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A 3P MODEL: CONSTRUCTION OF GENERAL RESIDENTIAL ACCOMMODATIONS IN DELHI

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ABSTRACT

The Public-Private Partnerships (3Ps) is a proven model in many countries and the past its implementation in many domains like transportation, power, water and sanitary, education and for an affordable housing project. With the application of 3P in the General pool, residential accommodation houses construction for the Government employees based on rationing has created a gap in which all the parties' cooperation helps in attain the desired goal and support in overcoming the problems. The private sector contributes through their quick access to funds, investment potential, efficiency, innovativeness, and skills, while the government organisations are responsible for accessing the risks and meeting the responsibilities. This research focuses the issues on implementing the 3P model for General Pool residential building with a model evaluation study. The study results indicate the factors responsible for successful implementation and peril perceptions of different stakeholders. This model of 3P's is suitable for evaluation of policy framework with the Government of India.

Key words: 3Ps, general pool residential accommodation, critical success, critical restricting factors.

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1. INTRODUCTION

Indian economy is grappling the development mantra and trying to establish its state of the art approaches for urban growth in a phased manner in the name of smart cities. The challenges are numerous, the critical being the housing sector. Several external and internal forces have a dramatical role in the development of the housing provision policy, and that affects its promulgation in a legislative and regulatory environment. The reason being Public-Private-Partnership model of regulations that influence the grant of habitable land, procedures for land acquisition and land prices for housing are controlled by the Government of India (GoI) as per the norms. The 3P model is a collaborative effort that maintains a cordial relationship between public and private stakeholders through partnership. The 3Ps models are useful tools for a government organisation as they bring the technical and manufacturing competences from the private institution and bind it with good governance to create a successful model.

The authorities made the central government employee housing provision and based on the criteria for allotment structured around General Pool Residential Housing (GPRH) bye-laws *www.gpra.nic.in* [1]. The central government employees and the employees working under the Government of the National Capital Territory of Delhi, working in the government offices, are eligible for allotment of general pool residence. They are entitled to an allotment of accommodation from the General Pool to the regulated pool *www.estates.nic.in* [2]. The entitlement for a house is determined by an employee's basic pay drawn on the first day of January month during the current calendar year. The Central Public Works Department (CPWD) is a nodal agency of Government of India is entrusted with responsibility for the construction of GPRA in different parts of the state capital. Although in the Public-Private-Partnership (3P) model takes the construction of housing and office spaces since pre-colonial period, has many multifaceted constraints. The 3P model lags as they fail to accomplish the number of dwelling units that are essentially required for the employees. The 3P's model in GPRA construction aims with the objective of that all the three parties plan to overcome the problems that would emerge by mutual arbitration. The private sector's ability to contribute to the project through their quick access to funds, investment potential, efficiency, innovativeness and skills, while the government organisations are shoulders the risks and meet the responsibilities. The issues addressed by much research literature address the impediment and influential factors in the 3P's model.

Before 1990 in India historical models of 3Ps were experimented, with an attempt to construct Enron's Dabhol power project. This model failed that caused significant delays in the cost hike. Other attempts were made in 2002, with mainly in designing contracts and procuring private sector partners. With growth, in the infrastructural demand 3Ps are localized as a line department in the state and central public work department Kim et al., (2011) [3]. The 3P model in India is designed to harness private sector investment, attain higher operational efficiencies in the implementation of public residential building construction projects and endow the required services. The private sector supplies the required technical and managerial expertise with their capital resources. In the perspective plan of GPRA for the year 2003-2004, 19,322 dwelling units were supposed to be constructed in Delhi, and 15,000 dwelling units in other cities *www.estates.nic.in* [2]. However, only 1,000 units were constructed for incumbency. To meet these challenges, Mr. Narendra Modi the Prime Minister of India has addressed an amicable solution to add another dimension need for reviving 3P model to a 4P model, i.e. involvement of the people towards growth and development. Mr. Narendra Modi during his incumbency as Gujarat Chief Minister had added another dimension of 'P' (i.e. people) including people's participation in any development project and the 4P concept was successfully implemented in the Vadodara Halot Toll Road project. In 2017 the GoI has started an initiative under digital India and a web portal is created to address the issues, regulations, standardization, frameworks, guidelines to the parties and with circulars and orders, as a transparent mechanism to encourage 3P model to newer heights (https://www.pppinindia.gov.in). This study aims at linking the 3P's model and identifies the promoting the factors, and we argue that why the 4P model cannot be implemented by restructuring the GoI policies and frameworks to meet the growing demand characteristics for residential accommodation. In the next para, the demand characteristics are addressed.

The pace of construction activities in Delhi progresses at rate 1000 dwelling units per year, at this proportion another 20 years may be needed to meet the total shortage of 70 percent demand, i.e. 19,322 houses are required (Table 1). The GoI is blamed for allocating a low budget for GPRA construction. The volume of fund allocated may be insufficient to fill the gap for the next 50 years. According to Directorate of Estates, Ministry of Urban

Development, the total demand for residential units in the year 2000 was 1, 12, 904. However, the availability was 64,335 that satisfy only 56% of the total demand *www.estates.nic.in* [2]. To reduce the demand and supply gap, the Prioritization Committee of India in the year 1984 decided a satisfaction level of 70% and 50%, for Delhi and other cities respectively.

Table 1 Details of requirement of additional dwelling units under GPRA

Type	Total demand for quarters	Availability of quarters	Demand target for 70% fulfilment	Shortage of 70% fulfilment
II (1BHK*)	49390	25694	34573	8879
III (2BHK)	23509	11758	16456	4698
IV (3BHK)	12149	6941	8504	1563
IV Spl.(2BHK)	2996	788	2097	1309
D-II (4BHK)	4436	1472	3105	1633
D-I (4BHK+1)	1996	839	1397	558
C-II (5 BHK)	1286	457	900	443
C-I (5BHK+1)	409	145	286	141
VII (6BHK)	196	86	137	51
VIII (7BHK)	211	101	48	47
TOTAL	96578	48281	67503	19322

*BHK: Bedroom Hall Kitchen

Source- Perspective Plan of General Pool Residential Accommodation 2002-2003, CPWD

By investigating deep into the available secondary data sources, it implies a wide gap between the demand and supply of houses. In the last three decades, about 66,465 houses were constructed in Delhi and 33,345 units in other major cities *www.estates.nic.in* [2]. The delay in procurement and a slow-paced construction have resulted in meeting the demand for an abode to the Government employees. Thus, there is awaited list of employees requesting the need for various types of accommodation. The shortages would pile-up with days to come and is a function of fulfilment which is commonly known as a satisfied level by the allotment sanctioning authorities.

The satisfaction level is defined as the ratio of the number of quarters available in a city to the number of government employees seeking residence. This satisfaction level varies from city to city and quarters type, due to the mobility of senior officers through transfers and tenure postings. The existing status of satisfaction level for different types of quarters varies from 26% to 82% (See Table 1). It is observed that the overall satisfaction level in Delhi city is low and hence, the numbers of quarters required are high, suggesting that CPWD needs to give immediate attention to the rapid construction of quarters in Delhi. In Delhi the monthly rent per sq. ft varies from Rs.12 per ft^2 to Rs. 61 per ft^2 (See Table 2). The Government employees must pay heavy rent for staying outside, and it is a burden to Government exchequer. Thus, employees seek GPRA houses as per their pay scale, and long-awaited queues cause an impact on their performance in the Government office. The additional cost of daily travelling and expensive arrangements for the houses would cost more than the previously furnished quarters.

Table 2 Rental values in Delhi-NCR of the year 2013

Locality name	Mean rent/month/ft^2	Locality name	Mean rent/month/ ft^2
Anand Niketan	61	Gulmohar Park	40
Chattarpur	30	Hauz Khas	37
Dwarka	13	Kalkaji Extn.	24
Dwarka Sector- 11	15	Mayur Vihar Ph-1	22
Dwarka Sector- 13	12	Mayur Vihar Ph-3	19
Dwarka Sector- 17	16	Panchshila Park	38
Dwarka Sector- 18	13	Paschim Vihar	17
Dwarka Sector- 18A	15	Patparganj	20
Dwarka Sector- 18B	13	Pitampura	20
Dwarka Sector- 19	14	Rohini sector-13	19
Dwarka Sector- 2	13	Rohini sector-14	20
Dwarka Sector- 22	13	Rohini sector-9	19
Dwarka Sector- 23	13	Safdarjung Enclave	36
Dwarka Sector- 3	13	Saket	29
Dwarka Sector- 4	13	Sarita Vihar	20
Dwarka Sector- 5	12	Vasant Kunj	29
Dwarka Sector- 6	13	Vasant Kunj Sector- B	26
Dwarka Sector- 7	13	Vasant Kunj Sector- C	30
Dwarka Sector- 9	14	Vasant Kunj- Sector- D	33
Greater Kailash-1	42	Vasant Vihar	58
Greater Kailash-2	41	Vasundhara Enclave	19

Source: Magicbricks, 2013 (www.magicbrick.com)

As a solution to the problem of expensive rents, the government must plan for utilizing the vertical space by constructing multi-storey flats in place of existing one/two storied quarters. For constructing these quarters, a substantial initial capital is required. The budget allocated by GoI for GPRA construction is insufficient. The burden of constructing GPRA, an alternate source of funding is required.

Apart from resolving the issue of high rents, the construction of multi-storied flats is to be replaced by the old quarters that have surpassed their lifespan. It is not feasible for the government sector to take this burden alone. Reasonably public-private partnership (3P) in this endeavour ensures mutually benefited results as the win-win situation. The 3P's model is implemented even in the construction of educational institution and for affordable housing project Gopalan and Venkataraman, 2015 [4]. The purposes of this research are (i) access the current supply shortfalls of dwelling, the need for creating innovative delivery models for central government employee's general purpose residential housing problems (ii) the 3P model for the GPR House project need to be investigated empirically. The research method proposes a 3P model and argues why the 4P model cannot be implemented with a survey data on demand that general pool houses that are critical success factor and restricting factors the following objectives.

The research objectives are: (a) assess stakeholder's perceptions on whether 3Ps are an appropriate and effective mechanism for the delivery of GPRA for the central government employees, (b) to identify the restricting factors for the participation of private sector in 3Ps for the construction of GPRA, (c) to identify the critical success factors (CSF)and critical restricting factors (CRF) for the implementation of 3P approach for the delivery of GPRA.

The significance of this research helps the decision makers in both public and private sectors in designing a 3P policy framework if possible 4P model. It also helps in the formulation of efficient delivery models to meet the housing needs of the central government employees and focus on the restricting factors. The analysis is considered for only dilapidated buildings belonging to the GOI and CPWD that are lying unoccupied due to the paucity of funds for refurbishing.

2. LITERATURE REVIEW

Under this section a sensitizing the different model of 3P available in the literature mountain and narrowing only on the definitions, global perspective and Indian scenario in the implementation of 3P as applicable to the housing sector.

2.1. Public-Private Partnership (3P)

There are varied definitions of public-private partnerships; 3Ps have been defined in many ways by several international organisations, public agencies, and academicians Bettignies and Ross, 2004 [5]. The Canadian Council of public-private partnerships defines 3P as it is a cooperative venture across public and private sectors, which is construed with expert's field partner who meets the predefined public demands are meet in an appropriate resource allocation, shared risks and getting rewards (www.pppcouncil.ca). The Ireland department of environment and local government defines 3P as 'A partnership between the public sector and the private sector for delivering a project or a service traditionally provided by the public sector. The 3Ps model in different forms is the heart and soul a project for better value for money that aims the objective to be achieved through exploiting the competencies from the private sector and the evaluation of risk, and capabilities to manage Panayotou,1998 [6]. While the housing Her Majesty's Treasury of The United Kingdom (UK) defines 3P as 'a way to bring public and private sectors together in long-term partnership for mutual benefits' Tang et al., 2010 [7].

The Indian Department of Economic Affairs (DEA) pronounces a 3Ps model as 'an arrangement with the government along with a legal entity. Even it may be government-owned entities, for the provision of public assets and/ or related services for public benefit, through investments being made by and/or management undertaken by the private sector entity for a specified time period, where there is a substantial risk sharing with the private sector and the private sector receives performance-linked outflows of funds against benchmarked practices that are predetermined and measurable performance standards' GoI [8]. A Public-Private Partnership it is a long-term contractual arrangement between the public and private sectors with a mutual benefit. In which (a) the private sector provides management and operating services, and (b) private finance that might face risk Garvin and Bosso, 2008 [9]. As viewed by many governments all around the globe a 3P model is a solution to the shortfall in infrastructure funding, Gribbin, 2006; Zouggari, 2003 [10, 11].

In conclusion, the critical element represented in the definitions are cooperation between public and private entities, sharing of responsibilities equally, decision-making, power and authority, sharing of risks and rewards, joint investment, legislative and regulatory compliance, and innovation.

2.2. A Global Perspective on 3P Models

The 3P model approach evolved in the twentieth century; it became recognized globally as an efficient way of delivering public infrastructure and services following the introduction of the Private Finance Initiative (PFI) during the nineties in the United Kingdom. Under the

sponsorship of PFI in 1992, the government began to involve private sectors to manage building and operation of investment previously taken care by the public-sector Terry,1996 [12]. Close to one hundred PFI projects initiated in the UK per year. The growing use of the PFI has inspired governments globally to adopt 3P arrangements, as governments recognized their value. The Australian government has used 3P to deliver several social infrastructure projects. Ireland has used 3Ps for transport infrastructure. In the Netherlands and South Africa, social housing and urban regeneration programmes have been delivered through 3P arrangements. Japan has roughly twenty new 3P projects in the pipeline. In Canada, some new infrastructure projects are designed, built, and operated by private sector. The United States is a pioneer in contracting out and has started experimenting with other forms of 3P, and emerging democracies from central Europe are following suit Deloitte, 2006 [13].

2.3. Public-Private Partnerships in India

In developing countries, 3P model plays a vital role in infrastructure development. In the 3P maturity model Figure 1, it is seen that India is rated low in its implementation and development of 3P model as a practical project delivery mechanism. India has witnessed several successful examples of 3P model implementation in transportation, health, sanitation, and many other sectors apart from the housing sector.

Figure 1 Market maturity curve in 3P model, (Source; Deloitte, 2006) [13]

With this backdrop of the facts in the year 2013 of the Department of Economic Affairs, GOI, there are 758 projects under the bracket of 3P projects the contracts are awarded, to more than 70 percentage projects work are being executed. Many of these projects have entered finishing phase, except a few that are at the stage of project approval rom multiple agencies. The total project cost estimated in the above cited is Rs. 3, 83,332.06 Crores. Many of these projects are in the pipeline in last five-seven years Panayotou,1998 [6]. Both globally and locally the accepted 3P models are discussed next.

2.4. Different Models of Public-Private Partnership

There are various 3P models for the implementation of a 3P project. The most common 3P models are explained below.

2.4.1. Design-Build (DB): A 3P model is one where the government enters into a contract with the private partner to design and build the facility as per the government requirements, on completion the government looks after the operations and maintenance of the project.

2.4.1. Design Build Maintain: The model is similar to Design-Build (DB) model except that the maintenance is done by the private agency while the responsibility of operations is with the public sector.

2.4.2. Design Build Operate: Once the private player designs and builds the facility, the title of the facility is transferred to the public sector with an agreement the private sector operates the facility for a specified period.

2.4.3. Design Build Operate Maintain (DBOM): The designing, building as well as operations and maintenance of the facility lie with the private partner for a specified period (concession period) beyond that the operation is transferred to the public sector.

2.4.4. Build Own Operate Transfer (BOOT): The private partner finances, designs, builds and operates the facility for a period (concession period) after that the ownership is transferred to the public sector.

2.4.5. Build Own Operate (BOO): The private partner finance, designs, build, operates and maintains the facility as well as retains the ownership of the facility.

2.4.6. Service Contracts (SC): In this model, the government makes a contract with the private player to provide services that the government was previously delivered.

2.4.7. Management Contracts (MC): The contract is like a service contract except that in a management contract, the private player operates and maintains the facility as well.

2.4.8. Lease: A leasehold interest is granted to the private player to the facility with a clause of terms and conditions, wherein the private agency operates, maintains the facilities.

2.4.9. Concession: A long-term contract period for operation and maintenance offered to the private parties. The ownership lies with the public sector.

2.4.10. Divestiture: The facilities are transferred to the private management by the Govt. agency either in part or full, subject to certain conditions relating to the sale of the asset Deloitte, 2006 [13].

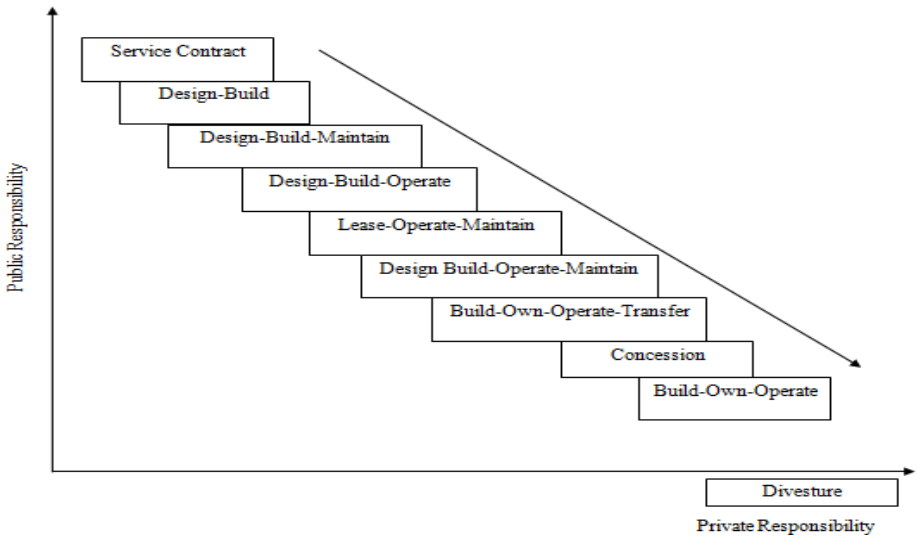

Figure 2 The public-private partnership continuum (Source: Deloitte, 2006) [13]

Determining that model must be adopted depends on to what extent it is decided to share responsibilities between the public and private sector. At one extreme, its service contracts

and at the other extreme, it is Build Own Operate (BOO) in this case the private party is responsible for the delivery of public services. The continuum runs from a service contract having minimum risk transfer, to BOO partnerships having maximum risk transfer. As the slope moves downward, the risk gets transferred to the private player (Figure 2).

For this study, the model of Design Build and Lease Operate Maintain are considered apporipate for formulating the 3P model for GPRA construction after discussing with the multiple agents of 3P's projects and while the framework is formulated.

2.5. Public-Private Partnerships in Housing

The 3Ps model in the housing sector is still at a preliminary phase in developing countries. The extent to that they are implemented depends on the typical political environment and economic willingness of the administration Sengupta, 2006 [14]. The emergence of 3P model, as it is embedded in a favourable environment. The government must provide a conducive environment that would foster 3P implementation for housing provision. The primary goal of providing the pleasant environment is to improve the efficiency of the housing sector by the public sector by eliminating constraints on both the supply and demand Sobuza, 2011 [15]. The involvement of private sector in affordable and low-income housing projects causes an increase the supply of low-income housing Susilawati and Armitage, 2004 [16]. A literature study reveals that the extent to that 3P's is implemented in the housing sector in developing countries are relatively limited compared to other areas Sobuza, 2011 [15]. It is well-documented globally that both the private and public sectors are engaging in partnerships for infrastructure development. However, in resorting to 3P model approach that meets the needs of the increasing population, the leadership style and the government machineries are facing the challenges globally.

Managing a public-private partnership in housing and infrastructure projects is difficult due to the incorporated nature of partners engaged in the partnership. In the implementation 3P model and the process of execution of the project, the parties' under-value the miscellany with their co-partners lacks. Usually 50-50 benefit sharing reduces risks and does not give scope for political dynamics. Transparency in partnerships is paramount to reduce potential conflicts that usually arises in the partnerships Susilawati and Armitage, 2004; Hayllar, 2010 [16,17]. The goals of the private sector usually oppose those of the public sector; the former focuses on monetary gains while the latter concentrates on the protection of public interest. Therefore, this difference causes friction and mistrust between the partners Boxmeer and Beckhoven, 2005; Ibem, 2011 [18,19]. Based on the sufficient revenue streams from the project to attract private sector participation in the housing sector Sobuza, 2011 [15]. In the light of all these challenges, it is essential to meticulously formulate 3P models that would help in the successful delivery of projects.

With more than half of the world's population living in urban areas, the local governments feel the pressure to adopt new partnership financing mechanisms and prudent urban planning strategies. However, it is expected that it is hard for many localities that lack essential negotiation, financing, contracting skills to manage highly complex urban projects such as 3Ps model for the housing sector. In few Indian states due to the fundamental laws and regulations in the local governments it is difficult to conduct business with the private sector, and try to bring change in the infrastructure is challenging Zhang, 2005 [20].

In the present context, ecumenical world having financial crisis and is changing the financial landscapes on urban 3Ps projects. On the one hand, tighter spending reviews have led many governments to adopt 3P models to try and ease the immediate effect of growing

deficits. On the contrary, strict credit conditions have made banks and investors increasingly cautious about commencing additional projects that is making it still harder to borrow money from banks. The present scenario many governments are struggling to secure revenue support streams for urban sector development through 3P model and some are considered as high risks projects. Finding an innovative way to attract private finance to housing, while ensuring that the financial limitations put on projects do not erode governments leading position in public infrastructure assets, is a challenge in moving forward Agyemang, 201; Zhang, 2005[20, 21]. The political instability is the barrier to the implementation of 3Ps modeled projects for the housing sector. Political instability includes the consequences and the likelihood of changes in government and the new government withdrawing support to a 3P project Jamali, 2004 [22].

3. METHODOLOGY

This section discusses the research methodology adopted to conduct this study. It discusses the research design, population, sampling method employed for the questionnaire survey for the 3P housing about the partnership feasibility through Design-Build (DB) and Build Own Operate (BOO). This helps to identify the factors and to formulate the policy recommendation to 3P models implemented for the construction of GPRA.

3.1. Research Design

Given that the present research was the first significant exercise to examine the suitability of 3P model approach for the construction of GPRA, it was decided that the mixed method is adapted to collect data. Quantitative data collected from questionnaire survey were complemented with the qualitative details obtained from case study Greene, 2008 [23]. Past studies on housing 3P model is preferred the case study approach as it has helped in formulating the best practices by integrating lessons from the existing practices Abdul-Aziz and Kassim, 2011; Payne, 2000 [24, 25].

The following objectives were stated

RO1 To assess the stakeholder's perceptions on whether 3Ps is an appropriate and efficient mechanism for the delivery of GPRA for central government employees.

RO2 To identify the critical factors that restrict the participation of private sector through 3Ps for the construction of GPRA.

RO3 To determinants of critical success factors for the implementation of the 3P approach for the successful delivery of GPRA.

Review of published literature on project management and construction management reveals seven significant factors that restricted the implementation of 3P in the housing sector. A questionnaire was developed using the earlier published three research papers that are validated to determine the suitability of 3P approach for the construction of GPRA.

3.2. Population and Sampling

The population for this questionnaire survey consisted of four distinctive groups; central government employees (engineers), consultants, contractors and private builders. They are the stakeholders in the construction, delivery and management of existing housing and GPRA projects. A sample was chosen from these four groups for the questionnaire survey.

The sampling method used for the questionnaire survey was non-probability judgments sampling. Non-probability judgment sampling is a sampling procedure in that the probabilities of every unit are fair, and the population is unknown in which the sampling is

either purposive or deliberate selection of units of the universe for constituting a sample that represents the universe Payne, 2000 [25].

This type of sampling guarantee in meeting specific objectives, but the limitation of this type of sampling is that bias might get introduced that can make the sample unrepresentative Sobuza, 2011 [15]. In non-probability sampling, the degree to that the sample differs from the population remains unknown.

The sample size attempts in achieving a rational sample that the researcher could have access. A list of central government officers holding the designation of director and above, contractors, consultants and private developers directly involved in the industry, out of that one hundred respondents were selected by the researcher see (Table 3). For this survey, the respondent's selection is done by their roles and responsibilities in the housing sector. The samples were carefully selected to include knowledgeable individuals having involved in the industry.

Table 3 Sample description

Stakeholder's Description	**Number**
Central Govt. Employees	30
Consultant	30
Contractor	30
Private Builder	10
Total	100

3.3. Data Collection

The questionnaire first developed consisted of 11 closed-ended questions. A pilot study is conducted using 30 central public works department employees. The motive of the pilot study is to check the completeness of the questionnaire in capturing the relevant information. All the respondents did not agree upon the completeness of the questionnaire, as it is not sufficient to capture the required information. Therefore, modifications are made in the questionnaire and final set of questions were used for the survey.

The modified questionnaire consisted of fourteen questions, of that twelve were close-ended, the respondents were asked to pick the options for the closed-ended questions, and two questions are based on Likert scale. For Likert scale, questions respondents were asked to rank the factors based on the importance and severity of the factors. One hundred questionnaires distributed to the primary stakeholders of whom 30 questionnaires were distributed to central government employees, 30 questionnaires to consultants, 30 questionnaires to contractors, and ten questionnaires to private builders. The researcher personally distributed the questionnaire and the respondents were given three weeks' time to resubmit. Follow up calls were made three weeks after distribution of the questionnaire. 63% percent returned after filling the questionnaires (Table 4). Literature survey shows that seven factors that contributes to the successful implementation of the project identified: (i) Innovative 3P model, (ii) Incentivizing the private sector, (iii) Stable legislative and regulatory environment, (iv) Government support, (v) Quick decision-making, (vi) Well prepared policy, (vii) Contract documents.

Table 4 Questionnaire distribution and response

Stakeholder's description	Blank questionnaire	Filled questionnaires
Central Govt. employees	30	28
Consultant	30	12
Contractor	30	19
Private builder	10	04
Total	100	63

4. RESULTS AND DISCUSSION

In this section, the data collected through the questionnaire survey was analysed, and the result is discussed. Questionnaire presentation and data analysis, questionnaire captured the information of the professional background of the respondents, knowledge and general experience in 3P projects. Out of the total respondents, it is found that 74% of the sample had experience of over 15 years in construction industry. The respondents who worked with both public and private sectors were found to be 68%. The survey results showed that the three most commonly 3P types known to people were (1) Build Own Operate Transfer (2) Design Built Operate maintain (3) Lease. The responses for the commonly used 3P models in infrastructure projects (Figures 3a, 3b). The percentage of respondents with experience in 3P model projects was found to be 93%, and most of them had to experience in transportation 3P projects.

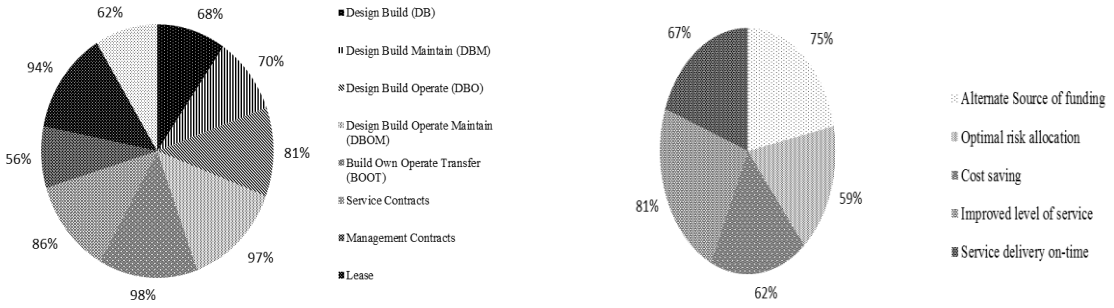

Figure 3 (a) Commonly known 3P type (b) benefits of implementing 3P approach

It is found that 76.2% of the respondents believed that private sectors are involved in the 3Ps in the housing sector, while 88.9% of the respondents believed that 3P is an appropriate mechanism for the delivery of general pool GPRA for the central government employees. As per the response (Figure 3), the significant benefits of implementing a 3P approach for the construction of GPRA are (1) improved the level of services, (2) alternate source of funding, and (3) service delivery on time.

When the questionnaire related to the critical success and restricting factors for 3P model implementation were asked the respondent identified seven factors that restrict the private sector from entering a partnership with the public sector in executing infrastructure projects. The factors that were given top priorities are (i) Business model (ii) Differing Goals (iii) Access to finance (iv) Capacity Constraints (v) Government Interference (vi) Volatility of market conditions (vii) Uncertain regulatory environment. Using the ordinal scale on a Likert metrics with 01(unimportant) to 05(extremely important) to calculate the relative importance of the factors.

The concept of Relative Importance Index (RII) in the context of the construction industry is used in this research to determine the relative importance of the factors that restrict the

private sector participation Agrawal, 2010; Sambasivan and Soon, 2007 [26, 27]. The five-point Likert scale was transformed to RII for each of the seven factors, and RII was calculated (Eq. 1).

$$\mathrm{RII} = \frac{\Sigma \mathrm{P}}{\mathrm{FxN}} \qquad (1)$$

In the above equation 'P' is the point ticked by the respondents for every factor five being the highest and one being the lowest. The 'F' is the highest point, i.e. five (extremely important), and N is the total number of respondents. The range for RII can vary between zero and one. The factor that is/was important will have higher RII. The RII gives a perception of different factors as the respondents perceived. The list of rearranged ranked factors that restrict private sector participation in 3P model for the construction of GPRA based on relative importance is listed (Table 5).

Table 5 Overall RII and Ranked factors as restricting private sector participation

Factors	Percentage of respondent scoring					RII	Ranking
	1	2	3	4	5		
Business model	0.0	0.0	9.52	55.6	34.9	.86	1
Differing goal	0.0	7.9	22.2	41.3	28.6	.78	4
Access to finance	1.5	7.9	28.5	36.5	25.4	.75	5
Capacity constraints	3.1	6.3	46.0	23.8	20.6	.71	7
Government interference	3.1	6.3	14.2	42.9	33.3	.79	2
Market volatility	0.0	11.1	34.9	33.3	20.6	.73	6
Regulatory Uncertainty	1.6	9.5	19.0	31.7	38.0	.79	3

The result shows that three most important factors emerged from the survey are a business model, government interference and uncertain regulatory environment.

Table 6 Overall RII and Ranked CSF for private sector participation

Factors	Respondent scoring (%)					RII	Ranked
	1	2	3	4	5		
Aligned goals	0.0	0.0	12.7	49.2	38.0	.85	5
Innovative 3P model	1.6	1.6	12.6	31.7	52.3	.86	4
Incentivizing the private sector	0.0	4.8	22.2	39.7	33.3	.80	7
Stable legislative and regulatory environment	0.0	0.0	17.4	41.2	41.2	.85	6
Government support	0.0	0.0	3.2	38.1	58.7	.91	2
Quick decision-making	0.0	1.6	12.7	33.3	52.3	.87	3
Prepared policy, contract documents	0.0	0.0	1.5	26.9	71.4	.94	1

The most critical success factors as perceived by the four groups of respondents were: well-prepared policy and contract documents, government support and quick decision making (Table 6). The overall ranking of the seven critical success factors as indicated by the ordered ranking of the three most critical restricting and CSFs for the implementation of the 3P approach for a GPRA construction. Table 7

Table 7 Ordered ranking of critical success and restricting factors

Success Factors	RII	Ranked	Restricting Factors	RII	Ranked
Prepared policy, contract documents	.94	1	Business model	.86	1
Government support	.91	2	Government interference	.79	2
Quick decision-making	.87	3	Regulatory Uncertainty	.79	3

In this research, the attempt was made to rank the critical success and restricting factors through RII method. Since the data collected by the questionnaire was based on Likert scale, it can be considered as interval data. Correlation analysis builds the relationship between the factors that have interval data. Therefore, a correlation analysis was done to study the empirical relationships between the different critical success factors (Table 8). It was found that the factors aligned goals and innovative 3P model were moderately significant at 0.01 levels. It ascertains that an innovative 3P model and aligned goals are two facets of a single coin. In an innovative 3P model, the goals of both the sectors are aligned. Each party works in the direction of achieving the set goals. At the same time, a negative correlation was observed between the two factors, incentivizing the private sector and government support. The support from the government is given to the private sector in the form establishing a proper framework for reference and by not introducing any changes into the initially set policy framework. On the other hand, incentivization of private sector involvement by creating an innovative 3P model so that both the parties' goals are aligned.

Table 8 Critical success factors correlation with implementation of 3P approach

Critical Success Factors	AG	I3PM	IPS	SLRE	GS	QDM
Aligned goals (AG)	1					
Innovative 3P model (I3PM)	.382**	1				
Incentivizing the private sector(IPS)	.293*	.286*	1			
Stable Legislative & Regulatory Environment(SLRE)	.268*	.181	.224	1		
Government support (GS)	-.038	.104	-.171	-.169	1	
Quick Decision Making (QDM)	.161	.113	.104	.187	.158	1
WPP&CD	.137	.224	.136	.112	.206	.209

* $p \leq 0.05$, ** $p \leq 0.01$

Based on the analysis of the data collected, it emerged that the problem of shortage of GPRA cannot be addressed by the public sector alone; there is a need for private sector participation. The combined execution capabilities of the public sector and private sector have exterminated the problem of GPRA shortage. The traditional procurement model typically requires significant public-sector investment. Alignment of goals with an innovative 3P model with the supporting structure of the model to create a win-win situation with all stakeholders.

The guiding principle for whether the risk associated with the project is borne by the public sector/private sector need to be decided on the based-on ability to manage the risk. Correspondingly, ability to take a higher amount of risk needs more rewarding. It is critical that this assignment of risks must be balanced appropriately so that all parties involved are benefited. The private sector invests with its upfront capital, with a hope of expecting a return

on investment. A project must be made financially viable either by reducing the share of the cost borne by the private sector or by reducing the risk to that the latter is exposed.

From the results of the survey, it was found that the unsupportive legislative and regulatory environment is the primary obstructions to the participation of private sector in 3P projects. An emphasis on establishing a well-structured legislative and regulatory framework is needed that usher more stability and hence avoids disruption during 3P project implementation. An unsettled political environment complicates the pursuit of goals and objective. The change in government often comes with a change in the direction of policy Sobuza, 2011 [15]. The failure factor in many 3P projects had been the absence of a robust and transparent agreement. Therefore, well-prepared policy and documents are the most crucial factor for 3P's model success. The public authorities must create the overall master plan of the proposed development considering all aspects of the economic and social benefits of projects. For the successful project venturing instead of documentation, an ambience to foster 3Ps model would be more critical.

According to the data collected by the Confederation of Indian Industry (CII) on the overall approvals required in most of the housing projects, 51 approvals are required to obtain a plan sanction. It takes more than three years for the developer to get the sanction that is a very time-consuming process and hence discourages the private sector from participation. It is essential to have a single window for the approval of plans and projects to speed up the process to go for 3P model. The public authorities must create a separate independent body to regulate the project. The public authorities must put in place a precise and stable frame of reference that is sufficiently transparent for the private partner. The critical success factors to 3P model are without the unpredictable taxation, and unreasonable interference from the governing authorities adds to the stability in the government.

5. CONCLUSIONS

Based on the analysis of the various perspectives collected from stakeholders, it was understood that the worldwide GPRA shortage calls for government intervention to create awareness and urgency in this regard. However, the scale of investment is enormous. So, there is a need for private sector participation in the construction of GPRA. A well-designed structure on 3P model aims to present excellent prospects to capitalize and maximize on the core spheres of respective players. Hence, the first objective of the research is met.

The three most critical success and restricting factors were found for the implementation of the 3P approach for GPRA construction are (ii) *Success Factors*-Prepared policy, contract documents Government support, Quick decision-making (i) *Restricting Factors*-Business model, Government interference, Regulatory Uncertainty.

For the successful implementation of 3P model in the GPRA construction, it is essential to formulate a 3P model that creates a win-win situation for both the parties involved. Proper risk allocation and auditing; the party bearing greater risk claim a greater rewards. Reasonable profit-making opportunity is to be provided for the private sector, as the private sector mainly works successfully when profit motto is the driving force. The public sector shall resolve the challenges associated with the social-economical and political situations. The public sector also involves interface with Non-governmental organisations and public bodies. The task of dealing with these institutions and getting approvals must be taken up by the public sector.

This study compiled a 3P models for the GPRA construction. While this model is developed with a perception of the central Govt. employees, consultants, contractors, and private builders about the critical success factors were also taken into consideration. The

model so developed is gives an opportunity for thinker, policy maker and authorities to dig further the successful factors for the GPRA construction.

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