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Geographies of the Anthropocene
IL Sileno Edizioni

21st Century Landscape Sustainability, Development and Transformations: Geographical Perceptions

Giovanni Messina, Bresena Kopliku (Eds.)

Preface by Elena dell'Agnese

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Editors

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Muhammad Ammad Khan, Maryam Dogar, Mahreen Khalid

12. Infrastructural development under CPEC and its impact on Pakistan's agricultural landscape

Muhammad Ammad Khan, Maryam Dogar, Mahreen Khalid [1]

Abstract

The year 2023 marked a decade since the China–Pakistan Economic Corridor (CPEC) was formally launched in Pakistan as a part of the larger Belt and Road Initiative (BRI). It focuses heavily on infrastructural development and aims to transform transportation linkages, build trade channels, generate energy, and enhance telecommunication. The project also promises to enlarge Pakistan's agriculture sector by increasing accessibility to remote agricultural areas, facilitating the access of agricultural goods to wider markets, improving the livelihoods of small farmers, and enhancing its contribution to the national economy. These ambitious goals hold the potential to attract foreign investment and offer diverse work possibilities in rural areas, thereby overcoming local challenges. Moreover, the agro-processing industries create export potential through the development of Special Economic Zones (SEZs) utilizing thousands of acres of agricultural land. This chapter delves into the multifaceted aspects of CPEC's impact on Pakistan's agriculture and farming communities. It explores the growing apprehension regarding the far-reaching consequences on the socio-economic and political aspects of communities that are engaged in agriculture and farming. The analysis in this chapter adopts the Triple-Bottom-Line (TBL) approach to sustainability. Drawing from the experiences of other economic corridors, the chapter emphasizes the importance of conducting thorough environmental impact assessments and implementing mitigation measures to ensure that CPEC's development is ecologically sustainable. By adhering to sustainability principles, CPEC can maximize the economic potential of Pakistan's agricultural sector, while also addressing pressing environmental and social concerns. It will also help it to remain relevant in the emerging

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landscape of corridors that strive to align themselves with sustainability goals. This chapter offers valuable insights for policymakers, researchers, and stakeholders involved in the CPEC project and similar initiatives worldwide.

Keywords: ***CPEC; Special Economic Zones; Infrastructure; Agriculture; Energy; Climate Change***

1. Introduction

Pakistan, an agrarian nation blessed with fertile land, diverse ecological and climate zones, and an extensive irrigation network, holds tremendous potential in its agricultural sector. This sector plays a crucial role in the country's economic landscape, serving as a significant source of employment for more than half of the nation's populace, food security, and poverty alleviation (Khan *et al.*, 2022). According to the Pakistan Economic Survey (2022-23), it has been determined that the aggregate cultivated land area amounts to 22.50 million hectares, thereby constituting a significant 22.9 percent share of the nation's gross domestic product (GDP). Since it employs 37.4 percent of the population, this sector is a major support base for the textile industry, which forms the backbone of Pakistan's exports (Shahid, 2023).

However, due to susceptibility to climate change and exposure to hydrogeological extremes, Pakistan Economic Survey (2022-23) shows that the agricultural sector experienced a growth rate of only 1.55% during the given year, a significant decline from the 4.27% growth rate in the previous year primarily attributed to floods. According to the Food and Agriculture Organization (FAO), about 82% of Pakistan's cultivated land relies on irrigation while 18% on rainfall (FAO, 2023). The Indus Basin Irrigation System (IBIS) is the primary source of irrigation water for the entire country (Hussain, Khan, 2023), but it faces significant issues such as water loss, waterlogging, and salinization. Studies, for instance, Sajid *et al.* (2022) and Young *et al.* (2019) reveal that Pakistan's irrigation system currently operates at a low- efficiency rate of approximately 30% which is very low compared to the global average of 58%, resulting in reduced crop yields and inefficient water usage (Caldera *et al.*, 2021). Given the heavy reliance on water, there is a pressing need for substantial reforms to ensure sustainable agricultural production amidst changing climatic conditions. Projections suggest that Pakistan is likely to encounter water shortages for irrigation due to climate change, particularly affecting drought-prone and arid/semi-arid regions. Furthermore, there is anticipated growth in crop water demand, exacerbating the existing demand-supply gap (Khan, Hussain, 2024; Zulqarnain, Khan, 2024, Shafeeque, Bibi, 2023).

The importance of the agricultural sector transcends its mere contribution to the GDP; it holds a pivotal role in ensuring food security domestically. However, findings from the 2018 National Nutritional Survey conducted by the Ministry of Health and the United Nations Children's Fund (UNICEF) reveal that 36.9% of households in Pakistan faced "food insecurity", with

18.3% experiencing severe levels of it. Baig *et al.* (2019) contend that this challenge may arise from various factors, including inadequate research and development initiatives aimed at cultivating diverse seed varieties, deficient planning strategies, compromised supply chains, ineffective marketing practices, and a lack of substantial governmental involvement in the agricultural domain. Additionally, obstacles such as restricted market entry, outdated cropping practices, limited crop insurance, and outdated post-harvest technologies further exacerbate the situation (Kanwal *et al.*, 2016).

Moreover, Pakistan's population has surged, propelling it to the status of the world's fifth most populous country, hosting 241.49 million people (PBS, 2023). This demographic expansion exerts considerable strain on the nation's natural, manual, physical, capital, and social resources (Haider *et al*., 2021). Recent data from the Pakistan Bureau of Statistics (PBS) (2023) indicates that approximately 38.82% of the population resides in urban areas, while 61.18% lives in rural regions which are characterized by higher poverty rates and lower human development indicators (Khan, 2022). According to the United Nations World Population Prospects of 2019, Pakistan's population is projected to swell to 262.96 million by 2030 (Hashmi, 2022). Consequently, Pakistan's agricultural sector grapples with multifaceted challenges in meeting the nation's food requirements, exacerbated by population growth and environmental factors such as shifting weather patterns, water scarcity, and recurrent droughts and floods.

To overcome these challenges and unleash the full potential of the agricultural sector, the Government of Pakistan has recognized the paramount importance of agriculture and started implementing several projects to broaden the agricultural sector under the China–Pakistan Economic Corridor (CPEC). The CPEC was formally launched in Pakistan in July 2013 as a part of the larger Belt and Road Initiative (BRI) (Hassan, 2020). It places significant emphasis on infrastructural development, stretching from the western Chinese city of Kashgar to Pakistan's Arabian Sea port of Gwadar, and aims to transform transportation linkages, build trade channels, generate energy, and enhance telecommunication. The project also promises to enlarge the Pakistani agriculture sector by increasing accessibility to remote agricultural areas, facilitating the access of agricultural goods to wider markets, improving the livelihoods of small farmers, and enhancing its contribution to the national economy (Yar *et al.*, 2021). These ambitious goals hold the potential to attract foreign investment and offer diverse work opportunities in rural areas. Furthermore, the establishment of agro-processing industries, particularly through the development of Special Economic Zones (SEZs) utilizing vast

stretches of agricultural land, holds promise for boosting exports (Hussain, Rao, 2020).

The development of infrastructure along the corridor fosters a more robust economic environment, promoting financial growth and profitability. The corridor's impact extends beyond mere economic transactions, influencing the overall quality of life in these urban centers. This encompasses improved access to education, healthcare, and social amenities, contributing to the well-being of the population (Aman *et al.*, 2022). The corridor not only connects major urban centers but also traverses through regions vital to agriculture thus promoting rural development. Infrastructure projects under CPEC are expected to improve connectivity in remote areas and upgrade essential rural infrastructure for agricultural mechanization. This collective effort aims to develop and revitalize medium and low-yielding land, establishing modern agricultural zones with water-saving technologies to maximize resource efficiency. Moreover, it presents an opportunity for collaborative efforts to address and improve Pakistan's water resource management through the adoption of more efficient methods (PakistanToday, 2023).

This chapter aims to delve into the multifaceted repercussions of CPEC on sustainability, shedding light on both its positive contributions and potential drawbacks. For this purpose, academic articles, reports, and working papers have been scrutinized to assess both the anticipated and current impact of CPEC projects on the agricultural sector. The evaluation employs the Triple-Bottom-Line (TBL) framework (Elkington, Rowlands, 1999) to elucidate the sustainability challenges arising from the infrastructure development under CPEC that affects the agricultural landscape. TBL framework is a multifaceted approach to sustainability assessment, often referred to as the 3Ps —Profit, People, and Planet— that provides a comprehensive framework for evaluating the holistic impact of large-scale infrastructure projects that go beyond conventional economic considerations. While navigating through the dynamic landscape of CPEC, our analysis will extend beyond the borders of Pakistan and China to learn from other existing economic corridors worldwide. By juxtaposing the experiences of various nations and regions, this study seeks to distill valuable insights into the intricate dynamics that shape the outcomes of economic corridors. By examining the policy implications of CPEC for agriculture, including the need for capacity building, technology transfer, and institutional reforms, this chapter could bridge the knowledge gap and provide valuable insights into developing interventions and policies that promote agricultural revitalization and sustainability.

In the following sections, we present an overview of the transformative

impacts of CPEC on Pakistan's agricultural landscape; an analysis examining sustainability challenges through the lens of the TBL framework; and an exploration of sustainable strategies within the context of global economic corridors and conclusion.

2. Transformative Impacts of CPEC on Pakistan's Agricultural Landscape

Massive infrastructure projects, like CPEC in Pakistan (Figure 1), are often seen as development catalysts, but their success depends on navigating regional shifts and internal challenges (Ali, 2021). Despite obstacles, developments in the energy and transport sectors under CPEC have had a positive impact, enhancing living standards and transforming the agricultural landscape. As per the CPEC Secretariat, Pakistan, a total of 16 significant energy projects have been completed across the country. The early harvest phase that included most of these have been successfully completed by 2020, adding 13,000 MW of additional energy to Pakistan's electricity supply and effectively reducing energy shortages (M Shah, 2021). Pakistan has historically faced a severe energy crisis, which significantly impeded national development. The availability of energy is crucial across all sectors, ranging from industry to agriculture. A study by Ali *et al.* (2017) highlighted that in 2016 alone, the energy shortfall cost Pakistan Rs. 14 billion. The positive momentum in the energy sector has far-reaching implications for the manufacturing industry. Sustained energy provision fosters industrial expansion and accelerates Return on Investments (ROIs), thereby enhancing the country's export potential (Hadi *et al.*, 2018). This positive impact contributes to the economic growth aspect of the TBL. Additionally, the inclusion of renewable energy projects, such as solar, wind, and hydropower, aligns with sustainability goals by promoting a diverse and eco-friendly energy mix, thus benefiting both people and the planet.

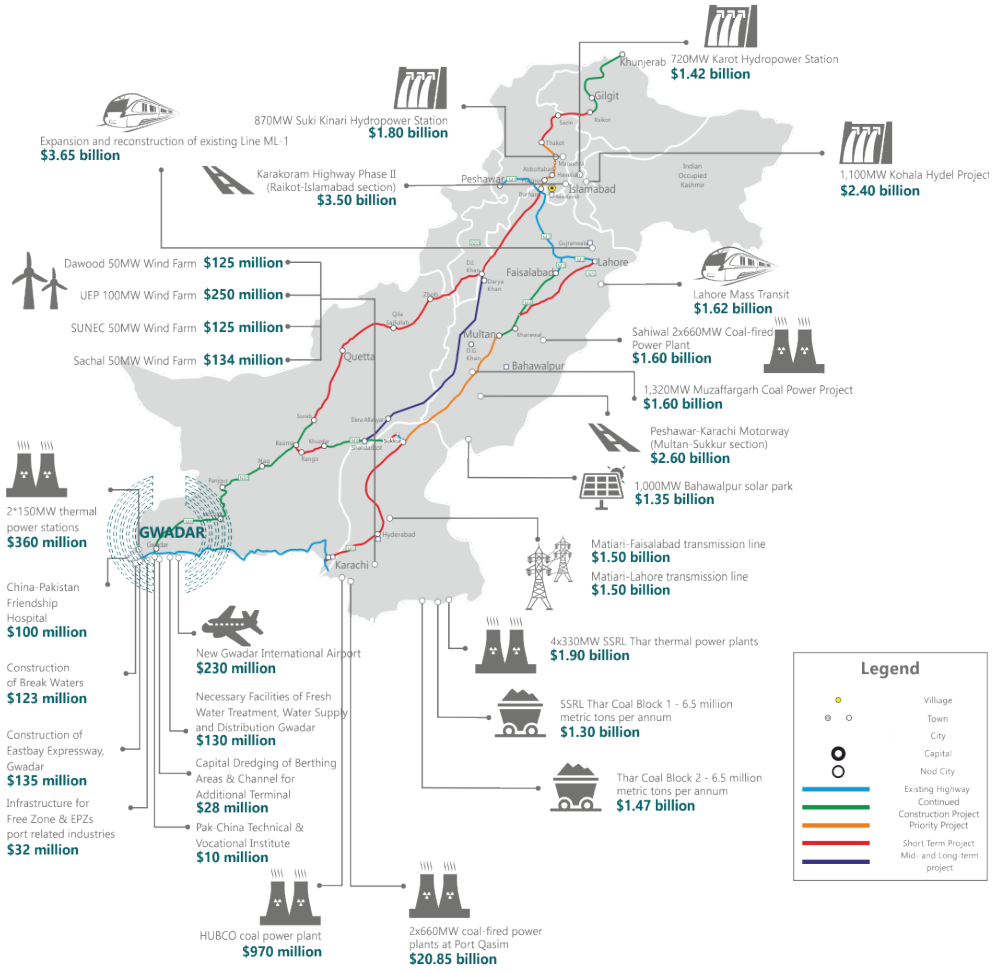

Figure 1: Infrastructure projects under CPEC (available via license: Creative Commons Attribution 4.0 International).

China's significant economic prowess has made a significant difference in Pakistan's economic landscape. China is Pakistan's largest commercial partner and main investor, accounting for 23.83% of its Foreign Direct Investment (FDI) totaling $102.5 million in the first quarter of fiscal year 2022-2023 and these inflows are expected to attract additional FDI in the coming future since CPEC's framework has been strengthened by the start of next phase which includes Special Economic Zones (SEZs) (Afzal *et al.*, 2023). So far, a total of nine SEZs have been sanctioned under the aegis of the CPEC infrastructure and energy corridor and these SEZs will make use of specially tailored beneficial tariff and tax regulations, allowing

Pakistan's manufacturing production to grow alongside the CPEC roads, assisting in the delivery of final products from this platform (Zia *et al.*, 2018). These zones are proposed under the midterm and final stages of CPEC development.

Similarly, the agriculture sector is a direct as well as indirect beneficiary of CPEC via development in backward and forward linkages (Ahmed, Mustafa, 2016). The improvement in rural electrification, facilitated by CPEC, simplifies the process of irrigating fields and cultivating diverse crops, thereby enhancing agricultural productivity (*Barnes et al.*, 2014). Research conducted by Ali *et al.* (2018) predicts that substantial investment in CPEC will positively influence land productivity, alleviate Pakistan's energy crisis, and generate numerous job opportunities. Furthermore, small-scale farmers are expected to experience socioeconomic improvements as a result of the project's implementation. Despite past neglect, the CPEC Long Term Plan (LTP) aims to revitalize Pakistan's agriculture industry. The establishment of food processing and storage zones, as outlined by the State Bank of Pakistan (SBP) (2018), aims to minimize post-harvest losses. Additionally, the industry is poised to adopt modern equipment and synthetic fertilizers to boost yields. Investments in agricultural technology will bolster Pakistan's food systems' resilience to climate change. Agricultural development fosters social equity and ensures long-term sustenance, not only within the sector itself but also for the broader population by guaranteeing food security. Hence, it forms the very basis that the TBL stands on.

3. Sustainability Challenges

Numerous studies, such as those conducted by Ahmad *et al.* (2020) and Khan *et al.* (2019), anticipate an increased agricultural production under the CPEC. They attribute this optimism to improvements in power and water supply, enhanced infrastructure, better market access, and technology transfer. However, several studies highlight concerns about the sustainability of the projects listed in Table 1 when examined through the lens of the TBL framework.

Profit	Concerns regarding the increased market presence of Chinese companies and Pakistan to secure a substantial market share in China (Younas *et al.*, 2021; Khawar, 2018).
People	In Qadirabad village, women shifted to low-paying jobs like domestic work and tailoring as agricultural lands transformed into the Sahiwal Coal Power Plant, leading to a major occupational change (Niazi *et al.*, 2019). The fishing community expressed worries about restricted coastline access due to the construction of an expressway at Gwadar Port (GRAIN, 2021). Small farmers are marginalized in export decisions, evident in the impracticality of exporting cherries which is not a viable option for small farmers, showcasing a lack of consideration for their participation in decision-making processes. (Spies, 2021).
Planet	There are concerns that the project leads to significant pollution, carbon emissions, environmental degradation, biodiversity loss, and habitat loss (Khalid *et al.*, 2021; Khayyam and Nazar, 2020; Nabi *et al.*, 2017). In the energy mix, 69.9% of the share is of non-renewable sources (PBS, 2022). Installation of coal power plants shows that both Pakistan and China have conveniently disregarded the commitments outlined in the Paris Agreement by heavily relying on coal-based power plants (Khalid, Ahmad, Ullah, 2021). Thus, evaluation of energy strategies is needed to align with the goals of the Paris Agreement.

Table 1: Sustainability challenges of CPEC identified through the TBL framework.

Recent data, presented in **Table 2**, regarding the crop production of Sahiwal district in Punjab province, shows that both area and production of Rabi (winter) and Kharif (summer) crops have reduced between the period of 2012-2013 to 2020-21 after the installation of the coal power plant. The plant was constructed over the cultivable lands as seen in **Figure 2**, which shows the vast lands of agriculture were converted to a coal power plant station and the negative consequence is apparent in the form of reduced crop production.

Year	Cotton		Wheat	
	Area (ha '000')	Production (bales '000')	Area (ha '000')	Production (tones '000')
2012-13	156.22	724.59	1239	1717.87
2020-21	36.02	162.02	387.28	1416

Table 2: Comparison of agricultural area and production before and after the installation of the Sahiwal Coal Power Plant

Source: Crop Reporting Service, Government of the Punjab, https://crs.agripunjab.gov.pk/reports

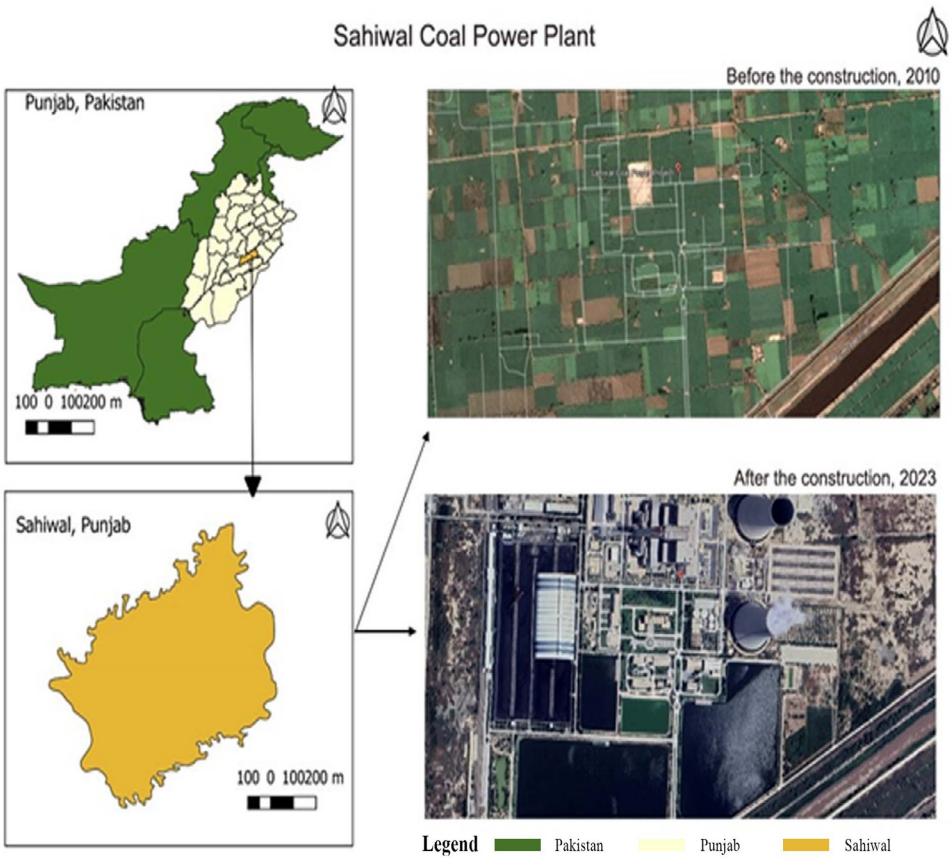

Figure 2: Map showing Sahiwal Coal Power Plant site.

Similarly, the initial hydropower endeavor in CPEC is the 720 MW Karot Hydro Power Project located near the villages of Karot in Rawalpindi district and Hollar in Azad Jammu and Kashmir (AJK) region. It was designed to cater to the needs of 5 million people, including domestic users and the farming community (Xinhua, 2022). The project is predominantly built on uncultivated land (340 ha). As depicted in Figure 3, there is a negligible difference in the cultivated and cropped area. However, its impact on biodiversity, particularly the aquatic and terrestrial habitats of Jhelum River and encroachment on national parks, as highlighted by Nowsharwan (2022), raises concerns about the project's sustainability (**Figure 4**).

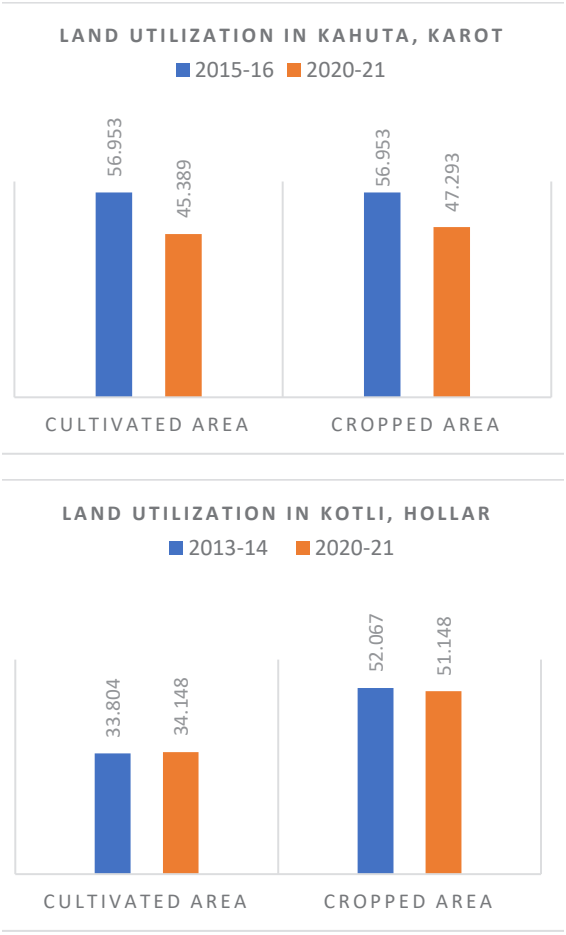

Figure 3: Comparison of land utilization before and after the completion of Karot Hydro Power Project. Source: Bureau of Statistics, Punjab https://crs.agripunjab.gov.pk/reports; AJK Statistical Yearbook, 2022, https://www.pndajk.gov.pk/statyearbook.php

Figure 4: Karot Hydropower Project located at the dual boundary of Rawalpindi District, Punjab and Kotli District, AJK, Pakistan. Source: CPEC Secretariat, Ministry of Planning, Development & Special Initiatives https://cpec.gov.pk/project-details/16

While CPEC promises benefits for Pakistan's agriculture, concerns arise about project sustainability, particularly in terms of increased mechanization causing land degradation and water sector sustainability (Asghar *et al.,* 2021). Historically, such issues have been linked to industrialization processes where technological interventions led to land exploitation. Moreover, CPEC's LTP (2017-2030) lacks alignment with Pakistan's climate priorities, lacking clarity on integrating water resource management and climate change, raising concerns about practical implementation. The omission of the Ministry of Climate Change from associated ministries underscores the absence of a clear strategy for addressing environment and climate-related issues and human development which is crucial for community upliftment through economic corridors. In his study, Rasheed (2023) highlights the importance of addressing these sustainability issues through community engagement. Munir and Khayyam (2020) recommend following global standards to reduce environmental degradation.

4. Sustainable Strategies: Lessons from Global Economic Corridors

The challenges and issues highlighted in the context of CPEC are not unique to this initiative alone; they are inherent to economic corridors (**Table 3**) and require continuous efforts for improvement through proper monitoring and evaluation. Some of the strategies that CPEC can adopt to make itself sustainable and viable for the local environment and community are discussed in this section.

The issue of exclusion of small farmers can be solved through the adoption of inclusive business practices and models. For this purpose, the evaluation of corridor investments and interventions should be viewed through the lens of an "*Engagement Model*," assessing how smallholder farmers and small and medium enterprises (SMEs) can be integrated into specific corridor activities (Gálvez, 2014, p.162). The literature recommends various approaches, for example, direct employment, participation in contract farming and out-grower schemes, and their role as land lessors. Initiatives like the Beira Agricultural Growth Corridor Initiative (BAGCI) and Southern Agricultural Growth Corridor of Tanzania (SAGCOT) prioritize the adoption of inclusive business models as a fundamental prerequisite for accessing corridor funds. In BAGCI, incentives were extended to companies investing in clusters with high agricultural potential, contingent upon the adoption of inclusive business models that would be beneficial for smallholder farmers (Kaarhus, 2018).

The success of CPEC lies in advancing arrangements that enhance farmers' access to vital resources such as financial services, seeds, agrochemicals, and farming and post-harvest technologies. For this purpose, BAGCI established support centers dedicated to providing agribusiness support services to investors, farmers, and other stakeholders (Gálvez, Webber, 2017, p.42). A positive change cannot be witnessed without the active participation of smallholder farmers in policy dialogues. Recognizing the significance of smallholder farmers as key stakeholders, SAGCOT attempts to increase their involvement by assessing their current understanding of policy and legislation, providing training to enhance their capacities, and facilitating meetings with other key stakeholders (Lugangira, 2018).

To resolve the issues of land-grabbing, SAGCOT has "*Participatory Land Management Processes*" in place (Sulle, 2020). Through these participatory processes, SAGCOT makes sure that the concerns of the local population are considered when large-scale investments are proposed. The village council meetings serve as a mechanism for transparent communication, allowing community members to express their opinions, voice potential concerns,

and actively participate in the decision-making process regarding land use. Adopting a similar approach, CPEC can establish a balance between economic development and the preservation of the community's rights and well-being. Another prevalent issue is the substantial delay in the disbursement of compensation payments. It is imperative that governments and project stakeholders prioritize the prompt disbursement of compensation payments. This pre-emptive measure ensures that affected families have a financial safety net in place before the commencement of any large-scale project.

In the year 2014, it was made mandatory under the *CAREC Transport and Trade Facilitation Strategy 2020* that performance must be measured and monitored on a periodic basis in Central Asia Regional Economic Cooperation (CAREC). It helps to have a systematic approach in place to evaluate the efficacy of initiatives and formulate targeted courses of action to overcome barriers. It has been proven to be instrumental in guiding decision-making processes and informing investment decisions.

Environmentally sustainable practices should be at the core of such projects (Khan and Saeed 2023), and SAGCOT actively advocates for green growth models through the *SAGCOT Greenprint* which is a framework for environmental and natural resource management (Milder *et al.*, 2012). To promote sustainable practices, a research project in collaboration with universities has been integrated, focusing on the exploration of optimal sustainable farming practices. Initial trials have shown significant potential to enhance crop yields and farmers' income without expanding agricultural areas or altering greenhouse gas levels. This emphasizes the importance of integrating academia and researchers into development projects since sustainable and desired outcomes cannot be achieved without their insights.

Observing the extent of environmental degradation resulting from CPEC, it appears that either the Environmental Impact Assessments (EIA) were inadequately conducted, or insufficient attention was paid to the findings, leading to a lack of implementation of effective control and mitigation measures. Despite the legal mandate for EIA in the country, the evident environmental harm contradicts this requirement. Nonetheless, according to Khan, Chang (2021), there is still an opportunity to rectify this situation by conducting a thorough EIA, suggesting that it is not too late to address the environmental concerns associated with the project.

Corridors	Countries	Geographical Scale		Sectoral Focus		Sectors						
						Agriculture	Infrastructure			Trade	Environment	Tourism
		National	Regional	Bi-sectoral	Multisectoral		Transport	Energy	Telecom			
BAGCI (2010)	Mozambique	☑		☑		☑	☑	☑				
SAGCOT (2010)	Tanzania (plus Zambia and Malawi)	☑		☑		☑	☑	☑				
CAREC (1996)	Afghanistan, Azerbaijan, China, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan and Uzbekistan		☑		☑		☑	☑		☑	☑	
GMS (1992)	Cambodia, China, Myanmar, Lao People's Democratic Republic, Thailand, and Vietnam		☑		☑	☑	☑	☑	☑	☑	☑	☑

Table 3: An Overview of the Global Economic Corridors

In the contemporary global landscape, the threat of climate change requires nations to explore innovative strategies to combat its detrimental effects. Recognizing the urgency of this challenge, it becomes imperative to integrate climate change considerations into infrastructure development projects. A very good example of it is the *Climate Change and Environmental Sustainability Program* (CCESP) of the Greater Mekong Subregion (GMS), which was established to address the multifaceted dimensions of climate change and the environment (Krittasudthacheewa, *et al.,* 2019). The GMS CCESP outlines a comprehensive approach encompassing six priority areas to address climate and environment-related issues. For Pakistan, this presents a unique and invaluable learning opportunity, wherein the integration of disaster risk reduction and climate change considerations into the CPEC can be transformative in fostering agriculture development and contributing to the global effort to mitigate the impacts of climate change.

Despite the encouraging news of women opting for truck driving under the CPEC project in Thar (Kumar *et al.*, 2022), the initiative's transformative impact on women's opportunities remains unclear. Insufficient evidence exists to demonstrate how CPEC has catalyzed empowering rural women

and providing them with opportunities. Interestingly, the LTP does not even mention "women". While the document acknowledges livelihood development, the omission of women highlights a lack of clarity in the plan regarding the participation and role of women in the agriculture sector despite being an important stakeholder. In contrast, CAREC has taken an inclusive approach by formulating its own *Gender Strategy 2030*. This strategy aims to ensure equal economic opportunities for women through capacity development and skill-building.

While one may argue that these economic corridors took a considerable amount of time to formulate sustainable strategies and it might be unfair to expect a similar initiative from CPEC in its initial stages. The urgency of contemporary challenges necessitates immediate action upon issue identification, as any delay would undermine the effectiveness of the development plan and lead to disparities. Therefore, it is imperative for initiatives like CPEC to proactively address community and climate-related issues and incorporate strategies that promote sustainability from the outset.

5. Conclusion and Recommendations

The strategic development through the CPEC route not only amplifies economic agricultural activities but also resonates across the three dimensions of the TBL. It enhances *Profit* through the development of agriculture, *People* through improved social well-being, and *Planet* through the promotion of sustainable practices, collectively contributing to a holistic and sustainable development paradigm for Pakistan. However, the analysis has shown the negative aspects of it that need to be addressed properly to overcome sustainability challenges.

The critique of the CPEC through the TBL framework also acknowledges the evolving dynamics of population trends and the potential impacts of pandemics, CPEC must adapt to the changing demographics of the country. With the current annual growth rate of 2.55% (PBS, 2023), the rise in population density in certain areas may pose challenges to infrastructure planning, resource allocation, and social services in the future. Moreover, the COVID-19 pandemic has exposed vulnerabilities in supply chains, healthcare systems, and overall project management. All these challenges necessitate a reimagination of the system especially to support smallholder farmers in times of crisis (Khan, 2022). CPEC should incorporate lessons from the pandemic and should come up with a framework to enhance its resilience,

ensuring that infrastructure and development plans are robust enough to withstand disruptions and contribute to long-term socio-economic stability. Moreover, the sustainability of the CPEC demands a nuanced evaluation that extends beyond the mere execution and completion of plans. There must be a proper evaluation of the projects in terms of the values that they add to the community.

CPEC must take swift action as the era where it was perceived as a game-changer is now surpassed by the emergence of its new European rival, the *Global Gateway (GG)*. GG is distinctive in its approach regarding contracts as it prefers transparency in projects. This marks a departure from the prevailing trend in CPEC contracts, which tend to predominantly favor Chinese state-owned enterprises and policy banks. The GG, in contrast, aims to prioritize financial, environmental, and social sustainability in the selection of contracts and projects (Kuo, 2021). It is imperative for CPEC to adapt to these changing dynamics to remain relevant in the evolving landscape of global economic cooperation. The adoption of sustainability will reflect a commitment to responsible development practices, which considers the environment and societal wellbeing in decisions regarding large-scale investments in the region. The success of agriculture under CPEC, as with any major project, relies on the collaborative efforts of diverse stakeholders which include local government, NGOs, private investors, financial institutions, academia, and the community. Only through such inclusive and performance-based approaches can CPEC realize its potential as a catalyst for sustainable agriculture growth and rural development in the region.

The scope of this chapter is limited mainly to energy projects and their impact on agriculture production and associated farming community as they were completed under the first phase of CPEC and have been operationalized for a long time now. The chapter discusses the potential of SEZs to create benefits for the agriculture sector through improved supply chains. However, currently these zones are under development. Thus, a comprehensive farm to fork impact through the lens of sustainability can only be evaluated once they are operationalized.

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Territories continue to transform due to endogenous and exogenous development drives. The thickening of logistics and transport networks, large commercial hubs, energy supply options, agricultural and industrial policies, tourism and migrations constitute then, individually and in a systemic sense, some of the lenses available to read the transformative dynamics of territories in the crucial current geopolitical context. In addition, the increasing reach of digital technologies in the spaces and practices of our daily lives, has changed the way we perceive and use the landscape. These transformations find a reified outcome in landscape transitions, becoming a foothold for a trans-scale geographical reflection. We therefore want to insert this volume on this horizon. In fact, we have wanted to stimulate the geographical community to try their hand at landscape analysis to identify, through methodological and/or applied research contributions, problems, practices and trajectories inherent in the transformative dynamics of territories, compressed between the urgency of development and the need to change the energy and consumption paradigm.

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