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STRATEGIC IMPLEMENTATION OF PPP FOR SMALL-SCALE INFRASTRUCTURE IN SRI LANKA: A COMPARATIVE ANALYSIS OF ALTERNATIVE PPP MODELS

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ABSTRACT

This study aims to provide a thorough comparison of Private Finance Initiative (PFI), Build-Operate-Transfer (BOT), and Joint Venture (JV) models for Small-Scale Infrastructure Development (SSID) in Sri Lanka and devise innovative, tailored recommendations to maximise efficiency, effectiveness, and compatibility. Employing a mixed-methods approach, the research systematically examines the key features, benefits, and limitations of PFI, BOT, and JV models in the context of SSID. A compatibility assessment is conducted, focusing on financing approaches, stakeholder engagement, and other critical success factors. The findings reveal that the BOT and JV models are superior to the PFI model due to their balanced stakeholder engagement, risk sharing, and alignment with critical success factors. Based on these insights, the study formulates novel, customised recommendations for optimising the selected model's efficiency, effectiveness, and compatibility with SSID in Sri Lanka, with the aim of informing policy and practice. Furthermore, the study highlights the need for future research exploring alternative financing models and emerging technologies in SSID, opening new avenues for innovative approaches to infrastructure development in Sri Lanka. In conclusion, this comprehensive comparison offers valuable guidance for academics, industry professionals, and policymakers seeking to enhance small-scale infrastructure development in Sri Lanka, emphasising the importance of selecting the most suitable financing model.

Keywords: *Procurement Perspective; Public-Private Partnerships; Small-Scale Infrastructure Projects; Sri Lanka; Stakeholder Engagement.*

1. INTRODUCTION

1.1 CONTEXT AND BACKGROUND

Sri Lanka's growing economy heavily relies on infrastructure development to drive growth and development, particularly through small-scale infrastructure development (SSID) projects aimed at providing essential services to rural and urban populations

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(Appuhami & Perera, 2016; Ranjith Bala, 2011). However, the successful implementation of SSID projects faces challenges such as inadequate financing, limited technical expertise, and insufficient stakeholder engagement (Akomea-Frimpong et al., 2021). Public-Private Partnerships (PPPs) have emerged as a potential solution to these issues, allowing for a collaborative effort between the public and private sectors in financing, designing, constructing, operating, and maintaining infrastructure projects (Miranda-Poggys & Morena, 2023). While PPPs have been widely used around the world and have been shown to improve project efficiency, reduce costs, and provide better services to communities, selecting the most suitable PPP model for SSID projects in Sri Lanka is challenging due to the unique economic, social, and political context of the country (Dabarera et al., 2019).

1.2 PROBLEM OF RESEARCH AND MOTIVATION

Although PPPs offer potential benefits for SSID projects in Sri Lanka, the most suitable model for the country's unique context remains unclear (Chan et al., 2010; Kandawinna et al., 2022). Traditional public procurement models have shown inefficiencies, delays, and suboptimal outcomes (Jamali, 2004; Wang et al., 2018). Inappropriate PPP model selection can result in financing challenges, insufficient stakeholder engagement, and poor project outcomes (Muhammad & Foziah, 2017; Opawole & Jagboro, 2018). This research aims to compare three PPP models (PFI, BOT, and JV) to identify the best option for Sri Lanka's SSID projects, providing tailored recommendations to maximise efficiency, effectiveness, and compatibility, and ultimately enable innovative PPP model implementation.

1.3 IMPORTANCE AND INNOVATION

The study's importance lies in offering empirical evidence to support the selection of the most suitable PPP model for SSID projects in Sri Lanka, informing policy and practice in the infrastructure sector for more efficient, effective, and sustainable projects. The research's innovation stems from its focus on tailoring recommendations to Sri Lanka's specific context, considering unique political, economic, and social factors affecting PPP implementation in SSID.

1.4 RESEARCH AIM AND OBJECTIVES

The aim of this research is to provide a comprehensive comparison of Private Finance Initiative (PFI), Build-Operate-Transfer (BOT), and Joint Venture (JV) models for Small-Scale Infrastructure Development (SSID) in Sri Lanka and devise innovative, tailored recommendations to maximise efficiency, effectiveness, and compatibility.

To achieve this aim, the following objectives was pursued: [1] To systematically examine the key features, benefits, and limitations of PFI, BOT, and JV models in the context of SSID, [2] To assess the compatibility of PFI, BOT, and JV models with SSID in Sri Lanka, focusing on financing approaches, stakeholder engagement, and other critical success factors, [3] To identify the most appropriate model among PFI, BOT, and JV for SSID in Sri Lanka by considering empirical evidence and contextual factors and [4] To formulate novel, customised recommendations for optimising the selected model's efficiency, effectiveness, and compatibility with SSID in Sri Lanka, with the aim of informing policy and practice.

Through these objectives, this research will contribute to the understanding of PPP models and their suitability for SSID projects in Sri Lanka and provide practical recommendations for policymakers and stakeholders to enhance the effectiveness of these models.

2. LITERATURE REVIEW

2.1 PUBLIC-PRIVATE PARTNERSHIPS (PPP) IN INFRASTRUCTURE DEVELOPMENT

PPP models have gained popularity as an alternative to traditional public procurement methods for global infrastructure development (Akomea-Frimpong et al., 2021; Almeile et al., 2022b). Involving public and private sectors, PPPs collaborate on financing, designing, constructing, operating, and maintaining infrastructure projects (Debela, 2021; Natalia et al., 2021). Characterised by risk-sharing arrangements, PPPs allocate risks and rewards to the party best equipped to manage them (Buzzetto & Monteiro de Carvalho, 2022; Osei-Kyei et al., 2022), differentiating them from traditional public procurement models (Deng et al., 2021).

2.2 DEFINITION, PRINCIPLES, AND RATIONALE

PPPs are contractual agreements between public and private entities, detailing their roles and responsibilities in infrastructure asset development (Opawole & Jagboro, 2018). Key principles include clear risk allocation, private sector incentives for efficiency and cost-effectiveness, and long-term value for money for the public sector (Chou & Pramudawardhani, 2015; Osei-Kyei & Chan, 2015). Preferred for infrastructure development, PPPs leverage private sector expertise, innovation, and resources for higher quality, cost-effective, and efficiently managed assets compared to traditional public procurement models (Kandawinna et al., 2022; Li et al., 2005a). PPPs can also reduce the burden on public finances by having the private sector contribute significantly to capital investment (Akomea-Frimpong et al., 2021; Kim et al., 2021; Li et al., 2005b).

2.3 DIFFERENT TYPES OF PUBLIC-PRIVATE PARTNERSHIPS AND THEIR FUNCTION IN INFRASTRUCTURE DEVELOPMENT

Public-Private Partnerships (PPPs) encompass various models that facilitate collaboration between the public and private sectors in infrastructure development (Kwak et al., 2009; Osei-Kyei & Chan, 2018; Robert & Albert, 2021; Rohman, 2021). Understanding the different types of PPPs and their functions is crucial for effective decision-making in project selection and implementation (Ametepey et al., 2020; Dabarera et al., 2019; Opawole & Jagboro, 2018; Yuan et al., 2009). Table 1 provides a summary of the PPP types, and detailed descriptions, enabling a clearer understanding of their respective roles and characteristics.

Table 1: Different types of PPP and their functions in infrastructure development

Source	PPP type and function
Opawole and Jagboro (2018); Kumaraswamy and Zhang (2001); Ranjith Bala (2011)	BOT (Build-Operate-Transfer) - The private partner is primarily responsible for designing and constructing the infrastructure. After completion, they operate and maintain it for a specified period before transferring ownership to the public sector. The BOT model allows private sector efficiency and innovation in both construction and operation phases.

Grimsey and Lewis (2002); Higgins and Huque (2015)	JV (Joint Venture) - The public and private sectors form a partnership to finance, design, and build the infrastructure. This model combines the expertise and resources of both sectors, allowing for shared ownership, decision-making, and risk management. Joint ventures promote collaboration and mutual benefit between the public and private sectors.
Akomea-Frimpong et al. (2021); Fleta-Asín et al. (2019); Song et al. (2019)	BOO (Build-Own-Operate) - The private partner designs, constructs, owns, and operates the infrastructure. They assume responsibility for the entire life cycle of the asset, including financing, operation, and maintenance. The BOO model offers the private sector the opportunity for long-term revenue generation and asset ownership.
Almeile et al. (2022b); Debela (2021); Robert and Albert (2017)	LDO (Lease-Develop-Operate) - The private partner leases the land, develops the infrastructure, and operates it for a specific period. This model allows the private sector to utilise public land and resources while assuming responsibility for the development, operation, and maintenance of the infrastructure.
Deng et al. (2021); Froud (2003); Li et al. (2005a)	PFI (Private Finance Initiative) - The private sector provides funding for the project and assumes responsibility for designing, building, financing, and operating the infrastructure. The public sector makes payments to the private partner over the project's lifecycle.
Babatunde et al. (2015); McCarthy and Robert (1991); Rohman (2021)	Concession - The private sector receives the right to finance, construct, and operate the infrastructure for a specific period in exchange for user fees or other revenue streams. Concessions transfer both the financial and operational risks to the private sector.
Almeile et al. (2022a); Dabarera et al. (2019); Robert and Albert (2021)	DBFO (Design-Build-Finance-Operate) - The private partner is responsible for designing, building, financing, and operating the infrastructure. They undertake the project's entire life cycle and are reimbursed through user fees or other revenue streams. This model provides the private sector with control over all project stages and financial returns.
Higgins and Huque (2015); Kim et al. (2021); Xiaohua and Hemanta (2008)	O&M Contracts (Operation and Maintenance Contracts) - The private sector is contracted to manage and maintain the infrastructure, ensuring its effective operation. O&M contracts typically cover a specific period and require the private partner to meet performance targets and service level agreements. This model allows the public sector to leverage the private sector's expertise in infrastructure management.
Dykes et al. (2020); Manik (2021); Wang et al. (2020)	PBC (Performance-Based Contracts) - The private sector is engaged to deliver specified performance outcomes, with payments based on meeting predefined performance targets. PBCs incentivise the private partner to achieve optimal performance, quality, and efficiency in delivering infrastructure services. This model aligns the private partner's compensation with the desired project outcomes and performance levels.

Table 1 provides a comprehensive overview of various PPP models and their roles in infrastructure development. Through the examination of relevant PPP types and descriptions, valuable insights are gained regarding the unique characteristics and responsibilities of each model. The diverse range of PPP models, including Design & Construction, Ownership & Operation, Financing, and Performance & Management, cater to specific project needs and facilitate private sector involvement throughout the infrastructure life cycle. The selection of the PFI, BOT, and JV models in this study is based on their prominence, relevance, and potential to address the specific challenges and requirements of SSID projects in Sri Lanka. These models offer a comprehensive representation of different PPP approaches, enabling a thorough comparative analysis within the scope of this research.

2.4 COMPARATIVE ANALYSIS OF PFI, BOT, AND JV MODELS

Public-Private Partnerships (PPPs) play a crucial role in facilitating collaboration between the public and private sectors for infrastructure development (Kwak et al., 2009; Osei-Kyei & Chan, 2018; Robert & Albert, 2021; Rohman, 2021). By examining the financing approach, stakeholder engagement, risk allocation, decision-making, and critical success factors, stakeholders can effectively assess and select the most suitable model for their specific projects (Fleta-Asín et al., 2019; Appuhami & Perera, 2016; Ranjith Bala, 2011). Table 2 provides a comparative analysis of the PFI, BOT, and JV models in the context of small-scale infrastructure development.

Table 2: Comparative analysis of PFI, BOT, and JV models for SSID

Features	PFI	BOT	JV
Financing Approach	Private sector financing (Almeile et al., 2022b).	Combination of public and private sector financing (Gross, 2010).	Combination of public and private sector financing (Jokar et al., 2021).
Stakeholder Engagement	Limited stakeholder engagement (Osei-Kyei & Chan, 2018).	Moderate stakeholder engagement (Almeile et al., 2022a).	High stakeholder engagement (Almeile et al., 2022b).
Risk Allocation	Reduced risk to the public sector (Babatunde et al., 2015).	Risk transfer to the private sector (Babatunde et al., 2015).	Shared ownership and risk allocation (Babatunde et al., 2015).
Decision-making	Limited involvement of stakeholders (Ametepey et al., 2020).	Moderate involvement of stakeholders (Gross, 2010).	Shared decision-making and collaboration (Osei-Kyei & Chan, 2018).
Critical Success Factors	Long-term funding and reduced risk (Fleta-Asín et al., 2019).	Balanced risk sharing and financing (Appuhami & Perera, 2016).	Shared ownership, risk management, and decision-making (Ranjith Bala, 2011).

The evaluation highlights the distinguishing features of each model, including financing approaches, stakeholder engagement, risk allocation, decision-making, and critical success factors. The PFI model offers private sector financing with reduced risk to the public sector, albeit with limited stakeholder engagement. The BOT model involves a combination of public and private sector financing, with moderate stakeholder engagement and shared risk allocation. The JV model emphasises shared ownership, decision-making, and risk management, presenting a higher potential for stakeholder engagement.

2.5 COMPARISON OF THE PFI, BOT, AND JV MODELS FOR SSID IN SRI LANKA

When considering the suitability of the PFI, BOT, and JV models for SSID in Sri Lanka, several factors need to be taken into account, including financing approaches, stakeholder engagement, and critical success factors and challenges (Akomea-Frimpong et al., 2021; Dabarera et al., 2019; Kandawinna et al., 2022). The table 3 summarises the key aspects of comparison:

Table 3: A comparison of the PFI, BOT, and JV models for SSID in Sri Lanka

Aspect	PFI	BOT	JV
Financing Approach & Flexibility	Relies heavily on private sector financing. Limited flexibility in financing (Dabarera et al., 2019).	Involves a combination of private and public sector financing. Greater flexibility in financing arrangements (Weththasinghe et al., 2016).	Can involve shared financing from both the public and private sectors. Greater flexibility in financing arrangements (Dabarera et al., 2019).
Stakeholder Engagement	Limited stakeholder engagement and accessibility (Deepika et al., 2018).	Moderate stakeholder engagement and involvement (Appuhami et al., 2011).	Potential for enhanced stakeholder engagement and collaboration (Kim et al., 2019).
Risk Allocation	Provides reduced risk to the public sector (Ranjith Bala, 2011).	Involves risk transfer to the private sector (Ranjith Bala, 2011).	Shared ownership and risk allocation (Dabarera et al., 2019).
Critical Success Factors	Long-term funding and reduced risk for the public sector (Fernando & Nanayakkara, 2020).	Balanced risk sharing, financing, and decision-making (Appuhami et al., 2011).	Shared ownership, decision-making, and risk management (Dabarera et al., 2019).

The evaluation encompasses financing, stakeholder engagement, risk allocation, and critical success factors. PFI utilises private sector financing with limited flexibility, while BOT combines private and public sector financing for greater flexibility. The JV model involves shared financing and offers flexibility. PFI demonstrates limited stakeholder engagement, while BOT exhibits moderate engagement. The JV model enhances stakeholder engagement and collaboration. PFI reduces risk for the public sector, BOT transfers risk to the private sector, and JV emphasises shared ownership and risk allocation. Critical success factors differ across the PFI, BOT, and JV models. PFI prioritises long-term funding and reduced risk, BOT emphasises balanced risk sharing and financing, and JV highlights shared ownership, decision-making, and risk management.

3. METHODOLOGY

3.1 RESEARCH PARADIGM, PHILOSOPHY, STRATEGY AND DESIGN

This study adopts a pragmatic research paradigm, which allows for the use of various research methodologies and methods to effectively address the research question. The research philosophy guiding this study is pragmatism, emphasising the practical application of knowledge and problem-solving. A mixed-methods approach is employed, combining both qualitative and quantitative research methods. The study utilises a sequential explanatory design, where quantitative data is collected and analysed first through questionnaires, followed by qualitative data collection and analysis using semi-structured interviews to provide an in-depth understanding of the research problem.

3.2 POPULATION, SAMPLING, AND DATA COLLECTION

The population of this study includes infrastructure projects in Sri Lanka that have adopted PPP models. A purposive sampling technique is employed to select a representative sample of projects involving PFI, BOT, and JV models. Questionnaires are

administered to key stakeholders, including government officials, private sector representatives, and local community members. Semi-structured interviews are conducted with senior industry professionals to validate questionnaire outcomes and gain additional insights. Secondary data is sourced from project documents, government reports, academic literature, and relevant databases.

3.3 DATA ANALYSIS

Data analysis involves both qualitative and quantitative methods. Descriptive and inferential statistics are used for quantitative analysis to identify patterns and relationships between PPP model variables. Qualitative analysis includes thematic coding and content analysis to uncover themes, patterns, and insights from interview transcripts and secondary data sources. The triangulation of qualitative and quantitative findings ensures a comprehensive understanding of the research problem.

3.4 ETHICAL CONSIDERATIONS AND TRUSTWORTHINESS OF THE STUDY

Ethical considerations are addressed throughout the research process. Informed consent forms are provided to participants, and necessary ethical approvals are obtained from the relevant institutional review board before data collection. By incorporating these changes, the methodology section provides a concise overview of the research paradigm, philosophy, strategy, design, sampling, data collection, data analysis, and ethical considerations, while maintaining clarity and coherence.

4. RESULTS AND ANALYSIS

This section provides an analysis of the study's results, including the demographic profile of the sample, the key features, benefits, and limitations of PFI, BOT, and JV models, and their compatibility with SSID in Sri Lanka. The section concludes with recommendations for optimising the selected model's efficiency, effectiveness, and compatibility with SSID in Sri Lanka.

4.1 DEMOGRAPHIC PROFILE OF THE SAMPLE

The study's sample of 100 diverse participants was primarily aged 35-44 (50%), with a moderately positive skew (coefficient of skewness: 0.648). The gender distribution was balanced (40% male, 58% female), and most participants held a bachelor's degree (34%). They were affiliated with professions in infrastructure development, project management, and finance, with common affiliations being the Institute of Quantity Surveyors Sri Lanka (31%) and the Institute of Engineers Sri Lanka (21%). Respondents were primarily full-time employees in government/public administration (30%) or the private sector (45%), with top professions being quantity surveyor (25%) and government official (22%). Participants represented all Sri Lankan provinces, predominantly Eastern (18%) and Western (19%) Provinces.

4.2 KEY FEATURES, BENEFITS, AND LIMITATIONS OF PFI, BOT, AND JV MODELS

Regarding the key features, benefits, and limitations of PFI, BOT, and JV models, the study found that: [1] PFI: Key features include off-balance-sheet financing and long-term contracts. Benefits include lower initial public investment and reduced public sector risk. Limitations include less public control and less risk-sharing between the public and

private sectors. [2] BOT: Key features include a time-bound concession and risk sharing between the public and private sectors. Benefits include lower public sector risk and better cost control. Limitations include the possibility of higher project costs and a focus on short-term returns. [3] JV: Key features include shared ownership and decision-making. Benefits include stronger collaboration, resource pooling, and shared risks. Limitations include potential conflicts of interest and higher complexity in management.

Qualitative outcome: The qualitative outcomes are consistent with the quantitative outcomes in identifying the key features, benefits, and limitations of PFI, BOT, and JV models. Specifically: [1] PFI: Key features include long-term contracts and private sector involvement. Benefits include reduced public sector risk and improved project delivery. Limitations include limited risk sharing and higher reliance on the private sector. [2] BOT: Key features include long-term contracts and balanced risk sharing. Benefits include lower public sector risk and better cost control. Limitations include possible higher project costs and a focus on short-term returns. [3] JV: Key features include shared ownership and synergistic collaboration. Benefits include resource pooling, shared risks, and benefits. Limitations include potential conflicts of interest and higher complexity in management.

Overall, the key features, benefits, and limitations of PFI, BOT, and JV models highlight the differences among the models in terms of risk sharing, collaboration, and management complexity, which are important factors to consider when examining their suitability for SSID projects.

4.3 COMPATIBILITY OF PFI, BOT, AND JV MODELS WITH SSID IN SRI LANKA

Quantitative outcomes reveal uneven age group distribution, potentially affecting result generalisability. The study found: [1] PFI is moderately compatible with SSID due to long-term financing and risk management needs, but limited stakeholder engagement and lower priority for local capacity building. [2] BOT is highly compatible with SSID, balancing risk sharing, long-term financing, and addressing critical success factors like local capacity building and technology transfer. [3] JV is highly compatible with SSID, enabling shared financing, risk management, strong stakeholder engagement, and prioritising critical success factors.

Qualitative outcomes support quantitative findings, showing PFI's moderate compatibility, and BOT and JV's high compatibility with SSID in Sri Lanka due to financing approaches, stakeholder engagement, and prioritisation of critical success factors.

The analysis suggests BOT and JV models are better suited for Sri Lanka's SSID than PFI, considering empirical evidence and contextual factors, as they promote balanced stakeholder engagement, risk sharing, and address critical success factors.

4.4 MOST APPROPRIATE MODEL FOR SSID IN SRI LANKA

Regarding the most appropriate model for SSID in Sri Lanka, the study found that: [1] PFI: Based on empirical evidence and contextual factors, PFI may not be the most appropriate model for SSID in Sri Lanka, as it has limited stakeholder engagement, and may not prioritise other critical success factors. [2] BOT: Empirical evidence and contextual factors suggest that the BOT model may be suitable for SSID in Sri Lanka, given its balanced risk sharing, long-term financing, and inclusion of both public and

private sectors in decision-making processes. [3] JV: The JV model may also be an appropriate model for SSID in Sri Lanka, considering empirical evidence and contextual factors. It encourages shared financing, risk management, and strong stakeholder engagement due to shared ownership and decision-making.

Qualitative outcome: The qualitative outcomes align with the quantitative outcomes in evaluating the most appropriate model for SSID in Sri Lanka. Specifically: [1] PFI: Considering the empirical evidence and contextual factors, PFI may not be the most suitable model for SSID in Sri Lanka, as it has limited stakeholder engagement and may not prioritise other critical success factors. [2] BOT: Empirical evidence and contextual factors suggest that the BOT model could be an appropriate option for SSID in Sri Lanka, with balanced risk sharing, long-term financing, and involvement of both public and private sectors in the decision-making process. [3] JV: The JV model may also be a suitable choice for SSID in Sri Lanka, based on empirical evidence and contextual factors. It enables shared financing, risk management, and robust stakeholder engagement due to shared ownership and decision-making.

Based on the analysis, the BOT and JV models appear to be more appropriate for SSID in Sri Lanka than the PFI model. Both models promote balanced stakeholder engagement, risk sharing, and address critical success factors.

4.5 RECOMMENDATIONS FOR OPTIMISING THE SELECTED MODEL

Regarding recommendations for optimising the selected model, the study suggests the following: [1] PFI: If PFI were selected, recommendations could include improving stakeholder engagement and prioritising critical success factors in decision-making processes to enhance its compatibility with SSID in Sri Lanka. [2] BOT: If the BOT model were selected, recommendations might focus on strengthening public-private collaboration, ensuring transparent and fair risk allocation, and promoting long-term financing for SSID projects in Sri Lanka. [3] JV: If the JV model were selected, recommendations could include fostering a collaborative environment for shared ownership, decision-making, and risk management, as well as facilitating stakeholder engagement to optimise SSID in Sri Lanka.

The recommendations aim to inform policy and practice, ensuring that the selected model aligns with the unique needs and conditions of SSID projects in the country.

5. DISCUSSION AND RECOMMENDATIONS

5.1 INTERPRETATION AND IMPLICATIONS FOR POLICY & PRACTICE

Section 4 demonstrates that BOT and JV approaches are superior to PFI for Sri Lankan SSID projects. BOT and JV models strike a balance between stakeholder participation, risk allocation, and crucial success factors. PFI provides long-term funding and reduced risk to the public sector, but it fails to engage stakeholders and prioritise essential success criteria. Thus, SSID policymakers and practitioners in Sri Lanka should favour BOT and JV models. These solutions accomplish risk sharing, long-term financing, and stakeholder participation, all of which are necessary for successful infrastructure development. Notwithstanding its strengths, the PFI model's limited stakeholder engagement and neglect of other crucial success factors may render it inappropriate.

5.2 RECOMMENDATIONS FOR ENHANCING THE SELECTED MODELS FOR SSID IN SRI LANKA

BOT Model: [1] Boost public-private collaboration for inclusive decision-making and improved outcomes. [2] Establish transparent, fair risk allocation framework with equitable sharing of responsibilities. [3] Promote long-term financing options, such as low-interest loans or development bank assistance.

JV Model: [1] Encourage shared ownership, decision-making, and risk management in a collaborative environment. [2] Facilitate stakeholder engagement, including local communities, to meet needs and expectations. [3] Build local capacity in infrastructure development, project management, and finance to enhance SSID project success.

5.3 LIMITATIONS OF THE STUDY AND FUTURE RESEARCH DIRECTIONS

The study has some limitations, primarily in the demographic profile of the sample, which may affect the generalisability of the results. Further research is needed to validate these findings with a more diverse and representative sample. Additionally, future studies can explore alternative financing models, such as crowdfunding and green bonds, and investigate the role of emerging technologies, like blockchain and artificial intelligence, in SSID in Sri Lanka.

6. CONCLUSIONS

6.1 SYNTHESIS OF KEY FINDINGS AND CONTRIBUTIONS

The study reveals that BOT and JV models are better suited for SSID in Sri Lanka compared to the PFI model, offering improved stakeholder engagement, balanced risk sharing, and long-term financing. Key findings: [1] PFI has limitations in engagement and risk sharing; [2] BOT and JV are highly compatible with SSID, while PFI is moderately compatible; [3] The BOT model is the most appropriate for SSID due to its balanced risk sharing, financing, and decision-making inclusivity; [4] The BOT model aligns with critical success factors, optimising efficiency and compatibility of SSID projects in Sri Lanka when combined with proposed recommendations.

The findings contribute to the understanding of infrastructure financing models and their suitability for SSID in Sri Lanka. By providing evidence-based recommendations, the study informs policy and practice, ensuring that SSID projects align with the unique needs and conditions of the country.

6.2 FUTURE RESEARCH OPPORTUNITIES AND FINAL REMARKS

Future research can explore alternative financing models and the role of emerging technologies in SSID in Sri Lanka. As the country's infrastructure needs continue to evolve, innovative approaches and models will be essential for sustainable and inclusive development.

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