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Perception Towards Sustainable Infrastructure Financing Innovations: A Ppp Driven Approach

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Abstract
With the rise in the global environmental issues, the demand for sustainable infrastructure is becoming the need of the hour. For accelerating it, financing for sustainable infrastructure is critical, keeping in view the issues of environmental degradation. This led to an increasing need of effective financial mechanisms which support these initiatives of sustainability. Therefore, it has prompted both public and private entities to explore innovative financing mechanisms. This study explores the funding options available for sustainable infrastructure financing and perception of people towards infrastructure financing. With the help of a structured questionnaire on Likert scale, data was collected from 300 respondents and analysed using SPSS software. The findings reveal that perceptions towards infrastructure financing innovations are not only influenced by demographic characteristics of individuals but also by level of awareness, perceived benefits and concerns related to such innovations. Additionally, it offers insights into the role of public and private sector entities (PPPs) in boosting sustainable infrastructure and industry.
Keywords: *Sustainable infrastructure, Innovative infrastructure financing, Public-private partnerships (PPP)*

1. INTRODUCTION

Infrastructure is one of the most crucial pillars of productivity in any economy, whether developing or developed. Promoting infrastructure development and organizing funds for infrastructure projects has been the most difficult problem specifically, in developing countries. Therefore, infrastructure investment is significant in both developed and emerging economies for transforming an economy. Global Infrastructure Outlook (2025) defined infrastructure investment as the "Gross Fixed Capital Formation (GFCF) by the public and private sectors on fixed, immovable assets that support long-term economic growth". It has been estimated that global infrastructure investment needs to be $94 trillion between 2016 and 2040. Four countries (China, US, India and Japan) account for more than half of global infrastructure investment requirements to 2040 (Global Infrastructure Outlook, 2025).

Over the years, the demand for infrastructure financing has increased across countries., which led to the need for diversification of funding sources and innovative solutions. Although global financial solutions are being anticipated, infrastructure project financing gaps have greatly expanded (Dash, 2018). Also, Sustainable infrastructure financing and the achievement of Sustainable Development Goals (SDGs) would require additional investment. Thus, the infrastructure financing landscape is experiencing fundamental changes. Although traditional sources of infrastructure funding, such as bank loans, syndicated loans, and multilateral development banks, still play a significant role, private investors are increasingly becoming involved in recent years. Innovative financing mechanisms such as green bonds, Public Private Partnerships (PPPs or P3) has emerged as a viable option for infrastructure development especially in the context of developing countries. These mechanisms seek to align financial incentives with the SDGs and attract investment from a variety of stakeholders, including institutional investors, development banks, and charitable groups. Despite advances, there are still considerable gaps and challenges in financing sustainable infrastructure and industry (Shrivastava et al., 2023).

The Inter-American Development Bank (IDB) recently published an adapted definition of sustainable infrastructure (Bhattacharaya, et al., 2019) as "Sustainable infrastructure refers to infrastructure projects that are planned, designed, constructed, operated, and decommissioned in a manner that ensures economic and financial, social, environmental (including climate resilience), and institutional sustainability over the entire life cycle of the project." It has been viewed as the relationship between social, environmental, and economic components of development. The world needs to ramp up investments in sustainable infrastructure to cope up with the infrastructure deficits especially in emerging economies. To address the challenge of filling the sustainable infrastructure investment gap, appropriate financial mechanisms and vehicles needs to be developed in accordance with the new sustainable

infrastructure paradigm.

This research paper contributes to the understanding of sustainable finance practices and level of awareness among people. It also identifies challenges by examining the current situation and making recommendations to stakeholders involved in sustainable development. On the basis of this, following research objectives have been framed:

i. To identify the factors affecting perception of people towards sustainable infrastructure financing innovations.

ii. To examine the influence of demographic variables on people's perception towards sustainable infrastructure financing innovations.

iii. To analyse the role of public and private sector entities in boosting sustainable infrastructure financing.

2. REVIEW OF LITERATURE

A sustainable infrastructure system which accounts for environmental, social, and economic variables and integrates the principles of green and resilient design. Developing sustainable infrastructure which contributes to inclusive prosperity by mitigating risks, creating tangible benefits and opportunities as well as reducing emissions and climate risks (De Gooyert, 2020; Inter-American Development Bank, 2018; Baietti, 2012; Studart & Gallagher, 2018). Financing and investing in sustainable infrastructure play an important role in attaining the United Nations Sustainable Development Goals. However, shifting to sustainable infrastructure is a complex task that requires advanced techniques and adequate funds. Financing mechanisms which include sustainability criteria for creating new infrastructure are required to achieve both investment and climate change goals. Traditionally, the public sector, which includes governments at all levels as well as international and bilateral lenders, has played an important role in supporting infrastructure systems. Given that public finances alone are inadequate to fill the funding gap, private finance is becoming increasingly vital (Vassallo et al., 2018). Furthermore, project finance under public-private partnerships (PPPs), in which the public sector serves as the principal and the private sector acts as the operator, has become a more common source of funding for infrastructure projects around the world. Since these approaches are the most essential tools for developing new infrastructure systems (Jefferies & McGeorge, 2009), there is a need for more detailed analysis of the infrastructure financing process (Farquharson & Yescombe, 2011; Gatti, 2023).

Incorporating sustainable financing mechanisms would allow growing eco-innovative techniques that benefit both the Sustainable Development goals (SDGs) and investment infrastructure targets (Clark et al., 2018). Innovative financing was aimed to enhance the supply of financial instruments to complement traditional sources and meet current needs (González-Ruiz et al., 2018). Thus, PPPs, credit improvement tools, and fixed-income financing instruments (such as bonds) have evolved to supplement traditional options, such as leaseback, projected revenue, and availability-based payment mechanisms (Mostafavi et al., 2012). Other approaches include eco-leases, climate mortgages, and green lending (Ozusaglam, 2012).

One of the key initiatives undertaken by Indian Government to boost economic growth by developing critical infrastructure sectors like highways, ports, power, and urban infrastructure through greater private sector participation via public-private partnerships (PPPs or P3). According to the Department of Economic Affairs, Ministry of Finance, Government of India (2007), PPP is defined as "A partnership between a public sector entity (sponsoring authority) and a private sector entity (a legal entity in which 51% or more of equity is with the private partner/s) for the creation and/or management of infrastructure for public purpose for a specified period of time (concession period) on commercial terms and in which the private partner has been procured through a transparent and open procurement system".

Therefore, in order to enhance public services or the management of public sector assets, the PPP combines the development of private sector capital with public sector capital (Michael, 2001). The various models and modalities to implement PPP are mentioned in table 2.1. It is not an exhaustive list; there may be more such categories depending on the nature of the project.

Table 2.1: Types of Public Private Partnership (PPPs)

BOT	"Built, operate and Transfer" (most commonly adopted method of Public Private Partnership)
BOOT	"Built, Own, Operate and Transfer"
BOO	"Builds, Owns and Operates". In this case, the Private entity is not required to transfer the project to the Government.
BLT or BRT	"Build, Lease and Transfer" or "Build Rent and Transfer"
BTO	In this kind of agreement, the Private entity builds the project and thereafter transfers it immediately to the government. However, the government requires that it should be operated by the Private entity for a certain period of time.
DBFO	It means design, build, finance and operate. In such kind of cases, after completion, the project can continue to be operated by the Private entity for indefinite period. It need not be transferred to the government.
MOT	"Modernization, Operation or Ownership and if required transfer to the government".
ROT	"Rehabilitate, Operate and transfer"

*Source: Fiscal Affairs Department, IMF; Khare (2014)

In general, the primary cause for such Public Private Partnerships is a lack of sufficient funds available to the country's government to complete a project of public interest. However, other reasons could be technical capacity, availability of necessary labor and equipment, and the ability to organize and execute a project successfully and efficiently (Khare, 2014). An important tool for progressing sustainable development from synergies of the strengths of public and private sector stakeholders (Marx, 2019; Wojewnik-Filipkowska & Węgrzyn, 2019). PPPs provides flexible financing options and attracts private investment in sustainable infrastructure and industry (Shrivastava et al., 2023).

Brazil, China, and India have remained among the top five PPI countries for decades. Over the last five years (2019-2023), these countries have contributed 57% of the total PPI. According to World Bank, PPI Database (2023), PPI investment in 2023 was $86.0 billion, accounting for 0.2% of the GDP of all low- and middle-income countries. China, Brazil, the Philippines, India, and Peru had the highest PPI investments in 2023. These five countries attracted $66 billion, accounting for over 77% of global PPI investment. As per the department of economic affairs (2025), 1825 infrastructure projects are under PPP with a total cost of $289.3 billion in India. During the year 2020–21 (1 April 2020 to 31 March 2021), Niti Aayog has appraised 125 PPP projects worth $20 billion. This consists of 123 Central Government projects and two State projects. The Public Private Partnership Appraisal Committee (PPPAC) of India has also appraised 386 projects from the year 2006 till 2026. The table 2.2 below shows the sector-wise allocation of the PPP projects (including those under the VGF plan) that were appraised:

Table 2.2: Appraisal of central government Public-Private Partnership (PPPs) by NITI Aayog and Public Private Partnership Appraisal Committee (PPPAC)

	NITI Aayog (2020–21)			**Public Private Partnership Appraisal Committee (2006–26)**		
Project Appraised	**No. of Project s**	**Total Cost (Rs in Crores)**	**Total Cost ($ in Billions)**	**No. of Projects**	**Total Cost (Rs in Crores)**	**Total Cost ($ in Billions)**
Roads	69	63,279	$7.3 Billion	283	427473	$50 Billion
Ports	12	3,359	$0.4 Billion	42	85113	$9.9 Billion
Eco-Tourism/ Tourism	10	2,232	$0.3 Billion	6	1914	$0.2 Billion

Tourism Infrastructure Project	-	-	-	2	767	$0.1 Billion
Silos	1	401	$0.04 Billion	-	-	-
Petroleum Reserves/ Oil/Gas/Liquefied Natural Gas (LNG) storage facility	4	27,728	$3.2 Billion	2	21977	$2.6 Billion
Ropeway	1	996	$0.1 Billion	-	-	-
Telecom	9	29,199	$3.4 Billion	4	94872	$11.1 Billion
Railway Stations	6	7,600	$0.9 Billion	1	947	$0.1 Billion
Railway Passenger Trains/ Railway track including electrical & signaling system, tunnels, viaducts, bridges	12	30,099	$3.5 Billion	15	135077	$15.8 Billion
Metro	1	7,420	$0.9 Billion	-	-	-
Affordable Housing	-	-	-	9	7634	$0.9 Billion
Airport	-	-	-	10	9017	$1.1 Billion
Infrastructure design and development	-	-	-	3	550	$0.1 Billion
Logistics Infrastructure	-	-	-	1	5924	$0.7 Billion
Post-harvest storage infrastructure for agriculture and horticultural produce including cold storage	-	-	-	3	2101	$0.2 Billion
Power	-	-	-	1	0	0
Sports Infrastructure	-	-	-	4	0	0
Total	125	1,72,314	$20 Billion	386	7,93,365.61	$92.7 Billion
*Source: https://www.niti.gov.in/verticals/ppp, https://www.pppinindia.gov.in/pppac_projects_summary						

The public-private partnership (PPP) landscape in India varies in different sectors, such as airports, electricity, information and communication technology (ICT), integrated municipal solid waste management, natural gas, ports, railways, roads, water, and sewage. The road and energy sectors have been the most active, accounting for more than 84% of the total number of projects (World Bank, 2024). Public-private partnerships have shown to be incredibly effective in India's infrastructure development, and the P3 model serves as the foundation for the country's major infrastructure development projects (Khare, 2014). It has emerged as a rational, practical, and essential means for the public and private sectors to collaborate as neither can meet the financial needs for infrastructure in isolation.

Despite the benefits, PPPs have their downsides as well, including political risk, financial complexity, regulatory barriers, and public opposition based on concerns about accountability and privatization Guijie, 2025). When projects are acquired through the PPP route, a number of

problems arise that adversely affect the achievement of sustainable development goals. The private sector's profit-driven mindset in PPPs can lead to sustainability difficulties that are not often encountered while procuring projects through the traditional route (El-Gohary et al., 2006). PPPs' goals don't seem to be in line with the goal of maximizing societal welfare (Agarchand & Laishram, 2017). Moreover, political instability, changes in government policies and bureaucracy adds more to the existing challenges.

Likewise, there are numerous possible impediments to innovative financing approaches from a public acceptance perspective. Mostafavi et al., (2011a); Grout & Stevens, (2003); Ortiz & Buxbaum, (2008) have demonstrated that a large number of financial innovations are difficult for the general public understand, which could lead to public opposition and raise the likelihood that they won't be implemented successfully. Noordegraaf et al., (2014) identified public support as an important factor in road pricing scenarios. Despite its importance, few studies have focused on public perceptions in infrastructure funding policy analysis and partner education. Studies on the public's approval of road pricing have been conducted in a number of nations; for example, Verhoef et al., (1997), Taylor and Brook (2002), Rienstra et al., (1999), Schade and Schlag (2003), Harrington et al., (2001), Podgorski and Kockelman (2006), and Yusuf et al., (2014), developed predictive statistical models to assess determinants of the public acceptance regarding road pricing (Mostafavi et al., 2014). By looking at the variables that influence observed and likely voting behavior on various financing efforts, Hamideh et al., (2008) investigated public acceptability of new sales tax measures to pay transportation improvements. They discovered that a wide range of variables statistically influence how people vote on proposed sales tax plans to pay for improvements to infrastructure. Dill and Weinstein (2007) examined into Californians' support for various revenue sources, such as bonds, taxes and fees, and tolling, to finance transportation. In another study, Jaensirisak et al., (2005) studied the impact of personal and travel variables, including journey time and distance, on public approval of road pricing in the United Kingdom. Furthermore, the studies that Zmud and Arce (2008) examined were restricted to evaluating public perceptions of road pricing; they did not take into account other aspects of infrastructure development, such as the effects of financing structure (private delivery, etc.), or other dimensions of public perceptions, such as awareness and attitude.

The review of the existing literature indicates that previous research studies have emphasized the importance of understanding the public preferences and perceptions towards infrastructure financing. However, there are few studies which have strived to facilitate such understanding. Most of the studies were related to public perceptions of road pricing and imposing tolls. Further, the studies were limited to the assessment of public perception regarding need for infrastructure financing and did not consider other dimensions of public perceptions such as awareness, attitudes and support for innovative infrastructure financing.

Moreover, very few empirical studies have been undertaken to investigate the perception of people towards infrastructure financing from sustainable development perspective. Therefore, the study presented in this paper bridges this gap by implementing a comprehensive research study to gain understanding of public perceptions and preferences towards innovative financing methods from the perspective of sustainable development. This paper also sheds light on innovations in finance crucial for driving sustainable infrastructure projects.

3. RESEARCH METHODOLOGY

This section explains the research methodology used in the study which includes the research philosophy, research design and types of data analysed. It also specifies the methods of data analysis used and independent & dependent variables used in the study.

The research methodology of the study is exploratory cum descriptive in nature. It aims to identify underlying factors influencing perception. The study also adopts a Post-Positivist research philosophy, which allows for empirical investigation using quantitative methods while recognizing the contextual influence of individual perceptions and experiences. It is a quantitative study which relies on primary data collected directly from respondents using a structured survey. Primary data was collected from a sample population of the public (older than 18) in India using convenience sampling technique. The statements were on 5-point Likert scale to measure different aspects of public perceptions related to innovative financing of infrastructure systems. Secondary data for this research highlighting the role of public–private partnerships (PPPs) was sourced from government reports, International financial institutions, academic journals, PPP project databases and reviewed from existing literature.

The data was analyzed using SPSS software. Descriptive and inferential statistical methods were executed on the quantitative data along with Exploratory Factor Analysis (EFA) and reliability & validity analysis. The results were presented in the form of tables and descriptive summaries.

4. Data Analysis

The data analysis is presented in different sub-sections including the descriptive statistics of demographics, inferential statistics, factor analysis and validity and reliability test.

4.1 Descriptive statistics of demographics

This section presents the descriptive statistics of demographics i.e. gender, age, educational qualification, residing area, profession and marital status. This section represents frequency distribution values of respondents as per demographics in different tables along with percentage of values. The tables are as follows:

Table 4.1 Frequency Distribution of the respondents as per their gender, age and marital status

Gende r	**Frequency** (%)	**Age (Years)**	**Frequency** (%)	**Marital Status**	**Frequency** (%)
Male	251 (83.7)	18-25	44 (14.7)	Married	210 (70.0)
Female	49 (16.3)	26-35	93 (31.0)	Unmarried	90 (30.0)
		36- 45	72 (24.0)		
		46-60	74 (24.7)		
		> 60	17 (5.70)		
Total	300(100)		300(100)		300(100)
Values in parenthesis are in percentage (%)					

Table 4.1 presents demographic data on gender, age, and marital status of the respondents. It shows that the sample population consists of 300 individuals, with a majority of the population being male 83.7% (251 individuals), while females constitute only 16.3% (49 individuals). In terms of age distribution, the largest group falls within the 26-35 years range, accounting for 31.0% (93 individuals) of the sample,

indicating a youthful cohort of respondents and professionals in the Construction Industry. This is followed by the 46-60 years group at 24.7% (74 individuals) and the 36-45 years group at 24.0% (72 individuals). The 18-25 years group comprises 14.7% (44 individuals) of the sample, while those over 60 years old are the least represented, making up only 5.7% (17 individuals). The marital status distribution reveals that a significant majority are married (70.0%), while 30.0% are unmarried. Overall, the data reflects a predominantly young to middle-aged male population, with a notable proportion in the prime working age groups, and a majority of them being married.

Table 4.2 Frequency Distribution of the respondents as per their qualification, profession and location

Qualificatio n	**Frequency** (%)	**Professio n**	**Frequency** (%)	**Locatio n**	**Frequency** (%)
12th	8 (2.7)	Study	33 (11.0)	Urban	265 (88.3)
UG	63 (21.0)	Job	267 (89.0)	Rural	35 (11.7)
PG	229 (76.3)				
Total	300(100)		300(100)		300(100)
UG – Undergraduate PG - Postgraduate Values in parenthesis are in percentage (%)					

Table 4.2 presents demographic data on the qualifications, profession, and location of the respondents. From the table, it's clear that the majority of the population holds a postgraduate (PG) degree, comprising 76.3% (229 individuals). Those with undergraduate (UG) degrees make up 21.0% (63 individuals), while a small minority have completed only up to the 12th grade, accounting for 2.7% (8 individuals). In terms of profession, the overwhelming majority of the population is employed in jobs, representing 89.0% (267 individuals). The remaining 11.0% (33 individuals) are engaged in studies. When considering the location, a significant majority of the population resides in urban areas, making up 88.3% (265 individuals). In contrast, only 11.7% (35 individuals) live in rural areas. This suggests that the sample population is highly educated, with most individuals holding postgraduate degrees and being employed in jobs. Additionally, alarge proportion of the population resides in urban areas, suggesting a concentration of educated and professionally active individuals in urban settings.

4.2 Inferential statistics

This section represents perception measures of central tendency and variability along with testing of hypothesis in the context of demographics i.e. gender, age, educational qualification, residing area, profession and marital status. Sample hypothesis is listed for these demographics in the following:

i. For gender

H_0: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is same for male and female.

H_1: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is different for male and female.

Similarly, hypothesis will be tested for all 12 statements of 3 dimensions i.e. Need for financing innovation, Costs & support for innovation and Innovation promotion.

ii. For age

H_0: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is same for 18-25 years, 26-35 years, 36- 45 years, 46-60 years and above 60 years.

H_1: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is different for 18-25 years, 26-35 years, 36- 45 years, 46-60 years and above 60 years.

Similarly, hypothesis will be tested for all 12 statements of 3 dimensions i.e. Need for financing innovation, Costs & support for innovation and Innovation promotion.

iii. For educational qualification

H_0: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is same for up to +2, under graduate and post graduate.

H_1: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is different for up to +2, under graduate and post graduate.

Similarly, hypothesis will be tested for all 12 statements of 3 dimensions i.e. Need for financing innovation, Costs & support for innovation and Innovation promotion.

iv. For residing area

H_0: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is same for rural area and urban area.

H_1: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is different for rural area and urban area.

Similarly, hypothesis will be tested for all 12 statements of 3 dimensions i.e. Need for financing innovation, Costs & support for innovation and Innovation promotion.

v. For Profession

H_0: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is same for profession.

H_1: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is different for profession.

Similarly, hypothesis will be tested for all 12 statements of 3 dimensions i.e. Need for financing innovation, Costs & support for innovation and Innovation promotion.

vi. For marital status

H_0: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is same for married and unmarried.

H_1: Mean perception score for the statements (Innovative infrastructure financing methods are essential for the development of our community/region) of financing innovation need is different for married and unmarried.

Similarly, hypothesis will be tested for all 12 statements of 3 dimensions i.e. Need for financing innovation, Costs & support for innovation and Innovation promotion.

The results of gender are presented in table no. 4.3. It can be inferred from the table that null hypothesis is rejected for none of the statements. Therefore, for all the 12 statements there is no evidence against null hypothesis.

Table 4.3 Mean perception score of the respondents as per gender

S. no.	Statements	Mean ± SEM		p- value
		Male	Female	
S1	Innovative infrastructure financing methods are essential for the development of our community/region.	4.12 ± 0.051	4.22 ± 0.102	0.383
S2	The traditional methods are insufficient for financing infrastructure by state and central governments to improve the existing deteriorating condition.	3.86 ± 0.065	3.90 ± 0.134	0.795

S3	I believe that innovative financing methods can effectively address the infrastructure needs of our community.	4.10 ± 0.044	4.24 ± 0.800	0.172
S4	Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community.	4.22 ± 0.046	4.20 ± 0.087	0.892
S5	Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community.	4.20 ± 0.053	4.24 ± 0.126	0.708
S6	Innovative financing methods can expedite the completion of infrastructure projects.	3.96 ± 0.052	4.00 ± 0.130	0.760
S7	I believe that innovative infrastructure financing has a positive impact on the quality of public services.	3.04 ± 0.082	2.80 ± 0.200	0.237
S8	Innovative financing can lead to cost savings in infrastructure development.	3.76 ± 0.060	3.55 ± 0.152	0.172
S9	I am concerned that innovative infrastructure financing can lead to corruption.	2.71 ± 0.072	2.49 ± 0.157	0.226
S10	Innovative infrastructure financing increases the direct costs incurred by users.	3.00 ± 0.071	2.80 ± 0.167	0.261
S11	Private infrastructure financing stimulates local economies.	4.05 ± 0.051	4.10 ± 0.093	0.659
S12	Efficient distribution of project finance risks enhances the adoption of private financing.	3.72 ± 0.055	3.88 ± 0.126	0.239

Represents significance level at 5%

The results presented in the table illustrates the mean perception scores for various statements regarding innovative infrastructure financing methods, comparing male and female perspectives. The mean perception score is highest (4.22) for the statement "Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community" (S4) for males followed by S5 (4.20 ± 0.053), and S1 (4.12 ± 0.051). On the other hand, the statement (S9) "I am concerned that innovative infrastructure financing can lead to corruption" (2.71 ± 0.072) scored lowest mean perception value followed by S10 (3.00 ± 0.071) and S7 (3.04 ± 0.082). Similar trends are seen in the mean perception score for 12 statements for female respondents. The value of mean perception score for the statement (S5) "Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community" (4.24 ± 0.126) has highest mean perception score followed by S3 (4.24 ± 0.800) and S1 (4.22 ± 0.102).

It can be inferred from the table that null hypothesis is rejected for none of the statements as p-values are greater than 0.05 thereby indicating no evidence against null hypothesis.

Table 4.4 Mean perception score of the respondents as per age (in years)

S.		**Mean ± SEM**	**p- valu e**

no.	Statements	18 to 25	26 to 35	36 to 45	46 to 60	> 60	
S1	Innovative infrastructure financing methods are essential for the development of our community/region.	4.00 ± 0.142	4.05 ± 0.092	4.18 ± 0.085	4.26 ± 0.061	4.18 ± 0.274	0.379
S2	The traditional methods are insufficient for financing infrastructure by state and central governments to improve the existing deteriorating condition.	3.70 ± 0.144	3.83 ± 0.107	3.86 ± 0.122	3.97 ± 0.109	4.00 ± 0.332	0.674
S3	Private infrastructure financing stimulates local economies.	3.93 ± 0.105	4.01 ± 0.079	4.14 ± 0.085	4.01 ± 0.108	4.47 ± 0.151	0.126
S4	I believe that innovative financing methods can effectively address the infrastructure needs of our community.	4.05 ± 0.103	4.01 ± 0.066	4.25 ± 0.081	4.20 ± 0.074	4.06 ± 0.234	0.148
S5	Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community.	4.14 ± 0.132	4.12 ± 0.076	4.26 ± 0.066	4.39 ± 0.069	4.00 ± 0.227	0.063
S6	Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community.	4.30 ± 0.136	4.28 ± 0.074	4.03 ± 0.117	4.20 ± 0.088	4.29 ± 0.254	0.337
S7	Innovative financing methods can expedite the completion of infrastructure projects.	4.00 ± 0.122	3.90± 0.089	4.01 ± 0.087	4.01 ± 0.097	3.82 ± 0.274	0.815
S8	I believe that innovative infrastructure financing has a positive impact on the quality of public services.	2.91 ± 0.205	3.24 ± 0.127	3.01 ± 0.156	2.72 ± 0.159	3.12 ± 0.319	0.148
S9	Innovative financing can lead to cost savings in infrastructure development.	3.73 ± 0.119	3.56 ± 0.106	3.65 ± 0.112	3.93 ± 0.113	4.00 ± 0.227	0.092
S10	I am concerned that innovative infrastructure financing can lead to corruption.	2.93 ± 0.176	2.78 ± 0.115	2.51 ± 0.127	2.53 ± 0.135	2.65 ± 0.308	0.213

S11	Innovative infrastructure financing increases the direct costs incurred by users.	3.45 ± 0.167	2.97 ± 0.105	2.74 ± 0.131	2.81 ± 0.140	3.29 ± 0.318	0.007 *
S12	Efficient distribution of project finance risks enhances the adoption of private financing.	3.80 ± 0.111	3.77 ± 0.084	3.64 ± 0.122	3.72 ± 0.101	4.00 ± 0.192	0.585

* Represents significance level at 5%

S. no.	**Statements**	**Mean ± SEM**			**p- value**
		12th	**Under-Graduate**	**Post-Graduate**	
S1	Innovative infrastructure financing methods are essential for the development of our community/region.	4.00 ± 0.189	4.05 ± 0.112	4.16 ± 0.052	0.541
S2	The traditional methods are insufficient for financing infrastructure by state and central governments to improve the existing deteriorating condition.	3.88 ± 0.295	3.56 ± 0.150	3.95 ± 0.063	0.025*
S3	Private infrastructure financing stimulates local economies.	3.25 ± 0.164	4.03 ± 0.078	4.09 ± 0.054	0.011*
S4	I believe that innovative financing methods can effectively address the infrastructure needs of our community.	3.75 ± 0.313	4.00 ± 0.091	4.17 ± 0.043	0.061
S5	Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community.	3.50 ± 0.267	4.19 ± 0.081	4.25 ± 0.047	0.012*
S6	Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community.	3.63 ± 0.263	4.14 ± 0.106	4.24 ± 0.056	0.106
S7	Innovative financing methods can expedite the completion of infrastructure projects.	3.50 ± 0.267	3.86 ± 0.113	4.01 ± 0.054	0.116

S8	I believe that innovative infrastructure financing has a positive impact on the quality of public services.	3.75 ± 0.164	2.86 ± 0.169	3.01 ± 0.088	0.188
S9	Innovative financing can lead to cost savings in infrastructure development.	3.13 ± 0.227	3.73 ± 0.114	3.74 ± 0.065	0.205
S10	I am concerned that innovative infrastructure financing can lead to corruption.	3.38 ± 0.183	2.62 ± 0.140	2.66 ± 0.076	0.200

The table presents the mean perception scores for various statements related to innovative infrastructure financing methods, compared across different age groups. The statement "Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community" recorded the highest mean score for the age group of 18–25 years (4.30 ± 0.136), indicating a strong agreement with the importance of sustainability. This was followed by (S5) "Innovative financing methods are necessary to accelerate/boost infrastructure development in our community" (4.14 ± 0.132) and (S4) (4.05 ± 0.103). The lowest mean perception score was recorded for (S8) "Innovative infrastructure financing has a positive impact on the quality of public services" (2.91 ± 0.205), followed by (S10) "concern about corruption" (2.93 ± 0.176).

In the 26–35 years age group, the highest perception score was observed for (S1) "Innovative infrastructure financing methods are essential for development" (4.05 ± 0.092), followed by (S6) (4.28 ± 0.074). And the lowest agreement was for the statements (S10) (2.78 ± 0.115) and (S11) (2.97 ± 0.105). Among 36–45-year-olds, the highest mean score was for the statement (S1) (4.18 ± 0.085) and (S4) (4.25 ± 0.081), indicating that mid-aged respondents largely support innovative financing methods. While the lowest perception was for the statements (S10) (2.51 ± 0.127) and (S8) (3.01 ± 0.156). The 46–60 years age group agreed highly with the statements (S5) (4.39 ± 0.069) and (S1) (4.26 ± 0.061). Whereas, they showed lower agreement for (S8) (2.72 ± 0.159) and (S10) (2.53 ± 0.135). In the 60 years and above age group, (S3) "Private infrastructure financing stimulates local economies" scored the highest mean perception score (4.47 ± 0.151), indicating strong support for private sector involvement, while the statements (S7) and (S10) had lower agreement levels.

Therefore, it can be inferred from the table that null hypothesis is rejected only for 1 statement (S11) i.e. the mean perception score across different age groups for this statement differ significantly. For the remaining 11 statements, p-values are greater than 0.05 thereby indicating the difference is not statistically significant.

Table 4.5 Mean perception score of the respondents as per educational qualification

S11	Innovative infrastructure financing increases the direct costs incurred by users.	3.25 ± 0.250	2.86 ± 0.145	2.98 ± 0.076	0.572
S12	Efficient distribution of project finance risks enhances the adoption of private financing.	3.50 ± 0.267	3.84 ± 0.099	3.72 ± 0.059	0.469

Represents significance level at 5%

The table presents the mean perception scores for various statements related to innovative infrastructure financing, categorized into three categories of educational qualification of respondents i.e. 12th pass, undergraduate, and postgraduate.

Among respondents with postgraduate qualifications, the highest agreement was observed for the

statement (S1) "Innovative infrastructure financing methods are essential for the development of our community/region" (4.16 ± 0.052), followed by (S6) "Investing in sustainable infrastructure projects is crucial for long-term well-being" (4.24 ± 0.056) and (S5) "Innovative financing methods are necessary to accelerate/boost infrastructure development" (4.25 ± 0.047). The lowest perception among postgraduates was for (S10) i.e. concern about corruption (2.66 ± 0.076). For undergraduate respondents, the highest mean score was observed for (S5) (4.19 ± 0.081) and (S3) "Private infrastructure financing stimulates local economies" (4.03 ± 0.078), indicating strong belief in the role of private finance in development. The lowest mean score was for (S8) "Positive impact on quality of public services" (2.86 ± 0.169) and (S10) (2.62 ± 0.140), reflecting some concern or lack of confidence in public benefit or integrity of innovative financing. For the 12th pass group, mean scores were generally lower across all statements. The highest was for (S1) (4.00 ± 0.189), and the lowest was for (S3) (3.25 ± 0.164), (S7) (3.50 ± 0.267), and (S11) (3.25 ± 0.250), indicating a more neutral attitude or lesser familiarity with the concepts among this group.

It can be inferred from the table that null hypothesis is rejected or 3 statements (S2, S3, S5) i.e. the mean perception score across different educational qualifications for these statements differ significantly. For the remaining 9 statements, p-values are greater than 0.05 which means the difference is not statistically significant.

Table 4.6 Mean perception score of the respondents as per residing area

S. no.	Statements	Mean ± SEM		p- value
		Urban	Rural	
S1	Innovative infrastructure financing methods are essential for the development of our community/region.	4.19 ± 0.048	3.69 ± 0.141	0.000*
S2	The traditional methods are insufficient for financing infrastructure by state and central governments to improve the existing deteriorating condition.	3.86 ± 0.062	3.86 ± 0.184	0.970
S3	Private infrastructure financing stimulates local economies.	4.12 ± 0.046	3.57 ± 0.144	0.000*
S4	I believe that innovative financing methods can effectively address the infrastructure needs of our community.	4.19 ± 0.039	3.60 ± 0.137	0.000*
S5	Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community.	4.25 ± 0.043	3.94 ± 0.108	0.014*
S6	Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community.	4.29 ± 0.047	3.57 ± 0.189	0.000*
S7	Innovative financing methods can expedite the completion of infrastructure projects.	3.98 ± 0.051	3.83 ± 0.139	0.298
S8	I believe that innovative infrastructure financing has a positive impact on the quality of public services.	2.95 ± 0.083	3.37 ± 0.159	0.076
S9	Innovative financing can lead to cost savings in infrastructure development.	3.78 ± 0.060	3.29 ± 0.133	0.004*
S10	I am concerned that innovative infrastructure financing can lead to corruption.	2.65 ± 0.072	2.80 ± 0.152	0.473
S11	Innovative infrastructure financing increases the direct costs incurred by users.	2.98 ± 0.071	2.83 ± 0.166	0.457

S12	Efficient distribution of project finance risks enhances the adoption of private financing.	3.80 ± 0.054	3.34 ± 0.129	0.004*

* Represents significance level at 5%

The table illustrates the mean perception scores for various statements on innovative infrastructure financing, comparing responses from urban and rural populations. The data reveals significant differences in how these two groups perceive the effectiveness and implications of financing innovations, particularly in the context of sustainable infrastructure and Public-Private Partnerships (PPPs or P3). Urban respondents showed higher levels of agreement across most statements. The highest mean perception among the urban group was for (S1) "Innovative infrastructure financing methods are essential for the development of our community/region" (4.19 ± 0.048), followed by (S5) "Innovative financing methods are necessary to accelerate/boost infrastructure development" (4.25 ± 0.043) and (S6) "Investing in sustainable infrastructure is crucial for long-term well-being" (4.29 ± 0.047). In contrast, their lowest mean score was observed for statement no. 8
i.e. "Innovative financing has a positive impact on the quality of public services" (2.95 ± 0.083) and for statement no. 10 i.e. "concern about corruption" (2.65 ± 0.072). Rural respondents showed relatively lower perception scores overall. Their highest agreement was for (S5) (3.94 ± 0.108) and (S1) (3.69 ± 0.141), while the lowest was for (S10) (2.80 ± 0.152) and (S11) "Innovative financing increases direct user costs" (2.83 ± 0.166).
It can be inferred from the table that null hypothesis is rejected for 7 statements i.e. the mean perception score across rural and urban people for these statements differ significantly. For the remaining 5 statements, p-values are greater than 0.05 thereby indicating no evidence against null hypothesis. Therefore, the results indicate that urban respondents are significantly more supportive and optimistic about innovative infrastructure financing methods, their benefits, and the role of the private sector as compared to rural people.

Table 4.7 Mean perception score of the respondents as per profession

S. no.	Statements	Mean ± SEM		p- value
		Study	Job	
S1	Innovative infrastructure financing methods are essential for the development of our community/region.	4.03 ± 0.166	4.15 ± 0.048	0.433
S2	The traditional methods are insufficient for financing infrastructure by state and central governments to improve the existing deteriorating condition.	3.82 ± 0.177	3.87 ± 0.062	0.787
S3	Private infrastructure financing stimulates local economies.	3.97 ± 0.134	4.07 ± 0.048	0.501
S4	I believe that innovative financing methods can effectively address the infrastructure needs of our community.	4.09 ±0.110	4.13 ± 0.042	0.772
S5	Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community.	4.06 ± 0.179	4.24 ± 0.040	0.179
S6	Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community.	4.42 ± 0.174	4.18 ± 0.050	0.112
S7	Innovative financing methods can expedite the completion of infrastructure projects.	3.88 ± 0.167	3.98 ± 0.050	0.522
S8	I believe that innovative infrastructure financing has a positive impact on the quality of public services.	3.00 ± 0.242	3.00 ± 0.080	1.000
S9	Innovative financing can lead to cost savings in infrastructure development.	3.58 ± 0.174	3.74 ± 0.059	0.352
S10	I am concerned that innovative infrastructure financing can lead to corruption.	3.06 ± 0.208	2.62 ± 0.069	0.036*
S11	Innovative infrastructure financing increases the direct costs incurred by users.	3.52 ± 0.185	2.90 ± 0.069	0.003*
S12	Efficient distribution of project finance risks enhances the adoption of private financing.	3.76 ± 0.138	3.74 ± 0.054	0.921

* Represents significance level at 5%

The table presents the mean perception scores of individuals based on their occupation status across 12

statements related to innovative infrastructure financing and public-private partnerships (PPPs).

Respondents engaged in jobs showed higher mean scores across most statements, suggesting a slightly greater acceptance or awareness of the effectiveness of innovative financing mechanisms among professionals. The highest score among job holders was for (S5) "Innovative financing methods are necessary to accelerate/boost infrastructure development" (4.24 ± 0.040), followed by (S1) (4.15 ± 0.048) and (S6) "Investing in sustainable infrastructure projects is crucial for long-term well-being" (4.18 ± 0.050). The lowest mean perception score was for (S10) "Concern that innovative financing may lead to corruption" (2.62 ± 0.069) and (S11) "Innovative infrastructure financing increases user costs" (2.90 ± 0.069), indicating relatively lower concern over negative consequences. Among students, the highest level of agreement was for (S6) (4.42
± 0.174), indicating strong support for sustainable infrastructure investment. Other highly rated statements included (S4) (4.09 ± 0.110) and (S1) (4.03 ± 0.166). On the other hand, students reported the lowest perception scores for (S8) "Impact on quality of public services" (3.00 ± 0.242) and (S10) "concern for corruption" (3.06 ± 0.208).

It can be inferred from the table that null hypothesis is rejected for only 2 statements i.e. the mean perception score across respondents based on their occupation status for these statements differ significantly. For the remaining 10 statements, p-values are greater than 0.05 thereby indicating no evidence against null hypothesis.

Table 4.8 Mean perception score of the respondents as per marital status

S. no.	Statements	Mean ± SEM		p- value
		Married	Unmarried	
S1	Innovative infrastructure financing methods are essential for the development of our community/region.	4.19 ± 0.052	4.00 ± 0.093	0.058
S2	The traditional methods are insufficient for financing infrastructure by state and central governments to improve the existing deteriorating condition.	3.86 ± 0.073	3.87 ± 0.099	0.970
S3	Private infrastructure financing stimulates local economies.	4.10 ± 0.055	3.97 ± 0.080	0.194
S4	I believe that innovative financing methods can effectively address the infrastructure needs of our community.	4.16 ± 0.048	4.03 ± 0.066	0.134
S5	Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community.	4.25 ± 0.046	4.13 ± 0.084	0.181
S6	Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community.	4.15 ± 0.059	4.33 ± 0.088	0.082
S7	Innovative financing methods can expedite the completion of infrastructure projects.	4.03 ± 0.056	3.81 ± 0.092	0.034*
S8	I believe that innovative infrastructure financing has a positive impact on the quality of public services.	2.94 ± 0.092	3.13 ± 0.135	0.252
S9	Innovative financing can lead to cost savings in infrastructure development.	3.77 ± 0.065	3.61 ± 0.107	0.187
S10	I am concerned that innovative infrastructure financing can lead to corruption.	2.57 ± 0.078	2.90 ± 0.119	0.022*
S11	Innovative infrastructure financing increases the direct costs incurred by users.	2.84 ± 0.079	3.26 ± 0.111	0.003*
S12	Efficient distribution of project finance risks enhances	3.75 ± 0.061	3.73 ± 0.089	0.897

	the adoption of private financing.			

* Represents significance level at 5%

The table presents the mean perception scores for the statements related to innovative infrastructure financing, comparing married and unmarried respondents. The data suggests some variations in perspectives between these two groups, with statistical significance observed among few statements.

Among married respondents, the highest mean score was for (S5) "Innovative financing methods are necessary to accelerate/boost infrastructure development" (4.25 ± 0.046), followed by (S1) "Innovative infrastructure financing methods are essential for the development of our community/region" (4.19 ± 0.052) and (S4) (4.16 ± 0.048). The lowest score among married individuals was for (S10) "Concern that innovative financing can lead to corruption" (2.57 ± 0.078), indicating lower concern for potential corruption. On the other hand, unmarried respondents showed the highest mean score for (S6) "Investing in sustainable infrastructure is crucial for long-term well-being" (4.33 ± 0.088), followed by (S1) (4.00 ± 0.093) and (S4) (4.03
± 0.066). Their lowest perceptions were for (S10) (2.90 ± 0.119) and (S11) "User cost increases due to innovation" (3.26 ± 0.111), both of these statements reflect more concern as compared to the married respondents.

It can be inferred from the table that null hypothesis is rejected for only 3 statements i.e. the mean perception score across respondents based on their marital status for these statements differ significantly. For the remaining 9 statements, p-values are greater than 0.05 which means their difference is not statistically significant.

The table 4.9 presented below shows the comparative analysis of perceptions of respondents towards innovative infrastructure financing and PPPs.

Table 4.9 Comparative Summary Across Demographic Variables

Demographic variables	**Significant findings**
Gender (Male/Female)	Both male and female respondents expressed strong agreement on the importance of innovative financing methods.
Age (18-25 years, 26-35 years, 36- 45 years, 46-60 years and above 60 years)	Overall, perception scores were consistently high across all age groups, with slightly greater optimism observed among the 46–60 years group, particularly for statements relating to the necessity and benefits of innovative financing whereas respondents perceive cost implications differently.
Educational qualification (12^{th}, UG, PG)	Respondents with higher education levels (postgraduates) showed more favorable perceptions towards innovative financing methods. Implying that education enhances awareness and trust in innovative and PPP-driven financing strategies.
Residential area (urban/rural)	Urban respondents consistently reporting higher mean perception scores for nearly all statements indicating that urban residents are more aware and open to the concept and benefits of infrastructure financing innovations.
Occupation (student/job)	Job holders reported slightly more confidence in innovative financing methods, whereas students expressed higher concern over corruption and cost burden.

Marital status (Married/unmarried)	Married individuals generally showed greater optimism regarding the effectiveness and necessity of innovative financing tools, while unmarried respondents expressed more skepticism.

4.3 Factor analysis

This section presents factor analysis of the study. Table 4.10 shows factors analysis -Principal Component Analysis and VARIMAX rotation was used to extract the factors and rotated component matrix was used for factor loadings and deciding on factors. The number of factors is three out of 12 statements, all the variables with loadings more than +0.3 were considered. The factors are as follows:

	Rotated Component Matrix[a]				
	Statements	**Component**			
		F1	**F2**	**F3**	**Communality**
	Need for financing innovation				
1	Innovative infrastructure financing methods are essential for the development of our community/region.	**0.594**	0.016	0.115	0.502
2	The traditional methods are insufficient for financing infrastructure by state and central governments to improve the existing deteriorating condition.	**0.510**	0.168	0.040	0.647
3	I believe that innovative financing methods can effectively address the infrastructure needs of our community.	**0.698**	0.084	0.082	0.658
4	Innovative financing methods are necessary to accelerate/ boost infrastructure development in our community.	**0.434**	0.044	0.066	0.503
	Innovation promotion				
5	Investing in sustainable infrastructure projects is crucial for the long-term well-being of our community.	0.455	**0.486**	0.118	0.613
6	Private infrastructure financing stimulates local economies.	0.054	**0.458**	0.061	0.574
7	Efficient distribution of project finance risks enhances the adoption of private financing.	0.033	**0.677**	0.187	0.474
	Costs & support for innovation				
8	Innovative financing methods can expedite the completion of infrastructure projects.	0.374	0.296	**0.388**	0.610
9	I believe that innovative infrastructure financing has a positive impact on the quality of public services.	0.119	0.046	**0.667**	0.575
10	Innovative financing can lead to cost savings in infrastructure development.	0.016	0.104	**0.387**	0.610

11	I am concerned that innovative infrastructure financing can lead to corruption.	0.026	0.086	**0.626**	0.653
12	Innovative infrastructure financing increases the direct costs incurred by users.	0.088	0.217	**0.341**	0.549
	Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
	a. Rotation converged in 14 iterations.				

Table 4.10: Factor analysis– Rotational component matrix and communality

Total Variance Explained

Total variance is explained in table 4.11. The sum of the variances of each individual primary component makes up the overall variance. The proportion of a principal component's variation to the total variance is known as the fraction of variance explained. The total variance is the result of adding the sample variances for each individual variable. Table is as follows:

Table 4.11: Total Variance Explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.192	26.596	26.596	3.192	26.596	26.596	2.374	19.780	19.780
2	1.637	13.642	40.239	1.637	13.642	40.239	1.928	16.067	35.847
3	1.125	9.373	49.611	1.125	9.373	49.611	1.652	13.764	49.611
4	1.007	8.392	58.004						
5	0.788	6.563	64.566						
6	0.741	6.172	70.738						
7	0.719	5.992	76.730						
8	0.655	5.457	82.187						
9	0.627	5.225	87.412						
10	0.577	4.810	92.222						
11	0.506	4.217	96.439						
12	0.427	3.561	100.000						

Extraction Method: Principal Component Analysis.

4.4 Validity and Reliability test

The validity and reliability of perception of people on innovative financing techniques have been acquired through content validity, face validity and reliability (Cronbach's Alpha). In additional, to improve the validity and reliability of this instrument, factor analysis was conducted to determine the construct validity of each statement that has been assembled. Then, the reliability of each concept is determined to confirm the instrument is consistent and only measures what is to be measured.

The purpose of face validity is to check whether the questionnaire items are easily understood in the same way by any respondent. Before beginning the procedures to establish or extract factors, several tests need to be done to determine the suitability of the sample data for exploratory factor analysis. Among the tests were the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of sphericity. Kaiser-Meyer-Olkin (KMO) is conducted to measure the suitability of sample data, while Bartlett's Test of Sphericity is executed prior to extraction or factor formation to ensure the suitability of data for exploratory factor analysis. In this study, the value of Kaiser-Meyer-Olkin (KMO) is 0.775 and Bartlett's test of Sphericity was also significant i.e. 0.726.

The value of Cronbach's alpha (reliability coefficient), Kaiser-Mayor-Olkin (KMO), the measure of sampling adequacy and chi-square value of Bartlett's test of Sphericity are given in Table 4.12. The value of Cronbach's alpha is good as it is greater than 0.7. The value of KMO suggests that degree of common variance is meritorious and the values of Bartlett's test are indicative that sample inter-correlation matrix did not come from a population in which inter-correlation matrix is an identity matrix.

Table 4.12: Reliability Co-efficient, KMO and Bartlett test output for all Factors

Reliability coefficient – Cronbach's alpha	KMO	Bartlett's Test
0.726	0.775	Approx. Chi-Square- 606.596 Degree of freedom- 66 Significance-.000

5. RESULTS & DISCUSSION

The findings of the survey highlight a gap in public's knowledge and awareness regarding the current practices related to innovative financing of infrastructure. According to the survey results, educated people residing in the urban areas of the sample population perceived current communication practices related to infrastructure development and financing to be clear. And not many respondents of the sample population were informed about different financing methods. Urban residents with higher education levels are more aware and receptive to the concept and benefits of infrastructure financing innovations, while rural respondents may lack exposure or trust in such mechanisms. Implying that education enhances awareness and trust in innovative and PPP-driven financing strategies.

Across all age groups, perceptions were largely favorable towards innovative infrastructure financing approaches, however concerns regarding corruption and cost to end users emerged as points of concern. The older and younger respondents perceive cost implications differently. Both male and female respondents expressed strong agreement on the importance of innovative financing methods. However, married individuals generally showed greater optimism regarding the effectiveness and necessity of innovative financing tools, while unmarried respondents expressed more skepticism. The findings also affirm the importance of integrating Public-Private Partnerships (PPPs) as a reliable and scalable mechanism, but their acceptance varies depending on awareness, perceived equity and trust. These findings highlight the necessity of inclusive policy designs that take demographic sensitivities into account, transparent financing structures, and targeted awareness campaigns.

The findings of the study also show the factors that affect the public perception towards innovative infrastructure financing in different ways: (i) the need for financing innovation (ii) the benefits and costs associated with innovative infrastructure financing (iii) the promotion of innovative infrastructure financing for sustainable development. These findings could help the organizations engaged in innovative

infrastructure financing in refining their public education and marketing campaigns to encourage public support for innovative financing.

The study also analysed the role of Public-Private Partnerships (PPPs) in sustainable infrastructure development. By examining the effectiveness of PPPs and challenges in realizing its benefits, the study aligns with the global goal for sustainable development since it evaluates how PPPs might accelerate progress towards attaining the UN's Sustainable Development Goals (SDGs). PPPs provide a viable strategy for financing and managing infrastructure, leveraging private sector investment, expertise, and innovation. But political instability, difficult regulatory regimes and public resistance are some of the issues that hinder implementation of PPPs. Stakeholder participation, clear policies, and a dedication to sustainability principles are required to address these issues. A potential approach could be enhancing strategies to facilitate learning for the public about innovative financing in infrastructure projects and citizen involvement strategies to get the public to buy into innovative financing. Therefore, the study offers useful insights for the agencies and stakeholders involved in innovative infrastructure financing to improve infrastructure resilience, promote green growth, and advance global sustainable development goals.

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