

# Evaluation and Design Optimum PPP Model for Implementation of Affordable Housing

N.S.R.K. Prasad Kethineni, A. Aravindan

**Abstract:** Since 2015 India's urban population is growing at an average of 2.1% every year, but housing growth has been unable to keep pace, due to the government sluggish pace its leads to 10 million housing shortage. Now to overcome this tangible challenge government of India is striving hard for investing on affordable housing constructions to Economic weaker section (EWS) and Lower income group (LIG) in order to achieve housing for all by 2022. Considering the government limitations in financing, the government of India introduced the PPP model to share risk with public authority in housing construction. This paper aims to provide optimum PPP model design for the implementation of affordable housing. This research paper is an explorative study to understand the challenges and possible models in affordable housing and comparative analysis across all Public-private partnership models. This model makes an appropriate allocation of risks, responsibilities, rewards, and penances, and create the incentives for value creation.

**Index Terms:** Affordable housing, Economic Weaker Section (EWS), Lower Income Group (LIG), Public-Private Partnership.

## I. INTRODUCTION

Affordable housing as the name itself suggests the housing units that are affordable by weaker section of the society whose income is below the certain median household income categories defined by the government of India. Affordable housing is to address the housing need of the lower income group (LIG) and economic weaker section (EWS). Since 2015 urban population was growing an average of 2.1% every year. If it continues like this according to 2022 it leads to nearly 30 million unit's shortage in urban areas. Considering the government limitations in financing, the government of India introduced a PPP model to share risk with public authority in housing construction.

Public-private partnership (PPP) [1] is the provision, long term operation and maintenance of public infrastructure by the private sector. It will be initiated by the public sector with a clearly defined project. Developing PPP projects is complex task required skills of a diverse nature many which are not normally required for traditional public sector projects. The success of PPP projects depends on the strong public sector, they should have the ability to identify, develop, negotiate, procure and manage the project through a transparent process.

### A. Necessary of Public-Private Partnership in Affordable Housing

The Ministry of Housing estimated a housing shortage [2] of 18.78 million houses with 99% in the economically

weaker section (EWS) and lower income groups (LIG). Due to an increase of shortage every year to control it by introducing PPP in the housing sector is only an option to speed up construction. PPP is not new to India in infrastructure development. In housing also, PPP was implemented as pilot projects in few states like Andhra Pradesh and Maharashtra. But the result is not up to the mark as expected by the government of India. It leads to a housing shortage. Fig. 1 shows housing shortage in India till 2012.

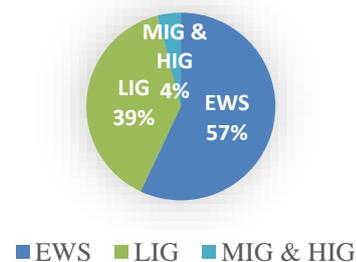


Fig.1: Ministry of housing & urban affairs 2012

Fig. 2 shows the percentage of households living in different type of houses as per ministry of housing and urban affairs 2012.

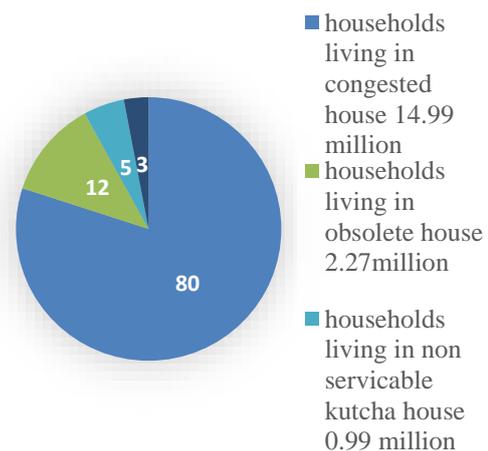
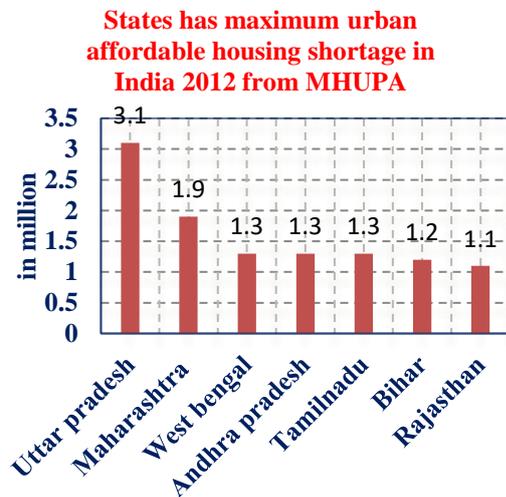


Fig. 2: Ministry of housing & urban affairs 2012

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**Fig. 3 Ministry of housing and urban affairs housing shortage 2012**

Housing shortage mentions states with maximum housing shortage nearly 7.61 million units. The main reason for gap due to lack of private participation in the segment. On 2017 June government of India introduced a new policy [4] to invest in affordable housing by private investor by providing central assistance and state assistance to Urban Local Bodies (ULBs).

- i. In-situ slum redevelopment (ISSR): Use this land as a resource, redeveloping slum by private partners and central government providing a 1lac grant for each house.
- ii. Credit Linked Subsidy scheme (CLSS): This scheme provides institutional credit to EWS, LIG and MIG households for the purchase of homes with interest subsidy credit and reduces housing loans.
- iii. Affordable Housing in Partnership: Main aim of this policy was to provide financial assistance to a private developer to involve in affordable housing development. In this policy central government rate 1.5lac per EWS house and construct at least 35% EWS categories houses in the project
- iv. Beneficiary-led individual house construction/enhancement: In this scheme central assistance 1.5lac per each family for new construction or extension houses for EWS and LIG.

#### *B. Public-Private Partnership Models in Affordable Housing*

Six models are provided by the central government to speed up the housing constructions they are

- i. Government land-based subsidized housing
- ii. Mixed development cross-subsidizing
- iii. Annuity based subsidized housing
- iv. Annuity cum capital grants based affordable housing
- v. Direct relationship ownership housing
- vi. Direct relationship rental housing

Involve of public-private partnership in housing not a new to India states like Andhra Pradesh, Maharashtra etc., constructed housings units but they not up to required units. According to Mohammed Sani and Abdulkadir Sani [5] exploring factors affecting implementation of public-private partnership housing project in Nigeria. This paper study

recommends that government and stakeholders should give more attention to the creation investment environment and support in policy formulation and managerial strategies to future implementation of PPP in housing projects.

Study on a public-private partnership with reference to India infrastructure projects [6]. Providing insight into a public-private partnership in Indian infrastructure projects. Government intervention and public-private partnership in housing delivery in Kolkata [7]. This paper investigates the dynamics of PPP policy in Kolkata, where public housing agencies have assumed both facilitator and regulator roles, setting to achieve a balance between market force and need of the low-income people.

Success and failure factors of housing public-private partnership in Malaysia [8]. Public opinion and affordable housing review by J. Rosie Tighe factors that influence other social policy attitudes particularly ideology and stereotyping [9]. According to dr. vidya telang, dr. Vaisakha kutumbale public-private partnership in India an overview of current scenario [10]. In this paper mentioned several bottlenecks and challenges have been encountered in PPP model development. A case study on affordable housing G. Vinay Kumar and Ganta Srinivas in this paper prototype model have proposed the construction of low-cost houses with low-cost materials. Low-cost housing can be achieved through an efficient planning project using local materials.

A critical review on making low-cost urban housing in India according to Maulik G. Gangani, Hitendra N. Suthar, Dr. Jayesh Kumar [11]. This paper aims to study the urban housing problem in India and tries to identify that how can we transfer rural area into an urban area and cater the housing needs for below poverty level (BPL) people. By providing low-cost housing construction techniques which will be economical, fast and better in quality.

## **II. OBJECTIVES**

- i. To understand the problems and blockages that prevent the success of the HFA 2022.
- ii. To understand the possibilities and potential for implementation of PPP models for the contractual structures to be created for different PPP strategies to address challenge of affordable housing.
- iii. Evaluate and design the PPP model structure that makes a sharing of risks and responsibilities in PPP model and also create the incentives for value creation.

## **III. RESEARCH METHODOLOGY**

This is an explorative study to solve the challenges facing in the implementation of affordable housing and risks connected with the public-private partnership models in the housing by doing comparative analysis across all PPP models. The secondary information/data was collected from different sources like a textbook, internet, articles, research papers etc. This study was made to design the PPP model structure that makes an appropriate allocation of risk.



#### IV. RESULTS & DISCUSSIONS

##### A. Comparative analysis across all PPP models for affordable housing

**The scope of work:** Private builder will be the responsible for building and Designing in all models, Maintenance of housing units in government land-based subsidized housing and mixed development cross-subsidized housing models are taken by the beneficiary after handover it from a public authority in remaining models private authority are responsible for maintenance. Distribution of housing units from private authority to public authorities. Mixed development cross-subsidized housing model having development mix for gaining profit and financed by commercial development. The responsibility of trunk infrastructure by public authority. Implementation of truck infrastructure by other PPP arrangements or separate EPC.

**Project structure:** Few key aspects related to project structure which is different across models.

The land provision under all the models land will be provided by public authority on a long-term lease to the selected private developer. Lease period in all the models would be 30 to 99 years for affordable housing. In mixed development, cross-subsidized housing model lease period is applicable for both affordable housing and commercial developments. The contract period for build design transfer and MDCH models will be only 2-4 years private builder will be the responsible, for rest of models will be 15-20 years. Bid parameter would differ across different models.

- a. Government land-based subsidized housing model the bid parameter would be lowest per unit cost (lump sum amount).
- b. MDCH bid parameter would be the number of units to be built by the developer in a given plot.
- c. Annuity based subsidized housing (ABSH) bid parameter would be per unit cost (lowest yearly annuity) amount to be paid by the public authority to the private developer.
- d. Annuity cum capital grants based affordable housing (AGSH) model provide grants to private developer lowest annuity amount.
- e. Direct relationship ownership housing (DROH) model bid parameter would be lowest per unit cost (lowest EMI or lowest lump sum amount)
- f. Direct relationship rental housing (DRRH) model bid parameter would be per unit cost (lowest monthly rent) which will be paid to the private developer by the beneficiaries. In design-build transfer, mixed development cross subsidy housing, annuity based subsidized housing and annuity cum capital grants based
- g. affordable housing models offtake responsibility will be borne by the public authority. Remaining two direct relationship model private developer is responsible. In the all the model's performance risk was handled by the private developer itself.

**Financial arrangements:** Few key aspects related to the financial arrangement

Except for annuity cum capital based subsidized housing model the financing for the construction of the housing units must be arranged by the private developer. In, the public

authority will pay a significant proportion of 40-50% amount will be paid while the construction phase itself.

Cost recovery by the developer has been different in each model. In the 1st model, the public authority will pay a lump sum amount post satisfactory completion of construction. In the 2nd model, a private developer will recover construction cost generated from high-end housing. In the 3rd model, the public authority will pay to the developer in a regular annuity payment for the period (15-20years). In the 4th model, the public authority will pay a significant proportion of project cost 40-50% to a private developer at the time of construction along with regular annuity payment for a period. In 5th model private developer is expected to recover the costs lump sum payment or EMI payment from the beneficiaries. In the 6th model, the private developer is expected to recover its costs from monthly rental payment from the beneficiary. In all models, the land will be provided by public authority on a long-term lease as a subsidy for the developer. For the first 4 models, the performance bonus limited to 10-15% of revenue generated will be paid to the developer by public authority.

**Beneficiaries:** Setting the Beneficiary eligibility criteria is the responsibility of the public authority in all the models. The beneficiary identification is the responsibility of public authority in first 4 models and a private developer will identify beneficiary in direct relationship models. Beneficiaries will pay the lump sum amount to the public authority in first 4 models and in remaining two models beneficiary will pay lump sum amount or monthly rent to a private developer. The beneficiaries will pay a certain percentage of the monthly income towards lump sum or loans from financial institutions in the first five models. In the direct relationship rental housing, the beneficiaries will pay a certain percentage of the monthly income for paying rents. Table I indicated the data regarding the construction of houses as per ministry of housing & urban affairs includes EWS

##### B. Challenges Facing for Implementation of Affordable Housing

For the implementation of affordable housing in India facing few challenges like a limited supply of affordable housing, high capital cost, lack of project clarity in the system, lack of attractiveness for private developers, lack of availability of urban land and regulatory issues and unfavorable developments norms are few major constraints.

- i. The high cost of land: Due to rapid urbanization and migration of large population to urban locations for better employment opportunities, the land becomes a scarce commodity.
- ii. Financing the land: There is no organized framework is set-up for financing the land for affordable housing so far.

**Table I: Data central assistance for construction of houses**  
(Source: ministry of housing & urban affairs includes EWS)

As on	Project proposed considered	Financial progress (crore) Investment in projects	Central assistance involved	Central assistance release	Physical progress (numbers) Houses involved	Houses grounded for construction	Houses completed
Apr3 2017	3,735	95,660.05	27,879.15	7,820.10	17,73,052	5,35,769	92,308
July31 2017	5,147	1,27,480.05	37,270.84	11,457.89	23,92,061	9,93,278	1,57,106
Oct 3 2017	5,974	1,54,180.15	44,270.49	12,065.85	28,57,321	11,50,783	2,00,096
Dec4 2017	6,671	1,72,293.56	49,537.19	12,764.47	31,99,267	14,08,537	2,88,963
Mar5 2018	8,341	2,25,219.26	62,463.93	13,507.22	40,62,364	17,99,159	3,39,866

- iii. The absence of a clear title: Is also a serious problem for the participation of financial institutions and real estate developers in new as well as redevelopment projects of real estate.
- iv. Shortage of land: In the absence of redevelopment and densification of
- v. available lands, land remains underutilized further contributing to the shortage of land and to the high land prices.
- vi. Lengthy statutory clearance and approval process: Around 20-30 clearance needed for each housing project, that too from multiple authorities. Its takes around 2years for all approvals.
- vii. Lack of participates of large organized real-estate players.
- viii. Challenges in beneficiary selection.

<b>Middle-income group 1</b>	Up to 120 square meters
<b>Middle-income group 2</b>	Up to 150 square meters

**C. Few risk connections with the PPP in housing**

- i. Poor quality work
- ii. Project Increased cost
- iii. Scope changes
- iv. Financial market changes
- v. Staff changes in government and contractor
- vi. Bankruptcy of contractor

**V. MODEL DESCRIPTION**

**A. Mixed Development Subsidizing Housing in Private Land**

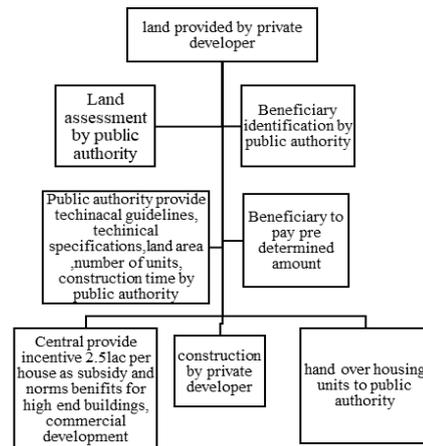
In this model, land is provide by a private authority for housing construction as well as bear responsibilities for the designing, building, finance for the project. Private developer handover stock at a pre-determined time in pre-determined cost. The government provides subsidy and norms benefits for high-end buildings and commercial development in agricultural land. In this model, the state government won't provide financial support for the project. According to central assistants for each house 2.50 lakhs. On 2017 government hike carpet area for middle-income group, 1 and MIG 2 as following below mentioned the carpet area. Table II indicates the increased carpet values for various standards of households.

**Table II: Data carpet area**

S. No	Size carpet area
<b>Economic weaker section</b>	9 to 30 square meters
<b>Lower income group</b>	Up to 60 square meters

In this model at least 35% of EWS houses should be constructed as per standards. A private developer will hand over the 40% stocks to public authority and remaining 60% of houses will handover to beneficiary directly by a private developer. Public authority will be responsible for the selection of the beneficiary in a transparent process. Of time to the private developer. State government should provide subsidized loans for the beneficiary in loans through the bank. In this project, a private developer will bear construction of the project. Private developer responsibility in financial risk and amount recovery from the beneficiary's on EMI or monthly rent base in 60% share of a private developer. Beneficiaries risk maintenance of housing unit once handover the unit from the public or private authority.

**B. Activity Flowchart**



**Flow chart 1:Activity flow chart**

The above Flowchart shows the activity flowchart of present study.

**C. Key Features:**

- a. Land allotment: Under this model private developer will share the land. A public developer will provide the subsidy grants and norms benefits for developments. Such as central subsidy, stamp duty.



- b. Design Build and finance: A private developer was the responsibility of design. Build and financial risk on a private developer
- c. Fixing a sale price of housing units: Public authority will fix the rate of units depend upon the city basis and project basis in a clear transparent process. Incentives provided by the state, central & ULBs. The state government will suggest the scales price of an affordable house
- d. Maintenance of housing units: Under this model, the beneficiary should bear maintenance once handover by public authority and a private developer.
- e. Cost Recovery: In this model cost recovery from the beneficiary was the private developer risk in 60% of share in the project and 40% of housing units public authority risk. That recovery was in the form of lump-sum payments or EMI for a fixed period.
- f. Beneficiary identification: Identify the beneficiaries was public authority responsibility. States that allotment of houses to identified eligible EWS beneficiaries in AHP projects should be in transparent process and beneficiaries selected should be part of HFAPoA. Selection in allotment may be given to different persons, senior citizens, Scheduled Castes, Scheduled Tribes, Other Backward Classes, minority, single and other weaker.
- g. Distribution: Distribution housing units by both public and private authorities depend on the share in the project.
- h. Payments by allottees: Allottees should be paid the pre-determined amount for the cost of the housing unit at the time of handover and remaining amount on EMI in a period to private builder.
- i. Financial support for allottees: Provide subsidy from bank loans to beneficiaries. Central assistance at the rate of Rs.2.5 lakh per housing unit.
- j. Risk sharing: The responsibility for trunk infrastructure and identification of beneficiary was taken by the public authorities. While the design and construction risk shall be taken by the private sector

**D. Risk sharing**

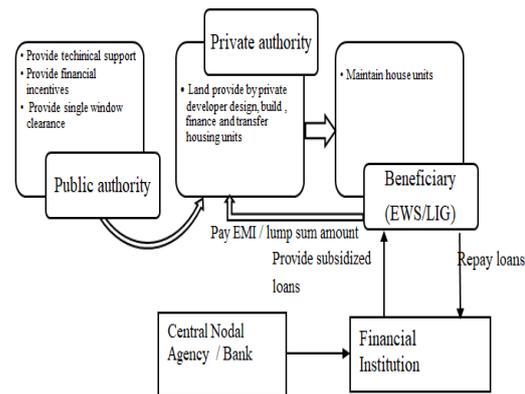
Table III indicates the risk sharing for various sectors in different stages of construction.

**Table III: Risk sharing**

Risks	Government	Private developer	Financial institution	Beneficiary
Land				
Design				
Construction				
Maintenance				
Cost recovery				
Trunk infrastructure				
Credit risk				

**E. Project Structure**

Help with LIG / EWS housing category. Central incentives 2.5 lakhs subsidy will be provided. At least 35% house is EWS in the project.



**Flow chart 2 - Project structure**

**F. Public Authorities Roles in MDSH Model**

**Exemptions:** Provide stamp duty exemptions, permissions for commercial development and provide external / internal development charges.

**Financial Incentives:** Reduce charges for usage of innovations/ prefab technologies and materials. Central subsidy 2.5 lakhs for EWS house unit. State subsidy on bank loans to benefit beneficiary.

**Single window clearance:** Provide fast track approval within 30 days and types of designs for EWS/LIG/MIG units as per local conditions.

**VI. CONCLUSION**

In MDSH model, I cracked challenges facing in the implementation of affordable housing.

- a. Clear definitions: In 2017 the government of India announced GST would be reduced from 8% for low-cost housing, however, the circular does not define low-cost housing also the government has said the GST will be reduced affordable housing.
- b. Ease of land availability: By providing a subsidy for private landowners for the utilization of land for housing constructions.
- c. Relaxed developments norms: Floor area ratio and density norms are critical in affordable housing. The government should regularly review master plans.
- d. Invest in infrastructure upgradation: Involving private players in government infrastructure.
- e. Dedicated approval window for affordable housing: Government agencies should provide separate open window system for fast clearance of projects.
- f. Strengthen microfinance.
- g. Use of advanced technologies.

From this MDSH model will helpful to crack risk connection in PPP.



- a. In this model public authority need to involve project life cycle actively monitor the construction work.
- b. In this model, a public authority will provide clear details about the project in tender time itself.
- c. Establish coordination and support between public and private authorities.
- d. Sharing risk as shown in Table III.

In this model sharing of responsibility between public and private sectors was defined clearly. Risks like financial, construction, maintenance, credit risks, and other risks etc.,

Mixed development subsidy housing (MDSH) makes a sharing of risks between public and private, responsibilities, rewards and creates the incentives for value creations for implementations of affordable housing.

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12. Table I, source ministry of housing and urban affairs. Data about affordable housing shortage year wise.

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