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Critical Success Factors of Public-Private Partnership (PPP) Implementation: A Study in Bangladesh

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ABSTRACT

This study **aims** to discover the perceptions of the critical success factors (CSFs) of the public and private sectors' players that influence the implementation of public-private partnership (PPP) infrastructure projects in Bangladesh. **Methods:** A questionnaire survey was adopted to discover public and private sector players' perceptions of the CSFs and success subfactors (SSF) of PPP projects. Based on the literature review, CSFs and SSFs were identified, and the agreement between respondents from the public and private sectors was tested. A total of 59 responses were collected and examined to reveal the perceived gaps between sectors and rank CSFs and SSFs. The Statistical Package for the Social Sciences (SPSS) software was used. The **results** show that the top-ranking factor was "economic viability", followed by "appropriate risk allocation", "sound financial packages", "favorable investment environment", and "reliable concessionaire". It was also found that the perceptions of the public and private sectors were mixed. **The key conclusion** of this study is that the identified factors must be effectively addressed in order to develop consensus and engage relevant stakeholders in Bangladesh.
***Keywords*:** public-private partnership; critical success factors; success subfactors; Bangladesh; public sector; private sector; infrastructure projects

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Критические факторы успеха реализации государственно-частного партнерства (ГЧП): исследование в Бангладеш

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АННОТАЦИЯ

Целью данного исследования является выявление восприятия критических факторов успеха (КФУ) участников государственного и частного секторов, которые влияют на реализацию инфраструктурных проектов государственно-частного партнерства (ГЧП) в Бангладеш. **Методы:** для выявления представлений участников государственного и частного секторов о КФУ и подфакторах (факторов более низкого уровня) успеха (ПФУ) проектов ГЧП был использован анкетный опрос. На основе обзора литературы были выявлены СФУ и ПФУ, а также было проверено соответствие между ответами респондентов из государственного и частного

секторов. Было собрано и изучено 59 ответов с целью выявления предполагаемых различий в восприятии различных секторов и ранжирования СФУ и ПФУ. Использовалось программное обеспечение статистического пакета для социальных наук (SPSS). **Результаты** ранжирования показывают, что на первом месте оказался фактор «экономическая жизнеспособность», за которым следуют «надлежащее распределение рисков», «надежные финансовые пакеты», «благоприятные инвестиционные условия» и «участие надежного концессионера». Также было установлено, что восприятие государственного и частного секторов неоднозначно. Основной вывод данного исследования заключается в том, что необходимо учитывать выявленные факторы для достижения консенсуса и оптимального привлечения заинтересованных сторон в Бангладеш.
Ключевые слова: государственно-частное партнерство; критические факторы успеха; подфакторы успеха; Бангладеш; государственный сектор; частный сектор; инфраструктурные проекты

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1. Introduction

Public-private partnerships (PPPs) are becoming an increasingly popular option for policymakers when it comes to delivering major public projects, particularly in the face of limited government financial resources and the need to combat governmental inefficiencies [1, 2]. To develop infrastructure, the Government of Bangladesh (GoB) shows great interest in PPPs to develop infrastructure. According to the Sustainable Development Goals' (SDGs) Financing Strategy, an additional amount of 928.48 billion US dollars is required to reach the target.[1] GoB has identified five possible sources of funding SDGs to meet the 17 goals by 2030. Out of the 85% domestic financing, PPPs have a target of 5.5%.[2] As a result, with the private sector contributing 42% and PPP accounting for 5.5%, nearly half of total SDG financing is expected to come from the private sector. Therefore, the GoB must play a significant role in attracting private capital and fostering an environment that will enable them to bring in the necessary investment to meet the nation's SDG targets.

In developing countries, governments are resorting to PPPs to address the investment shortfall, particularly in infrastructure development [3]. The PPP Authority of Bangladesh assists Line Ministries and Contracting Authorities in developing and implementing PPP projects. There are 77 projects in the PPP pipeline that are in various phases of development. The expected total investment amount is USD 38.77 billion. With two additional PPP contracts signed in 2022, the total number of signed PPP contracts stands at 17, with an anticipated investment of USD 4.5 billion.[3] One of them is operational, while the other nine projects are under construction. Reports indicate that 19 projects are currently in the procurement stage, while 40 projects are in various stages of project development. Despite the growing popularity of PPPs, there is a scarcity of research on the success factors of PPP application in Bangladesh. To effectively implement and deliver the planned infrastructure projects, sound knowledge on CSFs related to PPPs is needed [4].

Public works and services are no longer seen as being solely provided by the government. Private finance initiatives (PFIs), or public-private partnerships, have been acknowledged as significant methods of resolving issues that governments have in delivering infrastructure systems [5]. To reduce the burden on governmental budgets, a remarkable movement has been observed toward the participation of the private sector to develop public infrastructure as well as services [6, 7]. This tendency has been influenced by several factors, including lack of resources, deregulation of infrastructure, and the impact of international markets. This tendency has led to an increase in the importance of private financing.

In long-term PPP arrangements, it is found that there are immense risks and uncertainties, engagement of many partners, absence of knowledge, lack of experience and expertise in PPP in many areas, and varied issues emerging globally, which have surprising effects. Nevertheless, a practical and effective procurement strategy is urgently required to improve procedures in

[1] PPP Authority. Annual report 2021–22. Dhaka, Bangladesh: Government of the People's Republic of Bangladesh; 2021. See https://www.pppo.gov.bd/download/ppp/ar/PPPA_Annual-Report_2021–22.pdf

[2] Ibid.

[3] ADB. Public private partnership monitor: Bangladesh. Asian Development Bank, Manila; 2022. URL: http://dx.doi.org/10.22617/SGP220554–2

upcoming PPP projects, given the global trend toward PPPs. The process of identifying, analyzing, and classifying many elements that are crucial to the overall performance of PPPs is a crucial stage in the construction of such a protocol. The achievement of an infrastructure project's goals depends on a variety of variables, including cost, timeliness, and quality [7]. The identification of the critical success factors (CSFs) for these goals will enable the efficient distribution of scarce resources. The CSFs can be determined using either quantitative measurements or professional opinion [8]. An analytical hierarchy technique is used, for instance, by Chua et al. [8] to poll professional opinions on CSFs for construction projects.

According to Marks and Sparkman's study [9], PPP is defined as a collaborative engagement of non-state actors in the infrastructural development or service provision of public agencies to achieve win-win gains. With the expeditious change of market in the fastest-growing economy of Bangladesh, an inevitably competent PPP method is needed, which can be implemented to develop various sectors, industries, and infrastructure to meet the needs of its population. The success of PPP depends on key, specific factors known as critical success factors (CSFs). Central to effective PPP implementation are CSFs, which guarantee success during the planning, identification, and evaluation stages while also molding an organizational culture of excellence [10]. This study attempted to ascertain these factors, which are indispensable for PPP projects in Bangladesh. The purpose of this research is to find appropriate CSFs and success subfactors (SSFs), i.e., factors of lower level, for PPP projects in Bangladesh. An effort was also made to provide a road map for the successful delivery of the PPP projects.

2. Literature review

The main objective of PPP in Bangladesh is to ensure a faster, more inclusive economic trajectory and to better meet the demand for improved, high-quality public services while maintaining fiscal viability.[4] The Government of Bangladesh has continuously reviewed and revised the PPP arrangements for the enormous expansion of PPP implementation in Bangladesh in order to enhance current practices and ensure the attainment of its conclusive target. It requires enhancing PPP practices, which gives rise to this study that emphasizes the CSFs for effective PPP projects in Bangladesh.

The "success factor" concept was first developed by Daniel [11]; later, Rockart [12] refined that process into critical success factors between 1979 and 1981 [13, 14, 15]. Johnson and Friesen applied this concept to many sectors in 1995 [16]. Rocakart [15] stressed that project success depends on how much attention organizations give to CSFs. As understood from the study of Zhang [9], five CSFs for PPP in the development of infrastructure are crucial: economic viability, risk allocation, financial instruments, concessionaire consortium, and favorable investment environment. Besides Zhang, several researchers identified CSFs for different types of PPP. In negotiations and competitive tendering for Build-Operate-Transfer (BOT) contracts, Tiong [17] in his study pointed out six CSFs for private sector players: entrepreneurship and leadership; identification of right project; structure of consortium; transfer of technology; different financial packages; and strong guarantees. A study [18] conducted in China on the BOT project identified eight CSFs, including "identification of right project; stable political and sound economic situation; diversified financial package; level of toll or tariff; risk allocation; selection of right subcontractors; control of management; and transfer of technology". Another study [13] was conducted on Accor Stadium (former Stadium Australia), which was constructed through the PPP mechanism of build-operate-own-transfer (BOOT). He identified 15 success factors, and the most significant CSFs include: compatibility skills among the key parties, technical innovation to overcome project complication, and efficient approval process. Other important CSFs include environmental impact, legal and economic framework, political stability, right project, strategic alliances, efficient resource management, trust, support from community, feasibility study, technology transfer, financial competence, and structure of consortium. He argued that private investment initiatives do not automatically lead to success in an infrastructure project. He further added that the win-win principle is the foundation of the success of PPP projects. Again, a study [19] was conducted on a BOOT scheme to analyze the

[4] Public Private Partnership Act 2015.1422/16. URL: https://www.pppo.gov.bd/download/ppp_office/PPP_Law_2015_(Approved_Translation).pdf

CSFs. The study reflected the same CSFs and added new factors: "negotiation, client brief or outcome, feature of bid, business diversification, viability of business, competition, credit rating, teamwork, present infrastructure, asset delivery, growth of investment, and identification of project" [19].

Zhao et al. [20] evaluated the CSFs of two PPP power projects that used the BOT scheme. He identified 31 success factors and found that 3 factors are crucial: "the necessity of the project, expected debt-paying ability, and financial capacity of contractor". Moreover, he asserted that specific CSFs apply to each project individually: "project financing management of the contractor (project company) and efficiency of business operation and qualification of the contractor, competency of personnel, investment capacity of the contractor, profitability of the project, and legal environment". The study conducted by Almeile et al. [21] revealed that the three most often cited reasons for PPP projects in developing nations were 'appropriate risk distribution and risk-sharing', 'political backing', and 'the private sector's financial strength'.

A factor analysis approach was used by Li et al. [14] to discover CSFs in PPP projects for the UK construction sector. He found that "effective procurement process; ability of project implementation; guarantee from the government; sound and stable economic conditions; and availability of financial market" are the key success factors for the PPP project.

In the case of built environment, most studies on PPPs have focused to a large extent on five issues: (1) risks allocation; (2) relationships among the parties; (3) critical success factors; (4) challenges of PPP; and (5) financing/value for money. After a substantial literature review was conducted, it was found that the most arguable issue was gaining "value for money" because it is a lavish and prolonged procedure that thus needed adequate expertise and capability in finding the right projects for PPP, the right private sector player, the ability of risk management, and the management of all participants [22]. These issues made PPP popular. Many developed and developing countries, such as Bangladesh, believe that PPP can be an option to reduce the economic burden. Other reported issues include encouraging private player innovation and managerial expertise, risk allocation, value for money, and timely service delivery, to name a few. Almeile et al. [23] conducted a study in Saudi Arabia and found that economic imperatives, not political imperatives, influence the association between CSFs and the performance of public-private partnership projects in that country.

Most research concentrated on the influence of CSFs in developed countries, for example, Li et al. [14] and Algarni et al. [6] broadly in the United Kingdom and United States, and Cheung et al. [24] in Hong Kong. In spite of the emergence of PPP studies within developing countries, particularly in South Asia and countries such as Pakistan and India, Bangladesh remains at a strategic stage to develop and establish legal frameworks, fostering project plans, ideas, and hubs for PPP units. Insufficient research has been found that addresses CSFs in the South Asian context.

Furthermore, most PPP studies in Asia have used survey tools from developed countries. To fill that gap, this study examines the CSFs that influence the implementation of PPP projects in Bangladesh.

3. Aims and objectives

This study aims to discover the understanding and perceptions of players involved in the public and private sectors regarding the CSFs that influence the application of PPP projects in infrastructure in Bangladesh. To achieve the overall objectives, two specific objectives have been established. First, it aims to identify and assess the criticality of success factors (CSFs) required for PPP projects, and second, the study intends to identify and evaluate the significance of PPP success subfactors.

4. Methodology

4.1. Research instrument

One of the key messages from the reviewed literature is that there is a need to identify the critical success factors of PPP in Bangladesh. It is important to note that PPPs are often difficult to assess clearly. The success of a PPP project depends on CSFs. Initial factors were identified based on a comprehensive review of similar previous studies. Based on the comprehensiveness of the criteria and the recommendations of PPP experts, the authors used the factors identified by Zhang [7]. Given its extensive use in gathering expert opinions in construction management research [7], this study employed a questionnaire survey to gather data on CSFs for PPPs. Discussions with

participants in PPP projects, including government officials, construction and operation managers, architects, developers, and engineers, led to the development and refinement of the questionnaire.

4.2. Sample and collection procedures

One hundred twenty questionnaires were administered using the non-probability sampling technique. In total, 59 usable responses were received. The completed questionnaires were collected via email and postal service. To reduce the impact of the unacceptable sample on the overall sample, mail returned due to wrong or incomplete addresses, participants who no longer had the job, participants who were out of the office, and participants with little or no PPP knowledge were all taken into consideration as ineligible and were excluded from the final analysis.

4.3. Data analysis

Participants were requested to rate the indicators for CSFs and SSFs according to the five-point Likert scale. Values 0 through 5 were specified as being 'not applicable' to 'extremely critical', respectively. The Statistical Package for the Social Sciences (SPSS) software was used to analyze the data. Five-point Likert scale data were analyzed for the importance of each of the success factors using descriptive statistics by way of mean. Afterward, as considered by the overall respondents and by the public and private player groups individually, factors were classified according to their importance.

5. Findings and discussion

In this section, the results of the analysis and how they relate to the literature review will be discussed. The study entailed finding and analyzing the CFSs that influence PPPs, as well as developing a framework that would serve as a direction for both the state and non-state sectors in Bangladesh.

Table 1 illustrates the criticality indexes and rank of the five main success factors based on the overall respondents, state sectors, and non-state sectors. The index, known as criticality, of each success factor was computed as follows:

$$CI = (5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1) / 5(n_5 + n_4 + n_3 + n_2 + n_1).$$

Note: CI = Criticality Index, where n_5 = extremely critical, n_4 = very critical, n_3 = critical, n_2 = fairly critical, and n_1 = not critical.

The index of success subfactors (SSFs) was calculated through formula proposed by Zhang [7]. In this formula, "5", "4", "3", "2", "1", and "0" have significance indexes of 100, 80, 60, 40, 20, and 0, respectively.

$$SI = (0R_{i0} + 20R_{i1} + 40R_{i2} + 60R_{i3} + 80R_{i4} + 100R_{i5})/ (R_{i0} + R_{i1} + R_{i2} + R_{i3} + R_{i4} + R_{i5}).$$

Note: SI = "Significance Index" where R_{i0} = "number of responses as '0' for the *i*th factor or subfactor"; R_{i1} = "number of responses as '1' for the *i*th factor or subfactor"; R_{i2} = "number of responses as '2' for the *i*th factor or subfactor"; R_{i3} = "number of responses as '3' for the *i*th factor or sub factor"; R_{i4} = "number of responses as '4' for the *i*th factor or subfactor"; R_{i5} = "number of responses as '5' for the *i*th factor or sub factor".

5.1. CSFs of PPP implementation

It was found that the "economic viability" factor was graded top by both the public and private sector players (0.897 and 0.883, respectively), where "favorable investment environment" was graded lowest by the private sector (0.613) and graded 4 by the public sector (0.785). Many governments conduct economic viability analyses to ascertain if a proposed project is worthy of the use of state resources. A project is economically feasible when its economic advantages exceed its economic costs.[5]

The World Bank[6] also noted that the value-for-money analysis of PPP and financial modeling will both benefit from the initial inputs of the cost and demand estimations created for the economic viability assessment. Furthermore, El-Kholy et al. [25] argued that the economic, political, and administrative circumstances of the host country have a significant impact on the key risk variables of economic viability.

It is evident from *Table 1* that respondents ranked all 5 CSFs as either "extremely critical" or "very critical" for the successful implementation of PPP projects. Respondents believed that two factors are "fairly critical" for the success of a project are reliable concessionaire consortium and a favorable investment environment.

As shown in *Table 1*, "appropriate risk allocation" is the second most important success factor for PPPs in Bangladesh. A survey [14] was carried out in the UK to assess the relative impact of eighteen possible CSFs. The investigation concluded

[5] Success factors for private engagement in FCS. World Bank; November 1, 2022. URL: https://ppp.worldbank.org/public-private-partnership/success-factors-private-engagement-fcs

[6] Ibid.

Table 1
Perception of interviewee regarding the relative importance of CSFs of PPP

Success factors	Public Sector		Private Sector		Overall Respondents	
	C.I.	R.	C.I.	R.	C.I.	R.
"economic viability"	.897	1	.883	1	.889	1
"appropriate risk allocation"	.881	2	.807	2	.839	2
"sound financial package"	.833	3	.783	3	.805	3
"reliable concessionaire consortium"	.769	5	.765	4	.685	5
"favorable investment environment"	.785	4	.613	5	.767	4

Note: C.I. = "criticality index", R.= "ranking"

Source: Data collected by the authors.

that appropriate risk allocation is one of the three most important factors. Through the systematic research approach, Zhang [7] pointed out numerous CSFs that were analyzed to a greater extent and classified into five main CSFs, these are "favorable investment environment", "economic viability", "reliable concessionaire consortium with strong technical strength", "sound financial package", and "appropriate risk allocation". The results illustrate an acceptable level of agreement in the ranking of this factor between respondents from the public and private sectors and overall respondents.

As illustrated in *Table 1*, the third highly critical factor, ranked by the respondents, is "sound financial package". Zhang, Tiong, and Li, et al. [7, 17, 14] highlighted in their research how this factor is important to implement PPP projects. The viability of a PPP project is typically more influenced by the financial package than by the physical design or the cost of construction. Zhang [7] drew ten elements and recommended including these elements to make effective financial packages. These are: "sensible schedules for investment, payment, and drawdown"; "financial analysis"; "appropriate combination of financing sources and standby facilities"; "high equity-debt ratio"; "stable currencies of debts and equity finance"; "low financial charges"; "fixed and low interest rate financing"; "long-term debt financing that minimizes refinancing risk"; "ability to deal with fluctuations in interest and exchange rates"; and "appropriate payment structures".

We can learn from *Table 1* that factors were ranked significantly differently by the public and private sector players. Public sector players believe that the "reliable concessionaire consortium" factor is not as important as other factors that influence the implementation of PPP projects. They ranked this factor fifth, whereas private sector players ranked fourth. The same dissimilarities are shown in the factor "favorable investment environment". In this case, public sector players ranked this factor fourth and fifth by private sector players. The result does not imply that these two factors are not critical factors for effective application of PPPs in Bangladesh; perhaps in this case the ongoing political condition in Bangladesh is well balanced and PPPs are supported by the government, which means these success factors are perceived as less critical. PPP projects can be successful when the investment environment for private sector participation is adequately enhanced and favorable, as demonstrated by the Pamir Private Power Project in Tajikistan.[7]

5.2. SSFs of PPP implementation

Public sector, private sector, and overall responses are depicted in *Table 2*. It also summarizes the significance indexes as well as how respondents ranked the SSFs. The SSF "stable political system" under a favorable investment environment was regarded as an indispensable (94%) influencing factor for the implementation of PPPs, especially in infrastructure. Despite the fact that there are many SSFs ranked differently by the public and private sector players, both

[7] Assessing project feasibility and economic viability. World Bank; June 24, 2022. URL: https://ppp.worldbank.org/public-private-partnership/assessing-project-feasibility-and-economic-viability

sector players ranked "stable political system", "favorable economic system", and "predictable risk scenarios" as essential SSFs for successful PPP application. Correspondingly, the factor "promising economy" was ranked eleventh by both sector players.

Research has proven that "economic viability" plays a crucial role in the success of PPP projects. To succeed, this factor is dependent on a number of subfactors [7]. *Table 2* demonstrates that public and private players' perceptions of the SSFs of PPP applications in Bangladesh do not significantly differ. When it comes to factors such as "long-term cash flow" and "sufficient profitability to attract investors," both sector players exhibit slight differences. The public sector players viewed the factor "long-term cash flow" more critically than the private sector players. On the other hand, private sector players perceived the factor "sufficient profitability to attract investors" as more critical than public sector players.

In general, while the government is in a good position to foster non-state engagement to develop public infrastructure, non-state players play a crucial role in the successful application of PPPs [7]. Choosing the right concessionaire is critical to the effective implementation of the PPP project. *Table 2* depicts that under the CSF "reliable concessionaire consortium", nine SSFs out of twelve were ranked differently by both sectors. The last three SSFs ("partnering skills", "innovative technical solution", and "rich experience in international PPP project management"), both sectors ranked them as the same. The findings indicate that the concessionaire ought to have sound managerial skills. The analysis also portrayed that other subfactors, for example, leading role by the entrepreneur or enterprise, an effective project organization structure, strong relationships with government agencies or authorities, skills in partnership, sound experience in international PPP project management, multidisciplinary participants, and a strong project team, are needed to build a reliable concessionaire consortium.

It is considered that the financial package is the most important CSF for the successful application of PPPs in Bangladesh. *Table 2* illustrates that both sector players perceived all SSFs as important to a great extent and ranked them almost in the same fashion. The tendency indicates that the financial package has an immense influence on the viability of the PPP project. Zhang [7] recommends that a sound financial package should comprise all SSFs to speed up the capital expenditure of an infrastructure project.

Evidently, there are various risks associated with PPP projects. Hence, risk allocation is important for PPP risk management. This study found quite a different picture on the "appropriate risk allocation" factor. From *Table 2*, a level of difference was noted among respondents relative to their opinion about suitable risk allocation. The "concession agreement" factor was ranked top by both sector respondents. Respondents from both the public and private sectors significantly agreed that the agreement of shareholders, insurance, and supply is mandatory, and consecutively, the design and construction contract is an impactful factor for PPP projects. It is noteworthy that the percentage of significance is 59.3%, which is the lowest among all. This confirms that each SSF listed is significant; hence, these are critical to the success of PPPs.

5.3. Agreement analysis

By using Spearman's rank correlation coefficient (r_s), sequential rank agreement analysis was performed between public players and private players to compare the agreement in the ranking of these factors between the two groups. The value of r_s denotes agreement between the two groups. r_s of zero indicates absolute disagreement, whereas r_s of one indicates absolute agreement. *Table 3* and *Table 4* exhibit the success factors and success subfactors of r_s, respectively. It should be noted that the lowest r_s is 0.74 which confirms that there is a well-balanced agreement in ranking between two groups, that is, the public sector players and the private sector players.

6. Conclusion

This study investigated five CSFs suggested by Zhang [7] for successful PPP applications in Bangladesh. The results indicate that all these factors were graded as either "extremely critical" or "most critical". The analysis revealed economic viability as the top-ranked factor. Based on both sector rankings, the results are

Table 2
Summary of responses on significance indexes of SSFs under respective CSFs

Success subfactors	Public Sector		Private Sector		Overall	
	S.I.	R.	S.I.	R.	S.I.	R.
Favorable investment environment						
"stable political system"	92.5	1	94.7	1	94.0	1
"favorable economic system"	91.7	2	88.3	2	89.7	2
"government support"	89.3	3	79.0	4	83.3	3
"the project is in public interest"	84.5	4	74.7	6	81.3	4
"predictable risk scenarios"	83.7	5	78.3	5	80.5	5
"the project is well suited for privatization"	81.3	6	81.3	3	79.0	6
"adequate local financial market"	79.7	7	67.1	8	75.0	7
"predictable and reasonable legal framework"	79.0	8	72.0	7	72.5	8
"supportive and understanding community"	73.3	9	62.0	10	67.3	9
"predictable currency exchange risk"	70.1	10	65.3	9	66.7	10
"promising economy"	60.5	11	60.1	11	62.3	11
Economic viability						
"long-term demand for the products/services"	87.7	1	88.3	1	88.1	1
"long-term cash flow"	86.1	2	85.3	3	85.7	2
"sufficient profitability to attract investors"	84.5	3	86.5	2	85.7	3
"long-term availability of suppliers"	67.7	4	74.7	4	71.7	4
"limited competition from other projects"	59.0	5	69.0	5	64.7	5
Reliable concessionaire consortium						
"good relationship with host government authorities"	89.3	1	82.0	2	85.1	1
"strong and capable project team"	86.1	3	84.1	1	85.1	2
"leading role by a key enterprise or entrepreneur"	87.7	2	80.6	3	83.7	3
"effective project organization structure"	79.7	5	78.3	4	79.0	4
"sound technical solution"	80.5	4	73.1	7	76.1	5
"cost-effective technical solution"	77.3	6	74.7	5	76.0	6
"low environmental impact"	76.5	7	74.1	6	75.1	7
"public safety and health considerations"	65.3	9	72.0	8	70.5	8
"multidisciplinary participants"	69.3	8	71.3	9	69.1	9
"partnering skills"	62.1	11	69.4	11	69.1	10
"innovative technical solution"	66.1	10	71.3	10	66.3	11
"rich experience in international PPP project management"	57.3	12	60.7	12	59.3	12

Table 2 *(continued)*

Success subfactors	Public Sector		Private Sector		Overall	
	S.I.	R.	S.I.	R.	S.I.	R.
Sound financial package						
"appropriate toll/tariff level(s) and suitable adjustment formula"	92.5	1	85.3	1	88.3	1
"abilities to deal with fluctuations in interest/ exchange rates"	87.0	2	83.7	2	83.7	2
"sound financial analysis"	81.3	3	83.1	4	82.3	3
"investment, payment, and drawdown schedules"	79.7	4	78.3	5	80.5	4
"sources and structure of main loans and standby facilities"	76.5	5	83.6	3	79.0	5
"long-term debt financing that minimizes refinancing risk"	75.7	6	77.1	6	76.5	6
"stable currencies of securitization (debts and equity finance)"	72.5	7	76.7	7	74.0	7
"fixed and low interest rate financing"	69.3	8	72.5	8	71.1	8
"low financial charges"	60.5	9	70.1	9	66.1	9
"high equity/debt ratio"	57.3	10	70.1	10	64.7	10
Appropriate risk allocation						
Suitable and dependable risk allocation in:						
"concession agreement"	85.3	1	80.7	1	82.7	1
"off take agreement"	77.3	3	72.5	7	79.0	2
"guarantees/support/comfort letters"	80.5	2	77.7	3	78.3	3
"loan agreement"	76.5	4	79.5	2	75.5	4
"shareholder agreement"	75.0	5	73.7	5	76.5	5
"operation agreement"	73.3	7	77.1	4	74.1	6
"insurance agreement"	74.1	6	73.7	6	74.0	7
"design and construct contract"	69.3	8	62.0	8	65.1	8
"supply agreement"	64.5	9	58.3	9	61.0	9

Note: S.I. = "significance index, R.= "ranking".

Source: Data collected by the authors.

mixed. Although both public and private sector players ranked success factors and success subfactors differently, similarity was found in the ranking of a few factors.

Despite the differences in ranking between the public and private sectors, this indicates the diverse roles and responsibilities performed by each sector in the application of the PPP project in Bangladesh. Furthermore, the disparity in perception between the public and private sectors advocates a gap in perception between the two sectors. This gap must be effectively addressed to foster consensus and involve relevant stakeholders in Bangladesh.

Table 3
Agreement analysis of ranking CSFs

Success factors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
"economic viability"	0.895	1	0.882	1	
"appropriate risk allocation"	0.879	2	0.806	2	
"sound financial package"	0.831	3	0.782	3	**r_s = 0.89**
"reliable concessionaire consortium"	0.767	5	0.764	4	
"favorable investment environment"	0.783	4	0.612	5	

Note: C.I. = "criticality index, R.= "ranking", r_s = "Spearman's coefficient of rank correlation".

Source: Data collected by the authors.

Table 4
Agreement analysis of ranking SSFs

Success subfactors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
Favorable investment environment					
"stable political system"	93.7	1	95.7	1	
"favorable economic system"	92.7	2	89.3	2	
"government support"	90.3	3	79.0	4	
"project is in public interest"	85.5	4	75.7	6	
"predictable risk scenarios"	84.7	5	79.3	5	
"project is well suited for privatization"	82.3	6	82.3	3	rs = 0.91
"adequate local financial market"	80.7	7	68.1	8	
"predictable and reasonable legal framework"	79.0	8	72.0	7	
"supportive and understanding community"	74.3	9	62.0	10	
"predictable currency exchange risk"	71.1	10	66.3	9	
"promising economy"	61.5	11	61.1	11	
Economic viability					
"long-term demand for the products/services"	88.7	1	89.3	1	
"long-term cash flow that is attractive to lender"	87.1	2	86.3	3	
"sufficient profitability of the project to attract investors"	85.5	3	87.5	2	rs = 0.89
"long-term availability of suppliers"	68.7	4	75.7	4	
"limited competition from other projects"	59.0	5	69.0	5	

Table 4 *(continued)*

Success subfactors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
Reliable concessionaire consortium					
"good relationship with host government authorities"	90.3	1	82.0	2	rs = 0.91
"strong and capable project team"	87.1	3	85.1	1	
"leading role by a key enterprise or entrepreneur"	88.7	2	81.7	3	
"effective project organization structure"	80.7	5	79.3	4	
"sound technical solution"	81.5	4	74.1	7	
"cost-effective technical solution"	78.3	6	75.7	5	
"low environmental impact"	77.5	7	75.1	6	
"public safety and health considerations"	66.3	9	72.0	8	
"multidisciplinary participants"	70.3	8	72.3	9	
"partnering skills"	63.1	11	70.5	11	
"innovative technical solution"	67.1	10	72.3	10	
"rich experience in international PPP project management"	58.3	12	61.7	12	
Sound financial package					
"appropriate toll/tariff level(s) and suitable adjustment formula"	93.5	1	86.3	1	rs = 0.94
"abilities to deal with fluctuations in interest/ exchange rates"	87.0	2	84.7	2	
"sound financial analysis"	82.3	3	84.1	4	
"investment, payment, and drawdown schedules"	80.7	4	79.3	5	
"sources and structure of main loans and standby facilities"	77.5	5	84.7	3	
"long-term debt financing that minimizes refinancing risk"	76.7	6	78.1	6	
"stable currencies of securitization (debts and equity finance)"	73.5	7	75.7	7	
"fixed and low interest rate financing"	70.3	8	73.5	8	
"low financial charges"	61.5	9	71.1	9	
"high equity/debt ratio"	58.3	10	71.1	10	

Table 4 *(continued)*

Success subfactors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
Appropriate risk allocation					
Appropriate and reliable risk allocation in:					
"concession agreement"	86.3	1	81.7	1	
"off take agreement"	78.3	3	73.5	7	
"guarantees/support/comfort letters"	81.5	2	78.7	3	
"loan agreement"	77.5	4	80.5	2	
"shareholder agreement"	75.0	5	74.7	5	rs = 0.74
"operation agreement"	74.3	7	78.1	4	
"insurance agreement"	75.1	6	74.7	6	
"design and construct contract"	70.3	8	62.0	8	
"supply agreement"	65.5	9	59.3	9	

Note: C.I. = "criticality index", R.= "ranking", r_s = "Spearman's coefficient of rank correlation".

Source: Data collected by the authors.

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