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The interplay of community attitudes, local development, and personal benefits: understanding support for the China–Pakistan Economic Corridor

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Large-scale infrastructure projects like the China–Pakistan Economic Corridor (CPEC) are often promoted as catalysts for local community development, economic growth, and enhanced social wellbeing. Although CPEC offers considerable potential advantages for Pakistani communities, gaining insight into local perceptions remains an important research gap. This study investigates the determinants of local community support for CPEC development. Using a structured research model, data from 771 survey respondents across Pakistan were analyzed using Structural Equation Modeling (SEM) in AMOS 24.0. The findings reveal that CPEC-related infrastructure development positively correlates with perceived community development, overall community attitude, and quality of life. Crucially, community development significantly shapes overall community attitude toward CPEC, while improvements in quality of life do not exhibit a direct, significant effect on this attitude. Furthermore, a positive overall community attitude strongly predicts increased support for CPEC. A pivotal finding is the significant moderating role of personal benefit; the relationship between overall community attitude and support for CPEC development is significantly strengthened when individuals perceive greater personal gains from the project. This research underscores the importance of aligning large-scale infrastructure initiatives like CPEC with local community needs and perceptions, emphasizing that fostering tangible community development and ensuring residents perceive personal benefit are vital for garnering sustainable local support. The study discusses implications for policymakers and project planners, limitations, and directions for future research to better capture community dynamics in major infrastructure undertakings.

KEYWORDS

quality of life, community development, support for CPEC development, personal benefit, community attitudes

1 Introduction

Large-scale infrastructure projects, frequently heralded as engines of national economic growth and regional integration, often promise transformative benefits for local communities situated along their corridors. Projects like the China–Pakistan Economic Corridor, a flagship component of China's Belt and Road Initiative (BRI), represent massive investments aimed at

enhancing connectivity, trade, and energy security (Khan A. et al., 2025). Proponents argue that such initiatives catalyze local community development, elevate quality of life, and generate widespread economic opportunities (Khan S. et al., 2025). However, the realization of these potential benefits for proximate populations is not guaranteed and is often contested (Ascensão et al., 2018). The gap between projected macro-level gains and the lived experiences, perceptions, and tangible outcomes for local residents remains a critical area of concern (Waheed et al., 2024). Understanding the determinants of local community support is paramount for the sustainable implementation and long-term success of mega-projects like CPEC. While substantial research examines CPEC's geopolitical significance and macroeconomic potential (Small, 2015), there is a recognized scarcity of empirical studies focusing explicitly on the perspectives and attitudes of the Pakistani communities most directly affected by its development (Ali et al., 2018). To further contextualize this study, it is essential to acknowledge that the scholarly discourse on CPEC has evolved beyond its strategic ambitions to rigorously investigate its measurable economic and financial impacts. A growing body of empirical research has begun to quantify CPEC's influence on regional capital markets, employing advanced econometric and machine learning techniques. Complementing this, the research by Yuanyuan et al. (2023) establishes a direct link between media coverage of CPEC developments and stock market returns, highlighting the corridor's role in shaping investor sentiment and market dynamics. These studies collectively affirm that CPEC acts as a potent catalyst of financial volatility and a key variable for predictive modeling, thereby situating our research within a well-established quantitative literature that examines the corridor's concrete market repercussions. Local perceptions are crucial because community acceptance or resistance can significantly influence project timelines, social stability, and ultimately, the project's developmental impact (Vancley, 2017; Musonda et al., 2025). Community development encompassing tangible improvements in local infrastructure, services, and economic opportunities and enhancements in quality-of-life reflecting broader wellbeing and life satisfaction are frequently cited justifications for such projects. Yet, the extent to which these outcomes are actually perceived and valued by communities, and how they translate into support for CPEC development, requires rigorous investigation. Furthermore, the role of personal benefits the extent to which individuals perceive direct gains for themselves and their families as a potential amplifier or detractor of support based on broader community-level perceptions, remains underexplored in the context of CPEC. Does perceived community development directly foster a positive overall attitude? Do improvements in quality of life inherently lead to greater project support? And critically, does the perception of personal gain strengthen the link between a positive community attitude and active support for the project? Addressing these questions is essential for moving beyond top-down narratives and grounding project planning and policy in the realities of local stakeholders.

1.1 Research objectives and questions

This study aims to address the following objectives:

- 1 To investigate the determinants of local community support for the CPEC in Pakistan.

- 2 To examine how perceived community development and quality of life influence the infrastructure development and community attitudes toward CPEC.
- 3 To assess the moderating role of perceived personal benefit in the relationship between community attitude and support for CPEC.

Based on these objectives, the following research questions guide the study:

- 1 How does perceived community development influence local community attitudes and support for CPEC?
- 2 To what extent do improvements in quality of life contribute to greater support for CPEC among local communities?
- 3 How does the perception of personal benefit moderate the relationship between overall community attitude and active support for CPEC?

This study directly addresses this critical research gap by empirically investigating the determinants of local community support for CPEC development in Pakistan. Specifically, it examines the role of perceived community development and quality of life in translating infrastructure development into community attitudes, and the moderating role of perceived personal benefit in the relationship between overall community attitude and support for CPEC. By analyzing survey data from 771 respondents across Pakistan using Structural Equation Modeling (SEM), this research provides robust empirical evidence on the pathways through which CPEC influences local perceptions and garners support. The findings highlight the paramount importance of fostering tangible community development and ensuring residents perceive personal benefit as vital strategies for securing sustainable local backing for this transformative, yet complex, infrastructure undertaking. By empirically testing these relationships using robust survey data and advanced statistical modeling, this research aims to provide nuanced insights into the complex dynamics influencing local acceptance of CPEC. The findings underscore the importance of tangible community development and the need for residents to perceive personal benefits as essential factors in securing sustainable local backing for large-scale infrastructure projects. By empirically testing these relationships, this research offers valuable insights into the dynamics of local acceptance of CPEC, with important implications for policymakers, project planners, and community engagement specialists. To ensure that mega-projects like CPEC truly contribute to sustainable and inclusive development, it is crucial that the realities of local stakeholders are considered, and that benefits are demonstrated both at the collective and individual levels.

2 Literature review and theoretical background

2.1 Social exchange theory (SET)

This study is grounded in Social Exchange Theory (SET) (Blau, 1986), which explains human interactions based on a cost-benefit evaluation. SET suggests that individuals are more likely to support a development project if they perceive the benefits outweigh the costs (Palmer et al., 1995). SET has been widely used to understand community responses to projects like tourism and infrastructure

development (Allen et al., 1993). In this context, perceived community development (CD), quality of life (QOL) improvements, and personal benefits drive positive attitudes and support. Residents are more likely to support projects that enhance their socio-economic conditions, living standards, and provide personal benefits, such as job opportunities. However, perceived costs like environmental degradation or cultural disruption can lead to opposition (Kanwal et al., 2020). Specifically, for CPEC, support is influenced by residents' evaluations of its benefits, with CD, QOL, and personal benefits acting as key factors in strengthening community support. This study tests SET-derived pathways, including the role of CD and QOL and the moderating effect of personal benefits on CPEC support in Pakistani communities. While SET provides a useful framework for understanding community responses, it is crucial to also consider the on-the-ground challenges and risks associated with CPEC. Research by Surahio et al. (2022) highlights socio-political concerns in regions like Baluchistan and Khyber Pakhtunkhwa, where local communities have expressed opposition to CPEC due to fears of inequitable development and the displacement of local populations. Furthermore, Surahio et al. (2023) discuss the security and environmental risks that undermine local support for CPEC, emphasizing that the perception of personal benefit may be negatively impacted by these risks. Their work underscores the importance of addressing these concerns to align CPEC's development with the needs and expectations of local communities.

2.2 Community development and infrastructure megaprojects

Large-scale infrastructure projects (LSIPs) are often seen as drivers of local community development, economic growth, and social wellbeing. The China–Pakistan Economic Corridor exemplifies this vision, offering investments in energy, transportation, and economic zones across Pakistan (Wolf, 2017; Small, 2015). Supporters of these projects contend that they create jobs, enhance connectivity, and improve living standards (Ansar et al., 2025). However, the real impact on local communities directly affected by these projects is often complex and contentious, highlighting a significant gap in understanding local perceptions (Islam et al., 2025). While much of the literature has focused on macroeconomic analyses and geopolitical implications of CPEC (Khan and Ahmed, 2024) there remains a notable gap in understanding local perspectives on CPEC development in Pakistan. Specifically, the factors influencing community support for CPEC remain inadequately explored (Ali et al., 2018). Research suggests that local support for LSIPs is driven not only by national economic benefits but also by the perceived effects on local communities. Community development (CD), including improvements in infrastructure, economic opportunities, social cohesion, and the environment, is a key factor in local support (Kim and Sherraden, 2011; Vanclay, 2017). When residents believe that a project like CPEC contributes meaningfully to their community's development, they are more likely to support it (Mahmood et al., 2022). However, LSIPs like CPEC also bring potential downsides, such as traffic congestion, resource strain, rising living costs, displacement, and environmental degradation (Mengal et al., 2021; Vanclay, 2024). Despite these challenges, when the benefits of CD are clear and well-communicated, they often outweigh the costs, fostering support for

future phases of the project (Ibrar et al., 2019; Ng et al., 2024). China–Pakistan Economic Corridor aims to reduce regional inequalities, integrate remote areas with economic hubs, and stimulate urbanization (Zhao et al., 2022). Beyond commonly cited issues like displacement and environmental strain, projects like CPEC also face significant macro-environmental and security challenges that directly impact local communities and project outcomes. These challenges include geopolitical tensions, regional instability, and physical security threats to both the projects and personnel (Bhatti et al., 2020; Surahio et al., 2022, 2023). Such risks can disrupt development, delay the delivery of promised benefits, and increase the perceived 'costs' for local residents, thereby negatively influencing community attitudes and support. This underscores why the perception of tangible personal benefit is critical to offset these potential negatives and secure local backing. The perception of personal benefits, such as job opportunities, improved living standards, and community development, can act as a counterbalance to the risks and challenges associated with large-scale projects like CPEC.

2.3 Community quality of life (QOL) and infrastructure intervention

Quality of Life (QOL) is a crucial indicator of community wellbeing, encompassing both objective factors such as income, health, and safety, as well as subjective elements like life satisfaction and social cohesion (Ng et al., 2024). Infrastructure development, particularly improvements in transportation, energy, and sanitation, plays a direct role in enhancing QOL by increasing accessibility, health, and connectivity (Nazneen et al., 2022). For instance, reliable energy access is a critical foundation for modern QOL, and its disruption has been empirically shown to severely hinder community development and daily wellbeing (Hussain et al., 2023a). Large-scale projects like CPEC are anticipated to substantially improve QOL in marginalized areas by driving economic growth, real estate development, and establishing key social infrastructure (Ashraf et al., 2017). The successful execution of such projects is therefore paramount. Evidence suggests that the socio-economic impacts of rural infrastructure projects can be significant drivers of community development, but these benefits are contingent on effective and timely project delivery (Hussain et al., 2023b). However, the relationship between QOL and infrastructure development is complex and often non-linear. While projects promise tangible improvements, they can also introduce significant subjective challenges. **Project delays**, for example, are not merely a scheduling issue but a major source of community frustration, eroding public trust and negatively impacting perceptions of sustainable development (Hussain et al., 2023a). Furthermore, the development process itself can create disruptions such as noise, pollution, displacement, or perceived inequities in benefit distribution, which can adversely affect QOL perceptions and, in turn, influence community attitudes toward the project (Bachnik et al., 2024). The formation of a community's overall attitude toward a project like CPEC is a nuanced process. It depends on how residents perceive its impact on community development, QOL, fairness, trust in authorities, and communication (Jin et al., 2024). A positive attitude is critical for garnering local support, leading to acceptance, cooperation, and reduced resistance (Kalogiannidis et al., 2025). This underscores the importance of **community participation** and

government support, which have been identified as key factors in navigating these complexities and ensuring the successful reception of large-scale infrastructure projects (Hussain et al., 2023b).

3 Hypothesis development

3.1 China–Pakistan Economic Corridor infrastructure development, community development

Infrastructure development is increasingly acknowledged as a key driver of socio-economic progress, with significant effects on community development, societal wellbeing, economic vitality, and environmental conditions (Nazneen et al., 2022). In developing economies, robust infrastructure boosts economic activity, attracts foreign investment, and delivers tangible benefits to local communities (Kanwal et al., 2019a). Projects such as CPEC are specifically designed to connect regions, improve connectivity, and generate wealth through various development initiatives, with the goal of enhancing living standards, creating jobs, and promoting regional prosperity (Riazi, 2024; Haq and Farooq, 2016). Empirical evidence consistently shows that infrastructure development in areas like transport, education, and healthcare contributes to improved local community development (Ali et al., 2025). Based on this established understanding, we hypothesize that:

H1a: China–Pakistan Economic Corridor Infrastructure development is highly connected to the development of community

3.2 China–Pakistan Economic Corridor infrastructure development and community quality of life (QOL)

Empirical evidence highlights the substantial impact of infrastructure development on improving living standards and quality of life (QOL) for local communities in Pakistan (Kanwal et al., 2019b). Strong infrastructure, particularly transportation networks, serves as a key driver for regional economic growth. Enhanced road and transport connectivity fosters job creation, attracts investment, and boosts agricultural productivity by enabling the efficient movement of goods and access to broader markets (Yaqoob, 2025). Importantly, connecting remote areas to urban centers empowers local populations by providing access to fairer prices for agricultural products and essential goods and services, thereby improving household economic wellbeing (Ali et al., 2025). Beyond economic benefits, infrastructure development raises a region's profile, drawing both domestic and international investors (Afzal and Naseem, 2018). This influx of investment often leads to further economic diversification and development. The China–Pakistan Economic Corridor, with its extensive investments exceeding billions of dollars to build and upgrade over 2,000 km of roads, railways, and port facilities linking China to Gwadar (Khan et al., 2018), exemplifies the transformative potential of such infrastructure projects on a national scale. A keyway in which infrastructure development improves Quality of Life (QOL) is by creating a variety of business opportunities for local residents. The development process of new infrastructure generates demand for supporting services, allowing locals to start small businesses

such as restaurants, retail shops, workshops, and logistics services (Guo et al., 2022). This entrepreneurial ecosystem enhances local economic resilience and provides stable income sources. As a result, host communities experience tangible economic benefits, such as higher income, job security, and entrepreneurial success, leading to a significant improvement in their overall QOL (Jensen et al., 2017). Improved QOL extends beyond economic gains to include better access to healthcare, education, and social services, all of which are facilitated by enhanced infrastructure (Andereck et al., 2007). Based on this theoretical and empirical foundation, we propose the following hypothesis:

H1b: China–Pakistan Economic Corridor infrastructure development has a significant positive effect on community quality of life

3.3 China–Pakistan Economic Corridor infrastructure development and overall community attitude

Large-scale infrastructure projects like the China–Pakistan Economic Corridor are recognized not only for their broader macroeconomic impacts but also for delivering significant benefits to local communities (Kanwal et al., 2020). These projects serve as catalysts for local economic activity, creating a range of employment opportunities and promoting business ventures for residents. Empirical evidence consistently shows that local communities benefit substantially from infrastructure development in their areas (Kanwal et al., 2019b). In addition to the direct economic benefits, infrastructure megaprojects significantly transform the physical and economic landscape of a region. The construction of modern transportation networks, energy grids, and related facilities improves connectivity and accessibility, making the region more attractive to both local and foreign investors (Ali, 2022). This transformation fosters a sense of progress and opportunity within the community. Building on SET (Cropanzano and Mitchell, 2005), which suggests that individuals form attitudes based on the perceived benefits and costs, we argue that when host communities experience tangible advantages from projects like CPEC such as job creation, business opportunities, improved services, and enhanced regional prominence their overall evaluation of the project becomes more favorable. The perception of positive outcomes strengthens a favorable community attitude toward the development (Brewer et al., 2023). Thus, based on the established connection between perceived local benefits and attitude formation, we propose the following hypothesis:

H1c: China–Pakistan Economic Corridor infrastructure development has a significant positive effect on the overall attitude of the local community

3.4 Community development and overall community attitude

Previous literature consistently indicates that the overall attitude of local communities toward development projects is strongly influenced by their perception of tangible benefits (Kanwal et al., 2019a). These benefits include various aspects, such as

improvements in community development (e.g., better local services, economic opportunities, social infrastructure) and gains in education and employment. Infrastructure projects like CPEC are seen as vital in promoting community development. When residents perceive that these projects are effectively contributing to their community's progress through improved facilities, economic growth, or stronger social cohesion, it significantly shapes their evaluation of the project. Community development serves as a key marker of positive change, encouraging residents to engage more positively with the development process (Kanwal et al., 2019a). This relationship is effectively explained by SET (Cropanzano and Mitchell, 2005). According to SET, individuals evaluate interactions or projects based on a cost–benefit analysis. When the perceived benefits, such as visible and valued community development, outweigh the perceived costs or disruptions, individuals are more likely to form a positive attitude toward the initiative. In the case of CPEC, the perceived improvements in community wellbeing and development are expected to be a key factor in fostering a favorable attitude among local Pakistanis. Based on the theoretical foundation of SET and supporting empirical evidence, we propose the following hypothesis:

H2a: Perceived community development has a significant positive effect on the overall attitude of the local community toward CPEC.

3.5 Community quality of life and overall community attitude

The relationship between community quality of life (QOL) and resident attitudes toward development projects is well-documented in the literature (Nunkoo and Ramkissoon, 2011; Sirgy et al., 2006; Sirakaya et al., 2002). Empirical findings consistently demonstrate that perceived improvements in QOL encompassing factors such as economic wellbeing, access to services, environmental quality, and overall life satisfaction exert a significant influence on the formation of a positive overall attitude within the host community (Sirakaya et al., 2002). This linkage is fundamentally explained by SET (Cropanzano and Mitchell, 2005). SET posits that individuals evaluate projects based on a perceived balance of benefits versus costs. When residents experience tangible enhancements in their quality of life as a direct or indirect result of an infrastructure project such as better employment prospects, increased income, improved access to healthcare or education, or enhanced living standards benefits are weighed against any associated disruptions or costs. A net positive assessment, where QOL gains are perceived to outweigh drawbacks, fosters a favorable disposition toward the project (Nunkoo and Ramkissoon, 2010). Research specific to infrastructure development supports this mechanism, indicating that projects perceived to enhance local QOL contribute positively to community attitudes (Yoon et al., 2001). China–Pakistan Economic Corridor as a transformative infrastructure initiative, holds significant potential to elevate QOL for local Pakistani communities through job creation, economic stimulation, income generation, and improved service accessibility. Consequently, the perception of enhanced quality of life resulting from CPEC is theorized to be a key driver shaping a positive overall community

attitude toward the project. Therefore, grounded in SET and empirical evidence, we propose the following hypothesis:

H2b: Perceived community quality of life has a significant positive effect on the overall attitude of the local community toward CPEC

3.6 Overall attitude and support for development

China–Pakistan Economic Corridor development projects are multifaceted, impacting the local community's living standards in various ways, including economic, socio-cultural, educational, and environmental aspects. According to the SET model, local residents' perceptions of these impacts are antecedents to their overall attitudes and subsequent support for development (Kanwal et al., 2020). Scholars have identified a strong connection between residents' overall attitudes and their support for further development. The local community's positive overall attitude significantly contributes to their support for development projects. Previous literature highlights the critical role of infrastructure development in bolstering the economic conditions of local communities. Evidence suggests that the overall attitude of local residents in Pakistan is strongly influenced by the individual benefits they perceive from development projects (Kanwal et al., 2019c). The various advantages brought by CPEC infrastructure projects have fostered a more positive attitude among the local population, thereby increasing their support for development. Building on the above literature, the current study posits the following hypothesis:

H3: There is a strong correlation between the community's overall attitude and their support for CPEC development.

3.7 The moderating role of personal benefit

The Social Exchange Theory (SET) posits that the host community derives multiple benefits from infrastructure projects, which in turn enhances their support for these initiatives (Kang and Lee, 2018). Numerous studies have highlighted personal benefit as a crucial factor in the success of development projects. Communities may withdraw their support from development projects if they do not perceive direct benefits (Uysal et al., 2011). Barrios-Crespo et al. (2021) established a significant connection between infrastructure projects and the benefits they provide to local communities. In the context of CPEC, the promise of education, employment, and income generation has significantly motivated local communities to support the project. The hypothesis that personal benefit moderates the relationship between attitude and support is particularly relevant in high-risk settings like CPEC. Research has highlighted substantial security risks and macro-environmental uncertainties surrounding CPEC's implementation (Surahio et al., 2022, 2023). In such an environment, where communities perceive potential risks and instability, the presence of tangible, personal benefits become crucial. We argue that personal benefits not only bolster positive attitudes but also help alleviate concerns stemming from these broader risks. When individuals directly gain from the project such as through employment or business opportunities their personal stake may outweigh anxieties related to

security or geopolitical challenges, thereby strengthening the link between a positive overall attitude and active support for CPEC. As such, the greater the perceived personal benefit, the stronger the relationship between overall attitude and support for CPEC development. Based on this, the current study posits the following hypothesis:

H4: The personal benefit moderates the relationship between overall attitude and support for CPEC development. Specifically, the greater the personal benefit, the stronger the connection between overall attitude and support for CPEC development, especially in high-risk contexts where concerns about security and geopolitical instability may influence community perceptions.

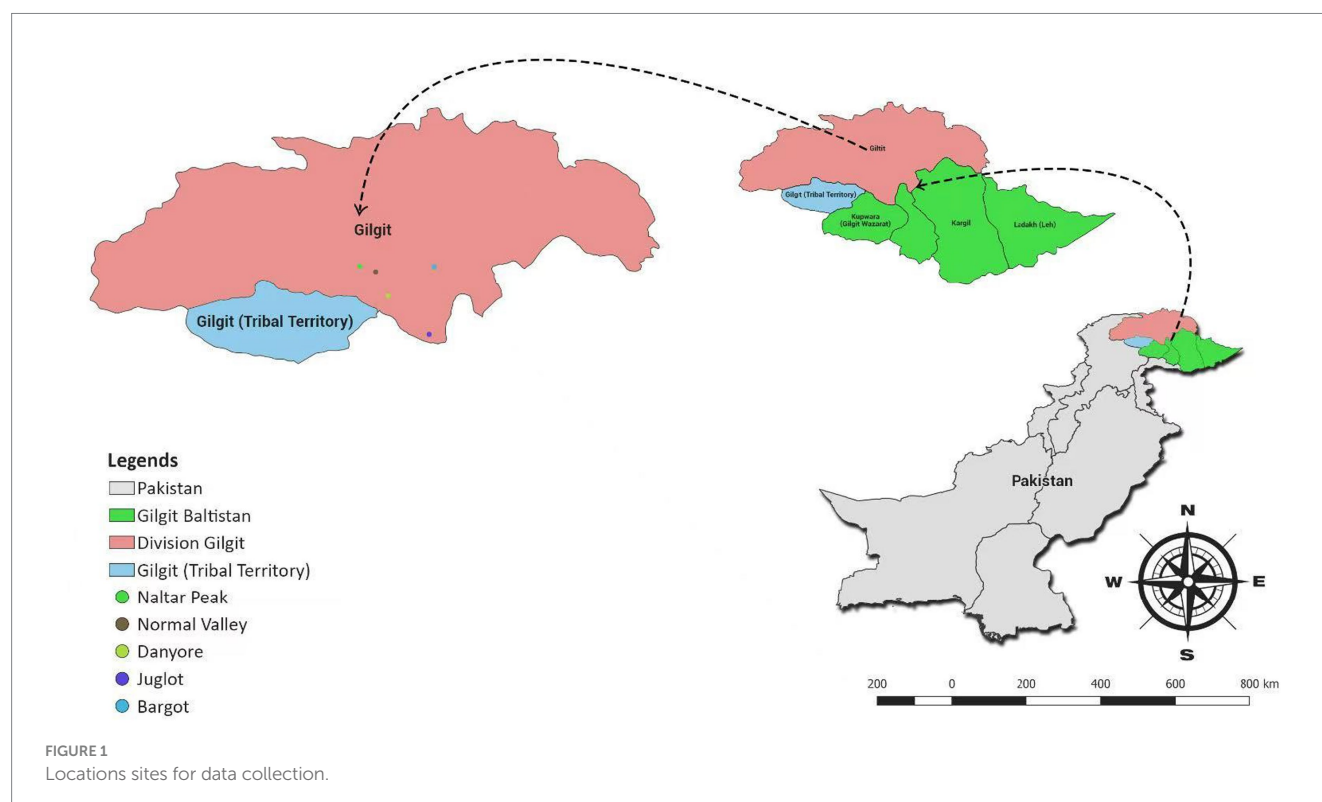
4 Study area

The focus of this research is the citizens of Gilgit-Baltistan, the tourism center and gateway between China and Pakistan. Gilgit-Baltistan, located in the northernmost region of Pakistan, serves as a key area in the context of the CPEC due to its strategic geographical position as the primary terrestrial link between the two countries and the potential benefits it stands to gain from this infrastructure project (Zhao et al., 2022). The region is known for its rich cultural diversity, picturesque landscapes, and economic significance, particularly as a conduit for trade and connectivity (Fatima et al., 2024). Historically, Gilgit-Baltistan's infrastructure has been underdeveloped, which has constrained its socio-economic progress and access to essential services (Rasul and Karki Nepal, 2024). With the advent of CPEC, however, the region is poised to experience substantial improvements in its transport,

energy, and communication networks (Karim et al., 2020). The development of road networks like the Karakoram Highway modernization, energy projects, and potential economic zones is widely cited in literature as a catalyst for facilitating cross-border trade, creating local job opportunities, and enhancing living standards for the population (Kveladze et al., 2025). The region's diverse socio-cultural fabric, including various ethnic groups, presents unique challenges and opportunities for securing local support for CPEC development (Khan and Ahmed, 2024). As such, understanding the perceptions of the Gilgit-Baltistan community is crucial, as local acceptance and cooperation are critical determinants of the project's long-term success and sustainability (Wang et al., 2020). This study specifically explores how the people of Gilgit-Baltistan perceive the potential benefits and impacts of CPEC on their community, economy, and overall quality of life, with a particular focus on how personal benefits shape their attitudes and support for development. For this study, data were collected from several regions within Gilgit-Baltistan, specifically from Bagrot Valley, Juglot, Danyore, Naltar Peak, and the Nomal Valley (Figure 1). These locations were chosen due to their high levels of project activity, demographic diversity, and accessibility. These factors ensured a broad representation of community perceptions across different socio-economic groups, allowing for a comprehensive analysis of CPEC's impact on the region.

4.1 Research instruments

To understand the overall objective of this study, we utilized several parameters. All scales and items were sourced from previous research that was well-organized and relevant to their specific areas.



A total of six constructs were incorporated into the model. These constructs include perceived CPEC infrastructure development, community development, quality of life, overall attitude, personal benefit, and support for CPEC development. A 5-point Likert scale was employed for all constructs (Hussain et al., 2019). The details of the measurement scales are as follows:

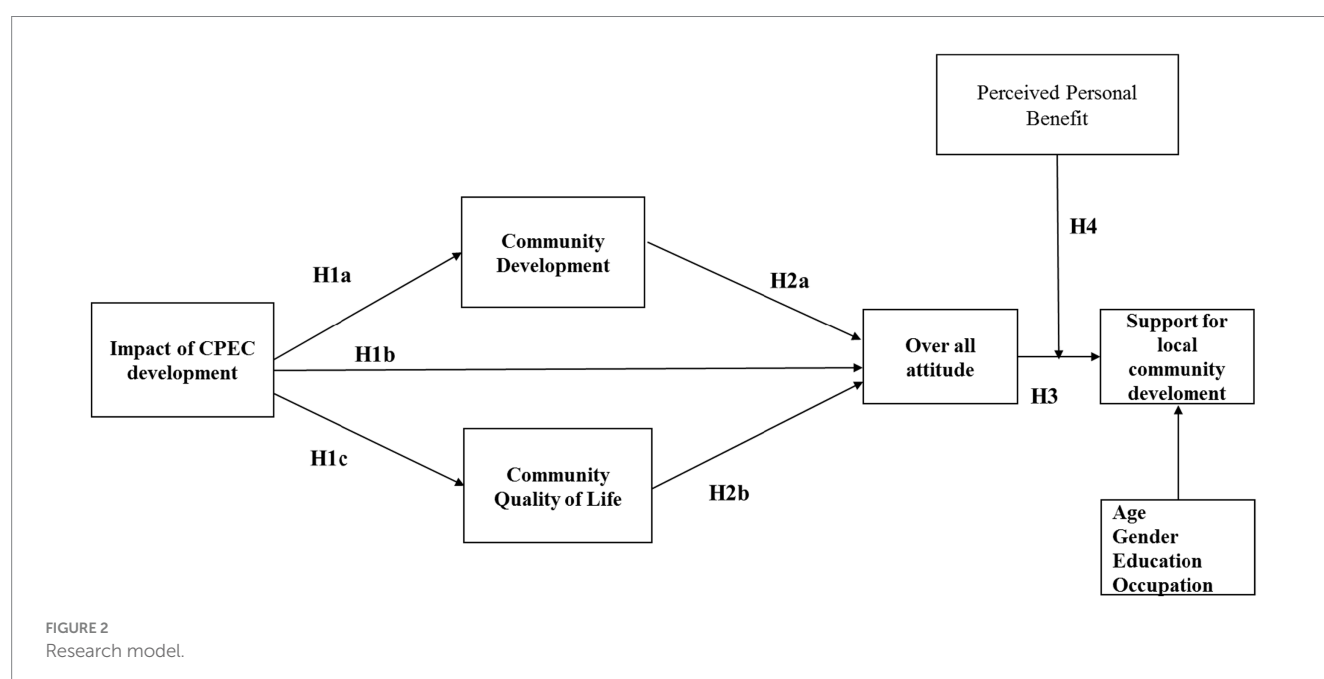
- 1 **Perceived CPEC Infrastructure Development:** The perceived impact of CPEC development was assessed using five items (Nazneen et al., 2019). These items measure the respondents' perceptions of the infrastructure development brought about by CPEC in Pakistan.
- 2 **Community Development:** Community development was assessed using the scale from Kanwal et al. (2020) and Yoon et al. (2001). This scale measures the development of local Pakistani communities, focusing on the infrastructure improvements brought by CPEC (Gao et al., 2025). A total of five items were used to evaluate community development.
- 3 **Quality of Life:** The quality of life was measured using a scale from Kanwal et al. (2020) and Yoon et al. (2001), consisting of four items. This scale assesses the improvement in the local community's quality of life as a result of CPEC project development.
- 4 **Overall Attitude:** The overall community attitude was measured using two items from Kanwal et al. (2020) and Yoon et al. (2001). This scale evaluates the local community's attitude toward the CPEC development project, capturing their overall perception of the initiative.
- 5 **Personal Benefit:** The personal benefit scale was measured using five items from Kang and Lee (2018) and Kanwal et al. (2019a,b). This scale assesses the overall personal benefits experienced by locals in relation to the development of CPEC.
- 6 **Support for CPEC Development:** The support for CPEC development was measured using five items adopted from

Kanwal et al. (2020) and Yoon et al. (2001). This scale evaluates the local community's support for the development of CPEC.

Control Variables: To assess the actual effects of the independent variables on the dependent variable, age, gender, education, and occupation of the respondents were used as control variables. The conceptual model guiding this investigation (Figure 2) posits pathways linking Perceived CPEC Infrastructure Development to community development, quality of life, and overall community attitude, which in turn influences support for CPEC development, with personal benefit moderating the final link. The information on each measurement item present in Appendix A.

4.2 Data collection procedures

This research aimed to examine local community perceptions and support for the China–Pakistan Economic Corridor development in Pakistan. A survey method was chosen, as it is particularly suitable for identifying relationships between various factors for individual participants, compared to case studies or interviews (Bell et al., 2022). In designing the survey, several steps were undertaken, including a comprehensive review by five professors specializing in economics and management, along with consultations with seven Ph.D. students with expertise in survey design. A pilot study is a critical step in refining research instruments and evaluating construct reliability (Hertzog, 2008). Prior to the main data collection, a pilot test was conducted with 55 respondents. This sample size is considered adequate for a pilot study, as it exceeds the commonly recommended guideline of using 10% of the final sample size for pre-testing and falls within the suggested range of 30–50 participants for stable reliability estimates (Yohanna, 2025). The pilot study results were satisfactory, with all constructs showing strong internal



consistency, as indicated by Cronbach's alpha (CA) and composite reliability (CR) values above the recommended threshold of 0.70 (Baharum et al., 2023). The insights gathered from the pilot study were used to make minor adjustments to improve the clarity and flow of the survey instrument. After the successful pilot, the main study was conducted. Following a thorough data screening process, the final dataset included 771 valid responses, with incomplete, duplicate, or incorrectly completed questionnaires excluded. The survey was administered in-person at various locations across Gilgit-Baltistan, including Bagrot Valley, Juglot, Danyore, Naltar Peak, and Nomal Valley, ensuring diverse geographical representation. Enumerators underwent extensive training on standardized data collection methods to ensure consistency, minimize interviewer bias, and maintain ethical standards throughout the process. The enumerators were trained on how to approach participants, explain the survey's purpose, and ensure accurate completion of the questionnaires. The sample size of 771 was determined based on recommendations for Structural Equation Modeling (SEM), which suggest that a sample size of 200–300 is typically sufficient for SEM analysis (Kline, 2016; Lomax, 2016). Jackson (2003) further emphasizes that larger sample sizes lead to more reliable SEM estimates. Thus, the sample size of 771 respondents is considered appropriate for this study. For the sampling method, purposive sampling was employed to select specific sites within Gilgit-Baltistan, particularly those with significant CPEC-related activity, demographic diversity, and accessibility. This approach allowed for a more targeted understanding of local perceptions in regions directly impacted by CPEC. Although purposive sampling provides valuable insights from specific groups, it should be noted that this approach may limit the generalizability of the findings to the broader population. Nonetheless, the study offers a deep understanding of local community attitudes toward CPEC in key areas of Gilgit-Baltistan. To assess potential non-response bias, the procedure outlined by Armstrong and Overton (1977) was followed, comparing the first 25% of responses with the last 25% across all variables. T-statistics for the means of all variables were found to be non-significant, indicating that non-response bias did not pose a threat to the validity of the study (Table 1).

5 Results and analysis

5.1 Common method variance (CMV)

Given the nature of self-reported data, the author employed several techniques to test for potential common method variance (CMV). First, the author used the method factor technique proposed by Xue et al. (2011) to assess CMV. The results showed that the average variance of the substantive factors was 76%, while the average method factor accounted for only 0.23% of the variance, indicating that CMV is not a concern in the dataset. Second, the correlation matrix in Table 2 reveals that all inter-construct correlations are below 0.90 (Kulachai, 2024), further suggesting that no significant CMV threat exists in the current study.

TABLE 1 Demographic information of the samples.

Demographic information	Number (N)	Percentage (%)
Gender		
Male	437	56.7
Female	334	43.3
Age		
21–30 years old	375	48.6
31–40 years old	350	45.4
41–50 years old	46	6.0
Education of respondents		
Under graduate	110	14.3
Bachelor	399	51.8
Master	262	34.0
Type of occupation		
Government job	164	21.3
Student	212	27.5
Business man	92	11.9
Self-employment	303	39.3

5.2 Validity and reliability

The research model in this study was assessed using confirmatory factor analysis (CFA) to evaluate the validity and reliability of the constructs. To ensure robust model fit and construct validity, several key aspects were examined, including convergent validity, discriminant validity, and reliability.

Convergent Validity: The factor loadings for each item across all constructs are presented in Table 3, and all values exceed the recommended threshold of 0.60 (Fornell and Larcker, 1981), indicating satisfactory convergent validity. In addition, the composite reliability (CR) and Cronbach's alpha (CA) values for all constructs are above the recommended threshold of 0.70, as shown in Table 3, confirming the reliability of the scales used in the study (Hair et al., 2012). The average variance extracted (AVE) scores for all constructs are greater than 0.50, further validating the convergent validity of the model (Anderson and Gerbing, 1988).

Discriminant Validity: Discriminant validity was assessed by comparing the square root of the AVE for each construct with the inter-correlations among the constructs. The results, presented in Table 2, show that the square root of the AVE for each construct is greater than the inter-correlations, confirming the discriminant validity of the research model (Fornell and Larcker, 1981). To enhance visual clarity, the square root of the AVE values in the correlation matrix have been formatted in bold. These findings provide strong evidence for the discriminant strength of the research model.

Additionally, we assessed the discriminant validity of the research model using the results presented in Table 2. The findings from Table 2 show that the square root of the AVE for all constructs is greater than the inter-correlations among the constructs, confirming the

TABLE 2 Correlations, standard deviation and means.

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
Impact of CPEC development	4.02	0.62	0.78									
Perceived benefit	3.67	0.79	0.29**	0.84								
Community development	4.03	0.60	0.42**	0.17**	0.76							
Quality of life	3.69	0.64	0.38**	0.04	0.67**	0.71						
Overall attitude	3.69	1.05	0.31**	0.51**	0.08*	0.02	0.78					
Local community support for development	3.62	0.75	0.30**	0.38**	0.31**	0.23**	0.34**	0.83				
Occupation	NA	NA	0.04	−0.16**	0.02	0.07	−0.15	−0.12	NA			
Education	NA	NA	−0.04	0.06	0.06	0.06	0.00	0.10**	−0.25**	NA		
Age	NA	NA	−0.01	−0.10**	−0.05	0.00	−0.14**	−0.20**	0.11**	−0.19**	NA	
Gender	NA	NA	−0.04	−0.07*	−0.08*	−0.07*	−0.06	−0.08*	0.14**	0.01	0.06	NA

* $p < 0.05$, ** $p < 0.001$.

TABLE 3 Confirmatory factor analysis results.

Construct	Items	Loading	CA	CR	AVE
CPEC development impact	5	0.740	0.75	0.89	0.62
		0.706			
		0.813			
		0.781			
		0.885			
Perceived benefit	5	0.786	0.89	0.92	0.71
		0.857			
		0.897			
		0.878			
		0.784			
Community development	5	0.701	0.88	0.87	0.58
		0.790			
		0.748			
		0.835			
		0.733			
Quality of life	4	0.610	0.83	0.84	0.51
		0.721			
		0.739			
		0.777			
Overall attitude	2	0.924	0.83	0.87	0.62
		0.828			
Local community support for development	5	0.894	0.89	0.92	0.69
		0.845			
		0.838			
		0.867			
		0.704			

CA, Cronbach's alpha; CR, composite reliability; AVE, average variance extracted; MSV, maximum shared variance; ASV, average shared variance = AVE > MSV.

TABLE 4 Comparison of structural and measure model.

Absolute fit measures				Incremental fit measures		Parsimonious fit measures		
Model	χ^2/DF	SRMR	RMSEA	NFI	PNFI	CFI	IFI	TLI
MM	2.50	0.05	0.06	0.92	0.91	0.94	0.92	0.94
SEM	3.51	0.06	0.06	0.90	0.86	0.94	0.91	0.91

TABLE 5 Hypothesis testing.

Path	Standard Coefficient	t-value	Result
Impact of CPEC development to community development	0.42	12.82***	Supported
Impact of CPEC development to overall attitude	0.38	11.62**	Supported
Impact of CPEC development to quality of life	0.31	9.09**	Supported
Community development to overall attitude	0.12	2.31*	Supported
Quality of life to overall attitude	0.02	0.71	Not Supported
Overall attitude to local community support for development	0.34	10.30**	Supported
Occupation to local community support for development	-0.04	-1.14	Insignificant
Education to local community support for development	0.06	1.89	Insignificant
Age to local community support for development	-0.13	-3.99	Insignificant
Gender to local community support for development	-0.08	-0.04	Insignificant

$p < 0.001$ is denoted as ***; $p < 0.01$ is denoted as **; $p < 0.05$ is denoted as *.

discriminant strength of the research model (Fornell and Larcker, 1981). To make the discriminant validity check visually immediate, the square root of the AVE values in the correlation matrix have been formatted in bold. In conclusion, the results from Tables 2, 3 validate that the research model exhibits an acceptable level of discriminant validity.

5.3 Hypothesis testing

The proposed research model was assessed using a structural equation method (SEM) approach with maximum likelihood (ML) estimation (Hair et al., 1998). The results for both the measurement model and the structural model are presented in Table 4. For the measurement model, the results are as follows: Comparative Fit Index (CFI) = 0.94, Tucker-Lewis Index (TLI) = 0.94, Incremental Fit Index (IFI) = 0.92, Normed Fit Index (NFI) = 0.92, Adjusted Goodness-of-Fit Index (AGFI) = 0.91, Standardized Root Mean Square Residual (SRMR) = 0.05, Root Mean Square Error of Approximation (RMSEA) = 0.06, and Chi-square to Degrees of Freedom Ratio (CMIN/DF) = 2.50. Similarly, for the structural model, the results are:

TABLE 6 Moderation test.

Variables	Standard coefficient	t-value	R^2
Outcome variable: support for CPEC development			0.24
Constant	0.39	1.69	
Personal benefit	0.38	8.37**	
Overall attitude	0.22	5.38**	
Overall attitude personal benefit	0.19	5.40*	
Occupation	-0.02	-0.74	
Education	0.05	1.27	
Age	-0.21	-4.02	
Gender	-0.04	-0.81	

* $p < 0.05$, ** $p < 0.001$.

CFI = 0.94, TLI = 0.91, IFI = 0.91, NFI = 0.90, AGFI = 0.86, RMSEA = 0.06, and CMIN/DF = 3.51. All of these values fall within the acceptable range as suggested by Hair et al. (2012), as shown in Table 4.

Table 5 presents the results of the structural equation modeling for the research model. The findings indicate that the impact of CPEC development significantly affects community development ($\beta = 0.42$, $t = 12.82$, $p < 0.001$), overall attitude ($\beta = 0.38$, $t = 11.62$, $p < 0.001$), and quality of life ($\beta = 0.31$, $t = 9.09$, $p < 0.001$), thereby supporting hypotheses H1a, H1b, and H1c. Furthermore, community development has a significant effect on overall attitude ($\beta = 0.12$, $t = 2.31$, $p < 0.001$), supporting hypothesis h2a. However, quality of life has an insignificant effect on overall attitude ($\beta = 0.02$, $t = 0.71$, $p > 0.05$), leading to the rejection of hypothesis h2b. Finally, overall attitude significantly impacts support for CPEC development ($\beta = 0.34$, $t = 10.30$, $p < 0.001$), supporting hypothesis h3.

5.4 Moderation analysis

To examine the moderation effect of personal benefit on the relationship between overall attitude and support for CPEC development, we used the PROCESS MACRO, as shown in Table 6. The results in Table 6 indicate that personal benefit significantly moderates the relationship between overall attitude and CPEC development support ($\beta = 0.22$, $t = 5.38$, $p < 0.001$). Therefore, hypothesis H4 is supported by the current study.

Additionally, to better understand the moderating effect of personal benefit, we utilized graphical procedures. The regression line showing the moderating effect of personal benefit on the relationship

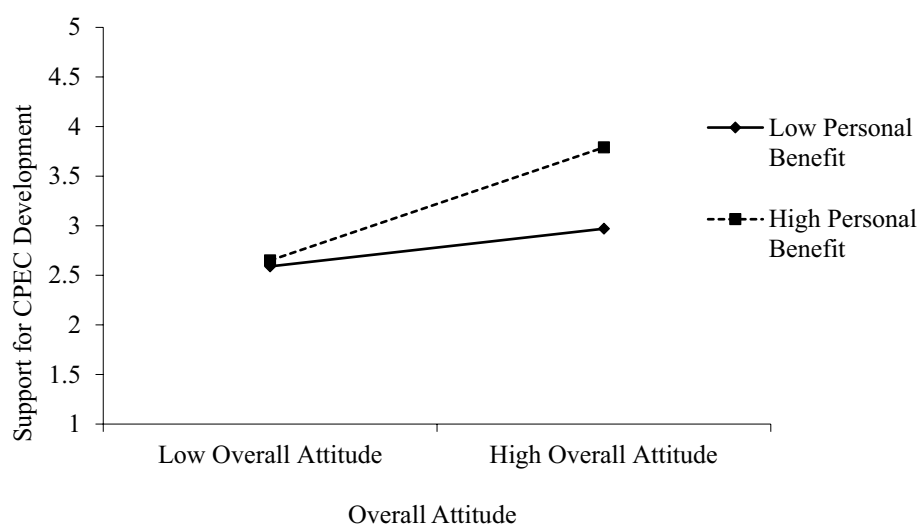


FIGURE 3
Moderating role of personal benefit with the relationship between overall attitude to support for CPEC development.

between overall attitude and support for CPEC development (Figure 3). The plot clearly shows that the line for “High Personal Benefit” is steeper, indicating a stronger relationship between overall attitude and support for CPEC development when personal benefit is high.

6 Conclusion, discussion, implications and limitations

6.1 Conclusion

This study aimed to explore the factors influencing local community support for the China–Pakistan Economic Corridor specifically focusing on the roles of community development, quality of life, and personal benefit. The analysis, based on survey data from 771 respondents across Pakistan, revealed several important insights. Firstly, our findings affirm that CPEC-related infrastructure development is widely viewed as a key driver of community development and improvements in quality of life. However, these two factors have distinct impacts on community support. While perceived community development plays a significant role in fostering a positive attitude toward CPEC, improvements in quality of life alone do not directly translate into a more favorable view. This suggests that communities place greater value on concrete, collective gains rather than broader, abstract enhancements in living standards. Ultimately, a positive community attitude is a strong predictor of support for CPEC. However, the most significant factor is personal benefit. The relationship between a favorable attitude and active support is considerably stronger among individuals who perceive direct personal advantages from the project. This highlights an important point: community support is not purely altruistic; it is driven by the expectation of tangible rewards. For policymakers and project planners, this research presents a clear recommendation: the success of large-scale projects like CPEC hinges on local community buy-in. To secure this support, strategies should go beyond overarching

economic promises. It is crucial to design initiatives that deliver visible, localized development and create opportunities for residents to directly benefit, such as through employment or business ventures. Without a focus on these concrete, localized benefits, projects risk being seen as external impositions, leading to indifference or even resistance.

6.2 Discussion

This research investigates the support of the local Pakistani community for the CPEC development project, using primary data from Pakistan. Our findings indicate that most of the hypotheses were supported, with CPEC development having a positive effect on community development, overall attitude, and quality of life, supporting hypotheses H1a, H1b, and H1c. These results are consistent with previous studies (Kanwal et al., 2019a,b,c), which suggest that CPEC projects benefit the local community. However, the finding that quality of life does not significantly influence overall attitude (contrary to hypothesis H2b) is particularly noteworthy and warrants further discussion. Several factors could explain this result:

- 1 Perception of Government Obligation:** Improvements in QOL, such as better infrastructure and public services, may be viewed by the local community as part of the government’s duties rather than specific outcomes of the CPEC initiative. As such, these improvements might not be seen as a direct benefit of CPEC, thus failing to positively influence attitudes toward the project.
- 2 Lag Effect:** The effects of improvements in QOL, such as better roads and increased electricity access, may be gradual and long-term, leading to a delayed impact on attitudes. In contrast, community development (e.g., new buildings or visible projects) offers more immediate and visible results, which may explain why it has a stronger effect on attitudes toward CPEC.

- 3 Negative Offsetting Effects:** While improvements in QOL are generally beneficial, their impact may be counteracted by negative effects such as inflation, pollution, or social disruption, which were not measured in this study. These adverse factors could neutralize the positive perception of QOL improvements, leading to more neutral or even negative attitudes toward CPEC.

This finding also connects to the limitation we acknowledge in the study regarding the lack of exploration of the negative effects of CPEC. Future research that considers both the positive and negative impacts of CPEC could provide a more comprehensive understanding of how QOL influences attitudes toward large-scale development projects.

6.3 Implications

This study has several theoretical and practical implications. First, it contributes to the development of Social Exchange Theory (SET) by demonstrating that in the context of mega-infrastructure projects, the theory's cost-benefit calculus is moderated by personal benefit. Specifically, our findings show that a positive attitude toward a project like CPEC only translates into support if individuals perceive a direct, personal gain. This extends SET by illustrating that the perceived personal benefit strengthens the relationship between overall attitude and support for development projects, which has important implications for understanding local community engagement in large-scale projects. Second, the results suggest that CPEC development officials should consider the personal benefits of the local community and tailor their policies to align with these benefits. Personal benefit serves as a critical factor in strengthening community support, and thus, understanding local perceptions of personal gain can help tailor more effective development strategies. Third, the study indicates that the overall attitude of the local community has a positive effect on support for CPEC development. This suggests that the local community's attitude may shift in response to the benefits and regional development stemming from CPEC. Consequently, we recommend that CPEC authorities focus on developing projects that directly benefit the local population. Establishing health centers, parks, schools, and universities under the CPEC project could significantly enhance the perceived personal benefit, leading to greater support for the project. Finally, we advise that CPEC development officials emphasize the benefits of the CPEC project to the local community through various communication channels, such as social media, television, or community meetings (Ullah et al., 2025). By increasing awareness of these benefits, the local community is more likely to offer greater support, and their overall attitude toward the project will become more positive.

6.4 Limitations

While this research provides valuable insights into the impact of CPEC infrastructure development on local communities, several limitations should be acknowledged. First, the study primarily focused on the positive outcomes of CPEC development for local communities, without fully addressing the potential negative effects. Future research should explore the negative consequences of CPEC development, particularly in terms of its impact on local living standards, social cohesion,

and cultural preservation. The need to assess the broader socio-economic impacts of CPEC, especially concerning communities that may not equally benefit from the project (Ali, 2018). Additionally, the data collected for this study was primarily sourced from respondents who generally supported CPEC, which limits the scope of the findings. This study does not capture the perspectives of individuals or groups who oppose CPEC development, particularly those from regions like Baluchistan and Khyber Pakhtunkhwa, where significant political and public opposition exists. These regions often revolve around the equitable distribution of CPEC's benefits and fears that the project may exacerbate existing regional disparities (Khan et al., 2022; Wolf, 2017). Therefore, future research should specifically investigate the sources and underlying reasons for this opposition. Understanding these viewpoints will be crucial for assessing the long-term sustainability of CPEC and ensuring that the development is inclusive and equitable. A second limitation lies in the narrow focus on the personal benefit of local communities as a moderating variable in the relationship between attitudes toward CPEC and community support for the project. While this variable provides useful insights, it only scratches the surface of the broader factors influencing local support. Future studies could expand on this by exploring additional moderating variables, such as the educational benefits, healthcare improvements, or broader economic benefits resulting from CPEC development. These constructs may offer deeper and more nuanced insights into the factors that shape community support or opposition to the project. Understanding the multi-dimensional aspects of CPEC's impact on local communities is essential for accurately assessing the long-term viability of such large-scale infrastructure projects (Hassan, 2020). While the "Overall Attitude" construct in this study is measured using only two items, we acknowledge that two-item scales can sometimes raise concerns regarding reliability. However, in this case, the two items used in the scale were selected based on their ability to capture the core aspects of the community's overall attitude toward CPEC (Nunkoo and Ramkissoon, 2010; Sirakaya et al., 2002). Additionally, the factor loadings for these two items were found to be greater than 0.8, indicating a high level of reliability for the scale. Despite this, we recognize the limitation of using a two-item scale and suggest that future research could explore the use of more items to further improve reliability and validity (Yoopetch, 2022). Furthermore, while our respondents were diverse in terms of occupation and educational background, the study still relies on a sample that may not fully capture the complexities of local perceptions. This limitation is particularly pertinent in the context of Gilgit-Baltistan, which includes many less-educated and rural inhabitants who may have different views on CPEC development. The current sample, which is predominantly from a more educated population, may not reflect the perspectives of these groups. To enhance the richness and depth of the findings, future researchers are encouraged to incorporate qualitative methods, such as in-depth interviews or focus groups, particularly targeting underrepresented groups such as less-educated and rural populations. These methods can provide more detailed and personalized insights into how different segments of the local community perceive CPEC, leading to alternative findings that may not be captured through quantitative surveys alone. This research has contributed to understanding the role of CPEC in local community development. However, there remains much to explore in terms of its broader socio-political implications. Future research should consider a 155 more comprehensive, multi-faceted approach to studying the diverse impacts of CPEC, including negative effects, opposition viewpoints, and the wider social and economic benefits or drawbacks that may arise from this ambitious infrastructure project.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the [patients/participants OR patients/participants legal guardian/next of kin] was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

YJ: Conceptualization, Resources, Project administration, Writing – review & editing. SK: Investigation, Data curation, Writing – review & editing. SH: Methodology, Formal analysis, Validation, Writing – original draft, Writing – review & editing. IUK: Data curation, Visualization, Writing – review & editing. MHR: Software, Writing – review & editing. BC: Supervision, Funding acquisition, Writing – review & editing.

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Appendix A

TABLE A1 Measurement model.

No	Construct	Items	Scale	Scale
1	Impact of CPEC development	5	1. CPEC will enhance road quality. 2. CPEC will expand transportation facilities. 3. CPEC will improve the quality of public facilities. 4. CPEC will improve standards of restaurants and hotels. 5. CPEC will boost local trade in the area.	Likert scale 1–5
2	Perceived benefits	5	1. CPEC will expand Pakistan's road networks. 2. CPEC will strengthen public and private transport systems. 3. CPEC will enhance the quality of public facilities. 4. CPEC will accelerate trade growth in Pakistan. 5. CPEC will speed up community development.	Likert scale 1–5
3	Community development	4	1. PEC construction destroys the natural environment. 2. CPEC will Increase air pollution. 3. CPEC disrupts local cultural practices. 4. CPEC causes traffic congestion.	Likert scale 1–5
4	Quality of life (QOL)	3	1. I am satisfied with CPEC's environmental improvements. 2. I am pleased with CPEC's economic benefits in my area. 3. I appreciate the social opportunities created by CPE	Likert scale 1–5
5	Overall attitude		1. CPEC will improve the quality of roads. 2. CPEC will provide transport facilities. 3. CPEC will enhance public facilities. 4. CPEC will boost restaurant and hotel quality in the area. 5. CPEC will increase trade in the region.	
6	Community support for CPEC	5	1. CPEC ought to progress. 2. CPEC brings more visitors to the region. 3. The area economy will be significantly impacted by CPEC. 4. Development of CPEC is vital to the area. 5. Supporting services development (travel agency, hotel, restaurants, entertainment, etc.)	Likert scale 1–5