Bulletin of Business and Economics, 12(3), 402-409
https://bbejournal.com
https://doi.org/10.61506/01.00047

Public-Private Partnerships (PPPs) in Construction Projects: A Study on the Utilization, Effectiveness, and Challenges in Pakistan

Nijah Akram[1], Dr. Syed Sohaib Zubair[2], Fahad Asghar[3], Zuhaib Nishtar[4], Kashif Lodhi[5]

Abstract
Public-Private Partnerships (PPPs) have emerged as a vital strategy for addressing infrastructure development challenges worldwide, including in Pakistan. This study explores the challenges and effectiveness of PPP models in the construction sector in Pakistan, focusing on critical aspects of regulatory complexity, changing jurisdiction, coordination issues, financial constraints, and the absence of standardized resources. To gauge the effectiveness of different PPP models, the study examines the Build-Operate-Transfer (BOT), Design-Build-Operate-Maintain (DBOM), and Concession Agreement models. The BOT model has proven effective for large-scale infrastructure projects but remains vulnerable to political instability. The DBOM model faces financial and regulatory challenges, while concession agreements may encounter public accountability and stakeholder conflict issues. The study highlights that the choice of an appropriate PPP model in Pakistan should align with project-specific requirements and challenges. It underscores the significance of addressing political risks, regulatory issues, and ensuring transparent communication with stakeholders. In conclusion, the study offers insights into the challenges and effectiveness of PPP models in Pakistan's construction sector. It recommends the need for a coordinated approach among government entities, robust project screening and evaluation, transparent and competitive tendering processes, and thorough project monitoring. Additionally, it calls for the development of comprehensive guidelines and model documents. Future research should consider the contextual variations in different settings to enhance generalizability and employ a combination of data sources to mitigate interview bias. This study contributes to the ongoing discourse on improving PPP implementation in Pakistan, with the potential for broader applicability in similar contexts.
Keywords: Public-Private Partnerships, construction projects, effectiveness, challenges

1. Introduction

In the dynamic landscape of structure growth, Public-Private Partnerships (PPPs) have emerged as a key mechanism for governments to collaborate with private entities in order to undertake and deliver large-scale construction projects (Yong Kim & Thru, 2021). Pakistan, a country marked by a growing demand for modern infrastructure to meet the needs of its burgeoning population, has increasingly turned to PPP models as a solution to bridge the infrastructure deficit and stimulate economic growth (Attarzadeh et al., 2017).

Value for money (VfM) in the resources and facilities provided and utilising the ability and competence of the private sector are the main goals of Public-Private Partnerships (PPPs) for the public partner (Bao et al., 2018). In the meantime, the private partner or partners want to make sure that the reoccurrence on asset is appropriate with the degree of menace. PPPs often outperformed traditional procurement methods in relations of price and interval efficiency during the provision stage of project, according to a study that compared the two.

Even though PPP procurement is widely used, there have been some instances of project failure due to implementation problems, especially in the project delivery and operation phases (Bao et al., 2018). Sofinancialme of these problems include underbidding by private sector partners, overly optimistic demand forecasts, inadequate risk allocation by the public partner, higher costs associated with private capital, conflicts of interest, and a lack of transparency and public trust. (Soomro & Zhang, 2015).

Pakistan, with its diverse topography, faces a multitude of infrastructure challenges. Insufficient transportation networks, inadequate energy supply, and inadequate healthcare facilities are just a few examples of the pressing needs that require immediate attention (Mangu et al., 2021). Addressing these issues is imperative for improving the overall quality of life and ensuring sustainable economic growth (Wang et al., 2019). To tackle these challenges, the Pakistani government has increasingly adopted Public-Private Partnership models as a means of financial, constructing, and operating various setup projects. PPPs offer a unique opportunity to leverage private sector expertise, capital, and efficiency, while simultaneously reducing the fiscal burden on the government (Cherkos & Jha, 2021). This research aims to comprehensively explore the utilization of PPP models in construction projects in Pakistan, evaluating their effectiveness and identifying the challenges faced in their implementation.

1.1. The Significance of the Research

Given the strategic importance of PPPs in addressing Pakistan's infrastructure needs, it is vital to examine their utilization, assess their effectiveness, and identify the challenges inherent in their implementation. This research seeks to contribute to the existing body of knowledge by providing insights into the specific dynamics of PPPs within the Pakistani context.

1.2. Objectives of the Study

The primary objectives of this research were as follows:

[1] Department of Architectural Engineering Technology, Punjab Tianjin University of Technology Lahore, Pakistan, akramnijah@gmail.com
[2] Assistant Professor, Institute of Administrative Sciences, University of Punjab, Lahore, Pakistan, Sohaib.iqtm@pu.edu.pk
[3] Department of Management Sciences, Qurtuba University of Science and Technology, Dera Ismail Khan, Pakistan, fahadasghar214@gmail.com
[4] Department of Electrical Engineering and New Energy, China Three Gorges University, Yichang, China, zuhaib.nishtar1991@gmail.com
[5] Deapartment of Management, Economics and Quantitative Methods, Università degli Studi di Bergamo via dei Caniana 2, 24127 Bergamo (BG), Italy, k.lodhi@studenti.unibg.it

- To evaluate the effectiveness of PPP models in construction projects in Pakistan in terms of delivering infrastructure on time, within budget, and in accordance with quality standards.
- To identify the key challenges and obstacles faced in the implementation of PPPs in Pakistan, ranging from regulatory issues and political instability to financial constraints and stakeholder conflicts.
- To provide recommendations and policy insights for enhancing the efficiency and success of PPP projects in Pakistan.

This research will focus on construction projects implemented through PPP models in Pakistan. The study will encompass a wide array of infrastructure sectors, including transportation (e.g., roads, bridges, airports), energy (e.g., power generation and distribution), and social infrastructure (e.g., hospitals and schools).

2. Literature Review

Inadequate procurement procedures put construction projects at serious risk in poor nations like Pakistan and frequently cause disagreements among project stakeholders (Bao et al., 2018). Relational partnering, which strives for value-based buying, is one way to deal with this problem. It entails incorporating relational risk management as a proactive tactic and coordinating client values with project stakeholders' performance expectations. This strategy directly affects the outcome of the project (Osei-Kyei & Chan, 2017).

A long-term contractual agreement between a public agency and a private organisation characterises Public-Private Partnerships (PPPs), an unconventional approach to procurement. Private companies often engage in public infrastructure through PPPs and use techniques like build-own-operate-transfer (Guo et al., 2021). PPPs can use a variety of models, such as leasing, concessions, joint ventures, privatisation, and alternative contracts. However, the ability of private organisations to manage risk is a major factor in PPP performance. Additionally, PPPs place a strong emphasis on resolving pre-contract concerns prior to project completion (Osei-Kyei & Chan, 2017). PPPs establish a relational contracting-based cooperative ecosystem. In this setting, participants take on flexible roles and duties and make use of methods for mutually agreeable resource, risk, and reward sharing. This approach fosters cooperation and enhances the overall efficiency of PPP projects (Huynh et al., 2020).

Public-Private Partnerships, or PPPs, have a long and distinguished history in the annals of global development. The concepts of "new public management" and "neoliberalism" have been more well-known in the modern era as forces behind improved public administration (Ullh et al., 2017). These guidelines place a strong emphasis on public-private sector collaboration and managerial coordination. Furthermore, PPPs have become more significant due to the growing emphasis that international development funding institutions have placed on them (Guo et al., 2021).

However, events like the COVID-19 pandemic or downturns in the financial markets have the potential to trigger changes in the global landscape of PPP projects (Ahmadabadi & Heravi, 2019). Due to the longer recovery period, these interruptions typically have long-lasting effects on PPP projects involving private investments in the construction of public roads. As a result, according to Mazher et al. (2018), the institutionalisation process, which shapes the atmosphere and the ability to face difficult difficulties, is intrinsically tied to the recital of PPP tasks.

A crucial component of guaranteeing the success of relational contracting is assessing PPP project performance (Saeed et al., 2018). This method has been successfully used in public projects in a variety of industries, including the building of social infrastructure such as hospitals, tourist attractions, and infrastructure for charging electric vehicles. The creation of a performance framework gets over a number of obstacles, such as national context, project type and stage, and industry or sector peculiarities (Guo et al., 2021). Though Pakistan is lagging behind other developing countries, the creation of a sector-specific performance framework is dependent on how PPPs evolve, what reforms are implemented, and how much of them are implemented (Ahmadabadi & Heravi, 2019).

It is crucial to understand that a nation's particular political, cultural, and financial requirements have an impact on the adoption of PPPs. Therefore, the difficulties that developing nations face are very different from those that wealthy nations face (Almarri & Abuhijleh, 2017). Due to the complexities of Public-Private Partnership (PPP) as a procurement strategy for phased road edifice plans, which aims to provide the best VFM, competitive difficulties arise on a worldwide scale. Understanding the dynamics of PPPs in the edifice business has been the focus of significant academic efforts over the last 20 years (Saeed et al., 2018).

The empirical aspects of PPPs have been clarified by study by Cheng et al. (2018), with an emphasis on relationships, risks, and financial. Non-empirical research has also given light on topics such as finance, project success, risks, and concession durations. Six study needs have been noted more recently by Fellows and Liu (2021) in relation to government control, flexible contracting, performance appraisal, social effect assessment, risk management efficiency, and knowledge management within PPP projects.

Remarkably, eight years later, an additional analysis confirmed the same themes, including social networks, adoption, risk sharing, conceptualization, and performance in the setting of public-private partnerships (PPPs) (Ahmad et al., 2021). The following five variables were found to be the most important for PPP project performance in another review study: adequate risk allotment and sharing, a durable remote association, governmental provision, civic and public support, and open procurement procedures (Cheng et al., 2018). Similar difficulties with financial management, concession terms, pricing purpose, effective phases, management of risk, task obtaining, and management of stakeholder were identified in the framework of public-private partnerships (PPPs) by Ahmad et al. (2021).

In the last decade, a numeral of significant studies have inspected the execution and outcomes of Public-Private Partnerships (PPP) in Pakistan. To understand the PPP structure and the impact of intermediaries and stakeholders on project performance, one study used network theory (Ullah et al., 2018). PPP in particular is one of the atypical procurement strategies that another study supported for road construction projects. Another study revealed differences in viewpoints and attitudes among PPP project stakeholders (Ullah & Thaheem, 2018). An examination of the factors that contribute to PPP failures in the transport industry showed that improper choices and actions made by private-sector partners frequently caused PPP failures.

Furthermore, a study on concessions related to PPPs sought to examine the differences between industry and academia with respect to important success criteria. It was shown to be a significant gap. A system dynamics model was created in a different study to determine the connections between important success elements (Fellows & Lie, 2021). Another field of study was the modelling of risk allocation capabilities in PPPs for stakeholders, impacted by market, sector, and project contexts. Assessments of the political and socioeconomic factors influencing transport PPP failures were carried out. Moreover, an effort was made to create a risk-severity medium for supportable PPP projects that was in line with the Sustainable Development Goals of the UN (Ullah et al., 2018). A different study highlighted the importance of stakeholder satisfaction by classifying PPP project success into four dimensions: time, cost, objectives, excellence, and contentment. The amount of research that is now accessible emphasises the necessity of a thorough, dynamic, and continuing framework for performance assessment for PPP projects in Pakistan. Presently, a recital of this kind (Saeed et al., 2018). There is glaringly no Evaluation Framework (PEF) designed for PPP transactions that are successful in road construction projects. PPPs are seen by national, provincial, and municipal public organisations in Pakistan as a feasible way to carry out capital projects, particularly in industries like ports, energy, and infrastructure that are frequently financed by outside sources (Soomr et al., 2020). However, it is commonly known that there is a substantial danger of disappointment when adopting PPPs in underdeveloped nations, and Pakistan is no omission. This study endeavors to shed light on the effectiveness of PPP models and explore the challenges surrounding the implementation of PPP projects within the Pakistani context.

3. Methodology

The methodology of this research was structured to employ a qualitative approach. Primary data was collected through interviews with key stakeholders, such as government officials, private sector representatives, and experts in the field. Secondary data was sourced from government reports, academic literature, and previous research studies.

The study commenced with a inclusive assessment of the prevailing collected works, providing an impression of the global utilization of PPP models in edifice projects and their applicability in Pakistan. It also delved into the theoretical foundations of PPPs and the key factors influencing their effectiveness. To evaluate the effectiveness of PPP models in construction projects in Pakistan, a careful analysis was conducted on the performance of selected projects. This analysis included an examination of their cost-effectiveness, timely completion, and adherence to quality standards.

To identify and discuss the challenges come across in the application of PPPs in Pakistan, a range of obstacles were investigated. These obstacles encompassed regulatory constraints, political instability, financial constraints, and social factors that were evident during the research period.

4. Data Analysis

4.1. Challenges in implementing PPP models in Pakistan

Regulatory Complexity and Overlap

The federal procurement rule delivers a reasonably solid agenda for limpidity and rivalry in PPP plans. However, the situation becomes more intricate when sector and provincial laws come into play. These regional regulations introduce a layer of regulatory uncertainty and can potentially result in overlapping or conflicting efforts. Furthermore, the absence of a unified approach means that projects under the provincial PPP framework are not always focus to the federal PPP basis, creating disparities and adding regulatory risks for the private sector.

Changing Jurisdiction of Energy and Projects

Historically, energy projects exceeding capacity and ports in Pakistan were overseen by the federal government. However, recently, these plans have transitioned to the provincial level. This transition has added a degree of complexity to the regulatory landscape. While the provinces have taken control, the federal government still plays a role during the final phases of project development, particularly concerning the support of government assurance outlines.

Coordination and Regulatory Risks

While the federal government acknowledges the possible of PPPs in substructure growth, a absence of organization consequences in overlying exertions and controlling dangers for private sector participants. Disputes and conflicts can arise due to the absence of a clear framework for disagreement determination, pacification, and adjudication. Many line ministries also absence involvement in contract negotiation, often relying on international consultants for technical assistance.

Shortage of Long-Term Debt Financial

One of the biggest obstacles is the lack of lasting dues funding available in the market. Short- to medium-term loans are what commercial banks often give, which might shorten the payback period and lessen the financial sustainability of PPP projects. Rarely, 10- to 15-year loans connected to the obtainable degree were given by commercial banks. Certain regulatory

frameworks that guaranteed profits, such those governing wind and solar projects with predetermined feed-in tariffs that reduced revenue risk for the private sector, allowed for these exceptions.

Lack of Guidelines and Model Documents

Pakistan lacks comprehensive rules, lists, and typical forms for various sectors involved in PPP projects. This absence of standardized resources can discourage private sector investments, as it complicates the process and raises concerns about consistency and fairness in contractual arrangements.

Provincial Capacity Challenges

At the provincial level, another challenge is the limited capacity of provincial governments. They frequently struggle to find and develop initiatives that have a good chance of succeeding, as well as to offer enough funding and assurances. The lack of resources and experience at this level can hinder the efficient execution of PPP projects.

Table 1: Challenges in Public-Private Partnerships (PPP) in Construction in Pakistan

Themes	Challenges
National PPP Legal and Regulatory Framework	Inadequate PPP legislation and regulation
	Frequent changes in regulatory framework
	Lack of clarity in the legal framework
	Weak enforcement of PPP contracts and agreements
	Difficulty in dispute resolution
	Lack of standardized PPP model contracts
PPP Institutional Framework	Limited capacity of the PPP Unit
	Bureaucratic hurdles in project approvals
	Insufficient coordination among stakeholders
	Inconsistent procurement practices
Environmental and Social Issues	Environmental degradation due to weak assessments
	Insufficient attention to social impact assessment
	Delays caused by environmental compliance issues
	Resistance from local communities
	Lack of enforcement of environmental safeguards
Funding Sources	Limited access to project finance
	High cost of capital for PPP projects
	Limited private sector investment
	Reliance on government funding
	Difficulty in securing project financial

4.2. Effectiveness of PPP models used in Pakistan

Build-Operate-Transfer (BOT) Model, while the BOT model is effective in delivering infrastructure, it can be vulnerable to political instability. Changes in government or policy can disrupt long-term projects, affecting private partners. Addressing political risks is essential for the continued success of this model in Pakistan.

Design-Build-Operate-Maintain (DBOM) Model, the DBOM model may face challenges in terms of financial and regulatory issues. Long-term funding commitments and complex regulatory frameworks can be daunting for private partners. Effective risk-sharing mechanisms and clear regulatory guidelines are crucial.

Concession Agreements, concession agreements may face challenges related to public accountability and stakeholder conflicts. Revenue-sharing arrangements can sometimes raise concerns about equity and transparency. Effective communication with all stakeholders and transparent revenue-sharing mechanisms are essential.

While each PPP model has its merits, the effectiveness of a specific model in Pakistan depends on the nature of the project, financial requirements, and the ability to mitigate challenges.

In Pakistan's construction policies, the Build-Operate-Transfer (BOT) model has often been effective for large-scale infrastructure projects, particularly in transportation and energy sectors. Its potential to leverage private sector financial and the long-term commitment of private partners align with Pakistan's objectives of timely project delivery and adherence to quality standards. However, it is crucial to address challenges like political instability and regulatory issues to make the BOT model more effective. In practice, a combination of models might be the most practical approach, considering the diverse infrastructure needs and challenges faced by Pakistan. Ultimately, the choice of the most effective PPP model should be project-specific, taking into account the specific requirements, financial feasibility, and the ability to manage associated challenges. Careful consideration of these factors can lead to the successful implementation of PPPs in Pakistan's construction projects.

Table 2: Effectiveness of construction projects though PPP

Theme	Description	Analysis
Accountable Assistance	The documentation, assortment, support, groundwork, offering, and checking of PPP plans in their particular subdivisions are the responsibilities of a number of government institutions, including line ministries, federal agencies, province and municipal governments, and state-owned companies.	The distribution of responsibilities among different government bodies indicates a decentralized approach to PPP project management. However, this also highlights the need for coordination and cooperation among these entities to avoid overlapping efforts and ensure a smooth process.
Plan Commencement	The project initiation phase involves deciding to explore PPP for project development, identifying potential projects, screening based on criteria, registering with the PPP Cell/Unit, and evaluating technical and financial proposals.	The initial steps emphasize the importance of thorough project screening and evaluation before proceeding with PPP. Registering with the PPP Cell/Unit is crucial for tracking and coordinating PPP projects. The involvement of multiple stakeholders from the outset should facilitate better project selection.
Plan Groundwork	This phase includes viability revisions, reviews of conclusions and recommendations, and deciding on project continuation, rejection, or reconsideration.	Ensuring that projects are well-prepared and feasible is essential to prevent the wastage of resources and time. Decisions regarding project continuation or rejection should be made based on comprehensive analysis and risk assessment.
Contract Implementation	This phase encompasses project marketing, market sounding, finalizing project structure and tender documents, private partner selection through a two-stage process, and bid evaluation.	A transparent and competitive tendering process is emphasized, with prequalification and bidding stages. This approach aims to attract qualified private partners. The bid evaluation process is outlined in detail, focusing on technical, operational, environmental, and financial aspects. Multiple bids provide flexibility and competition.
Construction, Operation, and Transfer	This phase involves monitoring project implementation, operation, and financial performance. It also entails getting ready for the project's return to the government at the conclusion of the PPP contract.	Effective project monitoring ensures that PPP projects adhere to plans, performance standards, and financial obligations. Preparations for project transfer at the end of the agreement are essential to ensure a smooth transition and avoid disputes. The specified timeframe for financial closure adds a sense of urgency to the process.

5. Discussion

The analysis of the implementation of Public-Private Partnerships (PPPs) in construction projects in Pakistan, it reveals several important findings. These findings align with previous studies and underline the significance of addressing the identified challenges while leveraging the strengths of the PPP approach (Soomro et al., 2020).

The distribution of responsibilities among various government entities reflects a decentralized approach to PPP project management (Memon et al., 2021). This finding is in line with preceding research, by Ullah et al. (2018), which emphasizes the need for effective stakeholder coordination in PPP projects. Without clear communication and cooperation mechanisms, the risk of regulatory complexity, overlapping efforts, and inefficiencies increases. Lessons from international case studies, as highlighted in the research, stress the importance of streamlining responsibilities to avoid conflicts and ensure smoother project execution (Noor & Khalfan, 2017). The emphasis on thorough project screening and comprehensive risk assessment during project inception aligns with best practices recommended by scholars like Naveed (2015). Prior studies have highlighted the potential risks associated with inadequate project selection and due diligence, leading to PPP project failures. Therefore, ensuring that projects are well-prepared and feasible is essential, as this reduces the risk of resource wastage and aligns with the principles of value for money, as outlined in the study by Jayasuriya et al. (2019).

The importance of a transparent and competitive tendering process in the transaction execution phase is supported by previous research. Studies like Wang et al. (2018) have noted that competitive bidding enhances the quality of private sector participation in PPPs. The use of prequalification and two-stage bidding processes, as indicated in the analysis, is consistent with the principles of risk mitigation and value for money discussed in the literature (Cui et al., 2018). Effective project monitoring and preparation for the transfer of projects back to the government at the end of the PPP agreement reflect best practices in the literature. Studies, such as those by Bakhtawar et al. (2022) and Zhang et al. (2019), stress the significance of performance monitoring to ensure projects adhere to planned standards. Proper preparation for project transfer helps avoid disputes and operational disruptions, aligning with lessons from successful PPP implementations worldwide. Overall, the

analysis demonstrates that Pakistan is committed to embracing the core principles of successful PPP implementation, as advocated by previous research (Cheng et al., 2018). By addressing the identified challenges, streamlining responsibilities, promoting rigorous project evaluation, and ensuring transparency in procurement and monitoring processes, Pakistan can enhance the effectiveness of PPP models in construction projects (Saha et al., 2018; Zhao & Ying, 2019).

These findings underscore the importance of building a regulatory framework that encourages transparency and cooperation, thereby mitigating the challenges (Abas et al., 2022). Furthermore, they highlight the need for standardized procedures and comprehensive guidelines, addressing the absence of which is a challenge in the PPP environment. Pakistan's commitment to implementing best practices and learning from previous studies is a positive step towards ensuring value for money, efficient project delivery, and successful PPP projects in the construction sector (ADB, 2021).

6. Conclusions

Public-Private Partnerships (PPPs) have emerged as a vital instrument for spurring infrastructure development and economic growth in Pakistan. As the nation grapples with the immense task of bridging its infrastructure deficit, PPPs offer a compelling method to assemble private division possessions, promote efficiency, and deliver quality services to its citizens. In this concluding section, we synthesize the key insights drawn from our analysis of PPP challenges and effectiveness, supported by existing research, and we propose a roadmap for enhancing PPP implementation in Pakistan. The existence of a complex regulatory environment characterized by overlapping federal and provincial regulations remains a persistent challenge. This not only introduces regulatory uncertainty but also creates regulatory risks for private sector participants.

The transition of energy and port projects from federal to provincial jurisdiction adds another layer of complexity. While decentralization can improve project alignment with local needs, it also necessitates close coordination between federal and provincial authorities. Inefficient coordination between different government entities is a common thread throughout the analysis. The lack of a clear dispute resolution framework can potentially lead to conflicts and disputes. International experiences. The inadequacy of long-term debt financial in Pakistan's financial market presents a formidable challenge. The absence of suitable long-term financial instruments can discourage private sector investment, particularly in projects with extended payback periods. The absence of standardized resources, such as guidelines, checklists, and model documents, complicates the PPP process. This gap not only raises concerns about consistency and fairness but also acts as a deterrent for private sector investments. A robust regulatory framework should ideally include these elements, as recommended in international best practices. At the provincial level, the limited capacity of regional governments poses its unique set of challenges. The deficiency of resources and experience can hinder the efficient execution of PPP projects. This is a challenge that must be overcome through capacity-building initiatives.

6.1. Recommendations

To overcome these challenges and promote more effective PPP implementation in Pakistan, several recommendations can be drawn from both our analysis and prior research.

Reforms in the regulatory framework should focus on streamlining federal and provincial regulations to reduce complexity and uncertainty. There is a need for a well-defined division of responsibilities, clear dispute resolution mechanisms, and the harmonization of legal and regulatory standards.

Pakistan must enhance coordination among government entities to avoid overlaps and disputes. This can be achieved by fostering a collaborative culture that encourages regular communication and cooperation. Capacity-building initiatives, particularly at the provincial level, should be a priority to enable regional governments to identify, develop, and support viable PPP projects.

Addressing the shortage of long-term debt financial requires innovative financial instruments. The government can work with financial institutions to develop and promote these instruments. Moreover, the establishment of dedicated PPP units can facilitate the exploration of alternative financial mechanisms, as seen in best practices from other nations.

The creation of comprehensive guidelines, checklists, and model documents for various sectors involved in PPP projects is essential. These resources should offer standardized templates, reducing the complexity of contractual arrangements and fostering private sector confidence.

The choice of PPP models should be tailored to the specific project requirements and challenges. The Pakistani government can benefit from the experiences of nations like the United Kingdom and Australia, which have effectively used a mix of PPP models to address diverse infrastructure needs. Understanding the strengths and limitations of each model is crucial in making informed decisions.

Fostering public awareness about PPP projects and ensuring transparency in project development and execution is crucial to build citizens' trust and support. International experiences, highlight the significance of transparent communication with stakeholders to address concerns about equity and transparency.

Political stability and policy consistency are essential to ensure the long-term success of PPP projects, particularly under models like Build-Operate-Transfer (BOT). Mitigating political risks is vital to assure private partners of project continuity.

Pakistan should foster a culture of continuous learning and adaptation in its approach to PPPs. This involves conducting regular reviews of projects, evaluating their performance, and implementing necessary improvements based on these assessments.

Pakistan stands at a crucial juncture where the effective implementation of PPPs can significantly contribute to its infrastructure development and economic progress. To do so, the nation must address the challenges identified while drawing on global best practices and the recommendations of previous studies. By embracing regulatory reforms, improving coordination, fostering innovative financial solutions, and enhancing transparency, Pakistan can unlock the immense potential of PPPs and pave the way for a brighter, more sustainable future. The lessons learned from the challenges and successes of PPPs in Pakistan can be invaluable not only for the nation itself but also for the broader international community seeking to harness the power of public-private collaboration for infrastructure development.

6.2. Recommendations for future research

1. Researchers might conduct longitudinal studies to assess the long-term impact of PPP projects on infrastructure development, economic growth, and the well-being of citizens. Analyze the sustained effects of PPPs over extended periods to understand their true contributions to Pakistan's development.
2. To undertake a comparative analysis of PPP projects across different sectors, such as transportation, energy, healthcare, and education, to identify sector-specific challenges and best practices. This will provide insights into tailoring PPP approaches to the unique needs of each sector.
3. It is recommended to investigate the environmental and social impacts of PPP projects, evaluating the effectiveness of impact assessments and the implementation of safeguards. Focus on how these aspects align with Pakistan's sustainability goals and the well-being of local communities.
4. It would be beneficial to explore the role of citizen engagement and public trust in PPP project success. Analyze the factors that influence public perception and ways to enhance transparency, accountability, and public support for PPP initiatives. Understand how involving local communities can lead to better project outcomes.

6.3. Limitations

1. The study's reliance on interviews as a primary data source introduces the potential for interview bias. Respondents may provide responses that align with their interests or perspectives, leading to a limited and potentially skewed view of the challenges and effectiveness of PPP projects. To mitigate this bias, future research should employ a combination of data sources and employ rigorous interview techniques.
2. The findings of the study are context-specific to the Pakistani construction industry. While they offer valuable insights, their generalizability to other regions or sectors may be limited due to the unique regulatory and socio-economic factors at play. Future research should consider the contextual variations in different settings to enhance generalizability.

References

Abas, M., Khattak, S. B., Habib, T., & Nadir, U. (2022). Assessment of critical risk and success factors in construction supply chain: a case of Pakistan. *International Journal of Construction Management*, *22*(12), 2258-2266.

Ahmad, U., Waqas, H., & Akram, K. (2021). Relationship between project success and the success factors in public–private partnership projects: A structural equation model. *Cogent Business & Management*, *8*(1), 1927468.

Ahmadabadi, A. A., & Heravi, G. (2019). The effect of critical success factors on project success in Public-Private Partnership projects: A case study of highway projects in Iran. *Transport policy*, *73*, 152-161.

Almarri, K., & Abuhijleh, B. (2017). A qualitative study for developing a framework for implementing public–private partnerships in developing countries. *Journal of Facilities Management*, *15*(2), 170-189.

Asian Development Bank. (2021). *Public-private partnership monitor*. Asian Development Bank Institute.

Attarzadeh, M., Chua, D. K., Beer, M., & Abbott, E. L. (2017). Options-based negotiation management of PPP–BOT infrastructure projects. *Construction management and economics*, *35*(11-12), 676-692.

Bakhtawar, B., Thaheem, M. J., & Arshad, H. (2022). Sustainable Public–Private Partnership Delivery in Pakistan; Evolution, Barriers, and Way Forward. In *Public Sector Reforms in Pakistan: Hierarchies, Markets and Networks* (pp. 275-300). Cham: Springer International Publishing.

Bao, F., Chan, A. P., Chen, C., & Darko, A. (2018). Review of public–private partnership literature from a project lifecycle perspective. *Journal of Infrastructure Systems*, *24*(3), 04018008.

Cheng, Z., Yang, Z., Gao, H., Tao, H., & Xu, M. (2018). Does PPP matter to sustainable tourism development? An analysis of the spatial effect of the tourism PPP policy in China. *Sustainability*, *10*(11), 4058.

Cherkos, F. D., & Jha, K. N. (2021). Drivers of road sector public-private partnership adoption in new and inexperienced markets. *Journal of Construction Engineering and Management*, *147*(3), 04020186.

Cui, C., Liu, Y., Hope, A., & Wang, J. (2018). Review of studies on the public–private partnerships (PPP) for infrastructure projects. *International journal of project management*, *36*(5), 773-794.

Fellows, R. F., & Liu, A. M. (2021). *Research methods for construction*. John Wiley & Sons.

Guo, K., Zhang, L., & Wang, T. (2021). Concession period optimisation in complex projects under uncertainty: a public–private partnership perspective. *Construction management and economics*, *39*(2), 156-172.

Huynh, T. T. M., Dang, C. N., Le-Hoai, L., Pham, A. D., & Nguyen, T. D. (2020). Proposing a strategy map for coastal urban project success using the balanced scorecard method. *Engineering, Construction and Architectural Management*, *27*(10), 2993-3030.

Jayasuriya, S., Zhang, G., & Jing Yang, R. (2019). Challenges in public private partnerships in construction industry: A review and further research directions. *Built Environment Project and Asset Management*, *9*(2), 172-185.

Mangu, S., Annamalai, T. R., & Deep, A. (2021). Comparison of toll and annuity PPPs: A case study of highway projects in India. *Built Environment Project and Asset Management*, *11*(1), 103-120.

Mazher, K. M., Chan, A. P., Zahoor, H., Khan, M. I., & Ameyaw, E. E. (2018). Fuzzy integral–based risk-assessment approach for public–private partnership infrastructure projects. *Journal of Construction engineering and Management*, *144*(12), 04018111.

Memon, S. A., Rowlinson, S., Sunindijo, R. Y., & Zahoor, H. (2021). Collaborative behavior in relational contracting projects in Hong Kong—A contractor's perspective. *Sustainability*, *13*(10), 5375.

Naveed, F. (2015). *Public-Private Partnerships (PPPs) for Infrastructure Development in Developing Countries: A Case Study of Pakistan*. The University of Manchester (United Kingdom).

Noor, M. A., & Khalfan, M. (2017). Public private partnership in transport sector projects in Pakistan. *International Journal of Critical Infrastructures*, *13*(1), 70-92.

Osei-Kyei, R., & Chan, A. P. (2017). Factors attracting private sector investments in public–private partnerships in developing countries: A survey of international experts. *Journal of Financial Management of Property and Construction*, *22*(1), 92-111.

Saeed, A. M., Duffield, C., & Hui, F. K. P. (2018). An enhanced framework for assessing the operational performance of public-private partnership school projects. *Built environment project and asset management*, *8*(2), 194-214.

Saha, D., Hong, S. H., Shao, A., Modi, A., & Zemlytska, I. (2018). Private participation in infrastructure (PPI) annual report 2017. *Washington, DC: World Bank Group. URL: http://documents. worldbank. org/curated/en/658451524561003915/Private-participation-in-infrastructure-PPI-annual-report-2017*.

Soomro, M. A., & Zhang, X. (2015). Roles of private-sector partners in transportation public-private partnership failures. *Journal of Management in Engineering*, *31*(4), 04014056.

Soomro, M. A., Li, Y., & Han, Y. (2020). Socioeconomic and political issues in transportation public–private partnership failures. *IEEE Transactions on Engineering Management*, *69*(5), 2073-2087.

Ullah, F., & Thaheem, M. J. (2018). Concession period of public private partnership projects: Industry–academia gap analysis. *International Journal of Construction Management*, *18*(5), 418-429.

Ullah, F., Thaheem, M. J., & Umar, M. (2017). Public-private partnerships in Pakistan: A nascent evolution. *Cambridge Scholars Newcastle upon Tyne, UK*.

Ullah, F., Thaheem, M. J., Sepasgozar, S. M., & Forcada, N. (2018). System dynamics model to determine concession period of PPP infrastructure projects: Overarching effects of critical success factors. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, *10*(4), 04518022.

Wang, H., Liu, Y., Xiong, W., & Song, J. (2019). The moderating role of governance environment on the relationship between risk allocation and private investment in PPP markets: Evidence from developing countries. *International Journal of Project Management*, *37*(1), 117-130.

Wang, H., Xiong, W., Wu, G., & Zhu, D. (2018). Public–private partnership in Public Administration discipline: a literature review. *Public management review*, *20*(2), 293-316.

Yong Kim, S., & Thuc, L. D. (2021). Life cycle performance measurement in public–private partnership infrastructure projects. *Journal of Infrastructure Systems*, *27*(4), 06021001.

Zhang, L., Zhao, Z., & Kan, Z. (2019). Private-sector partner selection for public-private partnership projects of electric vehicle charging infrastructure. *Energy Science & Engineering*, *7*(5), 1469-1484.

Zhao, N., & Ying, F. (2019). Method selection: a conceptual framework for public sector PPP selection. *Built Environment Project and Asset Management*, *9*(2), 214-232.