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PUBLIC-PRIVATE PARTNERSHIPS FOR INFRASTRUCTURE IN DEVELOPING ASIA: A SYSTEMATIC REVIEW OF CHALLENGES AND FUTURE RESEARCH AGENDAS

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Abstract
This study conducts a systematic review of Public-Private Partnership (PPP) literature in Asia to identify research trends, thematic concentrations, and critical challenges, with a particular focus on Indonesia, China, and India. Employing the PRISMA framework, a final corpus of 47 articles from the Scopus database (2007–2025) was analyzed using bibliometric methods and VOSviewer to map collaborative networks and key themes. Findings reveal a significant increase in PPP research, with India and China emerging as central hubs in collaborative networks. Key challenges identified include 'appropriate risk allocation and risk-sharing,' 'political support,' and 'the private sector's financial strength,' with six challenges being unique to developing countries. The research is notably interdisciplinary and often focuses on global health and food security, rather than general infrastructure. This study provides an evidence-based map of the PPP research landscape, offering a systematic agenda for future inquiry and practical guidance for designing effective PPP strategies in Asia.

Keywords: public-private partnership, local government, PRISMA, private sector, Asia

1. Introduction

1.1 Background

Public administration and public services are inherently interconnected. The paradigm in public administration, when effectively implemented in public service, leads to the realisation of excellent service delivery. The introduction of the New Public Management (NPM) paradigm aims to reform public sector governance by adopting ideas and practices that have been implemented in the private business sector (Denhardt & Denhardt, 2015). In essence, NPM aims to integrate the principles of private sector efficiency into public sector operations, thereby enhancing effectiveness and efficiency and addressing the public sector's historical image of being slow, wasteful, and corrupt (Winengan, 2018). In several countries, NPM has led to a shift from hierarchical governance towards more market-oriented models (Ferlie & Steane, 2002). This shift has resulted in fragmented governance, where public service delivery is no longer solely within the public sector, but also involves commercial organisations and communities through contracts, reducing the discretion and influence of public service professionals (Skelcher, 2005).

The idea underpinning NPM is to dismantle the monopoly of public service delivery, which has often been inefficient, and to create more entrepreneurial governance (Osborne, 2010). This transformation aligns with the transition to New Public Governance (NPG), a model that emphasizes collaboration and horizontal ties between individuals and institutions, as articulated by (Osborne, 2006). Furthermore, the emergence of third-party governance in the 21st century has further fragmented the public sector, requiring more interdependent relationships with external actors to address public policy challenges (Hodge & Greve, 2007; Kettl, 2016). NPG, grounded in organisational sociology and network theory, explains the increasing fragmentation and

uncertainty in public management (Haveri, 2006). NPG focuses on cooperation between the public and private sectors, as well as increasing community participation in decision-making and operational processes related to public services (Kenpahoom, Chinsan, Bunjongparu, & Wiwithkhunakorn, 2024).

The dominance of NPG in public policy implementation underscores a growing shift toward sustainable public services and effective governance, with an emphasis on collaboration (Osborne, 2010). Although NPG appears as a relatively new approach, the division of public authority through privatisation is not novel (Wettenhall, 2005). There is a stark contrast between NPM and NPS (New Public Service) perspectives, with privatisation enabling public-private competition but focusing on values such as efficiency and competition. In comparison, NPG emphasizes values such as participation, partnership, and democracy, decentralizing authority to local organizations and civil society (Pestoff, 1992). This transition from hierarchical governance to NPG offers a significant shift in how public services are delivered, promoting a more inclusive and democratic system, especially at the grassroots level.

Privatisation, according to Savas (1987); (Savas & Savas, 2000), involves reducing government roles or increasing the private sector's involvement in fulfilling public needs. This process often involves transferring functions or assets from public ownership to the private sector through contractual arrangements. Privatisation in the context of NPG does not eliminate government functions. Instead, it creates a balance between public and private roles to enhance service delivery, focusing on regulatory functions and equitable outcomes. According to (Savas & Savas, 2000), Public-Private Partnerships (PPP) serve as an essential governance model that facilitates this balance. PPPs are collaborations where the public sector leverages private sector expertise and capital for long-term infrastructure projects, with shared risk, performance-based contracts, and mutual commitment to social benefits. PPPs are vital in addressing financial gaps for infrastructure development, especially in regions where public funds are insufficient to meet growing demands (Savas, 2000).

In Indonesia, however, there is a distinction between the global concept of PPPs and the locally applied KPBU (*Kerjasama Pemerintah dengan Badan Usaha*), which represents a form of partnership tailored to Indonesia's specific needs. KPBU has emerged as a response to the financial constraints of local governments, aiming to address the significant gap in infrastructure provision. The adaptation of PPP concepts into the Indonesian context, often referred to as KPBU, necessitates a more comprehensive theoretical framework. This study is anchored in Savas' Theory of privatization (2000), which advocates for a balanced approach where the government retains its regulatory functions while outsourcing specific services to the private sector. By understanding privatization through this lens, the research will address the growing need for infrastructure in Indonesia, highlighting the differences between international PPP models and the challenges faced within the Indonesian KPBU framework.

The current state of infrastructure development in Indonesia reflects the broader challenges faced by the public sector in fulfilling its duties with limited financial resources. As shown in the World Economic Forum's (WEF) Competitiveness Ranking, infrastructure remains one of the most significant challenges in Indonesia, with limited improvement in comparison to other Asian countries (WEF, 2023). Despite ongoing efforts to enhance the country's infrastructure, including initiatives such as the KPBU, Indonesia still struggles to achieve the level of infrastructure development seen in countries like Thailand, Malaysia, and Singapore. The implementation of KPBU has encountered significant obstacles, including inconsistent policy frameworks, local-

level political complexities, and issues with regulatory and financial coordination (Jensen, 2005; Djonoputri, 2018). These barriers highlight the complexity of applying PPP models in a developing country context, particularly in regions where local government support and political stability are crucial to ensuring project success.

This research, therefore, aims to address these gaps by conducting a systematic review of the challenges and opportunities presented by KPBU in regional infrastructure projects. The analysis will explore stakeholder involvement, project readiness, and the political environment, providing a theoretical framework based on Savas' privatization Theory. By bridging the gap between international PPP models and the Indonesian context, this study will provide insights into enhancing the effectiveness of KPBU, thereby ensuring better public-private collaborations that ultimately lead to more sustainable and equitable infrastructure development in Indonesia's regions.

1.2 Aim and Research Question

The significance of Public–Private Partnerships (PPPs) is particularly magnified in developing countries, where these collaborative models offer the potential to address pressing infrastructure challenges and promote sustainable development (Cui, Wang, Liu, & Coffey, 2019; Ma et al., 2025). Against this backdrop, this study embarks on a state-of-the-art systematic review of project-focused literature on PPPs within the construction sector of developing countries. By synthesizing the totality of the evidence available in this area, our study aims to provide profound insights into the evolving trends in PPP research, shedding light on (i) publication volumes and their temporal variations, (ii) the types of projects most frequently studied, (iii) the research methods employed in analyzing PPP projects, (iv) the core themes that dominate the discourse, as well as (v) the critical challenges that continue to hinder the success of PPP projects in these regions. In doing so, we advance three key research questions, inspired by the rigorous methodologies of earlier studies by (Ke, Wang, Chan, & Cheung, 2009; Narbaev, De Marco, & Orazalin, 2020; Wang, Ma, & Liu, 2020), with the ultimate goal of offering a deeper understanding of PPPs and their implications:

RQ1: Is public-private partnership exploration a subject that will continue to have significance for future scientific inquiry?

RQ2: What is the allocation of research investigations related to public-private partnerships?

RQ3: What are the theoretical and practical implications from a future research perspective?

The findings of this study offer valuable guidance to both the public and private sectors, equipping them with a deeper understanding of how political and economic stability influence the success or failure of PPP construction projects. Furthermore, this study seeks to contribute to the growing body of knowledge on PPPs, offering a clearer picture of how these partnerships can be better structured and managed to deliver tangible outcomes for the benefit of all stakeholders involved.

The rest of the paper is structured as follows: Section 2 provides a detailed overview of the background to PPPs, setting the stage for the ensuing discussions. Section 3 outlines the essence of systematic literature reviews and their importance in synthesizing the research landscape. Section 4 presents a comprehensive summary of the PPP construction research literature based on the selected articles. In Section 5, the major themes and sub-themes identified through qualitative coding are examined in-depth. Section 6 examines how these themes and sub-themes vary across the developmental stages of countries, with a specific focus on the challenges that are most pronounced in developing contexts. Finally, Sections 7 and 8 present a comprehensive discussion of the findings, concluding with key recommendations for future research and practice.

2. Theoretical Background

2.1 What is PPP?

Public-Private Partnerships (PPPs) represent a procurement strategy that fosters collaboration between the public sector (government) and private entities (J. Liu, Gao, Cheah, & Luo, 2016). Under this model, the government defines the project's needs and sets the concession period, which is then granted to a private partner (Algarni, Arditi, & Polat, 2007). The private sector entity that enters this partnership is referred to as the concessionaire and may, if desired, form agreements with various stakeholders such as: (i) the public client; (ii) primary contractors; (iii) investors and financiers; (iv) insurers; (v) lead designers; (vi) suppliers of materials/equipment; (vii) operators/maintainers; (viii) purchasers of intermediate or end products/services; and (ix) non-governmental organizations (NGOs) (Zhang, Chan, Feng, Duan, & Ke, 2016). The primary objective of this public-private collaboration is to provide public infrastructure services (N. Lee & Schaufelberger, 2014).

As will be demonstrated, prior research on PPPs can generally be divided into several categories: (i) benefits of PPPs, (ii) critical challenges faced, (iii) issues related to tendering, (iv) differences between developed and developing country contexts, and (v) miscellaneous studies that do not fall into these categories.

Table 1 : Defining factors of public-private partnership

No	Defining factors of public-private partnership	Refrence
1	Public-private partnerships involve collaboration between public and private entities to deliver public services or develop public assets with private investment	(Hossin et al., 2024)
2	Public-private partnerships are used by the Indian government for waste-to-energy (WTE) incineration projects to generate power from plastics	(Jayanna et al., 2019)
3	It suggests that such partnerships are crucial for improving health infrastructures and providing universal healthcare	(Hardon et al., 2025)
4	In this partnership, the state pays for the service, while private operators are responsible for vehicle procurement, maintenance, and upkeep	(Sabde, de Costa, & Diwan, 2014)
5	Public-private partnership investment (PPPIE) involves long-term agreements between private and public institutions to ensure the provision of essential public goods and services to residents	(Gao, Ozturk, & Ullah, 2023)

2.2 Prior Relevant PPP Research

A substantial body of research has critically examined the literature on Public-Private Partnerships (PPPs), offering invaluable insights into various aspects of these projects. For example (Ke et al., 2009) conducted a bibliometric review of 170 publications on construction management and economics related to PPPs, spanning from 1998 to 2003. Their comprehensive analysis focused on three key elements: (i) the volume of PPP-related publications, (ii) contributions by leading authors, and (iii) the evolving research themes. Their findings revealed a

growing emphasis on three primary topics—risk, procurement, and financing—eventually expanding to seven major themes: (i) procurement, (ii) economic viability, (iii) investment environment, (iv) financial packages, (v) governance, (vi) integration research, and (vii) risk management.

Ma, Li, Jin, and Ke (2019) Provided a comprehensive review of the PPP literature, encompassing scholarly articles, institutions, countries, and future research directions. Their analysis mapped out the landscape of PPP research and highlighted areas for future exploration. Similarly, Kwak, Chih, and Ibbs (2009) past studies to better understand the contractual arrangements used in PPP infrastructure projects identified five critical research themes: (i) success factors and barriers, (ii) government roles, (iii) concessionaire selection, (iv) PPP risks, and (v) PPP finance.

Taking a step further, Tang, Shen, and Cheng (2010) reviewed PPP construction project studies published in six major construction journals, categorizing the research into empirical and non-empirical themes. Their study identified six core areas of focus: (i) concession periods, (ii) contractual agreements, (iii) PPP model development, (iv) finance, (v) risk management, and (vi) strategies for selecting the appropriate PPP model. Expanding on this empirical research, Xu et al. (2010) developed a comprehensive 17-factor PPP risk assessment model. Marsilio, Cappellaro, and Cuccurullo (2011) also used bibliometric methods to identify four primary research clusters in non-project-focused PPP literature: (i) governmental and intergovernmental organizations, (ii) public administration and policy, (iii) transaction costs and contracts, and (iv) strategy and alliances.

Further studies, such as those by (Neto, Cruz, Rodrigues, & Silva, 2016), revealed a traditional focus on a narrow set of topics in PPP research, including (i) contract design and risk-sharing, (ii) contract performance, (iii) costs and benefits, (iv) political and institutional issues, and (v) value-for-money tests. Osei-Kyei et al. (2019) conducted a critical review of PPP success factors from 1990 to 2013, focusing on the PPP implementation literature and identifying key regions, including Australia, China, Hong Kong, and the United Kingdom. Zhang et al. (2016) extended Osei-Kyei et al. (2019) work by reviewing PPP studies in Chinese journals and comparing them with international journals, finding thematic similarities but significant differences in research methods.

Recent studies have also examined emerging global trends in PPP research. Song, Zhang, and Dong (2016) noted a shift from concession pricing and periods to more contemporary topics, such as risk allocation and contract management. Bao (2018) reviewed PPP literature from a lifecycle perspective, exploring how understanding varies across different phases of a PPP project. Cui et al. (2019) identified five major research themes in PPP infrastructure projects: financial packages, economic viability, value for money (VFM), risk management, and success factors.

The research also highlights significant differences between the implementation of PPPs in developed and developing countries. Studies by Cui et al. (2018) and Ma et al. (2019) suggest that developing countries face unique challenges in executing PPPs, such as limited public sector resources, inefficiencies, uncertainties in the business environment, and political instability. These challenges often lead to higher failure rates in PPP projects in developing countries, exacerbated by weak political and economic conditions (S. O. Babatunde, Perera, Zhou, & Udeaja, 2015; T. Liu & Wilkinson, 2014). Ma et al. (2019) provided a comparative review of PPP research between developed and developing countries, identifying thirteen key themes that dominate PPP studies. Additionally, Narbaev et al. (2020) highlighted the multidisciplinary nature of PPP research, with

four primary research domains identified: (i) partnerships, (ii) public welfare, (iii) global diffusion, and (iv) PPP projects.

Zhang et al. (2020) mapped the evolution of PPP research between 2009 and 2019, identifying emerging research directions, including area development for regional social sustainability, quantitative risk assessments, compensation mechanisms, stakeholder satisfaction management, and regulatory frameworks. This shift in focus reflects a deeper understanding of the complexities inherent in PPPs, particularly in developing countries, where challenges such as inappropriate risk allocation, poor concession periods, financial weaknesses in the private sector, and lack of public support are common.

2.4 Developing Country Context

Studies by Cui et al. (2018) and Ma et al. (2019) highlight significant differences in the implementation of PPPs between developed and developing countries. Generally, developing countries are more susceptible to PPP failures due to factors such as limited public sector resources (human, financial, and expertise), inefficiencies, and other bottlenecks. Additionally, uncertainties in the business environment (S. Babatunde, Perera, & Adeniyi, 2018; S. O. Babatunde et al., 2015; Tamošaitienė, Sarvari, Chan, & Cristofaro, 2021) and low levels of political and economic stability (Aladag & Işik, 2018; Dewulf & Garvin, 2020; S. Kim & Kwa, 2020; T. Liu & Wilkinson, 2014) further exacerbate these challenges. Despite these risks, PPPs are often viewed as more beneficial for developing countries due to their ability to attract much-needed human resources, financial capital, and the expertise of the private sector (Gordon, 2012; Willoughby, 2013).

Several studies have focused specifically on PPP in the context of developing countries, such as those by Biygautane, Neesham, and Al-Yahya (2019) S. Babatunde et al. (2018) and (Kwofie, Aigbavboa, & Thwala, 2019), among others. However, literature on PPPs in developing countries remains relatively sparse compared to the volume of studies from developed countries. Zhang et al. (2020) argue that reviews focusing on developing countries are long overdue. For example, Biygautane, Hodge, and Gerber (2018) explored the prospects of PPPs in Gulf countries (Kuwait, Saudi Arabia, and Qatar), identifying challenges such as political interference, resource constraints, and weak institutions that hinder effective PPP implementation. Similarly, Babatunde, Adeniyi, and Awodele (2017) identified four key risk factors contributing to delays in PPP projects in Nigeria: political interference, resource constraints, weak institutional frameworks, and legal delays.

Osei-Kyei et al. (2019) examined conflict prevention measures in Ghana, identifying four key strategies: stakeholder consultation, goal clarity, role clarity, and transparent dispute resolution procedures. In Ghana and South Africa, Kwofie, Aigbavboa, and Thwala (2019) focused on understanding communication performance challenges in PPP projects, which is crucial for creating effective communication plans. Other notable studies include those by Eyiah-Botwe, Aigbavboa, and Thwala (2019) Bolomope et al. (2021) on local management, (Hai, 2022) on critical success factors for PPP infrastructure projects in Vietnam, such as procurement, risk management, and project information.

Overall, political and economic instability in developing countries often leads to delays in authorization and approval (Song et al., 2013) and unforeseen regulatory changes (Lee and Schaufelberger, 2014), stemming from poor decision-making processes (Bing et al., 2005). These factors make PPP success more challenging in developing countries, despite the inherent benefits. Thus, we propose that a dichotomy exists between developed and developing countries regarding

the success of PPP projects—a dichotomy that has not been fully explored in the literature. While the advantages of PPPs are more pronounced in developing countries, political and economic instability in these regions poses significant challenges to the success of such projects.

2.5 Other Studies

Drawing from Bao et al. (2018), some studies could not necessarily be appropriately classified into either study (i) examining the challenges facing PPP projects /or (ii) studies focused on a specific developing country context. Examples of such studies include those focused on the role of PPP as a tool for national/sustainable development (see Brogaard and Petersen, 2018; Wang and Ma, 2021). Driven by a recognition that numerous PPP initiatives will be handed back to host governments at the end of their concession period, Yuan et al. (2015) opined that the problems associated with the subsequent management of PPP projects were a key driver because Residual value risk (RVR) should be of interest to PPP practitioners. Here, Residual value risk (RVR) is defined as '… the risk that on expiry or earlier termination of the service contract, the asset (tangible or intangible) is not in accordance with the value originally estimated by the government at which point the private party agreed to transfer it to the government' (04014041). Examples of other PPP-related literature are those focused on tendering (see Carbonara, Costantino, and Pellegrino 2016; Liu, Wang, and Wilkinson 2016; Reeves et al. 2017; Simon et al. 2020), PPP risk exposure (see Chan et al. 2018; Jin et al. 2021), and revenue uncertainty (see Liu et al. 2020; Pellegrino 2021) and guarantees provisions (see, for example, Carbonara et al. 2015; Wang, Cui, and Liu 2018; Wang, Gao, and Liu 2019). Thus, for instance, as relates to tendering, Carbonara, Costantino, and Pellegrino (2016) developed a PPP decision model that can minimise public sector transaction costs. One of the significant advantages of this model is its ability to support public sector entities in decision-making related to PPP tendering. In Liu, Wang, and Wilkinson (2016), a total of 14 key factors impacting PPP tendering effectiveness were identified, a study later extended by Simon et al. (2020). Noting that unduly long tendering periods served to deter bidders, Reeves et al. (2017) sought to examine the factors impacting tender duration in PPP contracts, finding significant variations across different sectors (for example, between PPP housing projects and those commissioned within the healthcare sector).

3. Systematic reviews of literature

The purpose of a literature review is to conduct an inquiry that is both creative and systematic, providing a platform for scholars to engage in dialogue that fosters a deeper understanding of existing theories (Rowley and Slack, 2004; Montuori, 2005). Literature reviews are defined as "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners" (Fink, 2010, p. 3). The primary objectives of any literature review can generally be summarized as: (i) summarizing prior research, (ii) thoroughly examining this prior research, (iii) elucidating the outcomes of this research, and (iv) offering interpretations of alternate views on the research findings (Schwarz et al., 2007).

In recent years, systematic reviews have gained significant popularity. These reviews are commonly defined as "a form of secondary study that uses a well-defined methodology to identify, analyze, and interpret all available evidence related to a specific research question in an unbiased and repeatable manner" (Rowe, 2014, p. 246). Alternatively, they are viewed as an approach that employs explicit procedures and is regarded as a cornerstone of evidence-based practices (Bell, Bryman, and Harley, 2018, p. 104). Tranfield, Denyer, and Smart (2003, p. 209) define a

systematic review as "a replicable, scientific, and transparent process—a detailed technology—that aims to minimize bias through exhaustive literature searches and by providing an audit trail of the reviewer's decisions, procedures, and conclusions."

The growing popularity of systematic reviews is well recognized across various academic fields, including project management (Geraldi, Maylor, and Williams, 2011; Petro et al., 2019; Williams et al., 2019; Condé and Martens, 2020; Testorelli, Araujo Lima, and Verbano, 2020; Cantarelli and Genovese, 2021; Dallasega, Marengo, and Revolti, 2021) and operations management (Lightfoot, Baines, and Smart, 2013; Thome, Scavarda, and Scavarda, 2016; Glas, Henne, and Essig, 2018; Bagni et al., 2021; Zhou et al., 2022). Systematic reviews consist of two distinct procedures (Easterby-Smith, Thorpe, and Jackson, 2012, p. 108). The first involves reviewing protocols and conducting a mapping exercise, which includes accessing, retrieving, and evaluating the quality and significance of relevant studies. The second procedure records the outcomes of the first process and identifies current research gaps. Based on the frameworks provided by Tranfield, Denyer, and Smart (2003) and Easterby-Smith, Thorpe, and Jackson (2012), a systematic review framework involves (i) a comprehensive search, (ii) visual sifting, and (iii) a thorough review. Figure 1 illustrates how this framework is applied in our study

3.1 First Stage

In stage one, a thorough search was conducted using the title, abstract, and keywords in the SCOPUS database. SCOPUS was chosen for several reasons: (i) it is one of the most prominent abstract and citation databases for scientific journals (Osei-Kyei and Chan, 2015); (ii) SCOPUS outperforms other databases such as Web of Science, PubMed, and Google Scholar in terms of accuracy and coverage (Falagas et al., 2008); and (iii) it is widely adopted in similar systematic reviews in construction management (Bao et al., 2018; Narbaev, De Marco, and Orazalin, 2020) and operations management (Mahdavi et al., 2013; Geraldi, Maylor, and Williams, 2011; Akmal et al., 2018; Dallasega, Marengo, and Revolti, 2021).

Since there is no consensus on the definition of PPP (Liu et al., 2015a; Zhang et al., 2020), the search included all key definitions: Public-Private Partnership (PPP), Private Finance Initiative (PFI), and Build-Operate-Transfer (BOT). In PFI, financing is primarily provided by the private sector, a model first introduced in the United Kingdom in the 1980s, and later adopted in countries like Australia, the United States, and New Zealand (Raisbeck, Duffield, and Xu, 2010). BOT is commonly used in infrastructure projects as a financing and delivery model, where the private sector is given a concession period to operate and maintain infrastructure, generating revenue (Zhu, Xu, and Hu, 2016; Le et al., 2021). To broaden our search beyond just building-related construction, the terms 'Construction' and 'Infrastructure' were included in the search string. The IPA (2021) defines infrastructure projects as including energy, environment, transport, telecommunications, sewage, water systems, and the construction of new public buildings.

Furthermore, scholars like Reijniers (1994) argue that 'projectivity,' or the ability to manage projects effectively, is key to the success of PPP projects. Reflecting this, similar to Ma et al. (2019), we included 'Project Management' as a search term. The inclusion of 'Project Management' acknowledges that the implementation phase of most PPP projects, which includes construction, management, and operation over 20 to 30 years (Hueskes, Verhoest, and Block, 2017), requires careful management to ensure project success. This management process encompasses the integration of guidelines and standards (Kerzner and Kerzner, 2017), stakeholder management (Jacobson and Choi, 2008), and performance monitoring (Osei-Kyei, Chan, and Ameyaw, 2017).

3.2 Second Stage

Stage two was a visual sifting to exclude irrelevant articles which, while meeting the search criteria, did not actually qualify, for example, because of alternative meanings of PPP such as 'Purchasing Power Parity', 'Power Projection Platform', 'Projects, Plans and Policy', and 'Payment Protection Plan', etc. As a result, the final number of qualifying PPP construction project articles was 160. Table 1 presents the list of journals for the selected papers, along with the number of articles published in each journal.

3.3 Third Stage

Based on the results shown in Figure 1, a search was conducted on September 27, 2025, using the Scopus database. The query "Public-Private Partnership AND Asia" was applied to the article title, keyword, and abstract fields across diverse academic disciplines, with a publication range from 2007 to 2025. This initial search yielded 594 documents.

Following these findings, a multi-stage screening process was implemented. First, documents were filtered by type, which led to the exclusion of 199 items (e.g., book chapters: 47, reviews: 75, conference papers: 37, books: 18). The subsequent screening phase filtered documents by the authors' country of origin, excluding 301 documents from countries other than India, Indonesia, and China. The final screening stage was based on open access status, resulting in a final corpus of 69 documents. This dataset is further analyzed in this study to answer the following research questions: **RQ1:** Is the exploration of public-private partnerships a subject that continues to hold significance for future scholarly inquiry? **RQ2:** What is the present allocation of research investigations related to Public-Private Partnerships? **RQ3:** What are the theoretical and practical implications from the perspective of future research?

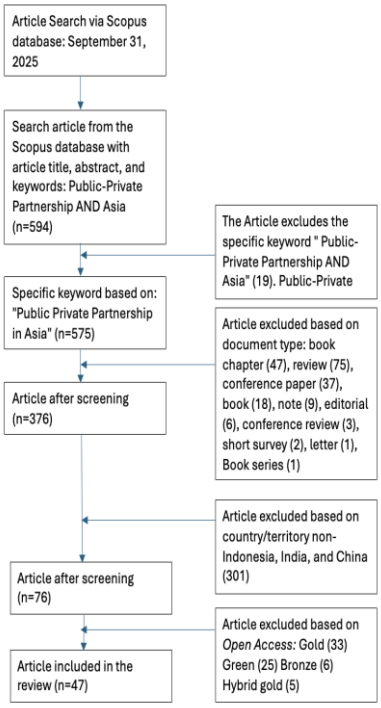


Figure 1 Systematic Literature Review information flow using PRISMA.

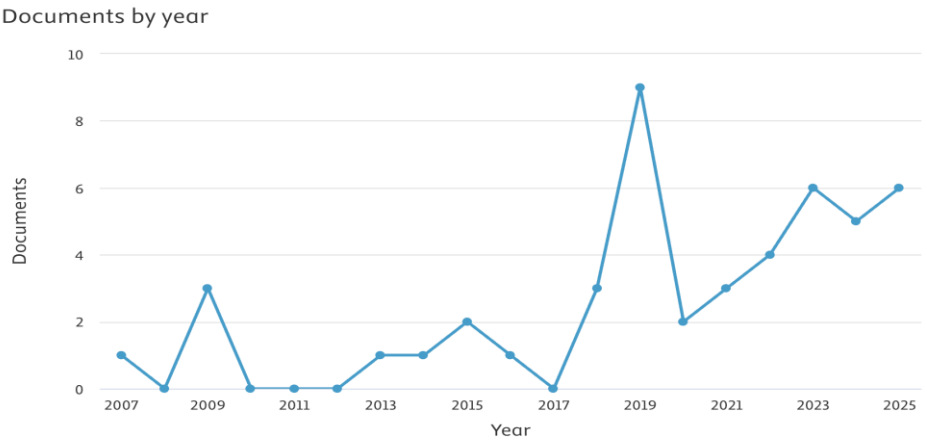
Finally, a statistical analysis was carried out to identify patterns over time, across different project types, research methods, themes, sub-themes, and between developed and developing

countries. Following this, a tabulation analysis was performed to categorize the development stage of each country, aligning it with the themes and sub-themes identified through the qualitative coding of the research articles. The cross-tabulation allowed for an examination of the variation in themes and sub-themes across different country types. This analysis also helped pinpoint challenges faced by PPP projects in developing countries, highlighting issues that were predominantly or exclusively reported in research conducted in these regions. Any sub-theme that did not reflect challenges was excluded from further analysis.

4. Results and Discussion

The results of this study focus on 47 articles from the SCOPUS database concerning Public-Private Partnerships (PPPs), with the data organized by publication year and journal source. This analysis highlights the most influential elements within the PPP literature, including key authors, affiliations, and countries. In addressing the question of whether PPPs will continue to hold significance for future scholarly inquiry, the findings suggest a strong affirmative. The fact that only 47 articles on this topic have been published over the past four decades suggests that investigations into PPPs remain relatively scarce, as illustrated in Figure 1, presenting significant opportunities for future research. Separately, the exploration of Islamic Leadership has seen progressive development over the last decade, particularly since 2019, as evidenced by the nine documents found. Its inaugural study was conducted Kayaga and Zhe (2007) with the title *" Analysis of public-private partnerships for China's water service,"* which marks the emergence of the term now known as Public-Private Partnerships (PPP).

Currently, the evolution of research concerning public-private partnerships is garnering significant scholarly attention, with a particular focus on collaborations between local governments and the private sector. This concentration is often aimed at enhancing regional infrastructure, especially for projects that present high sustainability challenges. (Dai, Huang, Khan, & Labbo, 2025; Dunan, Mudjiyanto, Karman, & Walujo, 2025; Hardon et al., 2025; Mohan, Jothikaran, Gudi, Abhijith, & Ashok, 2025; Rahut, Chhay, Datta, & Behera, 2025; Zaidi, Raman, Chowdhury, Azam, & Balasubramanium, 2025).

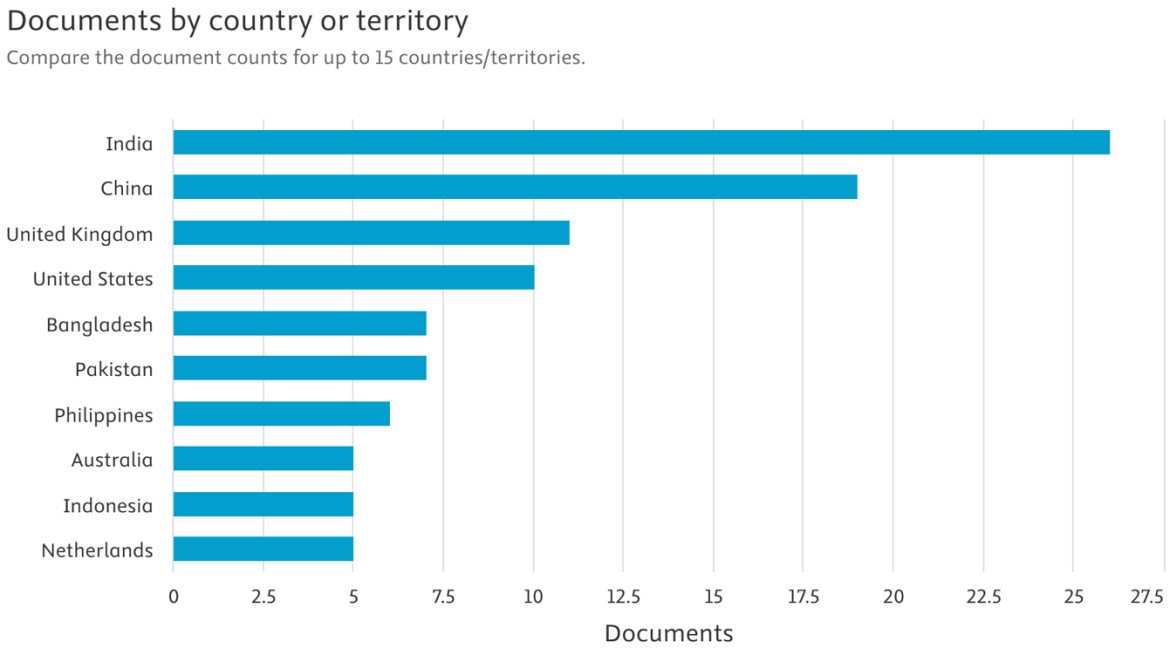


Source: Scopus database

Based on the data presented in the graph, the trend of scholarly publications on public-private partnership indexed in Scopus reveals significant dynamics over the period from 2007 to 2025. In the initial stage (2007-2017), the number of documents was consistently low, fluctuating and never

exceeding three publications per year. However, a drastic surge occurred in 2019, which became the highest peak with nine documents. After experiencing a decline in 2020, research interest in this topic resumed a progressive upward trend through 2025. This pattern indicates that the study of public-private partnerships has experienced substantial growth in scholarly attention in recent years, following a relatively stagnant period.

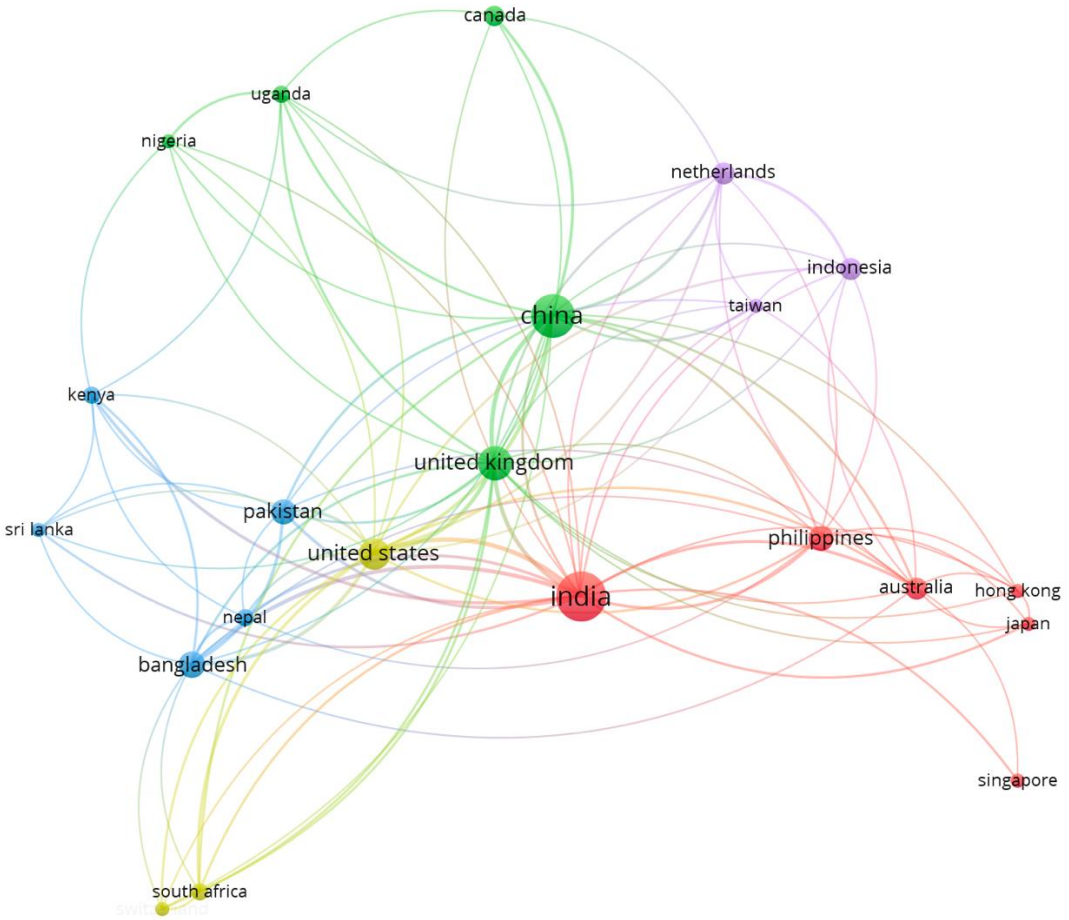
In response to the second research question **(RQ2), "What is the present allocation of research investigations related to public-private partnership?",** an analysis of the distribution across the 47 articles was conducted. This involved categorizing the articles based on classifications such as country, region, affiliation, source, and author, with a limitation to only the top 10 entries in each category. A deep understanding of the scholarly allocation in this field will benefit academics and practitioners by clarifying future research agendas, particularly for developing a sustainable public-private partnership paradigm. The initial analysis shows that India dominates the geographical distribution of research with 26 articles, followed by China with 19, and the United Kingdom with 11. Indonesia ranks 9th with a total of 5 articles. Accordingly, this study focuses specifically on three Asian countries—Indonesia, China, and India—selected for their comparable leadership categories, governmental systems, and patterns of cooperation.



Source: Scopus database

The allocation of scientific research on public-private partnerships, when categorized by country or region, shows the prominence of India with 26 manuscripts, followed by China with 19 manuscripts. Other significant contributions come from the UK (11 articles), the US (10 articles), Bangladesh and Pakistan (7 articles each), the Philippines (6 articles), and Australia, Indonesia, and the Netherlands (5 articles each). This finding indicates that PPPs have garnered attention not only in developed nations but also in developing countries, reflecting the topic's global relevance. To further contextualize these findings, particularly concerning the prominent Asian countries in this study (India, China, and Indonesia), it is crucial to understand the collaborative networks within related scholarly domains. Therefore, the researcher will next analyze the co-authorship

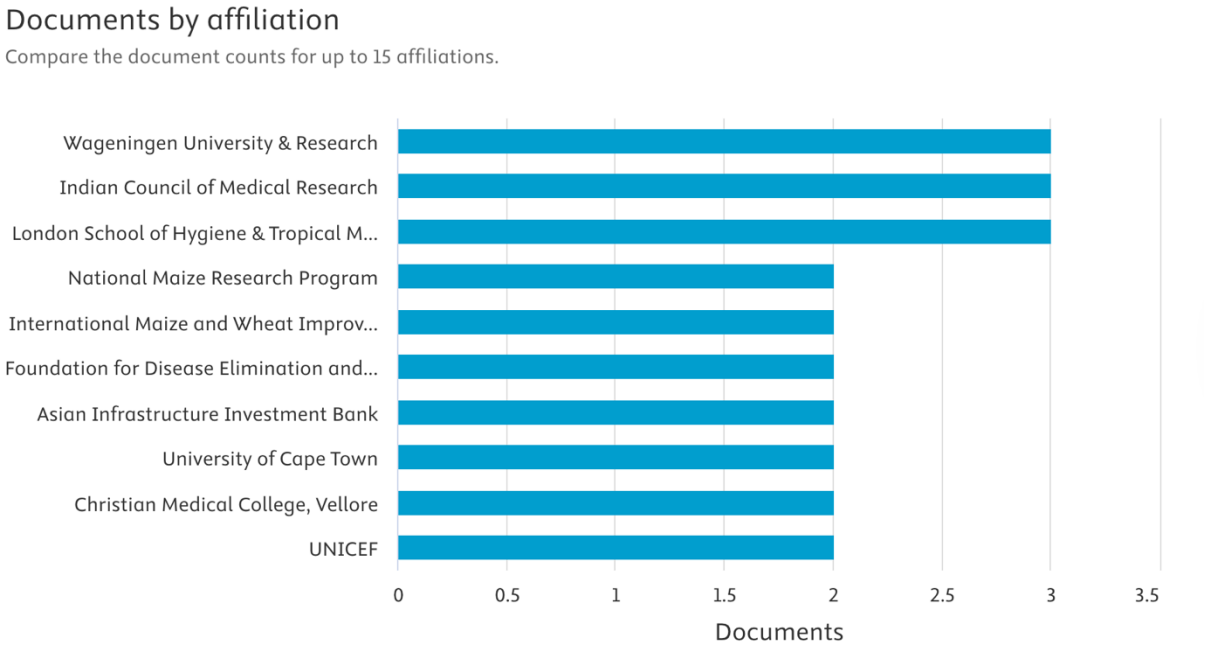
relationships between countries involved in Islamic leadership research using VOSviewer software. This analytical stage is vital for formulating a systematic and prospective research agenda. The VOSviewer findings will illustrate the international linkages in this related field, providing deeper insight into the academic landscape (see Figure 3).



This VOSviewer visualization map illustrates the research collaboration network among countries regarding Scopus-indexed public-private partnerships. The analysis reveals the formation of several distinct research clusters. India, China, the United Kingdom, and the United States emerge as the most productive countries and act as hubs within this network, indicated by their larger circle sizes. Clusters based on geographical proximity and collaborative ties are clearly visible; for example, the red cluster is centered around India with Asia-Pacific countries like the Philippines and Australia, while the green cluster is centered around China. Interestingly, countries such as the United Kingdom and the United States function as important bridges connecting several different clusters, signifying their central role in international research collaboration on this topic.

The data also highlights the most productive institutions. The top three—Wageningen University & Research, the Indian Council of Medical Research, and the London School of Hygiene & Tropical Medicine—are the most productive, each having published 3 documents. Following them is a group of other institutions such as the National Maize Research Program, the Asian Infrastructure Investment Bank, the University of Cape Town, and UNICEF, each with a

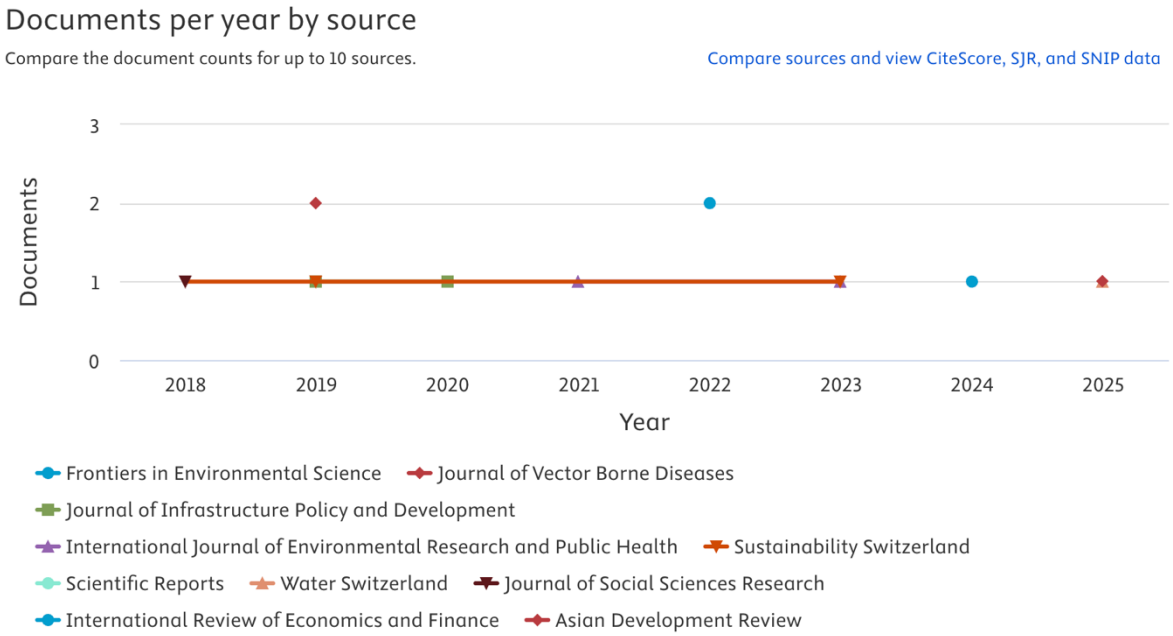
contribution of 2 documents. Overall, this graph illustrates that the research landscape on this topic is led by a few key institutions, followed by several other organizations with a similar level of productivity.



Source: Scopus database

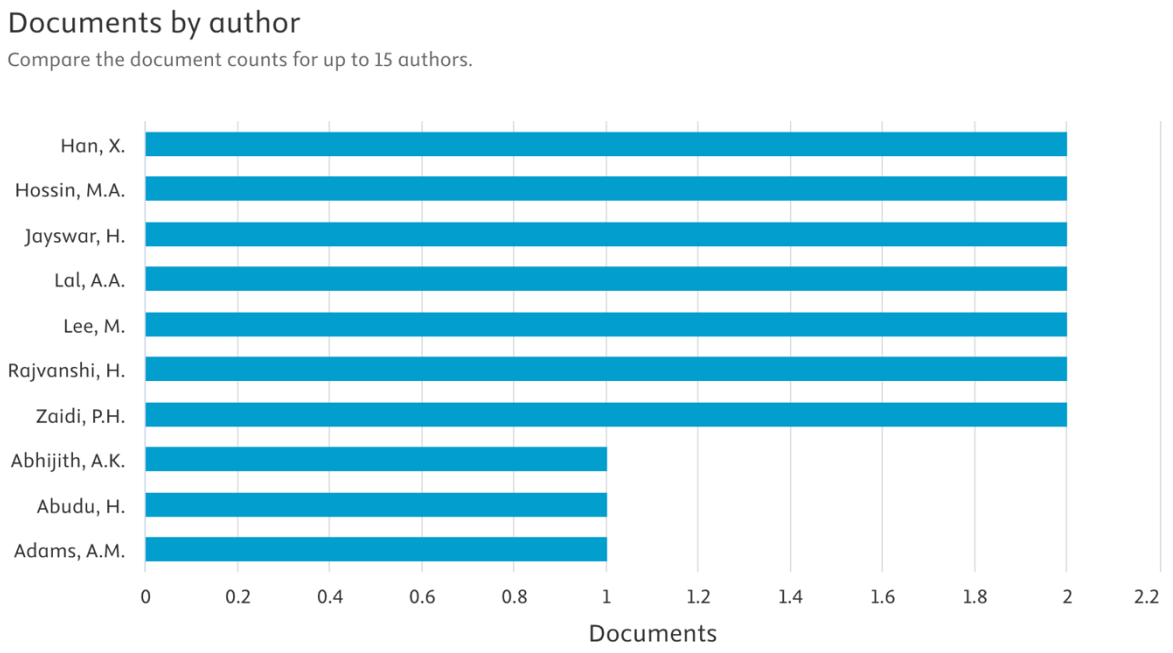
The primary reason these three institutions—Wageningen University & Research, the Indian Council of Medical Research, and the London School of Hygiene & Tropical Medicine—are the most prolific publishers in the context of Public-Private Partnerships (PPP) is that their primary focus lies in sectors heavily reliant on this partnership model. The research context here appears to be less focused on general infrastructure (such as toll roads) and more specific to the fields of global health, food security, and biomedical research.

The graph above presents a data visualization of the distribution of documents per year, based on their publication source, specifically scientific journals, within the 2018-2025 timeframe. An analysis of the graph reveals that publications on this topic are sporadically distributed across various journals, rather than being concentrated in a single primary source. The majority of identified journals, such as the *Journal of Infrastructure Policy and Development* and the *Asian Development Review*, published only one article in a specific year during this period. There are a few exceptions, where the *Journal of Vector Borne Diseases* showed higher productivity by publishing two articles in 2019, and *Frontiers in Environmental Science* also published two articles in 2022. This scattered distribution pattern indicates that this research field is interdisciplinary in nature and has not yet established a core journal that serves as a primary reference for researchers.



Source: Scopus database

The distribution of research related to public-private partnership, based on the author, does not show a clear dominance. Among the 10 top writers, 7 of them (Hossin et al., 2024; Lal, Rajvanshi, Jayswar, Das, & Bharti, 2019; M. Lee, Han, Gaspar, & Alano, 2019; Rajvanshi et al., 2023; Sarker et al., 2018; Zaidi et al., 2025) Each has written two articles, while only three authors (Adams, Nambiar, Siddiqi, Alam, & Reddy, 2018; Hossin et al., 2024; Mohan et al., 2025) who wrote an article (see figure 6).



Source: Scopus database

Our examination of 47 manuscripts from the Scopus repository reveals several key theoretical and practical implications for future research on public-private partnerships (PPP). Theoretically, this bibliometric analysis provides a clear map of the existing scholarly landscape. It highlights an intense concentration of studies focused on 'Asia' (13 occurrences), particularly 'India' (12) and 'China' (7), which points to a theoretical gap in understanding PPP models in other geographical contexts. The analysis also shows which variables have been extensively researched and which remain underexplored. For example, while core components like the roles of 'government' (5) and the 'private sector' (7) are established, emerging themes such as 'sustainable development' (6), 'sustainability' (3), and 'risk management' (2) have significantly fewer occurrences compared to the main topic of 'public-private partnership' (25). This presents a clear opportunity for future researchers to explore these critical areas further.

Practically, the findings offer a valuable guide for policymakers and managers. By understanding the dominant themes, practitioners can more easily access relevant knowledge on the 'organization and management' (6) of PPPs. This analysis serves as an evidence-based foundation for developing more effective partnership strategies that address crucial factors like 'economics' (4) and sustainability, helping organizations worldwide to implement successful PPP models.

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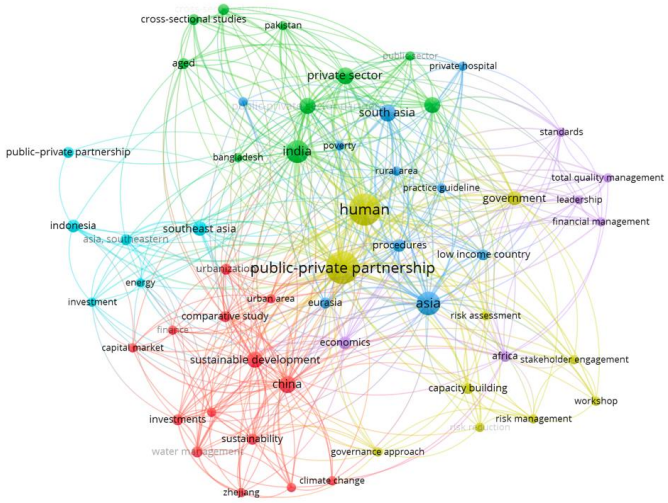

Source: VOSViewer Output

Rank	Keyword	Total Link Strenght
1	public-private partnership	368
2	India	196
3	asia	165
4	private sector	126
5	organization and management	94
6	government	93
7	china	79
8	sustainable development	70
9	risk management	38
10	indonesia	30

5. Overview of PPP construction projects literature

To provide a comprehensive overview of the literature on PPP construction projects, three key aspects were analyzed: (i) publication trends over time, (ii) the types of projects covered in the research, and (iii) the methodologies employed by researchers. For clarity and focus, this overview is presented at a broad level and does not delve into the specific details of each article within each category. The aim was to highlight the overarching patterns and trends in the field, offering a snapshot of how PPP construction research has evolved and the diverse approaches scholars have taken in addressing the topic.

5.1. Trends over time

The data pattern reveals two significant peaks in PPP construction research: the first, before the 2007–2008 financial crisis, and the second in 2019, coinciding with the onset of the COVID-19 pandemic. Interestingly, following the financial crisis, the volume of publications increased, with nearly two additional studies published each year compared to previous periods. This surge in interest is both understandable and significant. The subprime lending crisis, followed by the global COVID-19 pandemic, forced governments to reallocate substantial resources to urgent social programs. As a result, infrastructure funding was severely constrained. To overcome these limitations, the public sector had no choice but to look towards the private sector for alternative financing solutions to fill the growing funding gaps and maintain essential infrastructure investments. This growing reliance on Public-Private Partnerships (PPP) not only reflected the urgency of the situation but also highlighted the critical role of collaborative models in sustaining infrastructure development during times of financial and social distress.

5.2. Types of PPP construction projects

Nearly 36% of the 160 articles did not specify the type of PPP construction project discussed. Of the remaining articles, approximately 64% identified three main types of PPP projects: (i) transportation projects, (ii) utility infrastructure projects, and (iii) social service projects.

Transportation projects were the most prevalent, making up nearly 38% of the studies. Many of these studies have focused on road construction in various locations (Demirel, 2017; S. a. T. L. Kim, 2021; Verweij, 2015). Other research included harbor tunnel projects in Hong Kong and Thailand (Tam, 1999; Zhang et al., 2016), subway projects in the United Kingdom (Glaister, 2000) and China (Wu, 2016), tunnel projects in Hong Kong (Zhang et al., 2016), and bridge projects in both developed and developing countries (Kivilä, 2017). Rail projects in Taiwan (Huang, 2006; Ng, 2007) and airport construction in developing countries (Aladag & Işik, 2018; Biygautane et al., 2019) were also examined.

The second most common type was utility infrastructure projects, which made up nearly 10% of the studies. These studies focused on power plant projects in various countries (Bashtannyk, 2020), water treatment plants in the United Kingdom (Grimsey and Lewis 2002), China (Liu and Cheah 2009), and Kuwait (Al-Azemi, Bhamra, and Salman, 2014), as well as oil and gas pipeline projects in developing countries (Boudet, Jayasundera, and Davis 2011).

6. Key themes from PPP construction projects research

6.1. Project management

Research under the theme of ‘Project Management, Rationalities, Innovation, and Knowledge Sharing’ focused on improving the management of PPP construction projects and explored how rationalities, innovation, and knowledge sharing contribute to these projects. Within this theme, six sub-themes were identified: ‘Success factors and criteria,’ ‘Barriers to adopting PPP,’ ‘Cost

and time challenges in PPP,' 'Rationales for adopting PPP,' 'Innovation,' and 'Knowledge transfer.'

6.1.1. Success factors and criteria

In the existing literature, several studies have been conducted on the success of PPP construction projects. The first category of success studies focuses on identifying and ranking the critical success factors (CSFs) according to their significance, using three primary perspectives: (i) a national perspective (Hsueh and Chang, 2017; Nguyen, Likhitruangsilp, and Onishi, 2020), (ii) a PPP construction project perspective (Liu and Wilkinson, 2015), and (iii) a project life cycle perspective (Liu et al., 2015b; Osei-Kyei, Chan, and Ameyaw, 2017).

The second category of studies focuses on evaluating the success of PPP construction projects in relation to the goals of key stakeholders. Researchers in this category have identified the success criteria for PPP construction projects, including: (i) the UK (Dixon, Pottinger, and Jordan, 2005), (ii) cross-country comparisons (Osei-Kyei, Chan, and Ameyaw, 2017), (iii) key performance indicators (Yuan et al., 2009, 2012; Mladenovic et al., 2013), (iv) the success of PPP transport projects across four EU countries (Liyanage and Villalba-Romero, 2015), (v) success criteria for PPP construction projects in Ghana (Osei-Kyei and Chan, 2017a), and (vi) a model for quantifying PPP project success in developing countries (Osei-Kyei and Chan, 2017b).

The third type of success studies focuses on analyzing the relationship between the first and second categories—namely, CSFs and project success criteria. For example, Ng, Wong, and Wong (2010) examined the relationship between initial feasibility and stakeholder satisfaction in Hong Kong's PPP construction projects. Ahmadabadi and Heravi (2019a) explored the effects of CSFs during the procurement phase of PPP highway projects in Iran. Osei-Kyei and Chan (2019) developed a conceptual model to analyze the relationship between CSFs and success criteria in PPP projects in Ghana.

It is important to note that researchers studying CSFs for PPP construction projects in different countries, including China, Hong Kong, Taiwan, and Malaysia (Chan et al., 2010a; Cheung et al., 2012; Ismail, 2013; Hsueh and Chang, 2017), reported varying results. This suggests that CSFs may be context-specific, varying across different countries. Additionally, there is no universal global formula for the success of PPP construction projects (Kim and Kwa, 2020). For instance, Dulaimi et al. (2010) identified seven CSFs, while Salman, Skibniewski, and Basha (2007) identified 21 CSFs for the feasibility stage. Li et al. (2005a) found 18 CSFs for PPP construction projects in the UK, while Cheung et al. (2012) identified 15 CSFs for projects in China and Hong Kong. This variation may arise from the differing characteristics of each country or project. Furthermore, it is notable that only a limited number of CSFs can directly influence the success of PPP projects due to the complex relationship between CSFs and project success criteria (Ahmadabadi and Heravi, 2019a; Osei-Kyei and Chan, 2019).

6.1.2. Obstacles to adopting PPP

The study explored the potential barriers to the adoption of PPP construction projects across various countries. For instance, possible obstacles were investigated in regions such as Southeast Asia (Tam, 1999), China and Hong Kong (Chan et al., 2010b), Jordan (Mistarihi, Hutchings, and Shacklock, 2013), Greece (Ojiako, Papadopoulos, et al., 2015), and Nigeria (Adama, 2018). Other countries examined include Ghana and South Africa (Kwofie, Aigbavboa, and Thwala, 2019), as well as Vietnam (Kim and Le, 2021). The findings indicate that the primary obstacles are related to the lack of: (i) compatibility and complementary skills among key parties, (ii) effective negotiation between project partners, (iii) trust, (iv) open and effective communication among

stakeholders, (v) social and political stability and support, (vi) proper risk allocation and sharing, (vii) equality between partners, (viii) sufficient time for decision-making and problem-solving, and (ix) appropriate project management.

6.1.3. Rationalities for adopting PPP

The study explored the factors influencing the adoption of PPP construction projects across various markets. Li et al. (2005b) identified several reasons for the adoption of Private Finance Initiative (PFI) procurement in the UK construction sector, including reducing transaction costs, assisting the public sector with regulatory and financial limitations, fostering technological innovation, and providing societal benefits. Chan et al. (2009) compared China and Hong Kong, noting that respondents in Hong Kong placed greater emphasis on efficiency-related drivers, while those in China prioritized economic considerations. According to Cheung, Chan, and Kajewski (2009), the primary reasons for adopting PPP in the UK were financial, while in Hong Kong and Australia, the most frequently cited reason was the improvement of public project performance. Robert, Dansoh, and Ofori-Kuragu (2014) found that in Ghana, the main reasons for adopting PPP were to reduce administrative costs and budgetary constraints in the public sector, share risks, promote innovation, and support local economic development.

6.2. Public-private sector interactions

The final research theme addressed why and how the public and private sectors engage and cooperate in PPP construction projects. Research suggests that a springboard for PPP is governments encouraging the private sector to engage with the public sector to provide public services and to raise living standards (Gonz´alez-Ruiz et al. 2017). Typically, the project begins in the public sector, with participation from the private sector up to a certain point, to achieve the project objectives. Thus, the PPP project can be considered a form of government action. Naturally, the private sector will also ask for financial guarantees from the government to alleviate its risk concerns (Robert, Dansoh, and Ofori-Kuragu 2014). Therefore, it would be more appropriate to have a precise regulation for PPP projects to achieve the host government's goals, which is one of the government's primary responsibilities (The World Bank, 2017). To achieve success in PPP projects, the host government should consider several key factors, including government relations (Edkins and Smyth, 2006), initiatives and guarantees (Brandão and Saraiva, 2008), and a favorable legal framework (Zhang et al., 2015). 12.58% of articles within the Public-Private Sector Interactions theme could be split into two sub-themes: ‘government as champion and regulator’ and ‘partnering’.

6.2.1 Government as champion and regulator

Research on this sub-theme explored the dual role of the public sector in both promoting and sustaining PPP construction projects. Scholars such as Yang et al. (2016) and Kavishe, Chileshe, and Jefferson (2019) have identified key factors that governments must address to support PPP construction projects effectively in developing countries. These factors include (i) the win-win principle (Ho and Liu, 2006), (ii) political stability, (iii) a competitive procurement process (Yang et al., 2016), (iv) government guarantees (Cheah and Liu, 2006), (v) a favorable legal framework, (vi) state credibility, and (vii) the development of domestic capital markets (Kavishe, Chileshe, and Jefferson, 2019).

Wang and Tiong (2000) discussed the various initiatives and guarantees that governments can provide to support the implementation of transportation and utility infrastructure projects in developing countries. These include (i) granting exclusive concessions, and (ii) offering a range of guarantees such as: (a) power purchase agreements, (b) fuel supply guarantees, (c) force majeure

(including legal changes), (d) foreign exchange regulations, (e) compensation in the case of government default and political risks, (f) tax incentives, and (g) lenders' rights.

Other studies have examined how governments can facilitate PPPs through mechanisms such as (i) public support, (ii) efficient approval processes (Sinha and Jha, 2019), (iii) transparent and efficient procurement (Chen and Messner, 2005), (iv) providing a favorable legal framework (Zhang et al., 2015) and clarifying the roles of project partners (Wu et al., 2016), and (v) ensuring political stability and support (Algarni, Arditi, and Polat, 2007). Additionally, Brandao and Saraiva (2008) introduced a real options model to evaluate the value of minimum traffic guarantees. This model helps governments assess the costs and benefits of various levels of support. Furthermore, Wang, Ma, and Liu (2020) proposed a conceptual model that demonstrates how the public sector can improve efficiency by integrating governance in PPP projects, ultimately aiming for greater sustainability. Their findings outlined policy strategies for the public sector to regulate the PPP market better and address existing gaps. Key recommendations included (i) providing measurement tools and (ii) further standardizing guidelines and regulations for PPP infrastructure projects.

7. Variance in PPP research themes

After identifying the themes and sub-themes from the reviewed articles, a further analysis was conducted to examine how the research was distributed across the developmental stages of the countries studied. The goal of this analysis was to compare research findings from literature in developing and developed countries, and in doing so, to identify the specific challenges faced by PPP construction projects in developing countries. Table 2 presents a cross-tabulation of the developmental stage of countries against the themes and sub-themes classified in each article. Meanwhile, Table 3 lists the countries associated with the various PPP themes.

The analysis revealed that the PPP procurement approach garners more research attention in the developing world. According to the United Nations (2020) classification, nearly half of the studies, 79 in total (49%), were conducted in developing countries, which is almost twice as many as those in developed countries (36 studies, 23%). This finding highlights the growing recognition that PPPs hold particular promise for supporting the public sector in the developing world.

To gain deeper insights, we then conducted a more detailed analysis, identifying challenges for each sub-theme of PPP construction projects and distinguishing those specific to developing countries. Any sub-theme that did not have relevant challenges for developing countries was excluded from the analysis. The key findings are as follows: First, 24 challenges were identified (see Table 4), of which 18 were common across both developed and developing countries, and six were exclusive to developing countries (see Table 5). Second, the top three challenges identified were 'Appropriate risk allocation and risk-sharing,' 'Political support,' and 'The private sector's financial strength,' which appeared in 21, 15, and 11 studies, respectively. Third, the most common themes reporting challenges included 'Public-Private Sector Interactions' with 12 challenges, followed by 'Project Management, Rationalities, Innovation, and Knowledge Sharing,' and 'Financial and Economic Motivations,' each presenting 11 challenges. 'Legal and Contractual Arrangements,' and 'Risk Management in PPP Construction Projects' followed, with eight and seven challenges, respectively. Fourth, the top three sub-themes reporting challenges were 'Government as Champion and Regulator' (11 challenges), followed by 'Obstacles to Adopting PPP' (8 challenges), and 'Source of Finance' (7 challenges). In other words, these sub-themes represent the most significant areas of challenge for PPP construction projects.

The challenges unique to studies conducted in developing countries were found to be 'Compatibility and complementary skills among key parties,' 'Competitive procurement process,' 'Democracy,' 'Efficient approval processes,' 'Favorable legal framework,' and 'Transparent and efficient procurement.' Based on the issues examined by researchers, these challenges are considered the most prevalent in PPP construction projects within developing countries. Table 4 presents the complete list of these challenges. It is important to note that these challenges reflect only those highlighted by the research examined, and there may be additional challenges that were either overlooked or not reported by the researchers.

8. Discussion

8.1. Key challenges and contingent problems

This investigation, conducted via a systematic literature review, has elucidated 24 distinct challenges inherent in the implementation of Public-Private Partnership (PPP) construction projects. A substantial portion of these, numbering 18, manifests universally across both developed and developing nations. However, six challenges are particularly pronounced within the context of developing countries: the necessity for 'compatibility and complementary skills among key parties,' a 'competitive procurement process,' robust 'democracy,' 'efficient approval processes,' a 'favorable legal framework,' and a 'transparent and efficient procurement' system. While antecedent literature has touched upon some of these impediments (e.g., Edkins and Smyth, 2006; Shen et al., 2007; Jeong et al., 2016; Verweij, Loomans, and Leendertse, 2020), such studies have typically examined these factors in isolation. The present study contributes to the corpus of knowledge by synthesizing these disparate findings, thereby offering a holistic and more nuanced understanding of the multifaceted challenges confronting PPP construction initiatives.

Our analysis reveals that three overarching challenges are central to the success of PPP construction projects: 'appropriate risk allocation and risk-sharing,' sustained 'political support,' and the 'financial strength of the private sector.' Although the adoption of the PPP model is increasingly prevalent in developing economies, its implementation is frequently beset by a set of contingent, context-specific issues. These include, notably, a deficit in 'compatibility and complementary skills among key parties,' an insufficiently 'competitive procurement process,' underdeveloped 'democratic' institutions, protracted 'approval processes,' the absence of a 'favorable legal framework,' and a lack of transparency in 'procurement.' Such obstacles are often amplified in developing nations, where prevailing political and economic volatilities serve to exacerbate their impact.

The criticality of 'political support' as a determinant of PPP viability is well-documented (Soecipto, 2018; Verhoest, 2015). The capacity of private entities to secure project financing and advantageous interest rates is inextricably linked to the perceived commitment of the state to the venture (Soecipto, 2018). An erosion of political support can destabilize the very legal frameworks required for successful PPP implementation, consequently deterring private sector investment (Zhang et al., 2015). Indeed, the failure of numerous PPP projects in developing contexts can be attributed to the lacuna of such institutional safeguards (Zhang et al., 2015). This institutional weakness often fosters an environment conducive to corruption, which further impedes the efficacy of procurement mechanisms (Bildfell, 2018; Kumaraswamy, Garud, & Ansari, 2018). In stark contrast, nations like the United Kingdom, Australia, and Canada have cultivated mature and robust legal systems that substantively facilitate the PPP procurement process (Bildfell, 2018).

Another salient challenge identified is the necessity for substantial ‘financial strength within the private sector.’ Public sector entities frequently turn to private capital as a means to expedite infrastructure development. The inherent complexity and scale of PPP undertakings demand the participation of private partners possessing considerable financial resources, particularly during the nascent stages of a project where uncertainties may be high. The imperative of partnering with financially robust private firms has been underscored by prominent international bodies, including the OECD (2007) and the World Bank (2011).

Regarding the contingent issues, a deficiency in ‘compatibility and complementary skills among key parties’ is acutely observable in developing nations. In these contexts, local public authorities often lack substantive experience in managing PPPs. This experiential gap can result in the proffering of unrealistic guarantees or a misalignment of strategic interests, thereby elevating the risk of project delays or contractual defaults (Bildfell, 2018). Conversely, in developed economies with a longer history of PPP engagement, the potential for such opportunistic behavior is diminished (Li et al., 2005). Furthermore, a dearth of requisite skills and experience within the public sector of developing countries can precipitate significant inefficiencies in the procurement cycle, potentially leading to the selection of suboptimal private partners and a failure to realize potential value-for-money gains (Bildfell, 2018; Yang, 2016; Zhang et al., 2016).

Finally, the quality of ‘democracy’ and its direct bearing on political stability emerges as a crucial variable for PPP success. Developed nations typically benefit from more resilient democratic institutions, which foster the political stability indispensable for the longevity of large-scale infrastructure projects. A deficit in democratic accountability, often characteristic of developing countries, can cultivate an environment susceptible to disputes and operational inefficiencies in project execution (Yang, 2016). Moreover, administrative and approval processes in these nations are frequently characterized by their protracted and inconsistent nature, which introduces further delays and uncertainty into the project lifecycle (Yang, 2016).

9 Conclusions

9.1. Contributions to practice, theory, and the literature

From a practical standpoint, our study offers valuable insights for PPP project practitioners, highlighting several key factors that require careful management. For any given project, practitioners need to focus on 'appropriate risk allocation and risk-sharing,' 'political support,' and 'the private sector’s financial strength.' In the context of PPPs in developing countries, additional challenges surfaced that demand heightened attention. These include 'compatibility and complementary skills among key stakeholders,' 'a competitive procurement process,' 'democracy,' 'efficient approval processes,' 'a favorable legal framework,' and 'transparent and efficient procurement.' Recognizing that mismatched perceptions often arise within projects (U. Ojiako, Chipulu, M., Gardiner, P., Williams, T., Mota, C., Maguire, S., Shou, Y., and T. Stemanti, 2014; U. Ojiako, Papadopoulos, T., Stamati, T., Anagnostopoulos, D. and A. Marshall, 2015; Yang, 2016), project management professionals stand to gain several benefits from this study. One of the key takeaways is that our work provides a practical foundation for practitioners to fully understand the core challenges facing PPP projects, their potential solutions, and the contingent problems that may arise. Additionally, it helps practitioners recognize the likely variations in challenges depending on whether the PPP is being implemented in a developed or developing country.

In terms of theoretical contributions, our study provides two significant advancements in the literature on PPPs. First, our systematic review provides fresh insights into the current state, nature,

and quality of the literature on PPP construction projects. For the period we analyzed (2007-2025), we observed a significant increase in research output on PPPs, with the volume of published studies roughly doubling, reflecting heightened research activity. This observation aligns with findings from previous studies by Ke et al. (2009) and Ma et al. (2019). As expected, due to the perceived greater advantages of the PPP model in developing countries, the majority of the research was conducted in these regions. The primary focus of the studies was on transportation projects, utility infrastructure, and social service projects, with qualitative methods being the predominant approach. Even when quantitative research was conducted, sample sizes were often small, suggesting that the literature still lacks large-sample empirical studies that could yield statistically robust conclusions.

The second theoretical contribution of our research is the identification of three key risk factors—' appropriate risk allocation and risk-sharing,' 'political support,' and 'the private sector's financial strength'—which emerged as essential considerations for the public sector when managing PPP projects in developing countries. We argue that these factors, when considered together, form a critical framework for regulating and managing PPPs. However, we posit that these factors should be considered alongside other elements identified in recent literature, such as studies by Osei-Kyei and Chan (2015), Yuan et al. (2015), Bao et al. (2018), Cui et al. (2018), and Ma et al. (2019). Our study, therefore, provides a distinct perspective on PPP risk factors, adding depth to the understanding of the challenges associated with these projects.

Additionally, our study extends the work of previous studies in meaningful ways. For example, in response to Ma et al. (2019), who called for comparative studies examining differences in PPP practices between developed and developing countries, we identified several PPP-specific challenges unique to the developing world. Our findings can inspire further academic reviews of contemporary project-focused PPP literature, particularly in developing countries. This direction will encourage more comprehensive studies that offer a broad scope, enhancing the scholarly understanding of PPPs and shaping future research directions in the field.

9.2 Limitation

While our study has undoubtedly advanced the understanding of Public-Private Partnership (PPP) literature, it is not without limitations, which also present essential theoretical and empirical avenues for future research. The first limitation relates to the selection of keywords used in our study. We acknowledge that there are multiple forms of PPPs, such as BOO (Build-Own-Operate), BOT (Build-Operate-Transfer), BOOT (Build-Own-Operate-Transfer), and PFI (Private Finance Initiative). However, in our study, these specific iterations were not incorporated as search keywords, unlike in previous works such as those by Cui et al. (2018), Ma et al. (2019), and Wang and Ma (2021), which resulted in broader paper selections. For instance, Cui et al. (2018) retrieved 4,911 papers, while Ma et al. (2019) returned 1,209 papers.

The second limitation stems from the inclusion of the terms 'Project Management,' 'Construction,' and 'Infrastructure,' which may have further narrowed our keyword set. As a consequence, our search returned a more limited number of papers (312), and some relevant studies may have been inadvertently excluded. Despite this, we believe that the 312 papers retrieved are still representative of the general scope of PPPs in developing countries. Nonetheless, future research could benefit from broadening the keyword selection to include various PPP types, as in previous studies, while removing terms like 'Project Management,' 'Construction,' and 'Infrastructure' to reduce restrictions. An alternative approach might follow Ma et al.'s (2019)

method, which involved conducting a less restrictive search and subsequently manually excluding papers outside the project management domain.

The final limitation concerns the lack of country-specific analysis in our study. Future research could delve deeper into the variations in PPP research themes across different developing country contexts, offering more theoretical value. For example, additional research could enhance our understanding of how political and economic stability impacts PPP research and its outcomes in specific developing countries.

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Aladag, H., & Işik, Z. (2018). The Effect of Stakeholder-Associated Risks in Mega-Engineering Projects: A Case Study of a PPP Airport Project. *IEEE Transactions on Engineering Management, PP*, 1-13. doi:10.1109/TEM.2018.2866269

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