. The impacts of climate change are clear, with severe storms, natural disasters, food and water scarcity, and the potential for conflict being exacerbated. In order to mitigate these detrimental effects, immediate action needs to be taken. The escalating effects of climate change are evident in the form of extreme weather events, which are becoming more frequent and intense. Hurricanes, droughts, floods, and wildfires are just some of the manifestations of this phenomenon, causing destruction to homes, infrastructure, and livelihoods. These disasters not only have immediate consequences but also long-term.

In today's world, the reality of climate change is becoming increasingly undeniable. The impacts of rising global temperatures are being felt across the globe, from extreme weather events to the loss of biodiversity. While there has been progress in the fight against climate change, with investments in renewable energy reaching record levels and countries committing to reducing their carbon emissions, much more needs to be done. The current trajectory of global warming is unsustainable, and urgent and ambitious action is required to limit the rise in temperatures (The sustainable development goals 2023).

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Part III

Local Perspectives

11

Unraveling the Human Narrative: Exploring Well-being and Perspectives of Border Communities along the China-Pakistan Economic Corridor in Gilgit-Baltistan, Pakistan

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Abstract

Economic corridors around the world have created job opportunities for people living along their routes, which is why it is important to have the support of local communities. This study focuses on investigating the residents' support for the development of the China-Pakistan Economic Corridor (CPEC) and the perceived impacts and personal benefits of the CPEC project in Gilgit-Baltistan. The research approach used a quantitative method with random sampling for a field survey. Data were collected from four districts - Hunza, Nagar, Gilgit, and Diamer - located in the Gilgit-Baltistan province. The study breaks down subjective well-being into five distinct domains: Health, Material, Community, Emotional, and Educational Well-being. The model examines the structural connections between these dimensions, assessing their combined impact on the subjective well-being of residents and determining their implications for supporting the development

of the CPEC. After confirming the validity of the measurement model, a structural model evaluation was conducted. The results from the structural models provide valuable insights into the connections between subjective well-being dimensions and support for the China-Pakistan Economic Corridor (CPEC) project. The reliability and validity statistics of the measurement model ensure its robustness. Structural Model One's findings confirm a significant positive relationship between the perceived subjective well-being of local residents and support for the CPEC project. The results validate Material Well-being, Community Well-being, Educational Well-being, Health Well-being, and Emotional Well-being, demonstrating that each dimension significantly influences support for the CPEC project.

Introduction

Economic corridors represent strategic developmental initiatives designed to facilitate a nation's augmentation of internal or localized economic endeavors (Brand, 2018). These initiatives involve establishing linkages between distinct economic centers, fostering interconnectivity within transportation networks, and fostering the adoption of pivotal technologies crucial for regional economic consolidation and trade integration (Amir, 2016). The China-Pakistan Economic Corridor (CPEC) is the flagship project of China's Belt and Road Initiative (BRI), which aims to connect China's Xinjiang area to Pakistan's Gwadar Port by a network of roads, trains, and pipelines. The CPEC, which spans more than 3,000 km, has huge economic consequences for both countries, promising to improve commerce, infrastructure development, and energy cooperation. It is envisioned as a game changer not just for Pakistan's economy, but also for regional connectivity, forging closer relations between China and Pakistan while opening up new opportunities for investment and growth in the larger South Asian area.

The China-Pakistan Economic Corridor (CPEC) is an important initiative for both China and Pakistan. To promote economic ties between China and Pakistan, the China-Pakistan Economic Corridor (CPEC) is a development project that includes road infrastructure, energy, and various industries (Khwaja, Saeed, & Urooj, 2018). China focus also remains on strengthening their own economy, creating new economic goals, and searching for international markets and investment possibilities (Afzal & Naseem, 2018). To achieve this goal, the Chinese government launched the massive One Belt, One Road (OBOR) project, of which CPEC is a component. According to Abid & Ashfaq, (2015), CPEC is seen as a major economic game changer for Pakistan because it promises creating millions of jobs and business opportunities for the surrounding area (Haqiqat & Alam, 2023).

The China-Pakistan Economic Corridor (CPEC) is a project that has greatly benefited the community in Pakistan. For instance, the CPEC development project offers necessities such as employment opportunities, access to education, and convenient access to large cities and marketplaces (Ghanem, Xuemei, Alam, & Baig, 2021). Researchers and politicians argue that the China-Pakistan Economic Corridor (CPEC) will improve living conditions for the local population by providing more opportunities for economic growth (Ali et al., 2017; Kanwal, Chong, & Pitafi, 2019b). Several studies have showed that various development initiatives can improve the well-being of local communities (Kanwal et al., 2020; Woo, Kim, & Uysal, 2015). However, there are only a few studies that focus on the standard of living in local communities and the growth of CPECs (Kanwal et al., 2019b). According to L. Ali et al. (2017), by providing local people with global connections, the CPEC road and transit project can increase their standard of living. Additionally, Kanwal, Chong, & Pitafi (2019a) argue that the development of CPEC infrastructure can boost local community revenue by providing commercial, job, and educational opportunities, ultimately leading to an improved quality of life. According to Asomani-Boateng, Fricano, & Adarkwa (2015), the improvement of road and transportation infrastructure will increase trade, tourism and land connectivity. While CPEC has often been disregarded, prior research has looked at the influence of socio-cultural factors on local populations' well-being through festivals and tourist development (Nawijn & Mitas, 2012; Yolal, Gursoy, Uysal, Kim, & Karacaoğlu, 2016). This study will fill this research gap by primarily examining how the socio-cultural effects of CPEC on residents' subjective well-being are perceived by them. We will be able to determine the strength and direction of the association between sociocultural influences and residents' subjective well-being by assessing subjective well-being as an outcome concept. Since CPEC presents both opportunities and problems, we are looking at how CPEC projects affect individuals' well-being.

The China-Pakistan Economic Corridor (CPEC) traverses through China's Xinjiang Province and subsequently extends into Gilgit-Baltistan through the Hunza, Nagar, Gilgit, and Diamer districts, covering a distance of over 300 kilometers before proceeding into the Khyber Pakhtunkhwa (KP) region via the Kohistan area. The China-Pakistan Economic Corridor (CPEC) is anticipated to provide a significant opportunity for trade, particularly within the Gilgit-Baltistan region of Pakistan. Gilgit-Baltistan (GB) exhibits substantial potential for advancement through strengthened trade ties with China, possessing a conducive environment with the capacity for further development in energy, business, fruit handling, and livestock sectors, as highlighted by (Khan, 2013). It is envisioned that this multi-billion-dollar

collaborative project traversing the formidable Karakorum and Himalayan Mountain ranges in Northern Pakistan will not only stimulate trade and industrial activities in GB but will also contribute to the overall promotion of tourism in Pakistan and, more specifically, in Gilgit-Baltistan, as indicated by (Malik & Akbar, 2021). Given that one of the primary objectives of CPEC is to ameliorate the socio-economic conditions in underprivileged regions of Pakistan, the development of GB along the Karakoram Highway (KKH) remains a central focus of CPEC projects. Consequently, the enhancement of socio-economic circumstances is expected to exert a positive influence on peace, harmony, and reconciliation in Gilgit-Baltistan, as asserted by (Wolf, 2018).

Due to limited research on the subject of China-Pakistan Economic Corridor (CPEC) development initiatives in Pakistan, with a notable absence of prior scholarly works specifically addressing the region of Gilgit-Baltistan, the primary aim of this investigation is to examine the level of support among residents for CPEC development. Firstly, this study is the first to focus on the welfare of locals in Gilgit-Baltistan along the CPEC route. Secondly, by stressing the material, community, educational, health, and emotional advantages of CPEC as well as its favorable effects on infrastructure development, the current study raises awareness of CPEC projects among Gilgit-Baltistan citizens along the CPEC route. Thirdly, the multidimensional nature of subjective wellbeing, encompassing material, community, education, health, and emotional dimensions, plays a crucial role in shaping residents' attitudes toward CPEC development initiatives.

This research is organized as follows: Section 2 succinctly expounds upon the literature review within the framework of the China-Pakistan Economic Corridor (CPEC), introducing the CPEC itself, and formulating a hypothesis. Section 3 delineates the research methodology and details the procedures employed for data collection. Section 4 elucidates the data analysis undertaken in the study. Section 5 furnishes a discussion of the findings, implications, and limitations, while Section 6 offers a conclusion to the study.

Literature Review and Hypotheses Development

China–Pakistan Economic Corridor

China-Pakistan Economic Corridor (CPEC) encompasses a variety of infrastructure projects, economic development initiatives, industrial zones, and regional connectivity projects that are currently being constructed across Pakistan. Originating in Gwadar, Baluchistan, Pakistan, the China-Pakistan Economic Corridor (CPEC) extends all the way to Kashgar, China, passing through several provinces in Pakistan, namely Baluchistan, Sindh, Punjab,

Khyber Pakhtunkhwa, and Gilgit-Baltistan. This monumental initiative was inaugurated in April 2015 by Chinese President Xi Jinping and represents a substantial investment, totaling $62 billion (Ahmed, Arshad, Mahmood, & Akhtar, 2017). For China, the China-Pakistan Economic Corridor (CPEC) offers a vital strategic advantage. It provides a swifter and more cost-effective alternative to the Strait of Malacca, a route currently responsible for 83% of China's oil imports. The Malacca route, controlled by the United States, presents a potential threat to Chinese business interests. Hence, CPEC stands as a secure and efficient pathway, substantially shortening the distance from approximately 12,500 to 3,000 km. This reduction not only decreases shipping costs but also significantly cuts transportation time (Shaikh, Ji, & Fan, 2016).

In the context of Pakistan, the China-Pakistan Economic Corridor (CPEC) signifies a transformative economic initiative. It holds the promise of alleviating poverty, resolving energy shortages, and generating significant business opportunities and employment prospects for local communities (Sun, Pitafi, Ghani, & Islam, 2020). Amid these optimistic advancements, scholars have expressed apprehensions regarding potential adverse effects. Prior research has underscored environmental challenges, such as glacier melting in northern Pakistan attributed to CPEC (Nabi, Ullah, Khan, Ahmad, & Kumar, 2018).

Moreover, the significant water usage in the construction of various projects, such as motorways, gives rise to worries regarding potential water scarcity for neighboring communities (Khwaja, Saeed, & Urooj, 2018). The noise pollution stemming from drilling and the operation of heavy machinery not only irritates the local populace but also has the potential to disrupt the region's ecosystem. Additionally, the considerable deforestation undertaken to facilitate construction, particularly in forested areas, emerges as a noteworthy concern (Khwaja et al., 2018).

Hence, it is imperative to conduct a thorough examination of the subjective well-being of residents, scrutinizing the effects of the China-Pakistan Economic Corridor (CPEC) development project and its ramifications on the local community. Such a comprehensive research endeavor is indispensable for acquiring a nuanced comprehension and facilitating well-informed policymaking pertaining to the project.

Support for CPEC

Within this investigation, the dependent variable under scrutiny is the support for China-Pakistan Economic Corridor (CPEC). The imperative nature of local community endorsement is underscored, as it holds pivotal significance for

the efficacy of CPEC projects, given the substantial role played by the local community as a primary stakeholder in the initiatives associated with the China-Pakistan Economic Corridor (Alam, Baig, & Muhammad, 2023; Alam, Xuemei, et al., 2023). Previous research indicates that, generally, the local community maintains a favorable attitude towards development projects (Andereck & Vogt, 2000). Although there are limited studies suggesting a negative disposition of the local community towards certain development projects like tourism (Álvarez-García, Durán-Sánchez, & del Río-Rama, 2018). Consistent with the principles of social exchange theory, the level of support from the host community is contingent on perceived benefits. In the case of CPEC development projects, higher levels of support are expected when local residents perceive these projects as more advantageous. In light of the considerable proportion of the local community perceiving CPEC projects predominantly as economic undertakings, it becomes essential to grasp the perspectives of local residents regarding the impact of CPEC on diverse facets of well-being. These dimensions encompass health, material, community, emotional, and educational well-being. Such comprehension is of paramount significance for government officials, business leaders, and policymakers, as the realization of success in any development initiative is contingent upon the perceptions and endorsement of the local community.

Perceived Impacts of CPEC and its Integration for Regional Development

Numerous previous studies have delineated a direct association between the perceived impact of development projects and the level of support garnered for such initiatives (Kang & Lee, 2018; Luo & Xiao, 2017). It is pertinent to observe that local residents exhibit discernment regarding both favorable and adverse effects attributed to the China-Pakistan Economic Corridor (CPEC) project. The existing body of literature emphasizes the nuanced nature of the CPEC undertaking, elucidating a spectrum of impacts on the inhabitants of the region (Maqsood, 2018; Nabi et al., 2018).

Previous investigations related to the China-Pakistan Economic Corridor (CPEC) have posited a multitude of positive ramifications on the quality of life for local inhabitants, encompassing dimensions such as business prospects, employment opportunities, educational enhancements, and income augmentation (Afzal & Naseem, 2018; L. Ali, Mi, Shah, Khan, & Imran, 2017). Conversely, scholarly discourse has also directed attention to specific adverse outcomes associated with the CPEC initiative, including apprehensions pertaining to security, property valuation fluctuations, alterations in the community's image, and various social impacts (Hussain, 2019; Zia & Waqar, 2018).

Numerous academics and policymakers have emphasized the positive implications of the China-Pakistan Economic Corridor (CPEC) initiative (Shoukat, Ahmad, & Abdullah, 2016; Suleri, 2018; Xie et al., 2015). Policymakers, in particular, contend that CPEC endeavors are poised to bring about significant transformations in the socioeconomic landscape of the Pakistani populace (Makhdoom, Shah, & Sami, 2018). Arguing that the CPEC project holds the potential to address issues of unemployment, education, and energy within Pakistan (S. Ali, 2015; Tong, 2014), these studies collectively affirm that the perceived positive impacts play a pivotal role in shaping the attitudes of local residents, cultivating their inclination to actively participate in and endorse the CPEC project.

Prior scholarship and policymaking endeavors have presented evidence indicating that the CPEC project serves to mitigate unemployment by creating a substantial number of employment opportunities (D. F. H. Ali & Qazi, 2020; Chen, Joseph, & Tariq, 2018), catalyzing the establishment of new businesses, and offering fresh investment prospects (Raza, Mohiuddin, Zaidi, & Osama, 2018). Furthermore, the China-Pakistan Economic Corridor (CPEC) project is acknowledged for presenting avenues for enterprises of both substantial and modest scale (Rehman, Hakim, Khan, & Khan, 2018), thereby contributing to the generation of income for the communities hosting these initiatives (Raza et al., 2018).

Conspicuously, a contemporary undertaking entails the commencement of a bus service originating from Lahore, Pakistan, destined for Kashgar, China, with a unidirectional travel duration of 30 hours, affording scenic vistas of the northern regions of Pakistan. This endeavor not only augments the economic well-being of the local community but also functions as a revenue source, encompassing employment and small-scale business prospects for the indigenous population.

Furthermore, authorities assert that the implementation of the aforementioned bus service is expected to enhance positive sentiments within the host community towards China-Pakistan Economic Corridor (CPEC) projects, fostering improved amicable relations between the two nations. To summarize, all research findings consistently demonstrate a significant correlation between positive impacts and the attitude of the local community. Despite these positive aspects, it is noteworthy that the CPEC project also entails substantial adverse effects on the region. For instance, the establishment of various industrial zones under the CPEC initiative results in carbon emissions, noise pollution, degradation of the natural environment, and contributes to health issues and cardiovascular problems (Bluhm, Berglind, Nordling, & Rosenlund, 2007; Walker, 2012). Furthermore, CPEC projects involving road

infrastructure and transportation give rise to safety concerns for residents in contiguous areas.

Nevertheless, certain CPEC initiatives, such as development of modern infrastructure, including roads and fiber optic networks has significantly enhanced transportation efficiency and communication capabilities contribute positively to the well-being of the local community. The endorsement and support for CPEC projects hinge significantly on the perception of their impact by the host community. If the local community perceives the negative impacts of CPEC as outweighing the positive aspects, opposition to and lack of support for its development may ensue. A prevailing perspective asserts that a positive disposition within the local community toward the impacts of the China-Pakistan Economic Corridor (CPEC) enhances the likelihood of garnering support for future developmental endeavors. Conversely, if the host community perceives that CPEC projects yield more costs than benefits and adversely impact the quality of life for local residents, there is a tendency to withhold support for CPEC development initiatives. Specifically, the perception of positive impacts is associated with a more favorable community support compared to the recognition of negative impacts (Gursoy, Milito, & Nunkoo, 2017; Luo & Xiao, 2017). Thus, building upon the aforementioned literature discourse and aligning with the tenets of social exchange theory, which underscores the significance of both positive and negative impacts in influencing support for CPEC development projects, the ensuing hypotheses are formulated.

Subjective Well-Being (SWB)

Subjective well-being is operationally defined as "an individual's cognitive and affective evaluations of their own life" (Diener & Suh, 1997). Cognitive evaluations entail an individual's discernment of the impact a project can exert on their life satisfaction, while affective evaluations encompass an appraisal of the emotions, moods, and feelings that a project can evoke. Consequently, subjective well-being can be comprehended as an outcome shaped by individuals' emotional responses to projects and their cognitive assessments of the satisfaction and fulfillment that these projects may impart to their lives. Subjective well-being incorporates both the emotional and cognitive evaluations individuals undertake regarding their lives, encompassing their conceptualizations of happiness, peace, fulfillment, and life satisfaction (Diener, Oishi, & Lucas, 2003).

Subjective well-being assumes a pivotal role in individuals' lives, significantly contributing to the attainment of their optimal functional capacity, instilling confidence in the achievement of crucial objectives, and fostering the

motivation and energy required to consistently surmount life's challenges. Psychologists assert that the fulfillment of fundamental human needs, encompassing competence, independence, and relatedness, is imperative for sustaining enduring well-being (Ryan & Frederick, 1997). Moreover, they posit that the failure to meet these three essential psychological needs impedes individual flourishing (Ryan & Deci, 2000). A plethora of studies suggests that engagement in developmental endeavors, such as participation in initiatives like the China-Pakistan Economic Corridor (CPEC), can exert a positive influence on well-being (Naidoo & Pearce, 2018). Developmental ventures offer opportunities for the pursuit and realization of intrinsic aspirations and goals, including affiliation, socialization, self-actualization, togetherness, personal growth, and community attachment, directly addressing certain fundamental psychological needs.

Previous research robustly suggests that active involvement in developmental initiatives, exemplified by the China-Pakistan Economic Corridor (CPEC), possesses the potential to markedly augment individuals' happiness and life satisfaction (Keyes, Shmotkin, & Ryff, 2002). For instance, (Packer & Ballantyne, 2011) underscore that engagement in developmental events can wield a considerable positive influence on participants' psychological and social well-being. Moreover, scholarly inquiry indicates that participation in progressive activities with social dimensions, such as attending events associated with development projects in the company of friends, can foster feelings of satisfaction and enable individuals to satisfy various psychological needs. Consequently, these activities may contribute more significantly to enhancing subjective well-being compared to leisure pursuits lacking social interactions (Mingo & Montecolle, 2014; Newman, Tay, & Diener, 2014). In a parallel vein, a study conducted in Korea reveals a positive correlation between economic and cultural activities and socially oriented happiness, highlighting that such activities facilitate social interactions and cultivate a sense of belonging (Jeon, Shin, & Lee, 2014).

In light of the multifaceted psychological needs addressed through these initiatives, encompassing opportunities for entertainment, socialization, and novelty-seeking, they are poised to yield a considerable positive influence on the subjective well-being of participants, thereby potentially eliciting support for the project. The instrument employed for assessing subjective well-being in this study was adapted from the work of (Yolal et al., 2016).

Dimensions of Subjective Wellbeing of Residents

Material Wellbeing (MWB)

Material well-being, as expounded by Andrews, Withey, Andrews, & Withey, (1976), pertains to the contentment derived from essential economic components. White underscores its connection to fundamental necessities such as food, shelter, and economic goods. Meanwhile, (Andrews et al., 1976) adopt a more comprehensive view, defining it as satisfaction with diverse economic aspects, including governmental management of the economy, taxation, household income, and employment-related benefits. According to their perspective, material well-being delves into specific dimensions like financial security, standard of living, family financial dynamics, and aspirations concerning material possessions. In essence, it encompasses the satisfaction derived from one's economic circumstances, spanning from basic needs to broader economic considerations and personal aspirations. This nuanced understanding provides insight into an individual's or community's tangible prosperity across various dimensions.

Community Wellbeing (CWB)

The positive effects of development initiatives on communities have been extensively documented in prior scholarly investigations (Grunwell, 2007; Jeong & Faulkner, 1996). Additionally, research suggests that these initiatives typically necessitate substantial capital investments, concentrating on the development and organization of infrastructure (Litvin & Fetter, 2006). Furthermore, developmental activities are acknowledged for their crucial role in destination marketing, affording opportunities to showcase local attractions within the community (Fredline & Faulkner, 2000). Moreover, these initiatives contribute to the cultivation of a positive community image, act as catalysts for the revitalization of existing attractions, and function as drivers for additional socio-economic development, consequently attracting tourists, investors, and sponsors (Getz, 1991; Quinn, 2006; Richards & Wilson, 2004).

From an intangible standpoint, as underscored by Gursoy et al. (2004), these projects cultivate a sense of community pride and cohesiveness. Beyond the creation of economic opportunities, these initiatives furnish a distinct occasion for residents to express their dedication to their community (Rao, 2001). They also offer avenues for community revitalization and cohesiveness (Ferdinand & Williams, 2013). Furthermore, developmental activities facilitate cultural exchange and understanding among residents and visitors (Besculides, Lee, & McCormick, 2002) by establishing a platform for enhancing tolerance and

understanding between hosts and guests, as the guests are exposed to the host culture.

Moreover, the presentation of one's own culture to external observers not only promotes unity within the community but also enhances identity, pride, cohesion, and support. The interactive nature of socio-cultural activities further solidifies the association between the promotion of culture and the cultivation of social capital (Attanasi, Casoria, Centorrino, & Urso, 2013). As posited by (Arcodia & Whitford, 2013), the execution of a developmental plan heightens awareness of community resources and expertise, fosters social bonds among previously unconnected individuals, and generally reinforces more robust interaction among community organizations. Consequently, these activities contribute to the establishment of strong connections within a community and further fortify social and cultural identity (Gursoy, Kim, & Uysal, 2004).

The preceding discussions emphasize that endeavors like the China-Pakistan Economic Corridor (CPEC) possess the capacity to elevate the community's image, serving as a platform to display its unique and distinctive characteristics. Moreover, such projects wield a substantial role in enhancing the well-being of residents by providing economic opportunities, fostering community revitalization, facilitating cultural exchange, and fortifying social bonds. Consequently, community well-being emerges as a crucial determinant influencing the subjective well-being of local residents, thereby exerting a positive influence on the support for initiatives such as the China-Pakistan Economic Corridor (CPEC).

Educational Wellbeing (EDWB)

Research indicates that initiatives like the China-Pakistan Economic Corridor (CPEC) offer unique opportunities for the educational development of communities (Getz, 2004). (Dwyer, Mellor, Mistilis, & Mules, 2000) contend that projects and festivals create forums for the exchange of ideas among residents and visitors, functioning as educational and training venues for local residents. In a similar vein, (Koehler, 2009) observes that development projects serve as educational events, contributing to the cultivation of an educational culture within communities. Therefore, it is imperative to scrutinize development projects, particularly the CPEC, as educational events. Project activities can also facilitate enhanced understanding among community members from diverse ethnicities and cultural backgrounds, serving as foundational elements for community cohesion (Getz, 1991, 2004). Beyond providing educational opportunities for participants, these projects instill a sense of community pride (Mill & Morrison, 2002) and contribute to

the preservation of both the natural and educational environment (Backman, Backman, Uysal, & Sunshine, 1995). Additionally, they assist local communities in crafting their own identity and establishing educational opportunities in collaboration with other participants (Liang, Illum, & Cole, 2008).

Research contends that developmental projects yield advantages not only for the residents of the involved communities but also for individuals engaging with those communities (Besculides et al., 2002). Such endeavors can provide diverse opportunities for participants to satisfy higher-level needs, including learning and enlightenment (Cushman, Veal, & Zuzanek, 2005). Furthermore, various projects, industries, exhibitions, and award ceremonies offer unique experiences for local residents. Similarly, (Lee, Arcodia, & Lee, 2012) observe that cognitive benefits, such as acquiring new knowledge and expanding one's understanding, rank as the second most important motivational factor for attending multicultural events, following transformational benefits. The preceding discussions distinctly indicate that developmental initiatives present numerous educational benefits and opportunities for both local residents and participants. These advantages and opportunities are poised to exert a significantly positive impact on the subjective well-being of both residents and visitors, ultimately enhancing support for the China-Pakistan Economic Corridor (CPEC) project.

Health Wellbeing (HWB)

The earlier discussions strongly indicate that developmental initiatives provide a range of educational benefits and opportunities for both local-residents and participants. These advantages are poised to exert a positive and significant impact on the subjective well-being of both residents and visitors, ultimately fostering increased support for the CPEC project. Incorporating insights from studies such as those conducted by Welsch, (2007) and the Bano, Khayyam, & Alam, (2019), health well-being is intricately linked to factors such as water quality, pollution, littering, and noise pollution. The detrimental impacts of pollution on both physical and mental health are consistently evident in the literature. Therefore, in this framework, health well-being encompasses the comprehensive physical and mental health of a community, emphasizing the potential risks linked to compromised water quality, increased pollution, and the stress and irritation induced by noise pollution. Consequently, the study of health well-being becomes a crucial dimension in understanding the subjective well-being of local-residents, and it significantly influences the support for initiatives like the China-Pakistan Economic Corridor (CPEC).

Emotional Wellbeing (EWB)

The term "Emotional Wellbeing (EWB)" is employed to characterize an individual's state of wellbeing, emphasizing their awareness of the capacity to effectively manage daily stressors, sustain productivity at work, and make positive contributions to the community. Emotional wellbeing encompasses two fundamental components. Firstly, personal well-being is shaped by social factors, including the extent of available social support and the context in which emotional states manifest. Secondly, mental health necessitates consideration not only of the presence of diagnosable mental health disorders but also various factors such as socio-historical influences, personal choice, values, language, culture, emotional affect, social control, and social values that contribute to distress (Meadows & Foxwell, 2011). Therefore, emotional wellbeing is also regarded as a facet of subjective wellbeing that influences support for initiatives like the China-Pakistan Economic Corridor (CPEC).

Research Methodology

Study Area

The selection of the Gilgit-Baltistan province for this study was motivated by several considerations. Firstly, the CPEC initiative holds particular significance for the Gilgit-Baltistan province of Pakistan as it serves as the gateway for CPEC. The widening and enhancement of the Karakoram Highway (KKH) are expected to augment connectivity with both the down country and China. Secondly, the Gilgit-Baltistan province in Pakistan faces developmental challenges, and the CPEC initiative is anticipated to bring about transformative changes for the entire communities in Gilgit-Baltistan. Thirdly, certain nationalist groups express opposition to the development of the CPEC initiative due to various political and social concerns. Fourthly, in the Gilgit-Baltistan area, a number of particular projects under the China-Pakistan Economic Corridor (CPEC) have been approved and operationalized. These include the Karakoram Highway (KKH) extension, the Gilgit-Chitral land route, energy-related projects such as the Dasu Dam, tactical measures aimed at enabling the Khunjerab Pass to operate year-round, and the development of transport infrastructure in the region. (Babar & Alam, 2022). Data were collected from the four districts (Hunza, Nagar, Gilgit, and Diamer) situated along the China-Pakistan Economic Corridor (CPEC) route within the Gilgit-Baltistan province. Despite being rich in natural resources, Gilgit-Baltistan faces challenges related to insufficient infrastructure and awareness among local residents, rendering it a region lagging behind in development within Pakistan. Gilgit-Baltistan (GB) exhibits significant potential for advancement through trade connections with China, offering favorable conditions for further development in energy, business, fruit handling, and

livestock sectors (Khan, 2013). It is anticipated that this multi-billion-dollar joint venture project traversing the formidable Karakoram and Himalayas in Northern Pakistan will not only stimulate trade and industrial activities in GB but also enhance tourism in the broader region and in Pakistan as a whole.

Data Collection Procedure

To assess the research model of this study, a survey methodology was employed for data collection. The target population comprises residents of the Gilgit-Baltistan province residing in four districts (Hunza, Nagar, Gilgit, and Diamer) along the China-Pakistan Economic Corridor (CPEC) route. During the data collection process, the author and surveyors were assisted by local individuals. Prior to that, they had consulted with the community to discuss the impact of CPEC projects on their lives. Initially, a pilot survey involving fifty-five samples was conducted, and upon confirming adequacy, these samples were excluded from the final data collection. Utilizing a random sampling approach, 450 printed questionnaires were distributed across the four districts along the CPEC route, yielding 390 completed questionnaires with a response rate of 86%. Given the distinct characteristics and limited available information in the population, a random sample approach was recommended by previous studies (Boschini, Dreber, von Essen, Muren, & Ranehill, 2018). Following the evaluation of received questionnaires, those with incorrect or incomplete responses were excluded, resulting in a final sample size of 336.

Table 1 presents the demographic information about the survey participants with respect to their gender, age, education, and domicile district. These variables reflect the involvement of respondents across the four districts situated along the China-Pakistan Economic Corridor (CPEC) route. The survey indicates a higher representation of male respondents compared to their female counterparts. Regarding age distribution, the prevalent age group reported during the survey falls within the range of 36–45 years. Furthermore, most of the surveyed individuals (33.63 percent) held a bachelor's degree or higher. Additionally, a significant portion of the respondents (40.48 percent) originated from the Gilgit district.

Theoretical Model

The variables in our study were measured based on established methodologies from previous literature. We drew upon the measurement approaches and conceptual frameworks presented by (McGehee & Andereck, 2004; Yoon, Gursoy, & Chen, 2001) for the current investigation. For the present study, a five-point Likert scale was employed, where respondents could indicate their level of agreement on a scale ranging from 1 (strongly oppose) to 5 (strongly

support). This widely adopted five-point scale has been validated for similar research contexts, as highlighted by (Gursoy et al., 2017). Every question in the instrument underwent a meticulous review to ensure clarity, appropriateness, and ease of understanding in terms of language and content.

Table 1. Demographic information

Demographic Characteristics	Frequency	Percentage
Gender		
Male	233	69.35
Female	103	30.65
Age		
≤25.00	35	10.42
26–35	96	28.57
36–45	148	44.05
≥45	57	16.96
Education		
Illiterate	52	15.48
Primary	78	23.21
Secondary and Higher Secondary	93	27.68
Bachelor's and above	113	33.63
Domicile		
Hunza	104	30.95
Nagar	59	17.56
Gilgit	136	40.48
Diamer	37	11.01

Source: Survey Data

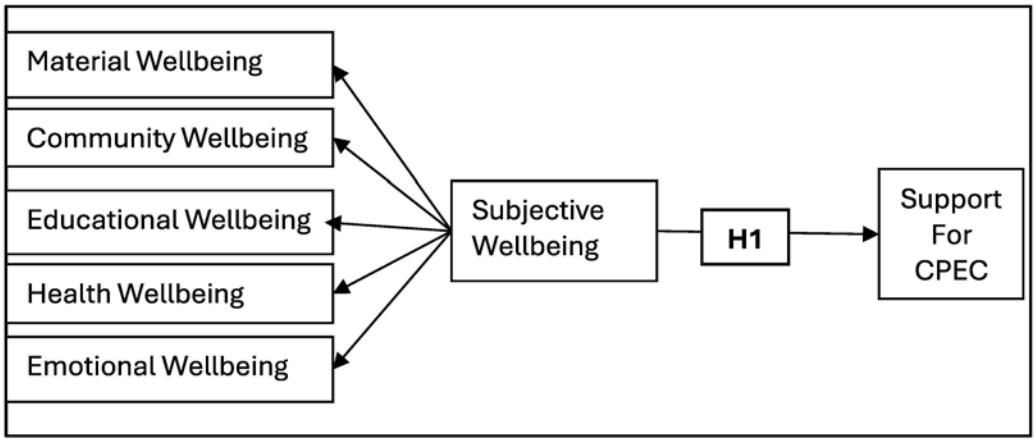

Figure 1: Theoretical Model for subjective wellbeing and support for CPEC

In this study, the hypothetical model breaks down the subjective wellbeing into five dimensions: Health, Material, Community, Emotional, and Educational Wellbeing. This conceptual model, informed by the literature review, illustrates the relationship between support for CPEC development

and the Subjective Wellbeing of residents (Fig. 1). Previous research discloses that support for CPEC Development is influenced by the Subjective Wellbeing of residents. The model explores the structural interconnections among the dimensions of wellbeing impacts, the impacts on the subjective wellbeing of residents, and the support for CPEC development. In theory, each dimension of wellbeing impact is postulated to influence the impact on the subjective wellbeing of residents, subsequently affecting the support for CPEC development. The conceptual foundation is rooted in social exchange theory, positing that residents are more inclined to support CPEC development when they perceive potential benefits without facing undue costs (Getz, 1991). The proposed hypothesis is derived from the theoretical model as follows:

Hypothesis 1 (H_1). There is a significant positive relationship between perceived Subjective wellbeing of local residents and support for the CPEC project.

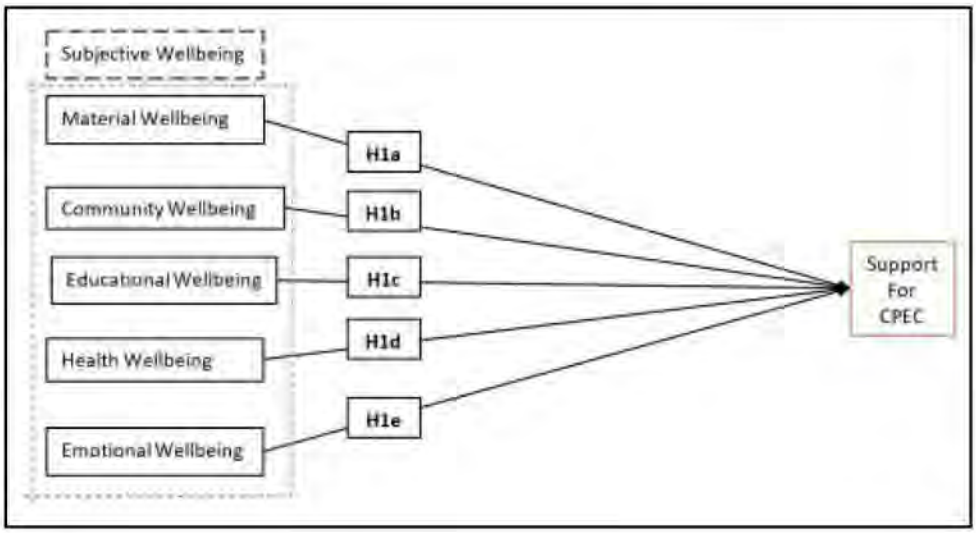

Figure 2: Theoretical Model for dimensions of subjective wellbeing and support for CPEC

However, it is also of great importance to explore the individual direct impacts of all five dimensions of subjective wellbeing by incorporating the perspectives of local residents, on support for CPEC as illustrated in Figure 2. While the 2nd order investigation presents a more parsimonious model, examining the relationship among various dimensions of subjective wellbeing at first order will further our understanding of the role of individual dimensions, making the findings more valuable. Therefore, the following hypotheses are formulated at first order:

Hypothesis 2 (H_1a). There is a significant positive relationship between Material wellbeing of local residents and support for the CPEC project.

Hypothesis 3 (H_1b). There is a significant positive relationship between Community wellbeing of local residents and support for the CPEC project.

Hypothesis 4 (H_1c). There is a significant positive relationship between the educational wellbeing of local residents and support for the CPEC project.

Hypothesis 5 (H_1d). There is a significant positive relationship between Health wellbeing of local residents and support for the CPEC project.

Hypothesis 6 (H_1e). There is a significant positive relationship between Emotional wellbeing of local residents and support for the CPEC project.

4. Data Analysis

The research incorporated a focus group to evaluate the content and face validity of the instrument. Based on the feedback received, certain items were excluded, thereby improving the reliability and comprehensibility of the instrument. Subsequently, quantitative data were collected from residents in four districts situated along the CPEC route in Gilgit-Baltistan. To prepare for analysis, data-cleansing techniques were initially applied.

Upon data collection, a multivariate normality test was conducted using the web-based software available at "https://webpower.psychstat.org/models/kurtosis/," aligning with the recommendation by Cain et al. [Cain et al.] and as applied in a recent study by (Yusliza et al., 2020). The Mardia's coefficient of multivariate skewness was 541.0564 ($p < 0.01$), and kurtosis was 2516.9260 ($p < 0.01$), indicating a departure from normality. Consequently, SmartPLS 3.2.8 [Ringle], a second-generation software for PLS-SEM analysis, was chosen to evaluate the proposed model. Furthermore, PLS-SEM was considered the most suitable approach for intricate structural models involving numerous constructs with multiple indicators. The SmartPLS software simultaneously assesses both models, termed measurement, and structural models [Chin, W.W], while mitigating concerns about multicollinearity (Maghsoudi, Zailani, Ramayah, & Pazirandeh, 2018). To estimate the significance of the structural model, the bootstrapping technique, a robust method for non-normal data, was employed with 5000 subsamples, as recommended in the literature (Peters, Chan, & Legerer, 2018).

Measurement Model

The measurement model was employed to assess the validity and reliability of the constituent constructs, following standard techniques outlined by Hair et al. (2017). Four key assessments were conducted to validate the reflective

constructs: indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Indicator reliability was confirmed by evaluating individual item loadings, which ranged from 0.617 to 0.930—exceeding the recommended threshold of 0.430, signifying reliable individual item measurements.

Composite reliability coefficients (CR) and Cronbach's alpha values for all constructs surpassed the minimum threshold of 0.70, indicating strong reliability and internal consistency within each latent construct. Convergent validity was established by assessing average variance extracted (AVE), with all AVE values surpassing the recommended threshold of 0.50. The range was from 0.558 to 0.848, suggesting satisfactory convergent validity across the constructs in the study.

Table 2. CFA Results of the measurement model

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE
CPEC	CPEC1	0.795	0.960	0.964	0.558
	CPEC2	0.75			
	CPEC3	0.742			
	CPEC4	0.718			
	CPEC5	0.754			
	CPEC6	0.703			
	CPEC7	0.743			
	CPEC8	0.705			
	CPEC9	0.802			
	CPEC10	0.799			
	CPEC11	0.776			
	CPEC12	0.749			
	CPEC13	0.617			
	CPEC14	0.631			
	CPEC15	0.649			
	CPEC16	0.768			
	CPEC17	0.823			
	CPEC18	0.802			
	CPEC19	0.772			
	CPEC20	0.793			
	CPEC21	0.756			
MWB	MWB1	0.874	0.919	0.938	0.715
	MWB2	0.868			
	MWB3	0.853			
	MWB4	0.888			
	MWB5	0.843			
	MWB6	0.738			
CWB	CWB1	0.834	0.898	0.929	0.767

	CWB2	0.91			
	CWB3	0.918			
	CWB4	0.838			
EDWB	EDWB1	0.901	0.889	0.931	0.819
	EDWB2	0.930			
	EDWB3	0.883			
HWB	HWB1	0.914	0.94	0.957	0.848
	HWB2	0.924			
	HWB3	0.928			
	HWB4	0.917			
EMWB	EMWB1	0.892	0.903	0.932	0.776
	EMWB2	0.876			
	EMWB3	0.906			
	EMWB4	0.847			

This study employed a relatively novel measure, the Heterotrait–Monotrait ratio (HTMT), to assess discriminant validity. The criterion for fulfillment of discriminant validity is met when the obtained HTMT values are below 0.85, as stipulated by [Henseler, J.; Ringle]. Additionally, Franke and Sarstedt [Franke, G.R.; Sarstedt] assert that if a value of 1 is absent in the upper limit of the HTMT bootstrapping values, it signifies discriminant constructs. As demonstrated in Table 3, all the ratios are below the specified threshold of 0.85, indicating differentiation among the measures. The conceptual model of this study defines Subjective Well-Being (SBWB) as a second-order construct characterized by five latent reflective constructs: CWB, EMWB, EDWB, HWB, and MWB.

Table 3. Heterotrait-monotrait ratio (HTMT) – Matrix

	CPEC	**CWB**	**EMWB**	**EDWB**	**HWB**	**MWB**
CPEC						
CWB	0.843					
EMWB	0.800	0.725				
EDWB	0.846	0.734	0.695			
HWB	0.832	0.723	0.725	0.741		
MWB	0.930	0.825	0.780	0.849	0.837	

Table 4 illustrates the associations among the constructs via the correlation matrix. The correlations between the constructs and other variables are

consistently positive, indicating a significant and positive relationship between them. Moreover, Table 4 provides evidence negating the likelihood of multicollinearity, as the independent variables exhibit no substantial correlations with each other.

Table 4. Correlation Matrix

	CPEC	CWB	EMWB	EDWB	HWB	MWB	SBWB
CPEC	1.000						
CWB	0.784	1.000					
EMWB	0.746	0.653	1.000				
EDWB	0.792	0.656	0.623	1.000			
HWB	0.795	0.666	0.668	0.678	1.000		
MWB	0.881	0.751	0.710	0.770	0.780	1.000	
SBWB	0.922	0.853	0.834	0.841	0.878	0.938	1.000

Since SBWB was established as a second order reflective- reflective construct, therefore, its measurement at second order needs to be evaluated separately. The technique employed for constructing the 2nd order was repeated indicator approach which assigns all items from the first-order constructs to the second-order construct, as outlined by (Sarstedt, Hair Jr, Cheah, Becker, & Ringle, 2019). The 2nd order measurement model for SBWB is presented in Table 5, which shows that the validity and reliability are duly established.

Table 5. Measurement of second-order construct

Construct	Items Loading	CR	AVE
	0.94		
	0.85		
SBWB	0.84	0.76	0.94
	0.88		
	0.83		

Structural Model

Once the measurement model is confirmed , the structural model is evaluated to estimate the structural relationships and testing the hypothesis, in accordance with the guidelines provided by (Hair, Risher, Sarstedt, & Ringle, 2019; Koehler, 2009). The results of structural model are presented in Table 5 and 6, corresponding to the models illustrated in Figures 1 and 2.

Table 6. Structural Model One Results and Hypothesis Testing

	Relationship	Std. Beta	Std. Dev	t-Value	R^2	f^2	Q^2	P Value	Decision
H1	SWB -----> CPEC	0.922	0.012	76.955	0.84	5.64	0.84	P < 0.01	Supported

The results presented in Table 6 demonstrate a positive relationship between subjective wellbeing (as 2nd order construct) and support for CPEC, (β=0.922, t = 76.953, p<0.01), affirming the hypothesis 1 (H_1). Hypothesis 2 (H_1a) posited a significant positive relationship between the material wellbeing (MWB) of local residents and support for the CPEC projects. The findings, as shown in Table 6, reveal that the material wellbeing (MWB) of residents positively influences support for the CPEC project (β = 0.385, t = 5.819, p < 0.01), confirming hypothesis 2 (H_1a). Hypothesis 3 (H_1b) hypothesized a relationship between the community wellbeing (CWB) of the local community and support for the CPEC project which is supported by the data (β = 0.179, t = 4.421, p < 0.01), thus confirming hypothesis 3. Furthermore, hypothesis 4 (H_1c) explored the relationship between educational wellbeing (EDWB) and support for the CPEC project. The results reveal a significant positive association between educational wellbeing and support for the CPEC project (β = 0.188, t = 5.559, p < 0.01), hence hypothesis 4 is confirmed. Moreover, hypothesis 5 (H_1d) investigated the association between health wellbeing (HWB) and support for the CPEC project. The findings show a significant relationship between health wellbeing and support for the CPEC project (β = 0.160, t = 3.126, p < 0.01), therefore, hypothesis 5 is substantiated. Additionally, hypothesis 6 (H_1e) examined the relationship between emotional wellbeing (EMWB) and support for the CPEC project. The results of data analysis indicate a significant association between emotional wellbeing and support for the CPEC project (β = 0.132, t = 3.757, p < 0.01), confirming hypothesis 7.

Table 7. Structural model Two results and hypothesis testing

	Relationship	Std. Beta	Std. Dev	t-Value	R^2	f^2	Q^2	P Value	Decision
H1a	MWB -----> CPEC	0.385	0.066	5.819	0.854	0.235	0.879	P < 0.01	Supported
H1b	CWB -----> CPEC	0.179	0.040	4.421	0.854	0.086	0.726	P < 0.01	Supported
H1c	EdWB -----> CPEC	0.188	0.034	5.559	0.854	0.091	0.706	P < 0.01	Supported
H1d	HWB -----> CPEC	0.160	0.051	3.126	0.854	0.062	0.769	P < 0.01	Supported
H1e	EmWB -----> CPEC	0.132	0.035	3.757	0.854	0.052	0.694	P < 0.01	Supported

In order to examine the predictive capabilities of the research model, R^2 effect size f^2 were assessed where the R^2 tuned out to be substantial. The values of f^2 ranged between 0.062 to 0.235, reflecting that the values were small for CWB, EdWB, HWB and EmWB whereas the value for MWB was found to be substantial. Another important value is that of predictive relevance Q^2 (Stone–Geisser criterion) obtained using the PLS Predict feature in SmartPLS 4. This procedure showed that the values for all the constructs are above 1 implying that both the models one and two possess adequate levels of predictive relevance.

Discussion, Implications, and Limitations

Discussion

The results of the structural models provide valuable insights into the relationships between subjective wellbeing dimensions and support for the China-Pakistan Economic Corridor (CPEC) project. The study utilized a robust research design based on established methodologies from prior research in the field of international project support, drawing upon the work of (McGehee & Andereck, 2004; Yoon et al., 2001). The demographic information reveals the characteristics of the survey participants, providing context for the study's generalizability. The higher representation of male respondents, the prevalent age group falling within 36–45 years, and a significant portion holding a bachelor's degree or higher highlight the diverse perspectives captured in the study. Additionally, the distribution across

districts along the CPEC route ensures a comprehensive understanding of the local context.

The reliability and validity statistics, assuring the robustness of the measurement model. Cronbach's alpha values exceeding 0.70 for all constructs confirm internal consistency, while the heterotrait–monotrait ratio (HTMT) values below 0.85 indicate discriminant validity. Table 4 further supports the absence of multicollinearity, enhancing the credibility of the measurement model. The findings from Structural Model affirm a significant positive relationship between perceived subjective wellbeing of local residents and support for the CPEC project, supporting hypothesis 1 (H_1). This result aligns with the social exchange theory, suggesting that residents are more likely to support CPEC development when they perceive potential benefits without facing undue costs. The high coefficient (β=0.922) indicates a strong association, emphasizing the importance of subjective wellbeing as a predictor of support for large-scale development projects like CPEC. Furthermore, the Structural Model assessing the direct relationship among the subjective wellbeing dimensions and CPEC further explores the distinctive role of the individual dimensions in securing support for CPEC. The results shows that the material wellbeing, community wellbeing, educational wellbeing, health wellbeing, and emotional wellbeing significantly influences the CPEC project. These findings also underscore the multidimensional nature of wellbeing and its role in shaping attitudes toward development initiatives. Additionally, the high values of the Stone–Geisser criterion (Q^2) indicate strong predictive relevance of both the models.

Implications of the Study

The study emphasizes the critical necessity of integrating considerations of multidimensional wellbeing into policymaking, making valuable contributions to relevant theoretical frameworks for policy formulation. By highlighting dimensions such as health, material, community, emotional, and educational aspects, the research enriches theoretical discussions on targeted interventions, particularly in projects like the China-Pakistan Economic Corridor (CPEC). Furthermore, it advances theoretical discourse on community engagement strategies by advocating for a comprehensive approach that encompasses various dimensions of wellbeing, fostering inclusivity and ownership. Theoretical implications extend to education and capacity building, underscoring their role not only in individual wellbeing but also in shaping attitudes toward development initiatives. The study provides practical insights, suggesting investments in education and skill development

to empower local communities, thereby contributing to both individual wellbeing and positive project perceptions.

From a practical standpoint, the study underscores the tangible benefits of the CPEC initiative for local communities along its route, highlighting aspects such as employment, education, and improved access to cities and markets. CPEC holds the potential to enhance the overall wellbeing of the local population by improving road and transportation infrastructure. The socio-cultural impact is explored, suggesting that CPEC could positively influence social interactions and familial connections. Importantly, the study focuses on residents' subjective wellbeing in the context of socio-cultural effects, providing an opportunity to comprehend how these factors shape individuals within the framework of CPEC projects. The specific implications for the Gilgit-Baltistan region, traversed by CPEC, add a nuanced perspective, emphasizing the potential for trade, industrial activities, and tourism promotion in this underprivileged region. This aligns with CPEC's overarching objective of improving socio-economic conditions in marginalized areas. Ultimately, the study surpasses theoretical discussions, offering practical insights into the tangible benefits of CPEC for local communities and its potential to positively impact socio-economic conditions and overall wellbeing.

Limitations and Research Horizons

The study, despite yielding valuable insights, possesses inherent limitations that necessitate consideration when interpreting findings. The reliance on cross-sectional data confines the investigation to a specific moment in time. To capture the dynamic evolution of attitudes and perceptions, future research could benefit from the utilization of longitudinal data, offering a more comprehensive understanding of the development of these relationships over time.

Acknowledging the potential influence of unaccounted contextual factors, future research should investigate deeper into regional economic conditions, political events, and cultural shifts to unveil nuanced influences on the association between subjective wellbeing and support for development projects. The utilization of self-reported public opinions introduces the risk of social desirability bias or other perceptual distortions. Enhancing validity in future studies could involve the integration of objective measures or triangulating data from diverse sources to ensure a more accurate representation of community sentiments.

The adoption of a longitudinal approach empowers researchers to monitor changes in subjective wellbeing and support for development projects over time. This approach may reveal trends, causal relationships, and potential intervention points for policymakers. To enhance the generalizability of findings, researchers should consider employing diverse sampling techniques, such as stratified or random sampling, to capture a more representative cross-section of the population along the CPEC route.

Further exploration of contextual variables, encompassing regional economic conditions, political events, and cultural dynamics, would contribute to a more comprehensive understanding of the factors shaping residents' attitudes towards development projects. Integrating objective measures alongside self-reported data can provide a more robust assessment of subjective wellbeing and project support, possibly involving the incorporation of data from official records, administrative sources, or expert evaluations.

The introduction of new variables, such as the religious sentiments etc. impacts of the CPEC, would offer a more holistic understanding of the multifaceted influences on project support. This expansion of variables has the potential to facilitate a more nuanced analysis of the diverse factors at play.

In conclusion, the acknowledgment of these limitations presents opportunities for refinement and expansion in future research endeavors. Addressing these issues and exploring new avenues will contribute to a more understanding of the social dimensions inherent in large-scale development projects, such as the China-Pakistan Economic Corridor.

Conclusion

This study contributes valuable insights into the relationship between subjective wellbeing and support for the CPEC project. The multidimensional nature of subjective wellbeing, encompassing health, material, community, emotional, and educational dimensions, plays a crucial role in shaping residents' attitudes toward CPEC development initiatives. The findings highlight the importance of considering diverse aspects of wellbeing in the planning and implementation of such projects. The study's reliance on established methodologies, meticulous instrument development, and robust data analysis using SmartPLS strengthens the credibility of the results. The demographic information ensures the study's relevance to the population along the CPEC route, while the measurement model's reliability and validity provide a solid foundation for drawing meaningful conclusions. This result aligns with the social exchange theory, suggesting that residents are more likely to support CPEC development when they perceive potential benefits

without facing undue costs. The results show that material wellbeing, community wellbeing, educational wellbeing, health wellbeing, and emotional wellbeing significantly influences the CPEC project. These insights have practical implications for policymakers, project developers, and community stakeholders involved in CPEC and similar international development projects. Understanding the impact of different dimensions of subjective wellbeing can inform targeted interventions to enhance community support and overall project success.

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12

Unlocking Economic Potential: CPEC-Driven Investment and Trade Opportunities in Gilgit-Baltistan

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Abstract

As CPEC transitions from Phase I to Phase II, the focus shifts to industrial cooperation, agricultural development, and trade promotion. Key areas include economic zones, job creation, innovation, inclusive development, and green energy. The success of Phase I has established a strong foundation in the energy and transport sectors, facilitating future advancements. Phase II is expected to significantly impact the socioeconomic conditions in Gilgit-Baltistan (GB). CPEC is seen as a game-changer for Pakistan, particularly for the GB region. It promises substantial improvements in living standards through projects in roads, energy, and railways. The local population in GB is optimistic about CPEC's potential benefits, but effective management and stakeholder involvement are crucial for long-term success. However, challenges remain. Regions like GB need industrialization to address poverty, unemployment, and regional inequalities. Issues with Special Economic Zones (SEZs), such as the one in Maqpoondass, need resolution. Energy is also a critical concern, with current shortages hindering the full potential of CPEC projects. Ensuring adequate energy supply is vital for boosting trade and investment in GB. Ultimately, the success of CPEC in Pakistan, particularly in GB, depends on addressing security, political, and geopolitical challenges. Resolving inter-provincial disagreements and ensuring all stakeholders' concerns are addressed is essential. The Pakistani government plays a crucial role in the effective implementation of these projects. Although it is a significant undertaking, if managed correctly, CPEC has the potential to be a transformative force for the entire region.

Introduction

The financing and execution of large projects can have significant implications for the socioeconomic development of a community. Economic corridors and collaborations between countries have been successful in many parts of the world. They are often used as a major policy tool to improve the

socioeconomic conditions of the region (Gálvez Nogales, 2014). In South Asia, the economic corridor is crucial in the relationship between China and Pakistan. It is an essential part of the national development strategy for both nations (Wolf, 2016). Economic corridors are considered significant strategies to expedite economic growth by alleviating trade and investment bottlenecks and broadening the base of economic progress in developing countries. Typically, the trading partnerships within economic corridors involve two countries, one developed and the other underdeveloped (Ali, Riaz, Ali, & Bano, 2020). Creating partnerships within economic corridors has enhanced trade volume among the partnering nations, considering the economic potential for countries (Thomas, 2009).The establishment of economic corridors is imperative in the modern era to build and strengthen regional integration, establish economic ties among partnering countries for their development, and ultimately act as an economic agent for socioeconomic change (Butt & Butt, 2015). Hence, many economic corridors contribute to socioeconomic development in less developed countries (Hauptfleisch & Marx, 2011). CPEC is a prime example of such corridors, facilitating China's access to Africa and the Middle East via the Gwadar port in Pakistan. It is also significant for Pakistan as it connects the country with Central Asian and European countries (Alam, Li, & Baig, 2019).

One of the parameters in assessing a country's socioeconomic development is the potential for trade and investment opportunities. In Pakistan, the China-Pakistan Economic Corridor (CPEC), a billion-dollar project considered a game-changer, is expected to create trade and investment opportunities for both nations, specifically promoting such opportunities in Gilgit-Baltistan (GB). The GB region is unique in Pakistan due to its geographical and historical background, serving as the entrance for the CPEC project (Nigar, 2018). This chapter specifically delves into a debate on trade and investment opportunities in Gilgit-Baltistan due to the CPEC projects.

Background of China-Pakistan Economic Corridor (CPEC)

The CPEC component of the Belt and Road Initiative (BRI) encompasses various infrastructure projects. These include projects related to roads, energy, railways, and gas pipelines that connect the southernmost part of Pakistan, Gwadar port, to the city of Kashgar in China's Xinjiang Uygur region. The Chinese CPEC project, initiated in 2015, is a crucial part of the BRI, with an estimated 15-year timeline for implementing diverse projects in Pakistan. The overall cost of the project, estimated at $62 billion under the umbrella of CPEC, aims to enhance infrastructure, develop communication (fiber optics and railways), and facilitate trade and commerce between Pakistan and China.

Furthermore, there are expectations to extend these benefits to neighboring countries such as Afghanistan, Iran, and the Central Asian Republics. It is anticipated that CPEC's intervention in Pakistan will create job opportunities, and due to this intervention, an annual economic growth of 2 to 2.5% is expected. The rapid investment in the project underscores China's strong commitment to growth and regional economic cooperation (S. Baig, Qasim, Xuemei, & Alam, 2020).

After four years of Phase I of the CPEC, Pakistan is now ready to embark on Phase II. Some 27 projects are planned within the framework of this new phase, emphasizing industrial cooperation, agricultural development, and trade promotion (I. Iqbal, 2020). CPEC, structured into three phases, initially focused on the early harvest projects aimed at establishing critical infrastructure, a prerequisite for industrial revival in the country (M. Khan, Alam, & Yasir, 2024). The success of Phase I is evident in the substantial groundwork laid in the energy and transport sectors, providing a robust infrastructure foundation for future development in industry, agriculture, and human resources. As Pakistan transitions to Phase II, the focus shifts towards industrialization and agricultural advancement, targeting five major areas: economic zones, job creation, the Corridor of Innovation, inclusive regional development, and the Corridor of Green Energy (A. Khan, Ilmas, Zubair, Khan, & Zhong, 2022). This chapter aims to elucidate the potential impact of phase II on the socioeconomic conditions in Gilgit-Baltistan (GB).

An Overview of Gilgit-Baltistan (GB)

GB is situated in the northern part of the country, and it is strategically important for Pakistan at the confluence of the Karakoram, Himalayan, and Hindu Kush Mountain ranges. This region is host to several projects under the CPEC platform, with the most prominent ones focusing on energy, fiber optics, Special Economic Zones, railways, and gas pipelines (M. Ismail, 2019). These initiatives are anticipated to and profound impact on trade and investment opportunities in the region.

To initiate a discussion on the emerging prospects of trade and investment opportunities in GB under the CPEC project, it is imperative to conduct a comprehensive analysis of the prevailing economic conditions in GB. The GB area spans 72,495 square kilometers and is characterized by challenging mountainous terrain, with an estimated population of 1.8 million. Details indicate a low population density of 18 inhabitants per square kilometer, making it one of the more sparsely populated regions in the country (Nigar, 2018).

Given its challenging geographical location, a World Bank report (2018) has identified three crucial determinants that impact economic output: the regulatory environment, market accessibility, and regional constitutional status. As the gateway for CPEC implementation, GB occupies a unique and significant position in terms of trade and investment opportunities. This chapter aims to meticulously analyze the influence of CPEC projects and their repercussions on regional trade and investment opportunities, focusing specifically on GB. Moreover, it endeavors to ascertain how the region capitalizes on its indigenous resources due to the proposed CPEC projects, thereby fostering trade and investment opportunities. This comprehensive approach is anticipated to stimulate and catalyze economic activities, expediting the utilization of regional resources and exploring prospects for trade in both national and international markets. The goal is to fuel growth in the job market, contributing to the region broader economic development.

Beyond Peaks: A Snapshot of GB's Socio-Economic Mosaic

The present trade and investment opportunities are limited in the region. The region's low connectivity and challenging terrain contribute to a fragmented market for factors of production and output. This limitation results in the economic activity being largely informal and dominated by small-scale industries with restricted capacity for value addition. The presence of large enterprises is scarce, and even the number of small and medium enterprises (SMEs) is limited. While there has been a gradual shift towards income crops, most agricultural production still primarily focuses on meeting basic needs rather than generating surplus (S. Baig et al., 2020).

Unraveling GB's Compact Private Sector

Although the formal private sector in GB is relatively modest. The SMEs in GB are confined to the following sectors: hotels, furniture, grocery, timber workshops, and sawmills. The scope of operation of these industries is limited to satisfying the consumption demands of the local populace (S. Baig & Zehra, 2020). On the agriculture side, there appears to be considerable potential for enhancing agricultural productivity, value addition, and marketing. A small-sized private sector is operational, specifically in minerals, tourism, and trade, with the potential to accelerate growth over the medium to larger term. This requires a provision of essential economic infrastructure, including energy, transportation, and irrigation, which is crucial to fostering private sector-driven growth, creating employment opportunities, and facilitating access to essential social services such as healthcare and education. The construction of the Karakoram Highway (KKH) has significantly boosted the private sector, leading to socio-economic impacts such as the growth of local retail

businesses, the commercialization of agriculture, and increased mobility related to education and employment (Anwar & Khan, 2019). This highlights the numerous benefits derived from public investments in critical infrastructure. Nevertheless, the private sector in the region has yet to flourish, unlike other parts of the country. The trade and investment opportunities in the private sector require drastic steps to be taken, including developing infrastructure, marketing for commercialization, and connecting the local market to the mainstream national and international markets. Similar findings were reported in research, indicating that the performance of domestic markets depends on the transportation, energy, telecommunications, and associated infrastructure experiences that contribute to competitiveness (Pinstrup-Andersen & Shimokawa, 2006).

Farm Sector as Pillars of GB's Economy

A substantial portion of the population in GB relies on agriculture, livestock, and forestry (ALF) as their primary source of income. Its capacity to bring about substantial changes in the local economy is constrained by modest productivity gains and a sluggish progression towards increased value addition as well as for commercial gain (Ghanem, Xuemei, Alam, & Baig, 2021). The region has the potential to produce delicious, high-quality fresh fruits and vegetables and these are considered the primary source of income generating across the whole GB. Similarly, GB's fruits were suitable for domestic and international markets. A variety of premium fruits, including apples, pears, walnuts, apricots, and cherries, can be found in the vicinity. Of the 169,000 tons of fresh and dry fruits produced in GB, only 10,119 are sold, primarily in lower-class markets. An enormous amount, or 57,178 tons, is wasted due to problems along the value chain. Comparably, out of 152,000 tons of veggies produced, 12,000 tons are wasted because of poor infrastructure, storage facilities, and connectivity (Hussain, Khan, & Liaqat, 2022). Moreover, vegetable crops grown in GB include potatoes, tomatoes, peas, Chinese cabbage, onions, and capsicum. A total of 10,109 hectares were planted with vegetable crops, yielding 153,017 MT of production, according to the agriculture census. Of this, households consume 28,135 MT, and of the 112,987 MT that are marketed, potatoes make up almost 94% of the total. Other than potatoes, only small amounts of other vegetables are typically farmed. While the construction of the Karakoram Highway (KKH) has facilitated the trade and market entry of surplus agricultural commodities, there is still a need to enhance market accessibility and input approaches for further success. Agriculture is reported to employ about 45% of the overall labor force. To support this, the development of intervalley link roads, including the KKH, has facilitated the implementation of a marketing system,

enabling the exportation of regional agricultural goods to domestic and global markets. As a result, residents can now sell their surplus produce, including apricots, potatoes, and fruits, which were previously discarded in the market (Anwar & Khan, 2019). Some of the major positions in the farm sector are outlined below.

Livestock

Livestock plays a significant role in the economy, contributing a diverse array of consumable and non-consumable goods. The primary reason for keeping livestock in GB is to produce domestic milk for daily use and dung used as fertilizer (Wright & Duncan, 2005). In general, livestock is raised to produce items such as milk, dairy products, meat, eggs, wool, leather, bone products, medicines, lipids, and industrial proteins. In GB, farmers rely on cattle to obtain meat and dairy products, making livestock a crucial component of the rural economy. However, livestock also has potential uses for both domestic and commercial purposes. The significance of livestock becomes evident as it significantly contributes to generating revenue for local traders. Hides, skins, and dung from livestock constitute a substantial portion, accounting for 35–40% of the total revenue generated from agriculture (Ning, Rawat, Joshi, Ismail, & Sharma, 2013). Despite this, the livestock industry is not fully optimized, as the study identifies insufficient productivity. Key products, such as milk, meat, and leather, hold significant cultural and traditional value (Anwar & Khan, 2019).

In the face of limited resources, the Karakoram Highway (KKH) plays a pivotal role in enhancing livestock production due to its seamless connectivity to the region (Anwar & Khan, 2019), making a noteworthy contribution to the domestic earnings of the populace. Rangelands, constituting approximately 40% of household earnings in GB, underscore the economic importance of livestock. The livestock population in GB increased from 1.92 million to 2.62 million between 2006 and 2019, emphasizing the cultural significance of livestock and the demand for enhanced productivity Khan et al., 2013). There is still space for commercialization-focused livestock production, introducing new species of livestock, and improving the marketing of livestock byproducts (Wright & Duncan, 2005).

Forestry

The GB region is renowned for its expansive forest coverage, spanning 281,600 hectares, primarily in the districts of Gilgit, Baltistan, Diamer, and Ghizer. These forests serve various purposes, including grazing, land use, timber, fuel, medicinal herbs, and non-timber forest products (NTFP). NTFPs like sea buckthorn berries, mushrooms, and honey are highly popular. Beyond

providing material resources, these forests play a crucial role in serving as watersheds for downstream populations (Tabassum, 2020).

The forests play a remarkable role in generating cash revenue by commercializing a wide array of NTFPs that the local populace gathers. Additionally, non-cash income is generated by households near the forest who utilize these resources at home rather than for commercial purposes. Cash and non-cash income significantly influences household earnings, complemented by other sources such as employment, trade, investment, establishing forest enterprises, and agricultural sales. This intricate relationship underscores the multipurpose role of forests, simultaneously generating income and ensuring sustainable livelihoods for the community in the region (Agrawal et al., 2013).

The consumption of forest resources plays a critical role in maintaining the economic and ecological balance of households; a practice passed down through generations in GB. The population depends on a combination of agriculture, livestock, and forestry. Although nonfarm sources of income are important, ALF (Agriculture, Livestock, and Forestry) remains the primary source of income, constituting 52% of the total household income. Despite the significance of nonfarm income sources, the harsh weather conditions in the region make ALF a major backbone for households that rely on forests for their livelihoods. Due to the region's marginalized condition and the unavailability of modern energy sources, households predominantly depend on forest resources for heating purposes (I. Ismail et al., 2018). This underscores the critical importance of forests in daily life, the economy, and environmental balance, going beyond economic aspects and playing a significant role in times of need while posing climatic challenges simultaneously. The local people use timber for construction purposes, but there is another use of the forest in the form of herbs and medicinal values. This sector is in a nascent stage of commercialization of medicinal plant and has huge potential for investing (Salim et al., 2019). The market could be particularly attractive to Chinese investors or traders with a long historical tradition of producing green tea.

Mineral sector

The GB region holds a significant geological potential that, if harnessed effectively, could propel the mineral sector as a catalyst for trade and investment. Despite a diverse range of precious and semiprecious stones, metals, and building materials in the region, the industry remains in its early stages, contributing minimally to overall employment, income, and government revenues. While the potential is evident, the sector requires strategic interventions. Currently, the government allocates minimal resources

to promote mining and related activities. Recent initiatives led by civil society organizations (CSOs) to enhance value addition through gemstone cutting and jewelry manufacturing are promising but still emerging. A shift towards higher value-added activities within the sector is imperative to unleash the full economic potential of GB's mineral wealth. This transition not only facilitates income generation but also serves to uplift individuals from subsistence agriculture and poverty. Capitalizing on these resources is crucial for expanding income-generating opportunities in the region. The region boasts a diverse array of valuable gemstones like rubies and sapphires, alongside building stones such as marble and granite and metals like gold, copper, molybdenum, and tungsten. However, the sector's contribution to employment, income, and government revenues is modest, with the mining and quarrying sector employing only 0.1 percent of the region's workforce (Ghanem et al., 2021).

Trading in the mining sector currently occurs primarily locally, with only a few instances where local trades approach international markets. However, despite this, the sector presents a plethora of trade and investment prospects. On the contrary, the mining industry faces many obstacles, as evidenced by a study conducted by the Government of Gilgit-Baltistan (2011). These challenges comprise restricted investment, inadequate administrative capabilities to ensure effective regulation and difficult physical accessibility. The obstacles hinder the sector's overall progress. The geographical obstacles GB faces, including the dispersed nature of mineral reserves, impede the smooth facilitation of trade and investment prospects. In order to guarantee accessibility, mine sites require critical infrastructure, such as roads and utilities, due to their intricate geographical features. Moreover, the absence of clearly defined private property rights in the region may present challenges for investors seeking to exploit regions offering substantial geologic potential. Addressing these obstacles is of utmost importance to fully harness the capabilities of GB's mining industry and create a favorable climate for long-term expansion and investment. It is imperative to prioritize the resolution of constraints related to physical accessibility, regulatory capability, and investment to establish a conducive atmosphere that promotes the growth and prosperity of the mining sector in GB (Makhdoom, Shah, & Sami, 2017).

Tourism sector

The GB region is known for its unique geographical importance. The region has inherited breathtaking scenery and a rich cultural legacy. Tourism offers a wide range of revenue-generating options that are underutilized, and still various options for investment in this sector. This region is isolated, and despite the challenges presented by the geography, it is still a major attraction

for adventure tourism. Thousands of tourists and travelers, whether national or international, come to the region with dreams and are eager to scale some of the world's most formidable 8,000-meter peaks. To utilize the potential of tourism and expand the related activities, efforts are needed to increase the revenue from the national and international voyages. There is a need to enhance the number of national visitors and continuously improve the associated services, such as infrastructure development and security in the region to promote the tourism sector (Makhdoom et al., 2017).

GB's stunning landscapes and profound cultural heritage make it a lucrative tourist destination, providing numerous opportunities for producing cash. Although GB's topography poses problems, it is a significant destination for adventure tourism, attracting numerous travelers ready to conquer some of the world's most daunting peaks or trek across vast glaciers adorned with alpine meadows. In order to maximize the benefits of tourism, it is necessary to focus on increasing income from international travel, attracting more domestic tourists, and making advancements in areas such as security. It is essential to offer a wider range of tourism experiences and improved services to attract higher average daily expenditure from international visitors. Enhancing transport reliability to and from GB would enhance its appeal to domestic tourists, as it would allow for shorter trips, particularly for those looking for a weekend escape. In order to strengthen trade and investment opportunities along the GB corridor and promote local value addition, it is crucial to enhance trade facilitation and remove governmental barriers about transportation and facilitation.

This not only offers opportunities for enhanced tourist experiences but also leads to increased daily average spending at tourist spots. Meeting tourists' expectations for their planned journeys in the region boosts domestic tourism and entices international tourists for shorter visits. It is crucial to encourage local value addition to materialize trade and investment opportunities through the GB corridor. Resolving issues related to trade facilitation services and addressing policy hurdles in transportation and export can be instrumental. Similarly, the ongoing maintenance of the KKH and other communication infrastructure has the potential to increase the flow of tourists in the region significantly.

Exploring Opportunities: A Comprehensive Examination of Trade and Investment Strategies in Gilgit-Baltistan as part of the CPEC Framework

GB represents an untapped market with significant potential for investment, constituting the main advantage of the region. Despite the unclassified status

creating ambiguity for CPEC project implementation, there remains potential to attract investors to various lucrative trade and investment. One key advantage that may draw many investors is the availability of tax exemptions, which can be capitalized upon. Moreover, numerous appealing opportunities exist for investors to venture into niche markets.

Investors are always searching for a secure environment for long-term existence and market share maximization. GB aligns with these expectations as terrorism events are negligible in most parts of the region, contributing to overall safety and security that builds investor confidence. While the full understanding of CPEC projects and their benefits is yet to be realized, considering they are still in the early stage of development, it is anticipated that once fully developed over 15 years, the projects will yield commendable trade and investment benefits in the region. Projections suggest significant impacts on trade and investment in the area, potentially altering the economic landscape and creating new growth opportunities. Stakeholders are closely monitoring the progress of these projects to gain insights into the potential effects of CPEC on trade dynamics and the investment climate, particularly in the prospective terrain of GB.

The exceptional status of GB offers a distinct advantage that might potentially attract more investors to the province. Although there is uncertainty regarding GB's position inside the CPEC deal, it can provide profitable prospects for domestic investors. By building enterprises in GB, investors can optimize their advantages and contribute to the area's economic development through this incentive. Furthermore, GB offers an attractive opportunity for investments because of the presence of a specialized market. Due to a relatively low level of competition, the region offers greater opportunities for investors to capitalize on. This feature is vital for firms seeking to establish themselves in a market where they can secure a substantial market share and promote growth.

The full ramifications of the CPEC initiatives remain to be comprehensively grasped, as they are now in their nascent phases. Nevertheless, there is a significant fascination with forecasting and understanding the possible outcomes, specifically concerning trade and investment prospects. The CPEC is a comprehensive system of different projects that includes pipelines, railroads, and highways. The primary objective of this network is to streamline the movement of goods between Kashgar, located in the northwestern region of China, and Gwadar Port, situated in the southern part of Pakistan. Projections indicate that there will be substantial effects on trade and investment opportunities in the region, which might change the economic situation and generate new prospects for growth. Stakeholders are closely

observing the advancement of these projects to obtain a deeper understanding of the potential impacts of CPEC on trade dynamics and the investment environment, specifically in the prospective region of GB.

Industrial Commercialization

The energy projects initiated under the CPEC platform have the potential to provide continuous electricity, which is essential for the seamless operation and expansion of businesses in Gilgit Baltistan. This is particularly advantageous for the numerous opportunities available in the region. Investors can make significant investments in sectors such as minerals, food processing, and ALF. Situated amidst three of the world's longest mountain ranges, GB is home to one of the most abundant reserves of natural resources. In addition to water resources and the largest glaciers outside the polar region, the area is rich in mineral deposits containing energy minerals, precious stones, non-metallic minerals, and various materials utilized in industry. 16 varieties of precious stones and 18 varieties of commercially valuable minerals have been identified. Energy minerals, metallic, copper, antimony, lead, iron, pyrite, Sulphur, tungsten, aluminum, palladium, thorium, and graphite are among those discovered in the region. GB is home to approximately 70% of Pakistan's estimated gemstone reserves and is ranked 5th globally in terms of gemstone deposits. The gemstones as mentioned earlier comprise aquamarine, moonstone, emerald, ruby, and sapphire; tourmaline, peridot, topaz, garnet, pargasite, diopside, sphere, apatite, azurite, and rose quartz; and agate. According to the estimation, there is a huge potential of demand for this product in Europe, India, USA, there is huge potential demand for this product in Europe, India the USA, the Middle East, Hong Kong, China, Taiwan, etc. Locals have been actively involved in the gemstone industry in GB through exploration, mining, and commerce ever since the initial gemstone mine was discovered in the early 1950s. Despite this, the mining industry continues to be informal, underdeveloped, and unprofitable. In the absence of local mining policy and legislation, inadequate human, technical, and financial resources, high risks, and substantial investment costs are the most significant obstacles to the industry. Regarding indigenous territories, the draft "Mining Concession Rules 2014" disregards the appropriate communities. The corridor investment would undoubtedly facilitate the entry of multinational corporations and investment in GB.

There are several challenges associated with this industry. In the absence of robust legislative and policy measures, the economic liberties of locals could be exploited. Additionally, developing a qualified labor force from the mine to the market is crucial for the growth of the regional industry. Similarly, exploration and mining must both undergo technological advancements to

remain competitive in the global marketplace, an aspect currently lacking in this industry.

Food Processing Potential

Agriculture has continued to play a major role in meeting the basic requirements of the communities throughout GB. Despite a substantial increase in non-farm income, agriculture continues to be the primary means of living for most people. Approximately half of the households' overall income in the region is derived from farm sources. There is significant potential to enhance farming techniques, which will ultimately increase income derived from farming activities. GB has great potential for implementing adaptable and ecologically varied organic farming systems, especially considering that its agriculture primarily relies on subsistence farming methods using local resources. The fundamental factors of farming systems in GB can potentially advance organic food production systems in the region. This exploration delves into the possibilities of combining organic food value chains with the trade and tourism industry. GB possesses ecological conditions, such as favorable water, soil quality, and climate that are conducive to cultivating valuable grain, horticulture, and vegetable crops. The typical landholding in the region is approximately 7.5 kanals of cultivated land, making it unsuitable for conventional farming. The terrain is well-suited for advocating low-intensity organic farming, which has the additional advantage of protecting the area's delicate ecology. The region exhibits a greater capacity for fruit production, particularly in apricots, apples, cherries, and walnuts. Potatoes have the highest production rate compared to other vegetable crops. Tomato and buckwheat are two commodities that have the potential to generate significant economic profits for growers (A. Baig, Ali, & Raza, 2022).

In contrast to conventional farming, organic farming maintains the health of soils, ecological processes, biodiversity, and the nutrient cycle while producing food without synthetic chemicals. An additional argument favoring implementing organic systems is that GB is a net importer of food commodities from other regions of the country. Food imports have been estimated to have totaled approximately PKR 2.5 billion as of 2018/19. Conversely, the region's food exports amounted to approximately PKR 435 billion. The chemical fertilizer is occasionally employed by vegetable, potato, and cereal crop cultivators to increase yields. While synthetic inputs on fruit trees are less prevalent, applying chemical herbicides and pesticides is widespread in some regions (A. Baig et al., 2022).

Implementing strategies to enhance productivity, create value, and access specialized markets is crucial for GB, particularly within the sub-sectors of

Agriculture, Livestock, and Forestry (ALF). In the domain of crops and fruits, improving productivity involves providing superior planting materials and allocating resources for infrastructure development. The energy projects under the CPEC play a pivotal role by facilitating the establishment of cold storage facilities and physical agricultural markets. Additionally, commercialization efforts should be directed towards enhancing value through processing innovations, promoting fair-trade practices, and encouraging organic production methods. The livestock sector in GB has benefited from energy projects, particularly by establishing local feed mills. This initiative contributes to improving livestock productivity and supports the sector's overall growth. In forestry, energy projects could prove critical in linking conservation efforts with revenue-generating opportunities. These opportunities may include sustainable tourism, wildlife credits, and the development of wood substitutes from Non-Wood Forest Products (NWFPs). By integrating conservation with income-generating activities, GB can sustainably leverage its forestry resources.

In a nutshell food processing could unlock growth trade and investment opportunities of the region; for instance, Ahmad notes that the GB of CPEC, due to its seasonal and elevation advantages, will lead to a fruit processing industry being set up in GB and "exports of fruit will get a boost" (Ahmad et al., 2017). This will facilitate achieving the expected Pakistan investment ratio from 15% to 16.5% of GDP over the next decade (F. Iqbal, 2019). There is potential for enhancing local trade and investment opportunities by implementing changes that focus on increasing value addition, diversification, and integration. Thus, the region can be promoted and developed into one of the principal centers and special zones to produce an array of premium organic products for sale in regional and international markets. An opportunity exists to enhance the local economy using a transition towards increased value addition, integration, and diversification.

Small and Medium-Sized Enterprises (SMEs)

Small and Medium Enterprises (SMEs) play a crucial role in the economic development of any nation, contributing significantly to GDP and employment generation. In low-income countries, SMEs contribute over 60% to GDP and around 70% to total employment (Fan, 2003). Access to electricity is essential for SMEs, enabling the expansion of small-scale industries, the processing of agricultural products, and creating new employment opportunities, ultimately boosting production and household incomes. The lack of reliable power has been identified as a significant impediment to the functioning of enterprises, particularly in the small-scale subsector, as evidenced by a study in Nigeria

(Ado & Josiah, 2015). Small-scale firms often allocate a substantial portion of their initial expenditure (up to 25%) to acquire generators for self-provision.

In the GB region, various small-scale businesses operate, emphasizing the essential role of reliable electricity for SMEs. Businesses, ranging from local shops to service providers, can operate more efficiently and extend business hours with consistent power. With its predominant SME presence, the region holds substantial untapped potential, particularly in sectors like organic farming, beekeeping, organic dry fruit production, tourism, fish farming, and mines and mineral leasing. The proposed energy projects in the region are expected to reduce the cost of self-generation and increase avenues for trade and investment. A recent study highlights the correlation between electricity provision and economic development. AKRSP's facilitation of electricity in 12 villages led to the establishment of over 40 new micro-enterprises in the valleys.

The contribution of energy projects under the China-Pakistan Economic Corridor (CPEC) is anticipated to provide uninterrupted power supply in Gilgit-Baltistan (GB), making the region more attractive to investors across the country. This can potentially establish large-scale industrial manufacturing units for export purposes using the CPEC corridor. Cheap energy availability will facilitate value addition services, especially in ALF indigenous manufacturing, opening avenues for national and international investors to establish facilities like cold storage, warehouses, packaging supplies, and logistics providers in the region, thereby increasing employment opportunities for the local populace. The positive impact of electricity provision on small and large enterprise growth underscores the interconnected development of the business ecosystem in Gilgit-Baltistan, argue that CPEC's development will enhance investment prospects in Pakistan, fostering progress and industrialization and creating new job opportunities for the local population.

With regional producers gaining access to additional markets, there has been a growing interest in producing marketable surpluses. Various indigenous cultivars of fruits, including apricots, apples, grapes, pomegranates, cherries, mulberries, and walnuts, are now cultivated in different regions of GB beyond domestic needs, considering their marketability. The GB region ranks as the second-largest apricot-producing area and a significant apple-producing region in Pakistan. With their exceptional flavor and vibrant color, Cherries are also gaining prominence. GB's potential for trade and fruit investment is evident from the substantial export of dry apricots, reaching 50 million tons in 2018/19 (A. Baig et al., 2022).

While there is potential for investment and trade in the region, certain challenges are associated with SMEs, such as the implementation and

utilization of fresh product handling, storage techniques, and cold storage technology in GB, which are not yet widespread. The market environment is highly competitive, and though there is limited collaboration among rival wholesalers on a horizontal level, some coordination occurs vertically within the supply chain. Accessing the global food market remains challenging due to the high expenses of obtaining certification. Only a few companies in GB, such as the 'Mountain Dry Fruits Company' and 'Hashwan Group,' are navigating the certification standards for agricultural exports. Despite the potential, foreign trade volume remains below 10 percent of the current aggregate agricultural exports from the region. The major impediments include power outages and the lack of a regular electricity supply (A. Baig et al., 2022).

Tourism and Hospitality

Tourism stands out as one of the most lucrative sectors in the local economy, with the KKH being the pioneering mega project that facilitates travel and significantly increases tourist influx into the region. In 2022, there was an unprecedented surge in tourist numbers in GB, surpassing 2 billion, according to official records from the GB administration. The advent of the CPEC is expected to further elevate GB into a prominent tourism destination within GB, given its abundance of natural features, including resorts, glaciers, lakes, and the world's tallest mountain range (Shang, Pitafi, & Rashid, 2022). Tourists visiting these natural attractions often require accommodation, primarily hotels provide. Regular electricity supply significantly enhances hospitality services, encompassing hotels, restaurants, and recreational facilities. This improvement contributes to a better overall tourist experience, enticing more visitors and fostering growth in associated businesses. Energy shortages lead to higher energy prices, adversely affecting the entire hospitality industry, where energy comprises approximately 60% of total costs in the hotel sector (Usman, Iorember, & Jelilov, 2021). Larger hotels with negotiating power can manage electricity prices and implement energy management strategies. In contrast, vacation rentals, especially in developing regions, often lack such preparedness and use outdated systems, increasing operational costs. Despite this, the region of GB remains highly appealing, attracting more tourists each year than its total population. The tourism sector is expected to strengthen further, with investors and personnel from provinces such as Punjab and KP relocating to GB to assume control of enterprises and administrative positions in various sectors (Khalil, 2021). Consistent energy availability is expected to attract more investment in the hotel industry. Recent developments indicate the establishment of well-known hotel brands such as Serena, RAMDA, PC Hotel Chain, and AVARY Express in the Gilgit-Baltistan region. It is

anticipated that more investments will flow into the hotel industry, contributing to the local economy. Additionally, sports activities enhance the overall tourist experience. The availability of energy enhances the experience for foreigners, as tour operators and travel agencies increasingly bring tour groups to explore different places in GB. The emerging trend of winter sports, particularly gaining tourist attraction (Nisar Ali, 2021), can also be influenced by an uninterrupted energy supply, leading to increased employment prospects for young people associated with hotels, motels, and guest houses.

Special Economic Zones

Special Economic Zones (SEZs) are designated geographic areas within a country's borders where business regulations differ from those in the rest of the country, encompassing export processing zones (EPZs), industrial parks, free trade zones (FTZs), and other delimited areas with unique economic restrictions (Xiaoyang, 2015). Numerous studies underscore the positive impact of SEZs on trade and investment, with the primary goal being to catalyze the process of industrialization (Farole, 2011).

In the context of GB, one of the nine proposed SEZs is earmarked for Maqpondass, covering approximately 250 acres and strategically positioned 35 km from Gilgit city and 160 km from Skardu city (Khalil, 2021). However, the challenging geographical terrain of GB poses hurdles for major projects like the Gilgit-Skardu road or KKH renovation, which are financially demanding for the local government. While such large-scale projects are essential for job creation and have transformative effects on the private sector, the SEZ in GB is currently not operational. A pending land issue with the government regarding grazing rights requires resolution (Babar & Alam, 2022). Despite these challenges, experiences with SEZ interventions in other countries have shown a significant economic contribution to the region. The substantial investment in SEZs in Pakistan will also serve as a strong economic incentive to improve the business environment, boost commercial activities for local trade, and consequently generate millions of job opportunities for the local community (Kanwal, Chong, & Pitafi, 2019). However, SEZs are expected to promote commerce and job creation, attract Foreign Direct Investment (FDI), and stimulate economic activity. The Maqpondass SEZ is expected to contribute significantly to the local economy. As GB currently lacks a SEZ, residents stand to benefit significantly from the success of establishing such a zone. This could create trade and investment opportunities and foster employment growth through SMEs (Babar & Alam, 2022).

Various studies focusing on SEZs in GB have anticipated significant progress due to the potential contributions of these zones to the local economy through

trade and investment opportunities. Khalid & Shah (2018) conducted a study in GB, highlighting a higher proportion of service sector industries in the SEZ, with a particular emphasis on the tourism and hospitality sector. The preference for the service sector in GB is attributed to its comparatively higher literacy rate among the labor force than other areas of Pakistan. The same study acknowledged dried fruits and minerals, giving greater importance to the tertiary sector. Another study suggested that investment opportunities are more resonant in a service oriented SEZ, focusing on tertiary sectors such as information technology, tourism, hospitality, training institutions, and jewelry (Khalid, 2018). It further recommended that primary and secondary industries concentrate on herbs, dehydrated fruits, and minerals with minimal emphasis.

(Bano, Khayyam, & Alam, 2019) conducted a study in GB, with respondents expressing the belief that the industrial sector would see a 28% boost, tourism would increase by 53%, and there would be a 19% increase in the agriculture sector due to CPEC projects. Another study emphasized that SEZ's focus should be on sectors such as marble, iron ore processing, fruit processing, steel industry, mineral processing units, and leather industry. Additionally, there is potential for investment in other sectors, including Agriculture based industries, minerals, livestock, handicrafts, and wood-related trades, all identified as having significant potential for trade and investments (Nigar, 2018). It is argued that when the SEZ is established, it will provide business opportunities for local investors. Moreover, It is planned that local and foreign investors will be given ten-year tax holidays, and exemptions of duties on imported capital, and the federal government will provide them with infrastructure facilities (Shafique & Iftikhar, 2017).

These policies have the potential to attract diverse investments and foster economic growth in the region. Additionally, mineral, and agricultural goods are anticipated to gain access to both domestic and international markets. This necessitates obtaining international quality certification, a mandatory requirement in most cases. The CPEC interventions are expected to expedite the process of attaining international quality standards for local investments, facilitating easier access for local firms to international markets. The projects under CPEC also offer diverse employment opportunities for residents. As a result of expanded trade opportunities with China, numerous employment opportunities will become available to the citizens of GB. Due to the labor-intensive nature of CPEC Phase II, an increase in employment opportunities is anticipated to accommodate the needs of the relocated industries (Babar & Alam, 2022). Moreover, the robust implementation of the CPEC has triggered a substantial upswing in Pakistan's steel and cement sectors. This surge in these critical industries has created conducive conditions for entrepreneurs to

explore and initiate new trade ventures, according to insights from Wasim & Siddiqi (2018). As the SEZ attains total operational capacity, it has the potential to foster an economic climate that encourages foreign investors to consider investing in GB. This will facilitate the integration of the moved industries into the mainstream GB economy (Babar & Alam, 2022). Multinational corporations are anticipated to emerge as significant players, facilitating increased FDI and fostering international trade. Currently, the Khunjerab Border serves as the primary trade route between Pakistan and China, operational seasonally. In the current trade landscape, China largely dominates the trade dynamics with Pakistan through the Khunjerab Border. Notably, only 1% to 4% of cross-border trade presently occurs through GB. In 2018, Pakistan imported 1508 containers from China, while a mere 61 containers were exported from Pakistan to China across the Khunjerab border (Alam et al., 2023).

The full functionality of economic zones in GB, opening the potential for substantial improvement in the trade balance. This transformation can be realized when both national and international counterparts actively engage in strategic investments in these designated economic zones. The emergence of thriving economic zones is poised to significantly contribute to increased trade and investment activities and overall economic growth in the region.

Conclusion

CPEC under the Belt and Road Initiative is considered an economic game-changer for Pakistan, serving as a cornerstone for the country to excel as a transformative force in global trade. The Gilgit-Baltistan (GB) region serves as the entry point for this project. It is expected to bring not only socioeconomic benefits to Pakistan but also to the Gilgit-Baltistan region. While the inevitable influence of CPEC extends to neighboring countries, the primary beneficiaries are unequivocally China and Pakistan. The overarching goal of this project is to bring about socioeconomic improvements for the local populace.

This chapter is meticulously crafted to elucidate how CPEC projects contribute indirectly to the region's socioeconomic development and create opportunities for trade and investment. Several planned CPEC projects directly traverse GB, encompassing fiber optics, road infrastructure, energy projects, and railway tracks. Although these projects are still works in progress, they hold immense potential to unlock trade and investment opportunities in GB. The anticipation is that upon completion, they will substantially improve the living conditions of the local people.

The positive perception of CPEC among the local population is notable, with 70.51% expressing optimism about the project's potential to bring regional prosperity and development (Azeema, Gillani, Shah, & Saba, 2021). However, the full benefits of CPEC can only materialize over an extended period if the project is managed in a manner that fosters consensus and a sense of ownership among all stakeholders. Certain regional sectors are expected to flourish, including the road network, internet connectivity, hospitality and tourism, small-scale private sector industries, and the energy sector. The establishment of small-scale private industries, particularly for processing gems, minerals, fruits, and other resources, is envisioned to provide diverse investment opportunities and elevate the living standards of the local populace.

However, industrialization is imperative, particularly in slower-growing areas like GB, to address poverty, unemployment, income inequality, and regional disparities. The proposed Special Economic Zones (SEZs) represent a potential step towards this goal. Notably, the SEZ in Maqpondass faces challenges in becoming operational despite being allocated land, highlighting the need for tangible and realistic actions (Ahmed, Khan, & Khan, 2022).

Similarly, energy projects wield a pervasive influence across various aspects of life, although progress in their development has been sluggish, with some projects yet to be initiated. The persistent energy crisis in the region hampers the efficiency of critical CPEC projects, including fiber optics. Despite these challenges, the Fiber Optics project has made commendable strides in GB, providing 3G/4G connectivity and positively impacting socioeconomic conditions. However, the region's ongoing energy deficiency impeded the full realization of the project's implications, leading to up to 20 hours of blackout. Voices in GB, shaped by political disenfranchisement or influenced by sectarian, ethnic, or nationalistic beliefs, underscore the existence of a political identity crisis. This crisis stems from the constitutional ambiguity faced by GB since gaining independence. Ensuring energy access for businesses emerges as a top concern for boosting the region's private sector-led trade and investment.

In a nutshell, the success of CPEC hinges on how effectively Pakistan prepares the stage for implementing CPEC projects. There are immediate issues to address, such as security, political unrest, and geopolitical complexities involving factors such as the Indian stance. Immediate resolution of provincial disagreements over the CPEC project division is imperative. Consultation with GB stakeholders, incorporating their perspectives and promptly addressing concerns, is crucial during this period when CPEC investments hold promise for Pakistan. The government's ability to integrate the region's concerns into

the political and constitutional framework will be pivotal, ultimately determining the success of these transformative mega projects.

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13

Understanding the Susceptibility of Gilgit-Baltistan to Fifth Generation Warfare: The Case of the China-Pakistan Economic Corridor

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Abstract

The study critically examines Gilgit-Baltistan's (G-B) susceptibility to the Fifth Generation Warfare (5GW), particularly in the context of the China-Pakistan Economic Corridor (CPEC). Novel technologies have altered how wars were waged in the past; now, states confront each other by using soft power and disseminating disinformation to achieve their desired goals. Major fault lines ignite 5GW in G-B, including disputed constitutional status, sectarian conflicts, ethnic divisions, separatist tendencies, and geostrategic significance. Qualitative research methods, including interviews with subject experts, are employed to gain insight into various dimensions of the subject. The study focuses on a comprehensive strategy to inculcate media literacy campaigns to mitigate the adverse repercussions of 5GW. It also provides original insights into the importance of understanding local perception and national narratives in the region and calls for regional stability and cooperation to counter external exploitation. The study concludes that Gilgit-Baltistan's instability has significant implications for regional and global stability and emphasizes the urgent need for proactive measures to address these challenges.

Introduction

The mountainous terrain of Gilgit-Baltistan has long served as a formidable bulwark against attempts by external powers to exert their authority over this region. For centuries, the Chinese, Russian, and British empire, among others, have struggled to overcome the resistance of the indigenous people and establish control over the area. However, in the modern information era, the vulnerabilities of this once-unconquerable terrain have been exposed, and G-B faces new and evolving challenges that threaten its stability and security. Specifically, the emergence of 5GW tactics has opened up new regional fault

lines that the government must navigate to maintain peace and stability. These tactics leverage digital platforms to incite social, political, and economic instability and potentially exacerbate existing cleavages in the region. Therefore, it is essential to develop innovative strategies to address these challenges to pursue lasting stability and security.

The threat of 5GW and its potential impact on the social, economic, and political stability of G-B cannot be underestimated. 5GW is a war of information and perception (Nawaz, Zeeshan, & Akhlaq, 2023) in which adversaries use various non-kinetic means to achieve military objectives such as disinformation and social engineering (Dayspring, 2015). One of the key tactics used in 5GW is disseminating false information to sow confusion and disrupt social and political systems. This can take various forms, such as fake news, propaganda, and disinformation (Hoffman, 2015). Adversaries tend to capitalize on cultural, economic, ethnic, political, religious, and social issues in the opposing lands to attain their goals (Krishnan, 2022). In G-B, adversaries could use 5GW to manipulate public opinion and incite conflict. For example, G-B has a disputed constitutional status (Joshi, 2020), which has made it vulnerable to external forces seeking to exploit the situation. The lack of clarity regarding the region's political and constitutional status has created fertile ground for adversaries to use 5GW tactics to manipulate public opinion, incite conflict and delay in much needed national integration (Kamboh, Mustafa, & Rasul, 2021)

G-B has experienced numerous instances of internet suspension over the years, each time as a measure to maintain law and order amidst heightened tensions. For instance, on September 1, 2023, mobile internet services were suspended across Gilgit-Baltistan and restored after 18 days following escalating sectarian tensions. This temporary measure was aimed at restoring law and order and stopping the spread of malicious content by miscreants on social media (Ali, 2023). The repeated instances of internet suspension show the region's susceptibility to influence from social media.

Adversaries could spread misinformation to exacerbate sectarian tensions between Sunni and Shia Muslims, who are already divided along sectarian lines (Hunzai, 2013). Resultantly, this could create an environment of distrust and hostility, leading to violence and unrest. Additionally, separatist, and nationalist ideologies could be exploited to incite violence and unrest. Given the strategic importance of G-B in the CPEC and its proximity to India and Afghanistan, it could be an attractive target for adversarial actors. By leveraging separatist and nationalist ideologies, adversaries could attempt to disrupt the project and sow regional instability. Ethnic differences could also

be exploited to stir up conflict in G-B. The region is home to distinct linguistic and cultural groups (Dad, 2016), making it vulnerable to misinformation and propaganda that plays into existing divisions and prejudices. Furthermore, 5GW could benefit from geostrategic and geo-economics concerns. For example, adversaries could use cyberattacks to disrupt the CPEC projects or spread misinformation to erode support for the project among the local population. Such tactics could lead to economic instability and political unrest, making the region more vulnerable to conflict.

These tactics often exploit a population by creating confusion, distrust, and fear. This can be particularly effective in G-B, where people are already divided along ethnic, religious, and political lines and where disputed constitutional status and its strategic significance make it an attractive target for adversaries seeking to manipulate public opinion and incite conflict by spreading false information. The potential consequences of such actions could have far-reaching implications, including the destabilization of the region, which could have a ripple effect across the broader South Asian region (Ahmad & Malik, 2017). To effectively address the threat of 5GW, the government and other stakeholders must invest in research and analysis to better understand the nature of the threat and develop effective strategies to counter it.

Conceptualizing the Fifth Generation Warfare

The concept of hybrid warfare has gained much of its traction in recent decades because there has been an apparent shift in states' modus operandi pertaining to the 'how' aspect of their preferences of waging wars on soils that are not their own (Abdyraeva, 2020). Conflicts in the present day and age have shifted from battlegrounds and war zones to being contained within devices as small as mobile phones–because the employment of informational technology and cybernetics is also one of the primary tenets of waging war in a hybrid manner (Fatić, 2002). Hybrid warfare can thus be understood to include an amalgamation, an interplay, and a combination of both traditional and non-traditional as well as conventional and non-conventional means, which, for instance, include various diverse tools about subversion, propaganda, etc (Kasapoğlu, 2022). One of Sun Tzu's quotes in the 'Art of War' resonates with this particular context; the quote asserts something along the lines of, "The supreme art of war is to subdue the enemy without fighting" (Griffith, 1971).

The most interesting notion about 5GW is the fact that thus far, it has had no substantially clear definition that posits in complete clarity its tenets and parameters, and yet the concept in itself has changed the very dynamics of

conflict and war in the modern world (Reed, 2008). As per many reports, Pakistan is being subjected to 5GW as well based on eight different typologies of the concept mentioned above of war; for instance, (Tahir and Afridi, 2019):

1. Attacks on economy,
2. Propaganda,
3. Cyber-attacks,
4. Foreign-sponsored creation of unrest within Pakistan,
5. Averse diplomatic smear campaigns against Pakistan, to name a few.

In conflicts of the aforementioned manner, the primary target chosen by adversaries to carry out their onslaught is any given country's population. Now, this primary target can be attacked both physically or psychologically, and in some cases via a combination of both. The goal here is to break the willpower of the people as well as diminish their sense of nationalism and nationality to make their minds and thought processes relatively easily penetrable. This then builds the discussion that 5GW is primarily driven by data and supported by military action that is largely non-kinetic; it is further imperative to mention that the proponents of the concept posit that the actors engaging in 5GW tend to take advantage of the cognitive biases that exist in the territories and people that they intend to exploit and manipulate–this thus results in the establishment and formulation of relatively newer and advanced cognitive biases.

The technologies and tactics associated with the concept of 5th generation warfare (Murden, 2007) are as follows, to name a few:

i. Social engineering
ii. Misinformation/Spread of false information,
iii. Manipulation over the social media sites,
iv. Mass surveillance (often using satellite imagery and spyware technologies),
v. Psychological warfare (with the employment and dissemination of meme content, fake news, etc.)
vi. Cyber-attacks and electronic warfare,
vii. Public opinion creation, etc.

However, this concept is still and ever involving, and as mentioned previously, its parameters are undefined. But the primary notion is that this typology of warfare broadens the notion of conflict to employ a multitude of the elements of national power to influence any given people to do the bidding of the aggressor or the adversary without the former faction even realizing their

subjugation. The techniques employed, as mentioned previously, are synchronized asymmetrically, and are taking place in a space that is largely multidimensional as they now virtually exist in all spheres, aspects, and walks of life.

Media Landscape in Gilgit-Baltistan

Comprehending the media landscape in G-B is crucial for the general public and policymakers to understand how information is produced, circulated, and consumed. It assists in assessing the quality of information, the miscellany of voices and the overall media ecosystem.

The Special Communication Organization (SCO) is an exclusive internet provider in the whole region of G-B. Yaqoob Abdi, the Marketing Manager at SCO, stated that there are around 1.2 million SCO users in the region. Meanwhile, there are 0.4 million users who actively use mobile internet service (Abdi, personal communication, November 6, 2023).

Table 1: Data of SCO Sim Users, Mobile Internet Users, Fiber to Home Connections, and DSL Connections in Gilgit-Baltistan.

Service	Users
SCO Sim Users	1,200,000
Mobile Internet Users	400,000
Fiber to Home Connections	13,000
DSL Connections	4,000

Explicitly, there is a lack of stark data regarding the social media users in the region to estimate what portion of the population is actively using social media platforms.

It is worth mentioning that dwellers of this region actively use various social media platforms, including Facebook, Instagram, and X/Twitter. Interestingly, the majority of the population has a robust presence on Facebook. People use Facebook for sharing information and content. Unfortunately, despite the region's growing number of social media users, there is no solemn digital policy.

It's important to highlight that while these platforms exhibit a strong presence on specific social media channels, not all maintain active pages and/or IDs on every platform.

Table 2: Using the G-B population census of 2017 and the social media penetration rates of Pakistan, we derived a potential range of social media users in G-B.

Units	Population	Percent	Facebook	YouTube	Instagram	X/Twitter	TikTok
Gilgit-Baltistan	**1,492,685**	**100**	**285,699/19.14%**	**470,643/31.53%**	**90,158/6.04%**	**2,2241/1.49%**	**119,862/8.03%**
Baltistan Division	**547,177**	**36.66**	104,729	172,524	33,049	8,152	43,938
Baltistan District	261,240	17.50	50,001	82,368	15,778	3,892	20,977
Ghanche District	156,608	10.49	29,974	49,378	9,459	2,333	12,575
Kharmang District	54,620	3.66	10,454	17,221	3,299	814	4,385
Shigar District	74,709	5.01	14,299	23,555	4,512	1,113	5,999
Gilgit Division	**580,246**	**38.87**	**111,059**	**182,951**	**33,046**	**8,645**	**46,593**
Ghizer District	172,763	11.57	33,066	54,472	10,434	2,574	13,872
Gilgit District	284,237	19.05	54,422	89,651	17,173	4,236	22,832
Hunza District	51,398	3.44	9,837	16,205	3,104	766	4,127
Nagar District	71,748	4.81	13,732	22,622	4,333	1,069	5,761
Astore Division	**365,262**	**24.47**	**69,911**	**115,167**	**22,061**	**5,442**	**29,330**
Astore District	95,422	6.39	18,263	30,086	5,763	1,422	7,662
Diamer District	269,840	18.08	51,647	85,080	16,298	4,020	21,668

Table 3: The table below outlines some noteworthy digital media platforms in G-B.

Name	Facebook	X/Twitter	Instagram
Daily K2	137,000	8,000	1,774
Pamir Times	576,000	24,900	7,014
Gilgit Media Network	187,000		981
Skardu TV	166,000	117	1,229
Ibex Media Network	426,000	2,700	26,700
Gilgit-Baltistan Times	47,000	4,400	3,792
Worldroof Media	167,000	150	180
Hunza News	100,000	1,000	2,787
Daily Ausaf Gilgit- Baltistan	88,000	148	
Wateen Digital	74,000	836	
W TV	169,000	21,500	1,499
Daily Ghanche TV	167,000		
Markhor Times	70,000	19	
Voice of GB	56,000	1600	546

It is pertinent to mention that the print media also plays a crucial role in shaping public opinion and campaigns regarding any issue.

Table 4: Overview of some prominent newspapers in Gilgit-Baltistan, along with their circulation figures

Name of Newspapers	Circulation (PID Data)
Daily K2	61,500
Daily Ausaf	45,000
Daily Baad e Shumal	30,000
Daily Sada e Himalaya	13,000
Daily Wateen	18,000
Daily Waadi	37,000
Daily Rehbar	9,500
Daily Fairy Meadows	31,000
Newsmart	15,000
Himalaya Today	20,500
Daily Bedaar	11,000
Gilgit-Baltistan Express	15,100
Daily Panah	25,500
Daily Bang-e-Sahar	18,000
Daily Tarjumaan Gilgit-Baltistan	20,200
Daily Muhasib	15,000

This table serves as a snapshot of the print media landscape in G-B. It is important to acknowledge that the actual circulation of these newspapers may vary.

Meanwhile, FM and radio broadcasting are pivotal in disseminating information and news across diverse places in Gilgit-Baltistan.

Table 5: Radio and FM stations in G-B, along with their frequencies and coverage details.

Station Name	Frequency	Coverage Area
Radio Pakistan, Gilgit-Baltistan.	AM 1512 Khz	Covers entire GB and the border areas.
Suno FM Radio Gilgit-Baltistan	FM 89.4	20-25 KM
FM 91	FM 91	20-25 KM
FM 99 KIU	FM 99	20-25 KM
FM 93	FM 93	20-25 KM
FM 93.4	FM 93.4	20-25 KM

As per Iftikhar Ahmed, President, Cable Network Association G-B, there are approximately 124 cable networks in G-B, servicing around 0.15 to 0.2 million cable connections. Ahmed notes, "Most of the cable networks have their own local channels on which they share content at their own will" (Ahmed, personal communication, June 11, 2023).

Cable Networks in G-B	Cable Connections in G-B
124	Around 0.15 to 0.2 million

Source: Data from Cable Network Association Gilgit-Baltistan

The disinformation challenge is one of the gravest challenges confronted by states in recent years. There are a myriad of digital means and channels to spread disinformation and false news about any issue. Within a matter of time, the public's opinions and points of view can be shaped to divert the attention of the public and create social discord. For example, the false news of handing over the region of G-B to China for 50 years spread in diverse places of the region within a matter of time.


چین کے تھنک ٹینک گرین سگنل دے یا معاہدہ ہونے کے بعد چینی افواج بھی گلگت بلتستان میں تعینات کی جاسکیں گی

پاکستان کے مخدوش حالات امریکہ کشیدہ تعلقات

گلگت بلتستان 50 سال کیلئے چین کو دینے پر غور

پاکستان کے قبائلی علاقوں میں بڑھتی ہوئی شورش نئے فورسز کی کارروائی اور امریکا کے ساتھ غیر یقینی حالات کے پیش نظر وفاقی حکومت نے متبادل آپشنز پر غور شروع کر دیا

However, the region struggles with the deficiency of digital literacy and limited internet services, despite these issues the news reaches a huge audience. Now, a layman cannot discern between genuine and fake news due to the robust propaganda tools and means operated by external actors in a sophisticated way. In addition to this, an article published in the Eurasian Times falsely claimed that Pakistan may hand over the region of Gilgit-Baltistan to China (Ali, 2020).

False news can distort public discourse, undermine the public opinions and have potential ramifications. Another specimen of a disinformation campaign has been revealed in the recent Twitter trend. (#gilgitbaltistanwantsbharat) managed from India (Tweet Binder, n.d).

EXPERT REVIEWS

Gilgit-Baltistan In 'PLA Clutches'; Pakistan Could Cede Part Of Kashmir To China In Barter Trade: OPED

OPED By Veteran Journalist R. C. Ganjoo Pakistan has inconspicuously planned a new deal with China to hand over Gilgit-Baltistan for 50 years. The reason...

gilgitbaltistanwantsbharat

FREE . 2000 POSTS . 2/26/2023

2000
Total Tweets

MOST ACTIVE	Tweets
ankittiwari Ankit Tiwari	52
radhikayad23661 Radhika yadav	38
s_commando66415 surya roshan EEE	27
priyam_raj21 Priyam Raaj	25
PriyaJamwal_jmu Priyanka Jamwal	22

Source: Tweet Binder

It is crystal clear that these malevolent campaigns are aimed at creating cynicism and despondency among the population so that the CPEC project can be halted.

PriyaJamwal_jmu | 5 days ago

This is how the students of Gilgit-Baltistan protesting against the hike in fee infrastructure. Feeling sad for these poor students who are barred from getting quality education just because of the govt's discriminative policies. #GilgitBaltistanWantsBharat https://t.co/MVbaiwPL1t

Source: Tweet Binder

BhatArushi | 6 days ago

The people are already suffering from huge inflation. exorbitant rise in prices of basic commodities & now the unprecedented hike in fee adding to their woes. forcing them to leave their education in between. #GilgitBaltistanWantsBharat https://t.co/hVFJ2vNiBa

Source: Tweet Binder

Therefore, it is necessary to keep an eye on all these malicious activities and create a formalized media strategy.

Nevertheless, Dr. Muhammad believes that the ongoing CPEC projects could be a game changer for regional development and may ultimately help to counteract adversary propaganda campaigns. However, given the significance of these projects, it is likely that both regional and global powers will continue to oppose them, and may intensify propaganda efforts against G-B and CPEC in the long run. Therefore, finding solutions that prioritize regional development and ensure a balanced information domain is crucial.

Lack of Digital Literacy

Digital literacy is rudimentary for thriving in a drastically evolving digital society, the effective utilization of various digital media platforms can inform and educate a society as a whole. These platforms are helpful for communicating and sharing valuable information in a digital space. It has been noticed that there is a lack of digital literacy in the region of G-B. The role of Information and Communication Technology (ICT) cannot be undermined, particularly since it is of immense significance for the economic development

and prosperity of any region. Dr. Faqeer Muhammad, who is the Director of the China Study Centre at Karakoram International University opined that the deficiency of digital literacy and comprehension of global dynamic forces is a concern for the region (Muhammad, personal communication, April 23, 2021).

The region requires a responsible and robust media landscape to shape positive public opinion about CPEC and its impacts on the whole region.

Analysis and Discussion

The data collected through both primary and secondary sources was analyzed using a thematic and historical analysis approach. The thematic analysis involved identifying and coding recurring themes in the data. This approach was chosen because it allowed for the examination of the rich and complex data collected through the expert interviews while also providing the opportunity to identify patterns and relationships in the data to find the major fault lines and their future implications for the region. Historical analysis also provided context and an understanding of how these fault lines evolved.

Figure 1 visually represents Gilgit-Baltistan's geostrategic significance and illustrates significant occurrences transpiring within the region Source: Map created by the author.

Gilgit-Baltistan, referred to as the "fulcrum of Asia" by John Keay in his work "The Gilgit Game: The Explorers of the Western Himalayas 1865–95" (Keay, 1979), holds great strategic importance due to its location at the intersection of three nuclear states: Pakistan, India, and China. Tensions between India and China have escalated in recent years, particularly in the Galwan region, while Pakistan and India have a history of conflict. The region also serves as a water source for Pakistan and provides a land link to China through the Karakoram Highway. The Wakhan Corridor connects Pakistan to the Central Asian Republics and offers potential access for India to Central Asia and China to Afghanistan's resources. However, the region's diverse demographics and socio-cultural and sectarian differences pose challenges and potential liabilities, with India attempting to exploit these fault lines through propaganda tools. Regional and global powers with interests in the region may also seek to exploit these fault lines for their gain.

The security situation in Badakhshan, Afghanistan, and Tajikistan, particularly in the Pamir region near the Wakhan border, is rapidly deteriorating. The increase in conflict, political instability, and the presence of non-state actors in these regions raises the risk of spillover and destabilization in Gilgit-Baltistan and surrounding areas. The Wakhan Corridor, linking G-B to Central Asia, is particularly vulnerable to these security threats, further emphasizing the need for regional stability and cooperation. The growing instability in Xinjiang and the Turkestan independence movement add to the complex security landscape in G-B. In conclusion, the intersection of multiple nuclear states, territorial disputes, and independence movements makes G-B a highly strategic and potentially volatile region with significant regional and global stability implications.

Major Fault lines

Gilgit-Baltistan holds a critical position in South and Central Asia due to its significant geopolitical, geoeconomic, and geostrategic importance (Ullah, Ali & Hussain, 2023). This region serves as a gateway to the CPEC, a vital project labeled as a game-changer for the region. G-B also shares borders with Afghanistan, China, and India, which makes it a hotbed of regional and international competition (Tanwar, 2022). G-B's constitutional ambiguity, sectarian tensions, separatist movements, ethnic divisions, and strategic importance all present potential vulnerabilities. Understanding these fault lines and their underlying causes is essential for assessing the region's susceptibility to 5GW and developing effective strategies for mitigating the risks.

Table 6 highlights the major fault lines in Gilgit-Baltistan that make it susceptible to 5GW

Fault Line	Description
Vague and Disputed Constitutional Status	Gilgit-Baltistan's constitutional status remains ambiguous, and its disputed status between India and Pakistan creates political and security challenges.
Sectarian	The region has a history of sectarian tensions between different sects, which could be exploited by malicious actors.
Separatist/ Nationalist Ideologies	There are separatist and nationalist movements in Gilgit-Baltistan that could be used to sow unrest and destabilize the region.
Ethnic	Ethnic tensions exist between different groups in Gilgit-Baltistan.
Geostrategic/Geoeconomic	Gilgit-Baltistan's strategic location and economic potential make it a target for regional and global powers seeking to gain influence or control.

Vague Constitutional and Disputed Status

The first and foremost fault line that faces the people of G-B is one about the region's constitutional rights–wherein the region's constitutional future remains uncertain, based largely on the will of the Pakistani ruling elite, for which the people of the region have been raising their voice on several platforms ever since the region acceded to Pakistan–wherein they demand to gain due attention from a) Federal governments, b) Provincial governments, and c) International, national, and local media channels.

The vagueness of the region's constitutional status to the Pakistani constitution, in addition to India's claim over the land as being part of the Kashmir region as well as being surrounded by volatile neighbors such as India and Afghanistan, increases the region's susceptibility to 5GW.

(Dad, 2016) believed that due to the absence of constitutional status, the political vacuum in G-B has been filled by sectarian outfits, separatist elements, and ethnic pressure groups. Recent developments suggest that India has shown a keen interest in G-B. A member of the Indian Parliament, the Bharatiya Janata Party (BJP), has proposed a bill in the Lok Sabha to reserve five seats in the Lok Sabha and one seat in Rajya Sabha for G-B (Sharma, 2017). Similarly, in Indian-occupied Kashmir, there are 25 reserved vacant seats for G-B (Reynolds, 2016). Indian National Security Advisor Ajit Doval has also acknowledged the country's interest in the region by stating, "We also have a 106 kilometers long non-contiguous border with Afghanistan (Wakhan Corridor)" (Ahmad Khan, 2020). Indian Prime Minister Narendra Modi also highlighted G-B and Balochistan in his Independence Day speech in 2016, where he claimed that the people of G-B had thanked him for voicing their rights/human rights violations (Shah, 2022).

Yasir Abbas, who served as the Coordinator to the Chief Minister of G-B, pointed out in a personal communication on February 07, 2021, that the region's strategic importance to Pakistan is immense, as it provides direct road linkage to China and is also the primary source of Pakistan's hydro potential. However, the lack of legal clarity regarding the region's status has resulted in numerous challenges. Howe and Hunzai (2019) stated that G-B has no representation in the core committee of CPEC due to its disputed status, and the region will not get its benefits due to constitutional limbo. (Bansal, 2008) believes in his book "Gilgit-Baltistan and its Saga of Unending Human Rights violation" that the region is facing various issues, including human rights violations, due to its vague constitutional issues.

Recent reports suggest that India is making attempts to claim G-B as its own territory. The Indian government has started broadcasting weather reports of G-B and Azad Kashmir, showing these areas as part of India (Venugopal, 2020). Former Indian army chief, General V.K. Singh, has openly stated that "Gilgit-Baltistan belongs to India and will come to us at the right time" (Khan, 2020). This clearly indicates India's interest in the region and its plans to take over G-B. According to Shabir Mir, a leading journalist in the region (Mir, Personal Communication, February 10, 2021), the disputed status of G-B is primarily a matter of constitutional rights. He argues that the "Fault line" vague constitutional status in the region has not been addressed and that the lack of constitutional rights granted to the people since 1947 has resulted in widespread demotivation from the state. This demotivation, according to Mir, creates a vulnerability that can be exploited by external actors, who may seek to take advantage of the region's susceptibility to 5GW tactics.

Sectarian Divide

In addition to the fault mentioned above line, one fault line that has proven to be inexplicably decisive and divisive is that of G-B's sectarian divide. Within these sectarian denominations, people tend to adhere rigidly to the tenets of their own sect's assumptions while also (at times) engaging in conflict with, discrimination of, and violence against those that fall outside of the aforementioned sectarian boundaries (Feyyaz, 2011). In January 2017, the G-B Inspector General reported that a plan, sponsored by India's Research and Analysis Wing (RAW), to sabotage the CPEC, had been foiled. The security forces arrested 12 individuals in the Yasin Valley of Ghizer district and seized a large quantity of weapons during the raid. The police officials confirmed that those arrested had received funds from RAW to sabotage CPEC and were also planning to attack a Jamat Khana (Ismaili Muslims Praying Place) in Ghizer and other parts of the region to trigger sectarian unrest (Nagri, 2017)

Syed Muhammad Abbas Mosvi, a local political and social activist, highlighted the impact of sectarianism on the political landscape of Gilgit-Baltistan. Mosvi noted that due to the geographical concentration of different sects, local election results are heavily influenced by sectarian demarcations (Mosvi, Personal Communication, February 18, 2021). Up until a certain point in the region's history, all communities lived with a sense of communal harmony amongst themselves, wherein tolerance about religion and sects was an appreciated characteristic of the people of G-B. (Feyyaz, Sectarian Conflict in Gilgit Baltistan, 2011). Associated further with the sectarian lines of division are political and doctrinal ones, which only tend to further instigate the conflict (Hunzai, 2013). The region's sectarian conflict, that has lasted several decades now, has damaged the societal fabric a great deal thus far–and if not curbed at the right time could become a threat that is existential to say the least. Rehan Khan (Personal Communication, February 16, 2021), a renowned columnist and religious scholar from G-B, emphasizes that the religious sectarianism, which has emerged due to various geostrategic factors, poses a severe threat to the religious harmony of G-B.

Kashif Hussain, a Security Analyst at the Strategic Studies Institute in Islamabad, highlights the long-standing sectarian conflict in G-B, which has hurt society in the region. In a personal communication on January 11, 2021, he stated that, despite efforts by the state, it has been unable to contain the unrest and discord in the region (Hussain, 2021). The constant unrest and sectarianism have contributed to the region's susceptibility to various forms of warfare, including 5GW. The support of certain factions, sometimes facilitated by the ruling elite for their interests, has added to the situation's complexity.

Separatist/ Nationalist Ideologies

Separatism and nationalism both predominantly stem out of the concept of identity politics; identity politics refers to a form of political approach wherein people and/or groups of people belonging to various shared binaries (religion, race, social background, class, gender, orientation, etc.) develop political agendas based on those shared identities and binaries (Huysseune, 2009). The nationalists of G-B had been demanding the revival of state-subject rule and an autonomous state of their own till the resolution of the Kashmir dispute.

Examples of such groups being in existence in G-B are prevalent already in the form of:

Balawaristan National Front (BNF)

Balawaristan National Front exists within G-B as a political party and has been represented as such in Gilgit-Baltistan's Legislative Assembly by Nawaz Khan Naji–who, alongside Abdul Hamid Khan, founded the party in 1989. As far as BNF-H is concerned, the separation of the two parties took place due to Abdul Hamid Khan's views being relatively more nationalist, unlike that of Nawaz Khan Naji–based on the same principles, BNF-H was banned by the Government of Pakistan. Recently, Abdul Hameed Khan, the nationalist leader of the banned organization, returned to Pakistan and apologized to the people of G-B. He confirmed that he played in the hands of the enemy.

Karakoram National Movement (KNM)

This particular party was founded in 1984 by several Karachi-based student activists. Proponents of the ideology of the Karakoram National Movement express great dissatisfaction towards the reinstatement of the State Subject Rule as well, which has resulted in people from the rest of Pakistan being permitted to buy land in and move to the G-B region–this, they consider, is the Pakistani government's attempt to change the social demography of the region which then ought to tarnish their own cultures, traditions, practices, and way of life (Dad, 2023)

Gilgit-Baltistan United Movement (GBUM)

This particular party emerged from the Skardu region. It represents a political movement within the region that demands the region's complete autonomy, resulting in a fully autonomous state that consists of both Gilgit and Baltistan (Singh, 2013). The Gilgit-Baltistan United Movement (GBUM), founder

Manzoor Hussain Parwana, chairman of the GBUM was critical about a self-empowerment package for G-B. He asserts that, "the supposed provincial setup is fraudulent and a blackmailing that is being provided by the federal government in order to hide the political atrocities and brutal colonial management on the folks within the occupied region" (Hussain, 2021)

Ethnic Variations

Gilgit-Baltistan is a region of multilingual and multiethnic diversity. In their study of ethnic variations in G-B, Butt and Abbas (2014) found that the demographic composition of the region is a mixture of immigrants from neighboring areas, including Turks, Kashmiris, Pathans, and Mongols. These communities migrated to G-B for trade and exploration and eventually settled in the region permanently. As per Khurshid Ahmed, President of the Press Club of G-B, communal conflicts have directly impacted the region (Ahmed, personal communication, February 2021). The unique geographical location of G-B has made it susceptible to multiple internal and external threats, and with the advent of technological innovation, traditional forms of warfare have become obsolete. Khurshid Ali Singay, an Assistant Professor of International Relations at Karakoram International University, Gilgit, observes that no known or remembered homogeneous collective government encompassed the present-day G-B throughout its history. This lack of collective governance has led to the emergence of different socio-political and cultural systems in the region (Singay, personal communication, February 16, 2021).

Zameer Abbas, a civil servant, and researcher based in G-B, highlights the ethnic variations in the region. According to Abbas, the primary division is between the Baltis and Gilgits, based on their race and language (Abbas, personal communication, February 19, 2021). These differences have caused tensions between the two communities, with the Baltis feeling aggrieved at what they see as the appropriation of resources by the Gilgitis because of Gilgit's central location. The division along ethnic lines can also be observed in Hunza, where the upper, central, and lower Hunza areas are home to people of different ethnicities and language communities. Similar linguistic divisions leading to separate identities can be observed in Nagar and Ghizer districts, where Shina, Burushaski, Wakhi, Khowar, Kohistani, and Gujari communities coexist. These ethnic variations underscore the complex social dynamics of G-B and the need to understand the region's diverse cultural groups.

Geostrategic/Geoeconomics

Gilgit-Baltistan's historical importance as a gateway between South and Central Asia on the old Silk Route has been renewed in recent times with its involvement in China's Belt and Road Initiative (BRI). The region's location makes it a crucial node in the BRI's CPEC, which connects western China to Pakistan's Gwadar Port, facilitating trade and investment across the region.

The region of G-B has been noted for its geostrategic significance due to its proximity to Indian illegally occupied Kashmir, China, and Afghanistan (Khan, personal communication, March 7, 2021). According to Masud Ahmad Khan, a retired brigadier and defense analyst from G-B demonstrated that G-B has an area that is over six times larger than Azad Kashmir and is rich in minerals and hydroelectric power resources, making it a vital gateway to the CPEC and providing access to Gwadar and the mineral-rich Central Asian States. Urooj Jamal, a Nuclear Scholar Fellow at the Center for Security, Strategy and Policy Research, provided insights into the geo-strategic significance of G-B. According to Jamal, a mere glance at the map of Asia is enough to understand the crucial importance of G-B for various geostrategic and geo-economic reasons. Jamal emphasized that the Wakhan Corridor in the north of G-B, is the sole land-based route connecting South Asia with Central Asia. Consequently, the region is essential for providing Pakistan with a link with China and Central Asia, which is vital for Pakistan's geo-economic future (Jamal, personal communication, March 19, 2021). It ought to be noted that G-B holds a geo-strategically important position on the world map–it is geo-strategically important because it could benefit three of the world's nuclear powers (namely; China, Pakistan, and India) in a geo-economic sense (Hussain, 2018), even more so with the advent and emergence of CPEC.

Beg, Baig, & Khan, (2018) argued that G-B plays a pivotal role in the CPEC, which is a significant project that aims to improve economic cooperation between China and Pakistan. The authors highlighted the geographical location of G-B, which is situated in the border region between South Asia, Southeast Asia, and Central Asia, making it a critical nexus for economic and political integration. Dr. Faqeer Muhammad, Director of the China Study Centre at Karakoram International University (KIU), asserts that Western media, particularly Indian media, is engaged in propaganda against the CPEC (Muhammad, personal communication, April 23, 2021). Recognizing the potential for opposition to CPEC and its potential implications for G-B's development is important. The increased propaganda against the project and the region may hinder its progress and exacerbate existing tensions.

Future Implications of 5GW on Gilgit-Baltistan

Due to the region's numerous fault lines, G-B remains vulnerable to 5GW threats. The lack of appropriate tools to identify and mitigate efforts that foment instability caused by these fault lines further exacerbates the vulnerability. As discussed by researchers such as (Murray & Mansoor, 2012) a nation or region that is engaged in such a decentralized and multi-pronged war needs an effective combined counter strategy against all facets of such warfare. This form of war is unique because conventional military wisdom may not necessarily apply. Kofman (2018) argues that mere territorial acquisitions and the elimination of fault lines may not help a country win in a battle of ideologies, where the perceived victim tends to gain sympathy among the masses. Therefore, a deeper understanding of the socio-political and economic factors that underlie the fault lines is necessary to address the underlying issues that perpetuate them.

Table 7: The following table outlines the potential future implications of 5th Generation Warfare (5GW) on Gilgit-Baltistan

Future Implications of 5GW on Gilgit-Baltistan	Description
1. Increased Instability	5GW could exacerbate existing fault lines in the region, leading to increased instability and potential violence. This could have significant implications for the security and stability of the region, as well as for neighboring countries.
2. Weakened Governance	5GW tactics, such as cyber-attacks and disinformation campaigns, could undermine the government's ability to govern effectively, erode public trust in institutions, and destabilize the region. This could make it more difficult to address other challenges facing the region, such as poverty and economic development.
3. Economic Disruption	5GW could also have significant economic implications for Gilgit-Baltistan, particularly if it disrupts key economic sectors such as CPEC, tourism or agriculture. This could exacerbate existing economic challenges facing the region and lead to increased poverty and unemployment.
4. Polarization and Divisions	5GW tactics, such as social media manipulation, could exacerbate existing social and political divisions in the region, leading to increased polarization and a further erosion of social cohesion. This could make it more difficult to address other challenges facing the region, such as sectarianism and nationalism.
5. Regional Instability	Finally, 5GW in Gilgit-Baltistan could have significant implications for regional stability, particularly if it leads to increased tensions between neighboring countries such as India and China. This could have wider regional implications and potentially lead to further conflict and instability.

Head of the Soni Jawari Centre for Public Policy, government of Gilgit-Baltistan, Izhar Hunzai emphasized that the region's population of two million individuals, representing a broad range of ethnic, linguistic, and sectarian backgrounds, presents both opportunities and challenges (Hunzai, personal communication, July 15, 2021). Nawaz Khan Naji, a member of Gilgit-Baltistan's Legislative Assembly and founding leader of the Balawaristan National Front (BNF) (Naji, personal communication, August 20, 2021), asserted that despite the region's vague constitutional status and India's abrogation of Article 370, Pakistan has not taken major steps to address these issues. In this era of social media, people express their grievances and frustrations more openly, creating fault lines that can be easily exploited through 5GW tactics.

As per Kashif Hussain, a security analyst at the Strategic Studies Institute Islamabad (Hussain, personal communication, February 11, 2021), in 5GW, the enemy uses various means, particularly media, to highlight issues that create rifts between the general masses and state authorities. As stated by Hussain, in the context of G-B, the enemy can capitalize on major fault lines, including but not limited to the vague constitutional status and disputed status of the region, which has led to concerns about the protection of human rights and representation at national decision-making bodies (Hussain, 2021). Munir Hussain Kazmi, academic and a defense analyst (personal communication, March 2, 2021), claims that the vague constitutional status and geopolitical importance of G-B make it susceptible to 5GW. Kazmi notes that the region's proximity to China, India, and Afghanistan is a significant fault line that could affect G-B in the near future. The region's strategic location places it in the middle of ongoing conflicts, including the Kashmir conflict, which has already had implications for its security (Kazmi, 2021).

As stated by Fehmida S. Bercha, a G-B based social and political activist (Bercha, personal communication, February 12, 2021), the population in G-B is particularly susceptible to ideological and informational vulnerabilities within the framework of 5GW. Bercha (2021) highlights that the region is confronted with 5GW threats from various angles, with adversaries seeking to exploit internal divisions. Moreover, Jonsson and Michael (2016) emphasize the critical role of perception, information, and national narratives in shaping a country's destiny in a 5GW scenario. In the context of G-B, the proliferation of social media has contributed to heightened societal polarization, leaving it open to manipulation by misinformation campaigns (Ramal, 2021). According to Lala Rukh Ramal, a Research Assistant at the Gilgit-Baltistan Policy Institute, the widespread availability of social media has exacerbated polarization, permeating into the general populace (Ramal, personal

communication, February 5, 2021). Ramal observes that polarization, once limited to the political realm, is now prevalent among supporters of ethnic, sectarian, and nationalist movements. In 2019, the European Non-Governmental Organization (NGO), EU Disinfo Lab, uncovered a network of 265 fake outlets managed by an Indian group. The purpose of this network was to influence the European Union and the UN by inundating them with content critical of Pakistan. The EU Disinfo Lab in 2019 reported that certain NGOs, including some inactive ones, were allegedly utilized by individuals in India to influence public opinion against Pakistan. Retired brigadier and defense analyst Masud Ahmad Khan stated that India is allegedly using various media platforms to discredit Pakistan by disseminating false information through paid individuals. Furthermore, it has been noted that individuals from China working on CPEC projects have reportedly faced targeted attacks in G-B. These incidents emphasize the importance of addressing security concerns in the region and ensuring the safety of all those involved in the project. Muhammad Khawar, a prominent social media influencer from G-B, said (Khawar, personal communication, March 19, 2021) that during a time of sectarian conflict and social media polarization in the region, a security official approached him for help in promoting sectarian harmony and peace. In response, Khawar created a video that quickly gained significant attention, amassing over 200,000 views, 13,000 likes, and 1,500 shares in just two days. The video received over 3,000 comments, with the majority supporting peace and denouncing sectarianism. This incident highlights the potential of social media as a tool for countering 5GW tactics in G-B, where disinformation, propaganda, and other forms of non-kinetic warfare often used to sow discord and distrust have emerged from various fault lines.

In the same light, Asif Saeed Sakhi, a former candidate for the Gilgit-Baltistan legislative assembly from Hunza of the Awami Workers Party (AWP) (Sakhi, personal communication, June 12, 2021), which has one of the most active social media presences and is active in running trends on social media in G-B, has expressed his concern regarding the absence of ethical journalism in G-B and the misuse of media platforms, particularly social media, for political and sectarian agendas. As presented in this chapter, the analysis and discussion of fault lines and their future implications in the age of 5GW offer valuable insights into the complex socio-political dynamics of G-B. These findings have important implications for policymakers and scholars working in contemporary warfare and regional security. In order to ensure a more peaceful and stable future for G-B, it is essential to address the root causes of these fault lines and develop comprehensive strategies to promote regional stability and development.

Conclusion and Recommendations

The geo-strategic position of Pakistan makes it a crucial player in China's Belt and Road Initiative (BRI), particularly in the CPEC project. To reap the boundless benefits of this project, it is indispensable to mitigate the adverse repercussions of 5GW. Both external factors and internal discord are creating unsurmountable challenges in effectively implementing this project. Major fault lines such as vague constitutional status, separatist/nationalist ideologies, sectarian issues, geostrategic/geo-economics significance, ethnic division, and lack of digital literacy are creating loopholes for the external actors to exert their power and influence to hamper the progress of CPEC In G-B. The proliferation of digital communication tools has made it easier for hostile foreign actors to manipulate public opinion and destabilize regions, including G-B. Disinformation campaigns and propaganda can be particularly effective in a region with a history of ethnic and sectarian tension, as fake news and propaganda can easily stoke tensions and exacerbate divisions. Therefore, the government of Pakistan needs to develop a comprehensive strategy that includes media literacy campaigns, fact-checking initiatives, and efforts to promote media diversity and independent voices in the region to counter disinformation and propaganda.

Overall, this study has significant implications for the future of G-B and the wider region. It highlights the need for a more nuanced understanding of the complex fault lines and strategic interests at play in the region, as well as the importance of addressing these issues proactively and constructively. Such efforts must consider the geostrategic significance of G-B and its linkages to neighboring countries, as well as the potential for 5GW to undermine the successful completion of CPEC. The study's findings have significant policy implications for policymakers and security practitioners in Pakistan and the broader international community. The findings are significant for policymakers, security experts, and academics who seek to understand the region's security dynamics and take measures to address the susceptibility of 5GW in the context of CPEC. The unique challenges posed by 5GW require a comprehensive and multifaceted approach. In the case of G-B, the government of Pakistan must take steps to address the local population's concerns, promote inclusive policies, and counter disinformation campaigns.

The following recommendations can help counter the threats of 5GW and promote stability in the region.

i. Effective strategic communication tactics are essential to cope with potential disinformation and misinformation campaigns regarding the

CPEC. Robust communication between the local communities, federal government, and international stakeholders can lessen the deleterious consequences of 5GW in the G-B region.

ii. External actors use propaganda tools and channels to ignite religious intolerance among communities and achieve their interests. Therefore, the government needs to foster religious harmony and tolerance through empowerment initiatives and community engagement. The local communities should be involved in the decision-making process regarding the CPEC project so that it can be successfully completed.

iii. The government should consider cybersecurity measures to protect the critical infrastructure of the CPEC project.

iv. The Government of Pakistan should amend its constitution to incorporate G-B as a provisional province until the resolution of the Kashmir dispute in order to address the concerns of residents about the region's disputed status.

v. To address the exploitation of local sentiment by nationalist movements, the government should prioritize addressing constitutional issues and protecting the basic rights of G-B's residents.

vi. To ensure that the region's leadership is involved in national decision-making and receives a fair share of benefits from large-scale development projects, the government should involve local leaders in national forums and provide an equitable distribution of resources to G-B.

vii. To counter disinformation and propaganda, the government should implement a comprehensive strategy that includes media literacy campaigns, fact-checking initiatives, and efforts to promote media diversity and independent voices in the region.

viii. To strengthen defense against 5GW, the government should foster strong relations with neighboring countries and regional organizations.

ix. The government should encourage research and studies on the topic to better understand the dynamics of 5GW and develop countermeasures.

x. The government should launch a comprehensive public awareness campaign to raise awareness about the dangers of 5GW and the importance of protecting G-B's sovereignty.

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Iram Jaffar belongs to the region of Jalalabad Gilgit. My parents, both are avid readers themselves, nurtured my love for literature by filling our home with a diverse array of books and relevant material. These hobbies evolved into a deep-seated passion for reading, and I spent countless hours immersed in the worlds created by authors like Charles Dickens, Jane Austen, and William Shakespeare and especially political essays written by Francis Bacon, Voltaire and other political essayists. As I progressed through school, my love for English literature only grew stronger. My teachers recognized my passion and encouraged me to explore the depths of literary analysis and criticism. I participated in literature clubs and debates, where I honed my skills in articulating my thoughts and engaging with different perspectives. I have completed my BS (Hons) in English Literature from Karakoram International University in 2022. Choosing to major in English Literature at Karakoram International university was an easy decision. The rigorous curriculum and the opportunity to study under esteemed professors at a renowned institution further fueled my passion. I delved into classical and contemporary authors, exploring various themes from politics, economics and poetics. Besides, I have also compiled a book on folk tales of Gilgit Baltistan in Shina language. During my time at university, I became an active member of the literary society, organizing events and discussions that brought together students and faculty to celebrate our shared love for literature. I also had the opportunity to present papers at conferences, where I engaged with scholars from around the world, enriching my perspectives and contributing to the academic discourse.

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Zaigham Ali is an esteemed academic professional currently serving as an Associate Professor and Head of the Department of Management Sciences at Karakoram International University's (KIU) main campus in Gilgit. With a Master of Science degree from the University of Bradford in the UK and a Doctorate from Dalian University of Technology in China, he has acquired a solid educational foundation. Dr. Ali's research focuses primarily on project management, project governance, and project sustainability. His expertise in these areas is evident through his numerous research papers published in reputable national and international journals. His contributions to the field have significantly advanced knowledge and understanding in project-related disciplines. With an impressive teaching career spanning two decades at KIU, Dr. Ali has honed his instructional skills and become a highly respected mentor to countless students. His passion for education extends beyond the confines of the university, as he has also served as a research associate at the University of Oregon in the USA. During his tenure there, he actively participated in various conferences and training sessions, ensuring that his knowledge and expertise remained at the forefront of his field. Dr. Ali is a certified trainer for esteemed organizations such as the International Finance Corporation (IFC) and YES (Youth Employability Services). Leveraging his extensive experience, he conducts diverse training programs on entrepreneurship and general management for various organizations. Through these initiatives, he helps individuals and businesses develop crucial skills necessary for success in the modern professional landscape.

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The China Study Centre (CSC) at Karakoram International University (KIU) is funded by the Higher Education Commission (HEC), Government of Pakistan. HEC frames the core objectives of the establishment of this Centre with special reference to the benefits that will achieve from creating a space that facilitates study and research on diverse arts, culture, history and polity of China, Pakistan, Gilgit-Baltistan and surrounding mountainous regions. The establishment of CSC aims to provide a base to learn Chinese society. The Centre provides an opportunity to develop research collaborations with counterparts in Xinjiang and mainland China. It is expected that these collaborations will play a key role in conducting research that has high relevance to Gilgit-Baltistan. There exist many commonalities between the two regions that provide important opportunities for collaboration between KIU, Chinese universities and beyond.

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