SATISFACTION OF INFRASTRUCTURE FINANCING: INSIGHTS FROM GOVERNMENT AND PRIVATE SECTOR OFFICIALS

***Dr. Vishnu P, **Aneesh M**

Abstract

Infrastructure is a critical driver of economic development, encompassing the fundamental systems and facilities necessary for the functioning of a region. This study aims to assess the satisfaction level of government and private sector officials regarding infrastructure financing in Kerala. Utilizing a stratified random sampling method, respondents were divided into two strata, government and private sector officials, and their perceptions were analyzed using statistical tools such as the Independent Sample t-test and the Friedman test. The findings indicate significant variations in satisfaction levels across different infrastructure sectors. Overall, the study underscores the importance of targeted infrastructure financing to address sector-specific challenges and enhance economic development in Kerala.

Keywords:- Infrastructure Financing, Infrastructure Development, Government Financing, Private Financing, PPP.

Infrastructure plays a pivotal role in fostering economic progress. It encompasses the essential structures and systems that support the functioning of a nation, urban center, or any given region, including the necessary facilities required for its economic activities. Public and private physical enhancements, such as road networks, bridges, tunnels, water supply systems, power grids, gas pipelines, and more, collectively form the backbone of infrastructure.

**Dr. Vishnu P, Assistant Professor on Contract, PG & Research Department of Commerce, Sanatana Dharma College Alappuzha, Kerala. E-mail: vishnu873787@gmail.com (ORCID-0009-0006-7838-2418)*
***Aneesh M, Assistant Professor, PG Department of Commerce, SARBTM Govt College Koyilandy, Kozhikode, Kerala. E-mail: aneesh2ndnov@gmail.com (ORCID-0009-0005-4245-841X)*

It comprises interconnected components that deliver vital goods and services, indispensable for enabling, sustaining, or improving the living standards of society. Infrastructure is the tangible elements of interconnected systems that are crucial for facilitating, maintaining, or improving the quality of life within a society by offering essential goods and services (Tripathi, S, & Gautam, 2010).

Infrastructure encompasses various aspects, including public utilities such as power supply, telecommunications, piped water supply, sanitation, sewerage systems, solid waste management, and piped gas networks. It also includes public works, which involve large-scale construction projects like roads, major dams, and canal systems for irrigation and drainage. (World Bank, 1994). Additionally, infrastructure comprises other transport sectors like urban and inter-urban railways, urban transport systems, ports, waterways, and airports that facilitate the movement of people and goods within and between regions. The World Bank's comprehensive classification provides a holistic understanding of the fundamental components that contribute to infrastructure development.

Investing in infrastructure is widely recognized as a highly effective strategy for combating poverty. Access to reliable infrastructure is crucial for enhancing economic opportunities and reducing inequalities. The presence of social and economic infrastructure plays a vital role in facilitating socio-economic development and accelerating progress. It is openly acknowledged by the Planning Commission that the absence of adequate infrastructure is a significant hindrance to India's economic performance (Saravanan. P, 2008). Ambitious plans for infrastructure development necessitate the availability of appropriate financing sources to ensure their successful implementation.

Significance of the Study

Infrastructure plays a crucial role in the sustained growth and competitiveness of nations across the globe. It is essential not only for economic progress but also for social and environmental advancements. Nevertheless, numerous countries encounter challenges in terms of developing and financing infrastructure projects, which could impede their prospects. The successful implementation of large-scale infrastructure initiatives necessitates significant investment capital. The requirement for the expansion of infrastructure holds the utmost significance and is an essential prerequisite for the progress and advancement of an economy (Briscoe, J, 1999). The Indian Government has formulated policies aimed at promoting domestic infrastructure investments, encouraging both local and foreign private capital. India has already emerged as an attractive destination for foreign investors seeking opportunities in the infrastructure sector.

Statement of the Problem

The state of Kerala in India faces significant challenges in infrastructure financing and development, which hinder its potential for economic growth and social progress. Despite commendable achievements in human development

indicators, Kerala faces inadequate infrastructure in sectors such as transportation, energy, water supply, communication, and social infrastructure. Furthermore, the limited availability of government funds to finance infrastructure exacerbates the challenge of infrastructure financing. Insufficient funding and limited financial resources hinder the implementation of crucial projects, necessitating sustainable financing mechanisms to bridge the funding gap. The main reason behind the sluggish growth of commercial and industrial infrastructure in the state is primarily attributed to a lack of sufficient financial resources. Numerous studies conducted by individual researchers or committees, both in India and internationally, have been undertaken to investigate various aspects of infrastructure development. This research aims to critically evaluate the satisfaction level of infrastructure financing in Kerala.

Scope of the Study

The study "Satisfaction of Infrastructure Financing: Insights from Government and Private Sector Officials" examines the trends and experiences related to infrastructure financing in Kerala since 2010. It analyzes the perceptions of government and private sector officials on various financing methods, including public funding, PPPs, institutional loans, and FDI. The study also considers the regulatory, political, and social factors influencing financial access and project implementation, aiming to evaluate satisfaction levels and identify key challenges and opportunities to improve the effectiveness and sustainability of infrastructure financing in Kerala.

Review of Literature

Infrastructure development plays a pivotal role in achieving the United Nations Sustainable Development Goals (SDGs), serving as a foundation for economic growth, social equity, and environmental sustainability. Anjani and Haryani (2023) emphasize the necessity of incorporating Environmental, Social, and Governance (ESG) principles into Public Works and Housing (PWH) projects to mitigate the adverse ecological and social impacts of infrastructure development. This aligns with Mishra's (2023) assertion that Development Finance Institutions (DFIs) can mobilize private capital and reduces investment risks in infrastructure projects, fostering a sustainable transition toward green growth. The economic dimension of infrastructure's impact is further reflected in the work of Piketty and Chancel (2018), who demonstrate that rising income inequality in India since liberalization has shaped infrastructure expansion, highlighting the need for equitable investment strategies. Complementing this, Hooper, Peters, and Pintus (2018) suggest that strategic infrastructure investments can reduce inequality and drive sustainable economic growth. In a broader global context, Cerra (2017) identifies both public and private sector contributions as key enablers in expanding infrastructure stocks, underscoring the collaborative approach required to achieve the SDGs.

At the regional level, particularly in Kerala, a series of studies provide valuable insights into localized challenges and opportunities in infrastructure financing. Abraham and James (2019) explore innovative funding avenues such

as crowd funding, impact investing, and green bonds to bridge financing gaps, while Nair and Kumar (2019) analyze the potential of public-private partnership (PPP) models, identifying key barriers like limited capital, weak regulatory frameworks, and inadequate institutional capacity. Similarly, Sudarsan and Sarin (2018) highlight the crucial role of multilateral development banks, and Soman and George (2018) emphasize the contributions of Development Financial Institutions (DFIs) in infrastructure funding. Gopalakrishnan (2017) synthesizes these perspectives by identifying structural challenges and recommending policy interventions to strengthen financial mechanisms. Rajan and Thomas (2015) further illustrate the operational dynamics of PPPs in Kerala through case studies, showcasing both their benefits in attracting private investment and the complexities in their implementation. Together, these studies reflect an interconnected understanding that sustainable infrastructure development depends on diversified financing models, strong governance, and inclusive policies ensuring alignment with the broader global agenda of the SDGs.

Objective of the Study

To assess the satisfaction level of the government and private sector officials regarding infrastructure financing.

Research Questions

1. What is the overall satisfaction level of government and private officials regarding infrastructure financing?
2. How do government and private officials perceive the effectiveness of current infrastructure financing policies and mechanisms?

Research Methodology

The present study adopts a descriptive and analytical research design to explore the satisfaction levels of government and private sector officials regarding infrastructure financing in Kerala. The descriptive design is suited to systematically describe the patterns, characteristics, and parameters of infrastructure financing and its development across various sectors. Both primary and secondary data were utilized to ensure a comprehensive understanding of the topic. The study also investigates the effectiveness of current financing mechanisms, available sources of funding, influencing factors, and challenges in utilization.

The target population for this study consists of 2,126 officials and executives from ten prominent registered infrastructure financing companies in Kerala, selected due to their strategic roles and domain expertise. The sample size was determined using the Yamane formula (1973), which is appropriate for finite populations, resulting in a minimum required sample of 380 respondents. To ensure representation and reduce sampling bias, the study employed stratified random sampling, dividing the population into two strata: government sector and private sector officials. A random sample was then drawn proportionately from each stratum to maintain balance and improve the generalizability of the results.

As per Kolmogorov-Smirnov, the test value is 0.680 and the significant value

Table 1

Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	**Sig.**	Statistic	df	**Sig.**
V173	.680	305	**.378***	.995	305	**.389**

***. This is a lower bound of the true significance.**

a. Lilliefors Significance Correction

Source: Primary Data

(P value) is 0.378, statistically not significant. Similarly, the Shapiro-Wilk test value is 0.995 and P value is 0.389, statistically not significant. Both shown the given data is normally distributed.

Data Analysis

This study aims to assess the satisfaction level of infrastructure financing across eight key sectors: roads and highways, railways, waterways, airports, telecommunication, energy and power, seaports, and social infrastructure. Data were collected using a 5-point Likert scale to evaluate perceptions from government and private sector officials. Each sector plays a distinct role in Kerala's growth while roads and highways have seen state-led expansion projects, the railway system is valued for affordability, and the airports contribute significantly to tourism and trade. Waterways, though

Table 2

Reliability Test: Cronbach's Alpha

Sl. No.	Constructs	Cronbach's alpha	No. of items
1	Satisfaction	0.821	8
2	Usage of available infrastructure	0.819	8
3	Factors affecting choice of source of finance	0.798	10
4	Risk factors	0.801	7
5	Perception about planning and development	0.894	10
6	Challenges	0.719	23

Source: Primary Data

Table 3

Descriptive Statistics

	Sector	N	Mean	SD
Road and highways	Government	304	1.64	.481
	Private	76	1.25	.436
Railways	Government	304	3.30	.904
	Private	76	3.25	.733
Waterways	Government	304	2.33	.628
	Private	76	1.93	.838
Airports	Government	304	4.76	.428
	Private	76	3.78	.479
Telecommunication	Government	304	3.87	.547
	Private	76	3.63	.486
Energy and Power	Government	304	3.52	.699
	Private	76	2.96	.807
Seaports	Government	304	2.36	.693
	Private	76	2.43	.914
Social Infrastructure	Government	304	4.22	.664
	Private	76	3.70	.542

Source: Primary Data

historically important, face challenges due to underinvestment, and seaports are evolving as vital trade hubs. The telecommunication sector has made substantial progress in connectivity, while the energy and power sector show potential with a need for greater focus on renewable sources. Kerala's social infrastructure stands out for its strong performance in education, healthcare, and welfare. This study provides a comprehensive overview of stakeholder satisfaction, highlighting the effectiveness and shortcomings in infrastructure financing across these sectors.

Social infrastructure was found to be the most prominent attribute among government respondents ($\overline{X}$ = 4.22 ± 0.664). Road and Highways found to be the least prominent among government and private sector respondents ($\overline{X}$ = 1.64 ± 0.481), ($\overline{X}$ =1.25±0.436)

Hypothesis

H0: There is no significant difference between levels of satisfaction of infrastructure financing based on sectors.

The results of independent samples t-test and applicability of equal variances assumption using Levene's test are shown in Table 4.

A greater than 0.05 significance of F statistics fails to reject Levene's null hypothesis that variances are equal. In all such cases the t statistics of independent samples t-test, when variances are unequal becomes irrelevant.

Table 4

Independent sample t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Road and highways	Equal variances	19.419	.000	6.403	378	.000
	Unequal variance			6.796	124.823	.000
Railways	Equal variance	3.831	.051	.441	378	.660
	Unequal variance			.500	138.060	.618
Waterways	Equal variance	6.435	.012	4.599	378	.000
	Unequal variance			3.877	97.053	.000
Airports	Equal variance	.598	.440	17.491	378	.000
	Unequal variance			16.349	106.874	.000
Telecommunication	Equal variance	2.947	.087	3.448	378	.001
	Unequal variance			3.704	127.018	.000
Energy and power	Equal variance	.176	.675	6.044	378	.000
	Unequal variance			5.542	104.801	.000
Seaports	Equal variance	14.815	.000	-.829	378	.407
	Unequal variance			-.704	97.621	.483
Social Infrastructure	Equal variance	2.729	.099	6.314	378	.000
	Unequal variance			7.127	137.082	.000

Source: Primary Data

The null hypothesis *'There is no significant difference between the level of satisfaction of infrastructure financing based on sectors'* get rejected, at a 5 per cent level of significance in the cases of Road and highways, waterways, Airports, Telecommunication, energy and power, and social infrastructure. Satisfaction regarding railways and seaports was insignificant. So, the hypothesis stands rejected and concluded that *there is significant difference between the levels of satisfaction of infrastructure financing based on sectors.*

Friedman test

The reason for lack of proper usage of available infrastructure finance is analyzed though Friedman test. The Friedman rank is a non-parametric statistical test that is used to compare three or more related groups. The test ranks the observations in each group and then calculates the average rank for each observation across all groups. The test statistic is then calculated based on the differences between the average ranks.

The proper usage of available infrastructure financing in Kerala is critical for ensuring that the state's infrastructure development goals are achieved efficiently and effectively. From table 5, problem of funding (7.10) is treated as major reason for infrastructure financing. Improper planning (6.56), inefficient administration (5.97) and political intervention (5.37) also create obstacle for infrastructure financing.

Findings

- Government officials reported high satisfaction with infrastructure financing in social sectors such as education, healthcare, and public amenities (mean = 4.22 ± 0.664).

Table 5

Friedman test

	Mean Rank	N	Chi-square	df	sig
Procedural delay	2.26	380	1830.962	7	0.000
Corruption	4.32				
Inefficient administration	5.97				
Public protest	3.19				
Problem of funding	7.10				
Improper planning	6.56				
lack of land availability	1.23				
Political interventions	5.37				

Source: Primary Data

- Both government and private respondents expressed low satisfaction with road and highway infrastructure (mean = 1.64 ± 0.481 and 1.25 ± 0.436, respectively) due to poor conditions and inadequate funding.
- Railway infrastructure received positive feedback for its affordability, convenience, and service quality.
- Waterway and seaport infrastructure were rated poorly because of insufficient financing, underdevelopment, and inadequate connectivity.
- Airport infrastructure received high satisfaction for its strong contribution to Kerala's economy, tourism, and trade.
- Telecommunication infrastructure, particularly internet and broadband services, was highly rated for improved connectivity and reliability.
- Power infrastructure showed moderate satisfaction, with recurring issues like outages and voltage fluctuations requiring attention.
- Perception gap observed: 67.1per cent of government officials believed funds were used properly, while 94.7per cent of private sector officials disagreed.
- Major challenges identified included funding shortages, limited land availability, weak planning, poor administration, and political interference in project execution.

Recommendations

- Strengthen public – private collaboration to enhance efficiency and shared responsibility in financing and project implementation.
- Increase investment in roads, power, seaports, and waterways to ensure balanced sectoral growth.
- Improve transparency and accountability through digital tracking and regular audits of fund utilization.
- Promote innovative financing models such as PPPs, green bonds, and impact investments to diversify funding sources.
- Streamline land acquisition procedures and reduce bureaucratic

delays to accelerate project execution.

- Enhance institutional capacity and administrative efficiency through training and technology integration.
- Align political priorities with long-term sustainable infrastructure goals to minimize interference and improve continuity.
- Establish monitoring and evaluation mechanisms to ensure timely completion and optimal resource use in infrastructure projects.

Conclusion

Kerala has made notable progress in areas like social infrastructure; telecommunications, and airport development, critical gaps remain in roads, seaports, and waterway infrastructure due to inadequate financing. Satisfaction levels vary significantly between government and private sector officials, with the latter showing greater concern about inefficiencies in the utilization of infrastructure funds. Addressing these disparities requires focused investment, better administrative coordination, and transparent financing mechanisms. Strengthening infrastructure financing, especially in underperforming sectors will be essential to achieving sustainable and inclusive growth in Kerala.

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