SUSTAINABLE AFFORDABLE HOUSING FOR LOW INCOME GROUP IN INDIA

Master Thesis

International Master of Science in Construction and Real Estate Management

Joint Study Programme of Metropolia UAS Helsinki and HTW UAS Berlin

Faculty of Engineering

from

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Conceptual Formulation

Master Thesis for Mr. Saurabh Dwivedi

Student Number: 572535

Topic:

SUSTAINABLE AFFORDABLE HOUSING FOR LOW-INCOME GROUP IN INDIA

Background:
Food, clothing, and shelter are fundamental human rights and given the situation in a developing country like India, housing for all has been one of the key development areas. Millions of people around the globe still don't have a proper house or shelter in place. There is a need for sustainable low-cost housing in order to provide shelter to all those in need.

The conventional construction method is generally expensive and often lacks the parameters which embrace the idea of sustainability. The main idea of sustainable housing is to use available local low-cost material to minimize environmental effects and reduce construction costs.

The goal of the study:
This research analyses the challenges of the sustainable low-cost housing system in India based on the existing literature review. This research aims to put forward a road map for the implementation of sustainable affordable housing in India based on the case studies of similar work across different countries.

Research questions:

1) What is the housing situation in India today?
2) What is sustainable affordable housing and how can it be used for low-cost housing?
3) What is the scope of low-cost housing in India considering economic construction aspects?
4) What are the challenges of sustainable affordable housing in India?
5) How can these challenges be minimized?

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Time-Line

Task	Start Date	End Date
Research on thesis topic	01.03.2020	01.05.2020
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Research scope, boundaries, questions	01.07.2020	01.08.2020
Research method and structure	01.07.2020	01.08.2020
Draft main research	01.08.2020	01.11.2020
Answer research questions	01.11.2020	01.12.2020
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Abstract

This thesis presents a detailed analysis of sustainable affordable low-cost housing in India. It may seem counterintuitive to combine the concepts of sustainability with affordability, yet it is the only method to increase a project's durability and lifespan. The thesis' main objective is to examine the current policies in existence as well as the execution of various policies throughout the world using literature review case studies. India is making significant progress toward its 'Housing for All Mission 2022' objective, but it still has a long way to go. The policies regulating affordable housing have laid the basis for a smoother procedure of involving numerous stakeholders at various stages. Within India, a global ecosystem is required to meet not only affordable housing needs but also skill training and reform opportunities for low-income and financially deprived people.

Keywords: Sustainability; Affordable Housing; Low-income

Table of Contents

Table of Figures

List of Tabulations

List of Abbreviations

1. Introduction

The home serves as an "essential basis" for all individuals to live on during social and physical activities (Byrne & Diamond, 2007). From the beginning of the twenty-first century, several country's housing became more costly (Haffner & Boumeester, 2010). There is a distinction amongst the low and high-income groups. Owning a decent home has become one of the unattainable goals of the low-income population. Governments are under increasing pressure to provide affordable housing. Many governments throughout the globe have now acknowledged this and are going to take greater action.

The history of inexpensive accommodation development has shown that western and eastern nations are in quite distinct positions and cannot share strategies. The creation of an inexpensive housing system began relatively early in the United States and Europe, but it did not begin until the middle of the twentieth century in Asian countries. Some of Asia's most industrialized countries and localities, such as Singapore and Hong Kong, began developing cheap housing projects in the 1950s, which was unusually early in the Asian region (Lin, 2011).

In India, affordable housing is seen as a pressing necessity. The ever-increasing urban population has put significant strain on the housing industry, particularly low-income housing. This industry has a lot of demand but relatively little supply (Agarwal, et al., 2013). This creates the research of inexpensive accommodation all the more essential since it can solve problems, tap into massive demand, and close the demand-supply gap in this area (Cushman & Wakefield, 2014). The government's efforts through plan distributions have not been adequate to address a problem of this size, and the policy has shifted from housing provision to allowing private sector housing provision (Nallathiga, 2006). The global economic crisis of 2008 caused a liquidity constraint in the Indian housing sector as well, and as a result, many developers changed their attention to cheap housing from opulent homes owing to a lack of cash formerly accessible through customers' phased payments (Calavita & Mallach, 2009).

The absence of a clear definition of cheap housing has resulted in misunderstandings and wildly differing interpretations by various groups, depending on their needs. In India, successive administrations at both the national and state levels have made affordable housing a priority. The media also expresses the opinion that this industry has a

lot of room for expansion and demand (Nallathiga, et al., 2018). One of the central government's programs, the Sardar Patel Urban Housing Mission, was launched lately with the goal of "Housing for everyone by 2022." With rising levels of urbanization, the number of slum dwellers, and the rate at which the urban population is growing, slums are becoming more common (ADB, 2014).

1.1 Objectives

This research analyses the challenges of the sustainable low-cost housing system in India based on the existing literature review. This research aims to put forward a road map for the implementation of sustainable affordable housing in India based on the case studies of similar work across different countries. Various affordable housing models are reviewed based on current housing supply and demand to understand the distinct characteristics of each model and how they contribute to the need for cheap housing. The objectives of the research include:

- Understanding the term "affordable housing" and various elements related to it.
- To examine the many inexpensive accommodation prototypes that have been implemented in India.
- To conduct a thorough investigation of a few inexpensive housing concepts in India.
- To create a comparison template of the many inexpensive housing prototypes that may be utilized for implementation and imitation.

Research questions:

1) What is the housing situation in India today?

2) What is sustainable affordable housing and how can it be used for low-cost housing?

3) What is the scope of low-cost housing in India considering economic construction aspects?

4) What are the challenges of sustainable affordable housing in India?

5) How can these challenges be minimized?

1.2 Research Method

A brief literature evaluation was conducted to meet the goals of this study. Various research papers on sustainability, affordable housing, and policy implementation aid in understanding how sustainability and affordable housing go hand in hand.

To comprehend the word sustainability in terms of social, economic, and environmental elements, a similar technique was employed. Because the study focuses on Indian affordable housing, a review of how affordability is defined in the Indian context is conducted.

The research of several inexpensive housing options that have already been implemented is completed, with good and negative features listed. To better comprehend the perspectives of different nations adopting affordable housing projects, a case study from around the world is provided.

1.3 Research Structure

The entire study is broadly divided into 6 sections. Starting with the introduction to this research followed by chapter 2 referring to sustainable and affordable housing.

The third chapter provides an overview of the Indian housing deficit, affordable housing, and policy framework. Chapter 4 discusses the many forms of public-private partnerships, the dangers they entail, and how to mitigate those risks. As a result, each model is evaluated in comparison to the others.

Case studies from various countries are represented in the 5th chapter giving a brief of various policies adopted for affordable housing.

The 6th chapter of this research presents the conclusion and possible suggestions based on the complete investigation.

2. Sustainable and Affordable Housing

The idea of sustainability began with human habitation and has since progressed to include concerns such as housing and community growth. Various concepts of sustainability have been proposed over time. The aim of preserving an entity, product, or method across time is known as sustainability (BASIAGO, 1999). The term "sustainable development" has been interpreted from a variety of viewpoints and various angles, resulting in a multitude of concept definitions. There are several concepts of sustainability, but the one suggested by the World Commission on Environment and Development (WCED) in their 1987 research, generally known as the Bruntland commission paper, is the most well-known and widely agreed upon (WCED, 1987). Sustainable development means meeting 'the needs of the present without compromising with the ability of future generations to meet their own need'. As per Newman sustainability is defined as a global process that also tries to help create an enduring future where environmental and social factors are considered simultaneously with economic factors (Newman, 2002). In terms of sustainability for housing Newman has indicated three key points:

- Ensuring there is a 'roof overhead' for the housing disadvantaged,
- Ensuring housing is more eco-efficient, and
- Ensuring housing is well located or is part of a project to improve locational amenity.

(Choguill, 2007) on the other hand, claims that while the WCED meaning seems to be clear, it is difficult to operate in actual-world situations. The word sustainability has been one of the most overused and all-too-often misused concepts in the development literature (Choguill, 2007). The concept of sustainable growth has been well-established in the literature on urban development and planning however, it is largely beyond the mainstream in terms of applying sustainable growth (Jepson, 2007). Choguill reports that the notion of sustainable development was originally associated with macroeconomic development, but that it has increasingly been extended to human development, reflecting housing. According to (Choguill, 2007) three goals must be considered to achieve housing sector sustainability. The first is to provide a foundation for household improvement, the second is to inspire vulnerable communities, and the third is to provide a psychological sense of self-worth to the urban poor. Currently, housing

affordability is seen as a means of making housing commercially sustainable, although other critical environmental challenges are widely overlooked. However, in recent years, the government's primary emphasis has shifted from economics to social issues as well as long-term environmental concerns.

2.1 Economic, Social, and Environmental Sustainability

Understanding the core impact of sustainability (Wanamaker, 2018) has resulted in three intertwined domains of sustainability that briefly define the interaction between economic, social, and environmental factors. Essentially, the statistic shows that almost all humanity accomplishes or strategies on the planet has environmental, economic, and societal ramifications, as well as the human race's continued life and well-being. Wanamaker says that everyone benefits as the ideas used in the three realms of sustainability are extended to real-world scenarios. Mineral wealth is protected, the ecosystem is protected, and the financial system is unaffected, and our people's quality of life is enhanced or sustained. The three spheres are shown in the diagram below, along with their relationships.

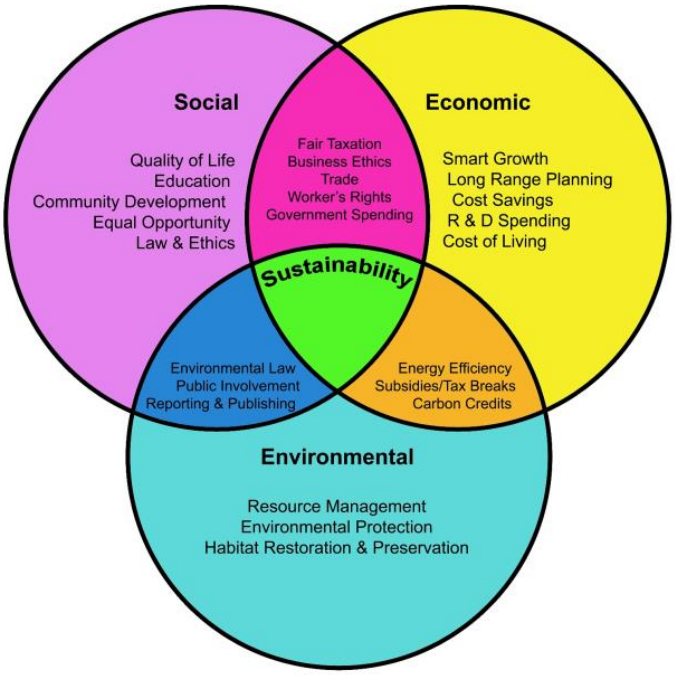


Figure 1:Sustainability in terms of social, environmental, and economic factors (Wanamaker, 2018)

Economic sustainability entails making policies in the most sustainable and economically stable manner possible while still taking into account other facets of long-term sustainability. Keeping in mind the long-term goals, a relevant decision should be taken during project planning. Wanamaker says that only the economic facets of anything can not result in true sustainability. The constricted strategy that only acknowledges economic development would result in an unacceptable outcome. When social and environmental considerations are combined, the path to economic development yields a good result. Economic sustainability will be achieved by focusing on smart growth, long-term planning, cost-cutting programs, and increased research and development investment.

As per the Western Australia Council of Social Services, “social sustainability occurs when the formal and informal processes; systems; structures; and relationships actively support the capacity of current and future generations to create healthy and livable communities. Socially sustainable communities are equitable, diverse, connected, and democratic and provide a good quality of life”. The philosophy of social sustainability is based on the idea that a decision or project benefits society. Future generations can, on average, have the same or better quality of life as the present generation. Human rights, environmental law, and civic engagement, and inclusion are all included in this definition. Failure to emphasize the social aspect of decision-making or policy will lead to the gradual breakdown of sustainable realms (Wanamaker, 2018).

Environmental sustainability refers to the natural environment's ability to stay productive and robust to maintain human life's existence. Environmental sustainability refers to the natural environment's ecological integrity and carrying capacity (Brodhag & Taliere, 2006). According to the United Nations (UN) World Commission on Environment and Development, environmental sustainability is about acting in a way that ensures future generations have the natural resources available to live an equal, if not better, way of life than current generations (UNEP, 2021). The inference is that resources should be collected as quickly as they can be replenished, and trash should be discharged as quickly as it might perhaps be incorporated by the ecosystem (Diesendorf, 2000).

However, because technological innovation may not be able to maintain exponential development, the pursuit for uncontrolled expansion is putting even larger demands on the earth system and straining these boundaries. Evidence to back up fears about

the environment's long-term viability is on the rise (ICSU, 2017). The consequences of the effects of global warming, for example, present a compelling case meant for environmental sustainability. Climate change is defined as major alterations in the immediate future in the climatic system resulting due to environmental climate change or social behaviors (Coomer, 1979).

All of these are significant environmental challenges because, as previously said, they have ramifications for how the ecological balance may be kept constructively consistent and robust to sustain individual life's existence along with growth.

2.2 Affordable Housing

The term and notion of affordable housing (AH) encompass a wide range of topics. As a result, it is critical to define the parameters of this discussion by defining the word "affordable housing" (Kalpana & Madalasa, 2015). It's also crucial to define AH so that targeted policies can be developed to make finance more available, such as interest percentage grants or favorable conditions comparable to infrastructure funding (NCHF, 2007). The phrase "affordable" has no clear definition because it is a relative word. Even the term "affordability" is fairly broad and can signify different things to various people depending on their income levels.

Housing affordability is characterized in a variety of ways around the world. By far the most popular notion of affordability that is widely recognized is housing affordability, which is defined as the ratio of housing costs to household income (Kalpana & Madalasa, 2015). This is also accepted by the Indian Government, which states “Affordable housing refers to any housing that meets some form of affordability criterion, which could be income level of the family, size of the dwelling unit or affordability in terms of equated monthly installments (EMI), size or ratio of house price to annual income” (NAREDCO, 2008). A frequently acknowledged standard for affordable housing, according to the United States Department of Housing and Urban Development, is that housing expenditures should not exceed 30% of a household's yearly income, including taxes and insurance for owners, as well as utility bills. If monthly carrying costs for a home exceed 30-35 percent of monthly household income, the housing may be considered unaffordable for that household. Monthly carrying costs include not only loan repayment, but also property taxes, payments of basic utilities such as water,

electricity, cooking fuel, and basic services such as internet, cable, and so on (JLL, 2016). However, this figure simply serves as a starting point for determining housing affordability; the concept of affordability varies depending on a family's unique circumstances (JLL, 2016).

To determine home affordability, Hulchanski identifies six variables of assessing housing expenditure to an income ratio. These six elements were created with North American usage in mind. Six components are:

(1) explanation of family expenses,

(2) assessment of developments,

(3) management of municipal accommodation by specifying eligibility benchmarks and subsidy levels,

(4) description of accommodating the need for municipal strategy objectives,

(5) estimate of the capability of a family to compensate the rental or the loan, and

(6) as part of the selection benchmarks in the decision to rent or provide a mortgage.

Each of the six uses is evaluated centered on the degree to which it is a rational and dependable measure of what it aims to evaluate (Hulchanski, 1995). He claims that using the term "housing affordability" is deceptive and that we should avoid using it because household consumption patterns and the mechanisms by which they meet their requirements are so diverse. Again, the definition of affordability varies from place to place and country to country, but the most widely accepted definition is the ratio of household income to housing costs (Hulchanski, 1995). It is largely agreed that housing should not consume more than 30% of a household's income (Hulchanski, 1995).

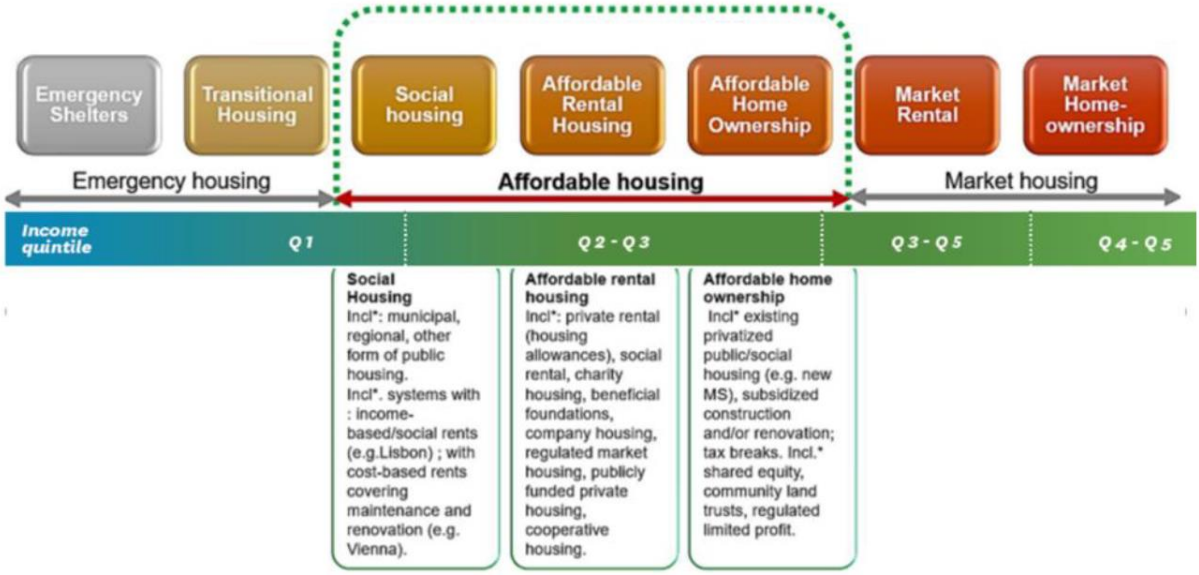


Figure 2:Affordable housing continuum according to income quintile (ECSO, 2019)

The above figure made the distinction amongst the community shelter sub-classification – a rental home that is both inexpensive and accessible homeownership are the following: prices for housing stock are frequently dependent on income (ECSO, 2019). On the other hand, affordable rental housing and homeownership may be provided by public and/or private institutions, and take the form of rental and homeownership (ECSO, 2019).

3. The Indian Context

India's development trajectory is on the upswing. Rapid development entails a faster pace of urbanization, which necessitates the phenomena of migration. This is fueled by the advantages that cities have over rural areas, such as a wider range of job opportunities, enhanced community values like wellbeing and learning, and easier connection to essential amenities.

According to the 2011 census, approximately 30 percent of the population lives in cities. As per 2019 data, India currently has a 32.47 percent urbanization rate. In India, cities accounted for almost a third of the overall population in 2019 (JLL, 2018). According to the United Nations' State of the World Population report from 2007, 40% of the country's population would be living in cities by 2030, with 377 million people out of India's 1.21 billion people living in cities as per the 2011 census. People have relocated out from rural areas to find a job and make a living in cities, according to the trend, which has increased by over 4% in the last decade (O'Neill, 2021).

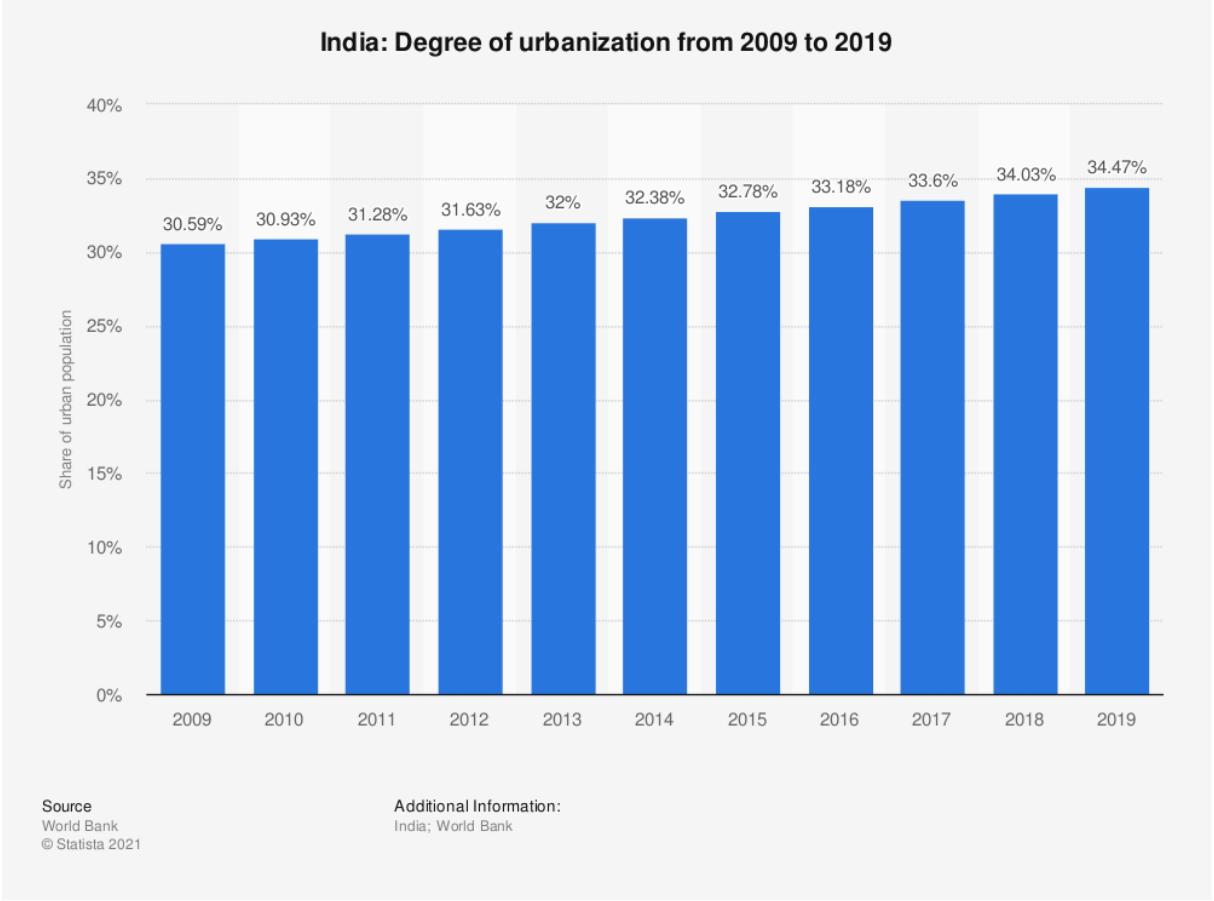


Figure 3:India Degree of urbanization from 2009 to 2019 (O'Neill, 2021)

The polarization of expansion towards metro cities and megacities makes it more difficult to provide housing in urban regions, which are quickly becoming overcrowded and lacking in basic services. The experience of poverty in cities is vastly different from that of the poor in rural areas. In addition to financial hardship, urban poverty is marked by asset deprivation and extreme difficulty in accessing essential services and facilities in the city when compared to other income levels. Slum-dwellers confront a variety of issues, including insecure terms and poor accommodation conditions besides lack of gateway to necessities such as access to clean water, sanitation, and solid waste disposal (JLL, 2018).

India's cities are under tremendous strain, and they are attempting to accommodate an ever-increasing migrant population. Mumbai, with a population of 12.5 million people, is India's most populous city, followed by Delhi, which has a population of 11 million people. In comparison to the 2001 census, the population of Delhi grew by 4.1%, by 3.1% in Mumbai, and by 2% in Kolkata, indicating the world's fastest rate of urbanization (JLL, 2018).

With population growth at an all-time high and unavoidable migration to expanding cities, housing demand appears to be inexhaustible and becoming more difficult to predict by the year. Cities nowadays suffer dwindling land availability, exorbitant land, and real estate prices as a result of population growth, overburdened and defunct essential facilities, insufficient exposure to fundamental services, ecological degradation and damage, and a persistent housing shortage. The inescapable outcome of unrestrained urbanization is slums. Approximately 65 million people living in slums and an additional 0.9 million destitute persons in metropolitan India, our cities are facing a growing housing shortage (JLL, 2018).

3.1 India's Housing Shortage

The housing scarcity in India has been steadily increasing in tandem with the country's growing population and migration to metropolitan centers, resulting in slums and scattered settlements. According to the Ministry of Housing and Urban Poverty Alleviation (MoHUPA) technical report on Urban Housing Shortage, there were 18.78 million homeless people across the country, with 99 percent of them belonging to the Economically Weaker Section (EWS) and Lower Income Groups (LIG) categories

(MHUPA, 2012). Nearly one million households live in non-serviceable kutcha dwellings, according to the study published by the Technical Urban Group (TG-12) on Urban Housing Shortage 2012-17 (MoHUPA). Homelessness affects more than half a million homes, according to the research.

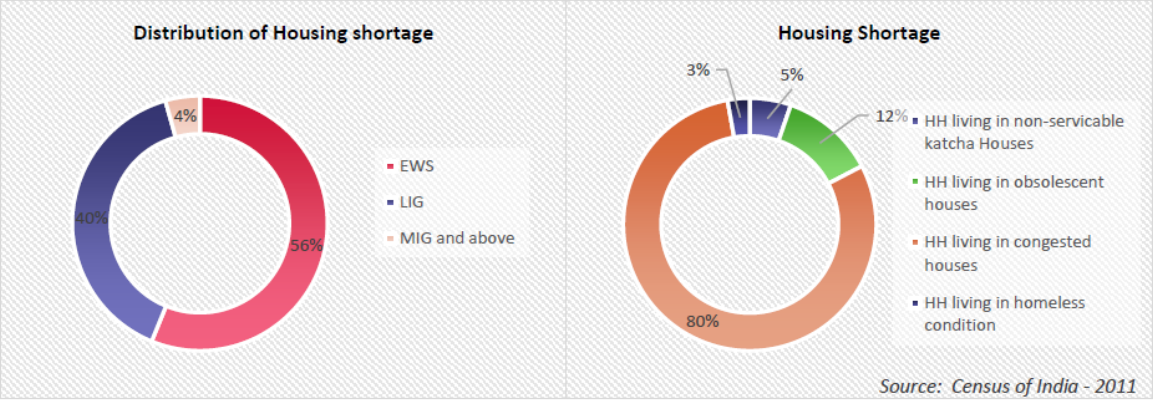


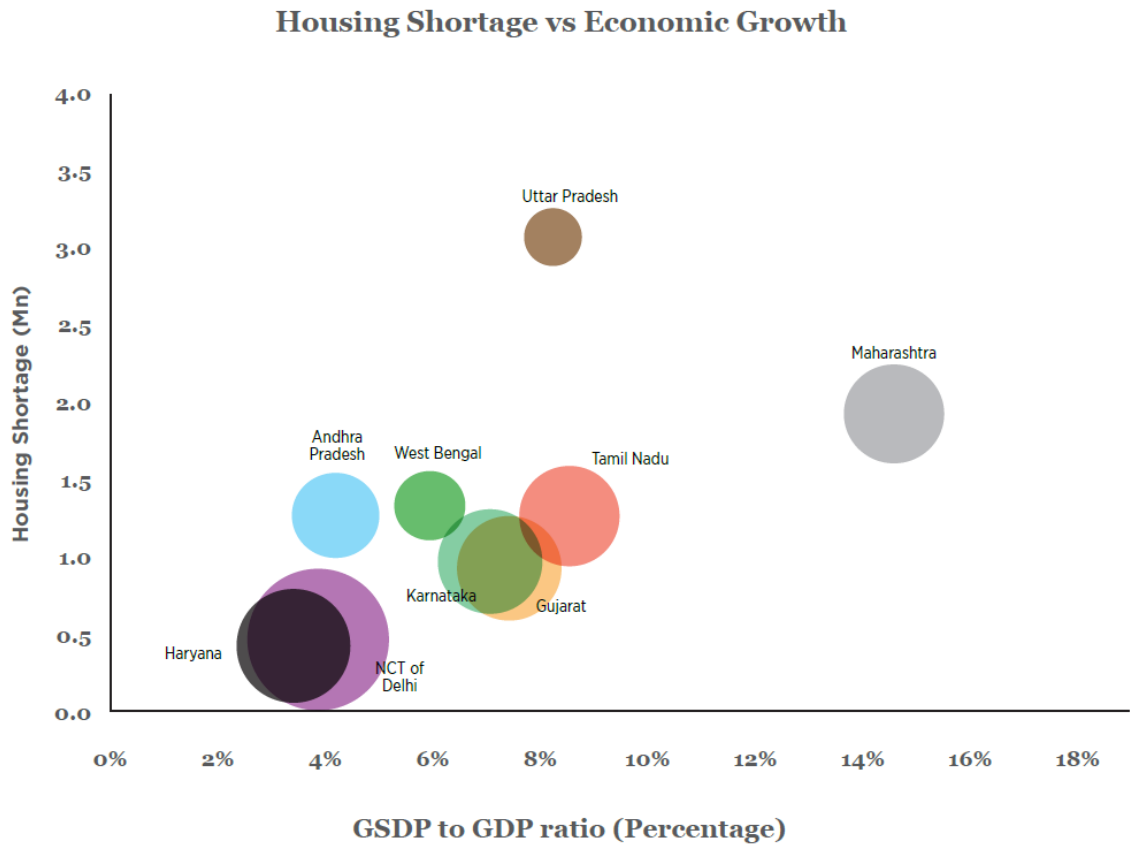
Figure 4:Distribution of Housing Shortage in India – 2012 (KnightFrank, 2020)

The Affordable Housing (EWS+LIG) Segment accounts for 96 percent of the housing shortfall, which is caused by congestion within the housing unit. Congested houses or kutcha houses account for 92 percent of the current housing shortfall, signaling a pressing demand for home improvement or home expansion loans. The EWS and LIG categories are chiefly responsible for India's urban housing deficit. However, the majority of the housing stock being created in metropolitan India is beyond of reach for the LIG and EWS segments. Due to the larger returns that can be obtained from such projects, private producers of property development predominantly aimed at the extravagance, elevated, and dwelling in the wealthy segments. Furthermore, high land costs, antiquated construction codes, strict licensing requirements, and delays in project clearance made low-cost housing developments unprofitable for private developers (MHUPA, 2012).

The state-by-state data reveals a mixed picture, with families living in substandard housing in both industrialized and developing states. According to 2012 figures, Uttar Pradesh ranks high of states with a housing deficit with over 3 million homes, Maharashtra is next with a shortfall of fewer than 2 million units, followed by West Bengal, Andhra Pradesh, and Tamil Nadu. In terms of urban housing shortages, the top ten

states account for 14.3 million people, or 76% of the total (KPMG, 2012) (MHUPA, 2012).

The state of Maharashtra, on the other hand, due to its significant impact on the nation's financial progress, stands out among the rest. Maharashtra has the highest Gross State Domestic Product (GSDP) to Gross Domestic Product (GDP) ratio of any state, at 15%. As of 2012-13, its per capita income was INR 1,11,980. Given these reasons, the state must focus its efforts on resolving housing concerns as soon as possible. As a result, it's reasonable to suppose that the state of housing and its scarcity require more attention (ANAROCK, 2019).



Source: CSO & Report of Technical Group on Estimation of Urban Housing Shortage 2012.

Figure 5:Housing Shortage vs Economic Growth (ANAROCK, 2019)

In recent decades, linking together the disparity between the strong requirement for sheltering and severe supply shortages has been a national priority. Working-class

housing that is both inexpensive and in near vicinity to one's workplaces is vital to an area's commercial viability. Large-scale, low-cost housing developments are without a doubt the way to go to meet the massive housing shortage. As a result, ‘Affordable Housing' has grown in popularity as a means of giving housing to people from all walks of life (JLL, 2018).

Several other issues can contribute to the scarcity of affordable housing, like as follows:

- Urban land scarcity: Because of the overpopulation in cities, there is a huge demand for public development. There is a growing necessity to reconsider government limitations that have aggravated India's man-made land shortage and driven up property values. The restricted convenience of property in metropolitan neighborhoods renders it unfeasible for makers to take on inexpensive accommodation ventures without government help. Furthermore, Government-owned businesses such as railways can make better use of large amounts of non-marketable urban land. There are several of these land parcels in centrally positioned regions. These land areas can be put to greater use by the administration by properly monitoring them, preventing the spread of slums and squatter communities in these locations (KPMG, 2012).
- Delays in receiving permits from several local authorities: According to estimates, real estate developers must go through 150 tables in around 40 departments of the federal and state governments, as well as municipal corporations (KPMG, 2011). Postponements in development authorizations might increase the development's budget by 25-30%. Improved coordination between the various agencies in dispensing with various approvals and permits could persuade construction companies to participate in the reasonably priced housing market (KPMG, 2012).
- Rising building costs: Unlike premium residential projects, where land costs play a big role in pricing, the cost of construction is the primary driver of inexpensive housing prices. In inexpensive housing projects, construction expenses account for about 50% to 60% of the overall selling price, but in luxury housing projects, construction expenses account for 18% to 20% of the whole selling price (TOI, 2012). Developing budgets reduce gradually from opulence developments to low-income housing developments, unlike land prices, which reduce

dramatically when developments are far from city center situated to periphery sections of a metropolis. As a result, lowering building costs is critical to making affordable housing projects possible (KPMG, 2012).

- Workforce problem: The property market in India encounters a workforce shortage. The supply and expense of affordable accommodation schemes may be harmed as a result of this shortfall. To fulfill the need of the significant percentage of unskilled laborers in the Indian workforce section, it is necessary to improve the education and training capacity given through various initiatives (KPMG, 2012).

Projected Human Resource Requirement (in '000)	2008	2012	2018	2022	Incremental
Real Estate	10,790	14,515	20,692	24,981	14,191

Source: Human Resource and Skill Requirements in Building, Construction Industry and Real Estate Services, NSDC

Figure 6:Projected manpower requirement (KPMG, 2012)

- Constraints on financing for low-income groups: The country's present finance framework is geared for tuning the MIG and beyond sectors. Consequently, the family unit in the EWS and LIG categories has a challenging time obtaining conventional home financing. People with little income whose salary varies with agricultural periods are insufficient to meet the criteria of "viability" to secure reimbursement, or might not offer security for mortgages are generally ignored by business depositories and various traditional sources of home funding. Furthermore, due to incompetence to produce the needed credentials for relaxed loan disbursement, housing finance companies (HFCs) are incompetent to work for the EWS and LIG categories (KPMG, 2012).
- Limited financing options for developers: In addition to buyers, real estate developers face funding issues. Banks have reduced their real estate investment due to prudent procedures, abandoning rising fund choices as an example Non-banking Financial Companies (NBFCs) and Private Equity (PE) funds as the only possibilities. Furthermore, the high cost of capital, along with falling demand, has wreaked havoc on developers' cash flow. As a result, developers have delayed project launches, modifying the planned supply. In addition, the high cost of financing prevents them from cutting property costs (KPMG, 2012).

- Laws and construction regulations are being re-examined: The necessity to re-think legislation like the Rent Control Act, which is appearing to be an obstacle to the expansion of rental homes and the restoration of areas with existing buildings, is becoming more pressing. By creating more explicit and specified guidelines under construction ordinances and policies for Floor Space Index (FSI), zoning, and development strategies, local urban organizations, and Government agencies can decrease the problems experienced in planning for new projects in India. (KPMG, 2012).
- The recoupment of property deals in India is a subject of debate and controversy due to the Union Government's lack of clarity, governments of separate states and municipalities have the authority to levy various indirect taxes on developers. Developers would benefit from a break from the existing system of dual taxation until the government provides a clearer definition of whether "real estate property" is a product or a service. The administration should also look into the lack of consistency in duties on stamps throughout the nation. In different states, the council tax payable at the moment of implementation of the supporting document varies between 5% and 15% of the land's cost (KPMG, 2012).

3.2 Indian Affordable Housing

Housing affordability is characterized in a variety of ways around the world. Among the most popular and widely acknowledged explanations of affordability is home affordability, which is defined as the ratio of accommodation expenses to household revenue (JLL, 2018). The following are the most commonly used parameters to estimate affordability around the world:

- Housing Cost Burden or Expenditure Method: The proportion of housing spending to family revenue is applied to determine affordability. The term "housing expenditure" refers to all costs associated with housing, such as rent, mortgage repayments, utilities, and maintenance. If the ratio is less than a certain cut-off point, housing units might be categorized as affordable. The decision of this cut-off is subjective; nonetheless, as a rule of thumb, it is set at 30% (JLL, 2018).
- Median Multiple Indicator: To calculate housing affordability, the median dwelling cost is separated by the average yearly family income. Demographia

International, a non-profit organization that performs affordable housing surveys around the world, classifies housing units as inexpensive if the price-to-income ratio is less than three (JLL, 2018).

- Housing and Transport (H+T): To calculate affordability, transportation costs are added to housing costs in this technique. The basic notion is that city congestion has resulted in an expansion in social colonies located far from the metropolis center, resulting in increased commuting expenses and time (JLL, 2018).

The Reserve Bank of India (RBI) changed the concept of affordable housing in July 2014. According to RBI, the cost of a house in the metros and non-metros may be INR 6.5 million and INR 5 million, respectively, to qualify as affordable housing. The RBI also stated that, due to inflation, it will examine the criteria of affordable housing regularly (JLL, 2016). As a result, it's difficult to come up with a general definition of inexpensive housing. For example, MoHUPA's task force on promoting affordable housing defines affordable housing as "any housing that meets some form of affordability criterion, which could be the family's income level, the size of the dwelling unit, or affordability in terms of EMI size or the ratio of house price to annual income (MHUPA, 2012)." While the first two characteristics are unrelated, the third is a dependent variable that can be linked to income and property values. Income levels help to distinguish between those with spending power, whereas unit sizes help to maintain a minimum level of liveable space (JLL, 2016).

DEFINITION OF AFFORDABLE HOUSING- MHUPA 2012

Income Categories	Size	Income Criteria	Affordability
EWS	• 21-27 sqm of carpet area • EWS maximum area could be between 25.2 and 30.8 sqm if subsidies are tied to them	The maximum Household Income for the EWS and LIG category are recommended to be INR 8,000 and INR 16,000 per month and since many households in this category do not have regular monthly income an annual income of INR 100,000 for EWS and INR 200,000/- for LIG households could also be used	The Task Force recommends that the desirable goal of a house price to income multiple that should be pursued for Affordable Housing projects should be 5
LIG	• 28-40 sqm of carpet area • maximum area for LIG could be between 36.9 and 45.1 sqm if subsidies are tied to them		
MIG	• 41-60 sqm of carpet area		

Source: Task force on Promoting Affordable Housing, MHUPA, 2012

Figure 7:Definition of affordable housing – MoHUPA 2012 (JLL, 2016)

Affordability in the perspective of metropolitan accommodation would involve the establishment of "sufficient shelter" consistently, assuring the wellbeing of residents within limits of the average urban family, under RICS Report on Making Affordable Housing Work in India (KnightFrank, 2020).

According to the “Taskforce on Promoting Affordable Housing,” the size of the house, the amount of money you make, and how much you owe on your mortgage are all factors as a standard for defining affordability for LIG and EWS, as follows:

- For EWS, the carpet area of the dwelling unit should not exceed 300 square feet, and for LIG, it should not exceed 600 square feet.
- For both EWS and LIG, the price of the housing unit cannot surpass four times the family's total yearly income.
- Both EWS and LIG monthly repayment commitments must not surpass 30% of the family's total monthly income.

According to the Ministry of Housing and Urban Poverty Alleviation's "Affordable Housing in Partnership" program, criteria for EWS and LIG were classified in terms of unit area and repayment capabilities as follows:

- Super built-up area not outstripping 300 and 500 square feet for housing units both for EWS and LIG segment.
- Carpet areas of no more than 25 square meters and 48 square meters, for EWS and LIG segments respectively.
- Both EWS and LIG monthly repayment commitments must not surpass 30% - 40% of the family's total monthly income.

According to the Ministry of Housing and Urban Poverty Alleviation's "Pradhan Mantri Awas Yojana," a Housing for all program started in 2015, criteria for EWS and LIG were classified in terms of income level and unit area as follows:

- Per annum household income not surpassing ‘Rupees Three Lakhs’ for EWS.
- EWS unit area not surpassing 30 square meters in terms of carpet area.
- The annual household income for LIG should be in the range of ‘Rupees Three Lakhs to Rupees Six Lakhs'.
- LIG unit area not surpassing 30 square meters in terms of carpet area.

While the majority of explanations of affordable housing involve area, price, and the occupier's affordability, the primary focus should be on the minimum size (volume) of usable units, general house components, pricing, and locality (JLL, 2016).

The volume required for residence: As the need for metropolitan property grows, the infrastructure of all kinds, whether it's a business or residential property, is growing upright. Though most explanations use an area standard, adding a volume standard allows architects to work on the upright planning of a housing unit (JLL, 2016).

The essentials facilities: While most concepts place a premium on the smallest possible footprint and lowest possible cost, considerations, basic amenities like electricity, clean water, hygiene to the housing unit are required. Furthermore, communal areas and services such as health care, schools, and recreational area, whether inside the development or in the surrounding area, are ideal (JLL, 2016).

The cost of the house should be considered not only when determining the buyer's affordability, but also when determining the dwelling unit's maintenance expenditures. Lowering operational and maintenance expenses by including sustainable elements is critical to any affordable housing project's success (JLL, 2016).

House location: An inexpensive housing development should be placed near a comfortable commuting remoteness of work and have adequate public transportation connections. Housing plus transportation (H+T) affordability is substantially impacted if housing is created far away from significant workplace hubs or entails significant transportation expenditures to get to the city hub, even if the price of the residential units is low due to cheaper land costs. Key industrial nodes can also act as workplace hubs in the case of innovative houses (JLL, 2016).

SUGGESTIVE DEFINITION OF AFFORDABLE HOUSING

Income Categories	Minimum Volume of Habitation	Provision of Basic Amenities	Cost of the House	Location of the House
EWS	• 250 sq ft carpet area • 2,250 cu ft internal volume	• sanitation, adequate water supply and power • provision of community spaces and amenities such as parks, schools and healthcare facilities, either within the project or in the neighbourhood, depending upon the size and location of the housing project	• cost of the house such that EMI does not exceed 30–40% of net monthly income of the buyer • reasonable maintenance costs	• located within 20 km of a major workplace hub (could be suburban hubs as well) in the city • adequately connected to major public transport system
LIG	• 300–600 sq ft carpet area • 2,700–5,400 cu ft internal volume			
MIG	• 600–1,200 sq ft carpet area • 5,400–10,800 cu ft internal volume			

Source: JLL Research and REIS

Figure 8:Suggestive definition of affordable housing (JLL, 2016)

3.3 Policy Framework

Homes initiatives in the era after independence focused on providing immediate infrastructure and social subsidies. The first five-year plan introduced programs including the Industrial Workers' Subsidized Housing Scheme, as well as EWS and LIG housing projects (IDFC, 2018). Housing provision was seen as a top-down centralized effort in the 1950s and 1960s, primarily targeting LIGs. State housing boards were established in the 1960s to build and distribute houses. However, the desired objectives of these programs were not achieved (Tiwari & Rao, 2016) (IDFC, 2018).

The Indian government implemented plans such as the Environmental Improvement of Urban Slums project (1972) and the Sites and Services scheme in the 1970s and 1980s. By providing infrastructure and tenure for the poor, these initiatives signaled a transition in the State's role from direct housing provider to partner and enabler. With the establishment of the Housing and Urban Development Corporation in 1970 and the Housing Development Financing Corporation in 1977, housing finance received a boost as well (IDFC, 2018).

With the establishment of the National Housing Board (NHB) in 1987, the government's role and duty in the housing sector shifted during the Seventh Plan (1985-90). The government's attention has turned to raising funds for housing, acquiring and developing land, and providing low-cost homes to the poor. The government issued the first comprehensive National Housing Policy in 1988, emphasizing the authority's

responsibility as a facilitator in promoting private segment involvement in housing delivery. The government has functioned as a facilitator in the post-liberalization period, providing the appropriate legislative and financial framework for private engagement (IDFC, 2018) (Tiwari & Rao, 2016).

The Ninth Plan (1992-97) maintained the focus on direct interventions and the distribution of financial assistance to low-income and weaker sections. The Valmiki Ambedkar Awas Yojana was established in 2001 to give houses to Below Poverty Line groups. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM), the greatest central government project concentrating on metropolitan public services, was launched in 2005 by the Union government (IDFC, 2018). Apart from directly addressing housing through targeted interventions for low-income households in cities under the Basic Services to Urban Poor scheme, the Mission also pursued precise housing and land market distortions by amending or repealing harmful laws like the Urban Land Ceiling and Regulation Act of 1976 (ULCRA). Similarly, the Rajiv Awas Yojana (RAY) was launched by the Ministry of Housing and Urban Poverty Alleviation, Government of India, in 2013 under JNNURM (MoHUPA). This project aimed to supply slums with utilities and infrastructure, as well as slum rehabilitation and methods for the production of cheap homes to avoid slum expansion (IDFC, 2018).

To develop affordable housing, the following policies have been implemented by the Indian government.

National Urban Housing and Habitat Policy (NUHHP), 2007

This policy selected 'Affordable Housing for All' as a significant emphasis section for addressing issues that stymie long-term metropolitan growth. The program's main objectives are given below (JLL, 2016):

- Assisting EWS and LIG in gaining access to serviced land and houses.
- Both the commercial and public sectors should support land acquisition, development, and disposal.
- Establishing significant collaborations between the public, private, and cooperative sectors.
- Developing a sufficient leasing and title accommodation supply.

- Modernizing and enhancing energy and budget effectiveness, efficiency, and excellence through technology.

Jawaharlal Nehru National Urban Renewal Mission (JNNURM), 2005 – (BSUP and IHSDP)

JNNURM was established in December 2005 to instrument reorganization-determined, strategic city progress in a Mission mode, with an emphasis on improving municipal substructure, creating a supply of dwellings, and providing essential amenities for the underprivileged in cities, as well as ensuring public involvement and liability of Urban Local Bodies (ULBs). During the mission period (2005–2012), the main goal for the housing sector was to build 1.5 million dwellings for the urban poor in 65 mission cities (JLL, 2016).

- **Basic Services for the Urban Poor (BSUP):** The initiative is overseen by the Ministry of Urban Development. It aims to offer low-income sectors in the 65 targeted metropolises with seven entitlements or services: security of tenure, affordable housing, water, sanitation, health, education, and social security (JLL, 2016).
- **Integrated Housing and Slum Development Programme (IHSDP):** The goal is to take a holistic approach to enhance the economically marginalized residents' living circumstances who lack proper housing and live in deteriorating conditions. Except for cities and towns covered by the BSUP, the program applies since the 2001 census, to all urban areas. The Central Government and State Governments/ULBs/Beneficiaries would share funds in an 80:20 ratio (JLL, 2016).

Interest Subsidy Scheme For Housing The Urban Poor (ISHUP), 2008

Such initiative makes it simpler for LIG and EWS members to obtain housing in urban regions. It permits EWS and LIG sectors to receive interest subsidies to purchase or develop homes. The plan encourages poor people to take out loans from commercial banks or HUDCO for house construction and receive a 5% interest discount on credits a maximum of INR 1 lakh (JLL, 2018).

Rajiv Awas Yojana (RAY)

The Rajiv Awas Yojana (RAY), which was launched as a Centrally Sponsored Scheme (CSS) and will be realized in Mission mode for ghetto inhabitants and the impoverished of the city from 2013 to 2022, aims to create a "Slum-Free India" by inspiring to address the problem of favelas permanently. RAY's scope includes the growth, enhancement, and upkeep of basic amenities for the municipal underprivileged, such as clean water, sewage, drains, waste recycling, access, and interior roadways, and streetlights, community lavatories, and baths, as well as unorganized sector marketplaces and economic hubs, are examples of public amenities (JLL, 2016).

- **Affordable Housing in Partnership (AHIP):** This initiative encourages local governments, business sectors, private actors, and state governments to collaborate to increase the affordable housing supply. In affordable housing projects undertaken under various types of partnerships, including private partnerships, EWS/ LIG units of residence of size 21 to 40 square meters receive financial assistance for Rs. 75,000. Under the plan, developments with a minimum of 250 units of residence are entitled to financing (JLL, 2016).
- **Credit Risk Guarantee Fund (CRGF):** Under this plan, institutions interested in developing greater access to loans for LIG and EWS groups are approved for a loan of Rs. 8 lakhs with no security as a backup (JLL, 2016).

(Rs in Crore)

RAJIV AWAS YOJANA (RAY) : State wise Progress

[as on 29th June, 2020]

Sl. No.		State/UT	City/ Town Covered	Project Approved	FINANCIAL PERFORMANCE			PHYSICAL PERFORMANCE			ISSUES					
					Project Cost	ACA Committed	ACA Released	DUs Sanctioned	Construction Completed	DUs Occupied	DUs in Progress	Unoccupied DUs	Yet to Start DUs	ACA to be Claimed	ACA Recovery	UC Pending
1	States	Andhra Pradesh	2	2	87.19	41.26	32.87	1,617	79	79	1,538	-	-	24.83	-	15.28
2		Bihar	5	7	454.65	297.72	161.70	11,276	4,171	4,171	3,173	-	3,932	136.01	-	80.94
3		Chhattisgarh	1	1	13.60	6.09	6.42	300	300	300	-	-	-	-	0.33	-
4		Goa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5		Gujarat	13	25	1,737.17	451.46	315.08	30,494	23,612	19,216	2,774	4,396	4,108	141.56	-	43.46
6		Haryana	4	4	278.82	206.93	119.28	3,226	1,403	1,403	749	-	1,074	114.54	-	51.16
7		Himachal Pradesh	1	1	34.00	27.62	9.21	300	-	-	104	-	196	18.41	-	-
8		Jharkhand	3	4	212.74	97.15	73.40	3,931	2,841	2,757	145	84	945	23.75	-	38.64
9		Karnataka	10	23	1,185.34	638.77	529.59	23,125	20,955	18,075	1,898	2,880	272	109.17	-	92.72
10		Kerala	5	5	160.77	66.06	37.43	2,118	644	644	347	-	1,127	40.21	-	14.28
11		Madhya Pradesh	7	8	444.32	229.65	183.92	8,123	6,147	4,684	1,976	1,463	-	63.26	-	23.91
12		Maharashtra	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13		Odisha	4	16	582.08	290.16	170.03	11,235	4,108	1,986	3,129	2,122	3,998	153.41	-	30.26
14		Punjab	-	-	-	-	3.78	-	-	-	-	-	-	-	1.32	-
15		Rajasthan	16	27	1,078.79	450.07	278.17	21,908	12,841	9,443	3,858	3,398	5,209	171.90	-	115.46
16		Tamil Nadu	8	15	317.36	135.25	112.52	4,880	4,749	4,749	15	-	116	22.73	-	3.65
17		Telangana	1	1	58.75	22.25	62.38	1,198	-	-	334	-	864	13.35	40.13	8.90
18		Uttar Pradesh	16	18	576.99	279.22	172.07	8,409	5,221	5,221	153	-	3,035	106.55	-	95.67
19		Uttarakhand	10	10	186.67	128.80	107.48	3,130	1,448	1,448	789	-	893	33.43	-	55.22
20		West Bengal	3	3	28.09	15.05	11.58	472	192	192	250	-	30	7.77	-	5.58
Sub- total (States) :-			**109**	**170**	**7,437.33**	**3,383.50**	**2,386.92**	**1,35,742**	**88,711**	**74,368**	**21,232**	**14,343**	**25,799**	**1,180.89**	**41.79**	**675.12**
21	North East States	Arunachal Pradesh	4	4	95.52	77.39	77.39	1,536	-	-	1,536	-	-	-	-	-
22		Assam	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23		Manipur	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24		Meghalaya	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25		Mizoram	1	1	11.20	9.49	7.51	142	142	142	-	-	-	1.98	-	-
26		Nagaland	3	3	56.39	41.68	24.74	1,054	512	480	542	32	-	16.94	-	8.51
27		Sikkim	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28		Tripura	4	4	98.79	77.92	59.94	3,005	1,856	1,856	1,149	-	-	17.98	-	2.40
Sub- total (N.E. States) :-			**12**	**12**	**261.90**	**206.48**	**169.58**	**5,737**	**2,510**	**2,478**	**3,227**	**32**	**-**	**36.90**	**-**	**10.90**
29	Union Territories	A&N Island (UT)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30		Chandigarh (UT)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31		UT of DNH & DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32		Delhi (NCR)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33		J&K (UT)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34		Ladakh (UT)	1	1	22.22	15.98	11.56	369	62	62	15	-	292	4.41	-	5.30
35		Lakshadweep (UT)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36		Puducherry (UT)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub- total (UT) :-			**1**	**1**	**22.22**	**15.98**	**11.56**	**369**	**62**	**62**	**15**	**-**	**292**	**4.41**	**-**	**5.30**
Grand Total (RAY) :-			**122**	**183**	**7,721.45**	**3,605.96**	**2,568.06**	**1,41,848**	**91,283**	**76,908**	**24,474**	**14,375**	**26,091**	**1,222.20**	**41.79**	**691.32**

Figure 9:Rajiv Awas Yojana Progress (MoHUA, 2021)

External Commercial Borrowing For Commercial Housing

This scheme was approved in the Union Budget 2012–13. This has been done to ensure that the segment's borrowing costs are reduced. According to the regulations, it's possible that the ECB will have to act through the National Housing Bank (NHB), which might operate as a centralized structure to assist tiny business owners in obtaining the finance. Additionally, the administration might enable developers to seek such funds solely for certain projects in which the LIG and EWS State-Sponsored Initiatives receive a considerable part of the units (75–90%) (JLL, 2016).

Pradhan Mantri Awas Yojana (PMAY), 2015

While there have been attempts to construct low-cost housing for a long time, this scheme, which was established in 2015, provides it a fresh impetus. PMAY aims for ‘Housing for All’ with a combination of all previous schemes. The PMAY-U is expected to resolve a 20 million housing deficit. There are four parts to the mission.

- In-situ slum redevelopment (ISSR): This makes use of the land as a resource. Previous settlements on public and private land are being redeveloped, the project attempts to offer dwellings to eligible slum dwellers. Financial assistance amounting to Rs. 1 lakh is offered to state agencies for enactment and development under this initiative (JLL, 2018).
- Credit-linked subsidy scheme (CLSS): This facilitates effortless functional credit for the acquisition of dwellings with straightforward credited interest subsidy to the debtor's account routed via primary lending institutions. This reduces home loans and equated monthly installments (JLL, 2018).
- Affordable housing in partnership (AHP): To boost private partnership, monetary aid of Rs. 1.5 lakhs is offered to promote the EWS housing category in private developments (JLL, 2018).
- Beneficiary-led construction or enhancement (BLC): For the EWS/LIG, this program provides central help of INR 1.5 lakh per household for new buildings or extensions of existing homes (JLL, 2018).

प्रधान मंत्री आवास योजना-शहरी
Pradhan Mantri Awas Yojana-Urban

Pradhan Mantri Awas Yojana (Urban) - Housing for All (HFA)

State wise Progress (since 2014)

[as on 14th August, 2020]

Sr. No.		Name of the State/ UT	Project Proposal Considered	Physical Progress (Nos)			Financial Progress (Rs in Crore)		
				Houses Sanctioned	Houses Grounded*	Houses Completed*	Investment	Central Assistance	
								Sanctioned	Released
1	States	Andhra Pradesh	1,023	20,15,891	6,88,119	3,42,255	87,031.67	30,443.81	7,917.32
2		Bihar	505	3,59,280	2,01,669	72,555	19,339.39	5,581.09	1,952.06
3		Chhattisgarh	1,639	2,57,886	2,07,049	99,147	10,946.99	3,933.12	1,902.84
4		Goa	10	1,240	1,182	1,181	276.10	28.05	27.51
5		Gujarat	1,350	6,93,111	6,03,912	4,22,875	64,535.33	12,458.92	8,250.90
6		Haryana	538	2,73,840	54,556	27,611	27,312.40	4,399.91	934.95
7		Himachal Pradesh	159	10,656	8,838	3,798	607.63	188.39	96.00
8		Jharkhand	388	2,01,825	1,49,767	82,054	12,900.47	3,052.74	1,759.80
9		Karnataka	2,603	6,57,740	4,10,002	1,87,290	43,213.66	10,505.67	3,862.04
10		Kerala	510	1,20,983	1,07,034	78,425	5,899.22	1,939.11	1,297.02
11		Madhya Pradesh	1,463	7,99,900	6,97,116	3,39,476	41,564.55	12,553.78	7,074.82
12		Maharashtra	1,014	12,34,231	5,81,875	3,45,387	1,19,474.93	19,676.47	7,075.17
13		Odisha	616	1,56,384	1,10,939	72,878	6,093.67	2,454.04	1,195.09
14		Punjab	885	96,742	54,148	29,102	5,092.39	1,544.49	583.64
15		Rajasthan	404	2,12,587	1,26,414	1,01,275	14,696.55	3,621.88	1,654.53
16		Tamil Nadu	3,454	6,82,462	5,49,389	3,08,385	40,231.06	10,636.15	5,409.60
17		Telangana	286	1,95,072	1,86,963	1,21,448	20,738.68	3,222.17	2,077.50
18		Uttar Pradesh	4,286	17,47,926	12,29,367	6,00,680	77,053.75	26,900.76	10,827.35
19		Uttarakhand	209	39,084	22,651	15,932	2,959.08	727.37	410.28
20		West Bengal	466	4,66,988	3,50,281	2,09,723	23,324.67	7,269.02	3,649.99
Sub- total (States) :-			**21,808**	**1,02,23,828**	**63,41,271**	**34,61,477**	**6,23,292.22**	**1,61,136.94**	**67,958.40**
21	North East States	Arunachal Pradesh	48	7,262	7,214	2,862	419.79	163.50	109.91
22		Assam	340	1,22,089	63,239	20,691	3,755.43	1,839.34	939.69
23		Manipur	37	50,154	33,031	4,364	1,280.94	752.70	237.08
24		Meghalaya	36	4,702	1,606	1,025	182.24	70.98	7.08
25		Mizoram	44	35,222	11,815	3,448	767.05	538.37	119.45
26		Nagaland	64	32,002	21,290	4,193	935.28	505.96	166.37
27		Sikkim	11	553	525	260	17.50	8.54	3.68
28		Tripura	82	85,591	62,658	42,955	2,570.31	1,342.33	798.83
Sub- total (N.E. States) :-			**662**	**3,37,575**	**2,01,378**	**79,798**	**9,928.54**	**5,221.72**	**2,382.09**
29	Union Territories	A&N Island (UT)	4	1,168	37	21	202.50	17.54	0.47
30		Chandigarh (UT)	-	651	5,611	5,611	155.32	14.59	14.59
31		UT of DNH & DD	9	6,398	5,929	3,815	474.36	122.48	100.53
32		Delhi (NCR)	-	20,200	60,780	44,180	4,156.63	456.91	456.91
33		J&K (UT)	332	55,088	29,703	8,569	2,999.05	831.85	192.03
34		Ladakh (UT)	8	1,777	910	370	84.99	36.67	17.28
35		Lakshadweep (UT)	-	-	-	-	-	-	-
36		Puducherry (UT)	30	13,645	14,398	3,793	653.13	208.28	115.18
Sub- total (UT) :-			**383**	**98,927**	**1,17,368**	**66,359**	**8,725.97**	**1,688.31**	**896.99**
Grand Total :-			**22,853**	**1.07 Cr.**	**66.60 Lakh**	**36.08 Lakh**	**6.42 Lakh Cr.**	**1.68 Lakh Cr.**	**71,237 Cr.**

* *Included incomplete houses of earlier NURM.*

सबका सपना, घर हो अपना

Figure 10:Pradhan Mantri Awas Yojana Progress (MoHUA, 2021)

4. Public-Private Partnership

The government must intervene through policy reforms and financial support to reduce the obstacles facing India's affordable housing scenario. Various policy improvements have previously been discussed in the preceding section, as well as how they have aided in the resolution of housing shortage challenges. One of the greatest barriers is the soaring price of the property, this is the outcome of several factors. Another key problem that developers/builders confront in creating affordable housing is land financing. Land remains underutilized due to a lack of renovation and downzoning of accessible property, supporting property scarcity and high land prices (MoHUA, 2017).

While there is little opportunity for guiding privately owned property towards low-cost, affordable housing, appropriate Public-Private Partnership (PPP) arrangements are employed to entice the private sector to follow suit (MoHUA, 2017). In return for permission to utilize the property more intensively or license to achieve higher housing, attempts have been made to divert private property for housing affordability. Awards and incentives from the government, as well as PPP initiatives, can be used to unlock undeveloped or underdeveloped pieces of government and privately owned land for affordable housing (MoHUA, 2017).

However, the success of such collaborations as a system execution technique and authority involvement hinges on the proper distribution of risks, duties, incentives, and penalties among the many parties. Any PPP strategy's crucial aspect is risk allocation. The ideal directive is one where consequences are delegated to someone who can handle them in a better way. It is anticipated that such a risk distribution will not only result in the greatest potential program and project results but also at the lowest feasible cost. This ought to result in high-quality results at low costs. PPP contracts that are splendidly constructed and balanced are thus best in answering affordable housing concerns (MoHUA, 2017).

4.1 Improved Gateway to Affordable Land

Concerns about low-cost housing are centered on the availability and pricing of well-located land. Land expenses can range from 20% to 60% of the entire project cost, depending on the project location. However, the possibility of repurposing privately owned land to provide low-cost housing is limited. The private sector might perhaps be

rewarded by implementing the below tactics through proper PPP arrangements (MoHUA, 2017).

- **Private Land for an inexpensive home in trade for authorization for additional rigorous use of land:** As part of this approach, the government makes attempts for capturing plus commercialize the aforementioned authority to control property utilization. The administration demands that land or additional property be given for the construction of a reasonably priced shelter in exchange for allowing private sector firms to use land parcels in more advantageous ways. This category includes all initiatives that pursue to deal better FAR/FSI awarded to the privatized domain. This scheme forces privatized domains to use the profits from better FAR/FSI towards enhancement of cheap accommodation (MoHUA, 2017)

- **Reserved Property for low-cost accommodation in trade for consent to construct elevated accommodation:** As a prerequisite of being allowed to build high-end housing with a successful market, private sector builders must provide affordable housing. It is safe to infer that in these circumstances, the developer will successfully fulfill a considerable fraction of the "onus" of building inexpensive accommodation for the high-end component of the project's customers. As a result, higher-income customers will effectively supply affordable housing to low-income customers through a cross-subsidy developed under this PPP model (MoHUA, 2017).

- **By releasing underutilized/unused pieces of state property, state property can be used for cheap housing:** It is a strategy to increase the amount of land accessible for the construction of inexpensive shelter. Several divisions and organizations of the state administrations possess enormous swaths of property that are much more than their needs for the foreseeable future, are underutilized, and are frequently encroached upon illegally. Such lands can be brought under affordable housing through a systematic strategy and effort, and then made inexpensively accessible to the private market for the construction of low-

income housing developments using private money and expertise within suitable PPP agreements (MoHUA, 2017).

- **Reconstruction of underused metropolitan centers can provide land for cheap homes:** Slums now encompass enormous swaths of some of the world's most costly land in metropolises like Kolkata, Mumbai, and Delhi. Even when the site is privately owned and developed, a substantial number of dilapidated single and double-story tenements with CI sheet roofs are common. These constructions are more akin to improvised temporary structures than luxury metropolitan structures (MoHUA, 2017). Program blockages, outmoded property use limitations, lease management statutes, and property ownership challenges are frequently the cause of such weak and inadequate use of privately held metropolitan areas. Affordable housing, commercial structures, and high-end homes can all be created as part of these redevelopment initiatives (MoHUA, 2017). Redevelopment is a win-win technique in which all parties benefit from more efficient and effective use of limited land resources. In such projects, public-private partnerships make it possible to achieve a state-of-the-art kind of project by utilizing the knowledge of state authorities and private players together (MoHUA, 2017). Administrations perform a market-maker responsibility by offering supervisory mistakes and acting as a mediator and honest negotiator, which helps to build faith and commitment among proprietors of tiny plots of land and properties and occupants to take part in revitalization projects with big designers (MoHUA, 2017).

- **Change of Land Use (CLU) of Agricultural Lands:** The aforementioned options are led by government initiatives and can contribute significantly to the challenge of diverting additional property to inexpensive housing. Nonetheless, the scale of the reasonable shelter dilemma in India, like destitution, has been a far bigger problem. It'll never be dealt with exclusively based on a beneficiary-centered, particular scenario perspective (MoHUA, 2017).

  The cost of land in prime locations must fall to levels that allow India's low-income and poor residents to engage in the market. The government may create a conducive environment for a huge expansion in the quantity of land and

substantially solid growth of communities and associated infrastructure, lowering land prices to affordable levels, by implementing a regulated but uncomplicated and reasonable process of land-use modification (MoHUA, 2017).

The government's duty would be to produce transparent and sacrosanct master plans. Changes in land use should not be authorized or required on a case-by-case basis. Government regulatory duties should be separated from development functions and combined with planning functions. Most significantly, governments must take the lead in enabling people to live productive lives by providing trunk infrastructures such as roads, water, sewage, power, and public transportation (MoHUA, 2017). This would be the optimum strategic Public-Private Partnership, capable of addressing the core causes of the affordable housing crisis. Furthermore, the facilities for connections can be supplied through a mix of correctly organized PPP and public sector projects. Infrastructure PPP initiatives can be conducted as stand-alone projects or in conjunction with affordable housing projects (MoHUA, 2017).

Another PPP technique for addressing the difficulties of affordable housing is to reduce expenses through increased efficacy in building and procedures. Through the utilization of modern, effective organization, and building techniques, the personal segment can be projected to bring efficacy improvements in land advancement, construction, operations, and repair for affordable housing. Furthermore, major projects and a higher number of private partners can be expected to deliver economies of scale to the private sector. Projects that are delivered at a reduced cost and with fewer costs and time overruns may assist to improve the provision of inexpensive housing. PPP projects must be structured in such a way that suitable benefits for successful results by the private sector partner are created to accomplish these positive outcomes (MoHUA, 2017).

4.2 Risks for PPP and Methods for Elimination

It is critical to executing the execution strategy, interference between many stakeholders, allocation of tasks, responsibilities, and risks to accomplish the needed success of the provided plan. Undeniably, the PPP strategy's defining element is risk allocation.

Concerns must be delegated to the group ideally prepared to handle them, according to the golden rule. It is expected that such a risk allocation will not only result in the greatest potential system and scheme results nevertheless, the lowest feasible cost. As a consequence, elevated outcomes should be achieved at a cheap cost (MoHUA, 2017).

Recognizing the risks of delays and cost overruns in an affordable housing PPP project, lowering the risk through rigorous designing, scheduling, and financing of a project, finally distributing the concerns and issues to one of the stakeholders or the development authority via a legal contract result in smart risk management. The task for defining the allottees who are qualified appears to be best handled by the government, at least on the surface (MoHUA, 2017).

However, even the best-allocated risks will not produce benefits unless they are strictly enforced. The enforcement of risk allocation arrangements necessitates that the arrangements be entrenched in contracts with legal standing, defining the penalties of non-implementation of commitments as well as the methods for enforcing them under local law (MoHUA, 2017).

A risk matrix highlights and illustrates the common hazards that must be considered while implementing various PPP strategies for affordable housing. The Risk Matrix demonstrates that threats may be minimized to the greatest degree feasible and divided between the numerous authorities (MoHUA, 2017).

Planning and design, protection and repair, finance, ecology, and procurement of land are only a few of the threats. Offtake Risk is one of the major risks encountered by affordable housing initiatives, and it deserves special attention. Even though there is a severe lack of inexpensive accommodation, the vacancy rate is still very likely to stay. This is frequently owing to the site of a low-cost house, which is inaccessible to necessities and sources of income. The inadequate condition of reasonable accommodation buildings may also deter qualified recipients from acknowledging the allocation (MoHUA, 2017).

Better sharing the offtake issues among individual authorities and government agencies would prove beneficial. Engaging individual segment contractors in offtake risk management has the potential to improve outcomes. When a qualifying allottee accepts the allotment, a reasonable extra compensation could be provided to the

individual contractor for each dwelling group. After conducting a fair demand assessment, this risk-sharing amongst both sectors might create encouragements for the creation of inexpensive homes in acceptable places (MoHUA, 2017). It also provides a suitable enticement for the individual division associate to assure high-class shelter supply construction. This will provide individual contractors with a hedge of their level and result in excellent results. To limit the danger of idle stock, the civic agency should additionally safeguard the existence of higher-order development on the designated location (MoHUA, 2017).

As a result, this Risk Matrix can shed light on potential contract designs for various forms of PPP developments for reasonable homes and aid in the development of agreements that incorporate such blueprints (MoHUA, 2017).

4.3 Implementation Models

With potential hazards and mitigation techniques, the implementation models strive to meet the goals of affordable housing. The models also consider how primary advantage is represented, as well as how potential risks are allocated among multiple shareholders. In all models, land should have clear titles and be free of any encumbrances (MoHUA, 2017).

Model 1: Government-land Based Subsidized Housing (GLSH)

Individual contractors are allotted land as per governmental agencies' offers which acts as a government incentive. Individual contractors are responsible for planning, constructing, and budgeting the development based on defined criteria and a fixed price with a limited period. On acceptable completion and handover of the units, based on stipulated criteria, finance, and period, the public body would reimburse the private developer for the housing stock. The fee to the individual contractor depends on development growth as measured by milestones (MoHUA, 2017). The Public Authority should create specified objectives based on the accomplishment of specified outputs, with a landmark fee reflecting the job's worth completed and deliverables accepted. The Concessionaire Contract would have to identify the deliverables that must be

completed or delivered to achieve the target, as well as the condition that they are accepted as a term of payment. Payment can be arranged depending on the percentage of work completed for parts of contracts that do not have specified milestones (MoHUA, 2017).

At the time of handover, there is a payment of the fixed amount for the housing segment made by the allottees. Alternatively, the Allottees might be obliged to pay the public authority specified equivalent monthly amounts for a predetermined length of time (MoHUA, 2017). As a result, the government has the obligation and risk of cost recovery. The responsibility and entitlement of the civic organization will be to determine the eligibility of beneficiaries. Before the scheme's execution, the same will be announced. The allottees would be chosen transparently and equitably from among the eligible beneficiaries by the public authority. This might be achieved by the collaboration of municipal bodies, civic society, and non-governmental organizations (MoHUA, 2017).

Following the handover of units to allottees, no private developer or governmental entity is involved in the upkeep of the units. For the care of common amenities and public spaces inside the Group Housing premises, a Resident Welfare Association (RWA) may be formed, with members from all economic classes of residents (MoHUA, 2017).

Public authorities are assigned housing stocks by private developers. For this aim, housing finance organizations might make loans to allottees at a reasonable rate of interest and for a reasonable period. Through a single nodal agency (NHB/HUDCO), an interest subsidy for allottees might be integrated into a financial subsidy system (MoHUA, 2017).

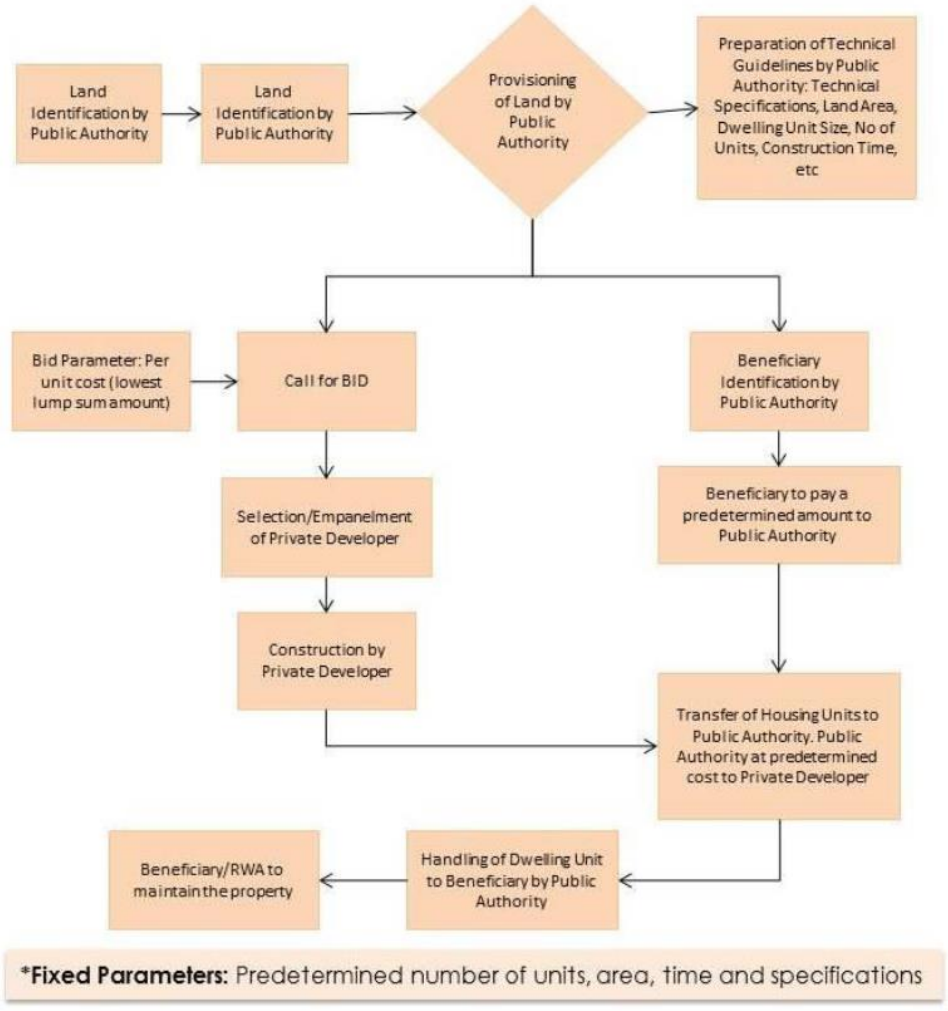


Figure 11:GLSH activity flowchart (MoHUA, 2017)

Important Characteristics

Technical guidelines: The public authority must establish technical guidelines for project execution that include technical specifications, property vicinity, apartment component dimensions, number of apartments, development period, and any other relevant information (MoHUA, 2017).

Design-Build and Finance: The private sector will be responsible for planning, constructing, and funding low-income housing stock and related services to defined criteria, at a specified price, and within a specified time frame (MoHUA, 2017).

Maintenance by the Beneficiary: Following the handover of units to allottees, neither the private sector nor the government is involved in the maintenance of the units. For the care of common amenities and public spaces inside the Group Housing premises,

a Resident Welfare Association (RWA) may be formed, with members from all economic classes of residents (MoHUA, 2017).

Public Agency to recompense the Private Segment Collaborator: The civic corporation agrees to reimburse the individual contractor for the accommodation stock through a milestone-based payment plan if the units are completed and handed over according to the stipulated specifications, costs, and timelines. As a result, the government has the obligation and risk of cost recovery (MoHUA, 2017).

Beneficiary Identification by Public Authorities: The government will be responsible for determining whether or not recipients are eligible. Before the project's execution, the same will be announced. The government would choose the allottees fairly and equitably from among the qualified beneficiaries. This might be accomplished either precisely by state authorities or in partnership with civil society and non-governmental organizations (MoHUA, 2017).

Distribution: The private sector will surrender the housing stock to a government department or agency that the government has designated (MoHUA, 2017).

Payments by Allottees: At the time of handover, there is a payment of the fixed amount for the housing segment made by the allottees. Alternatively, the Allottees might be obliged to pay the public authority specified equivalent monthly amounts for a fixed period. The public authority's one-time pay or equated monthly installments will be escrowed to a private business (MoHUA, 2017).

Financial Assistance to Allottees: For this aim, corporations that fund development or other agents might make loans to allottees at a reasonable rate of interest and for a reasonable period. A financial subsidy system might also include an interest subsidy for allottees (MoHUA, 2017).

Public-Private Partnerships for Trunk Infrastructure: The public sector will have responsibility for the trunk infrastructure and connections. The government, on the other hand, may finance and implement the project directly or via distinct PPP provisions (MoHUA, 2017).

Risk Sharing: Government takes the accountability for the property, subsidies, and higher development, whereas individual contractors are accountable for accomplishment. Financial entities – public or private – or government agencies take the risk of giving the appropriate loan to the allottee (MoHUA, 2017).

Bid Parameter: In this case, a smart bidding approach would be to choose the private developer based on the bid parameter of per-unit cost. Before construction, the number of dwelling units to be given, as well as the area, technical specifications, and construction time frame, would need to be determined (MoHUA, 2017).

Risks	Risk Allocation			
	Government	Private Developers	Financial Institution	Beneficiary
Land	■			
Design	■	■		
Construction		■		
Maintenance				■
Financing		■		
Cost Recovery	■			
Off-take	■	■		
Trunk Infrastructure	■			
Credit Risk			■	

Table 1:Risk Matrix for GLSH adopted from MoHUA (MoHUA, 2017)

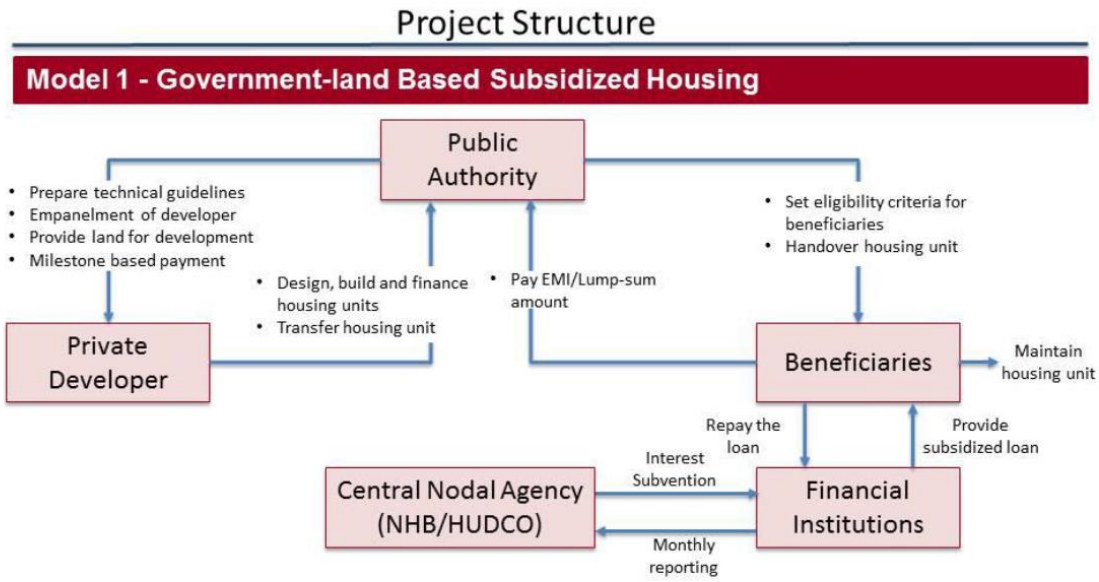


Figure 12:Stakeholder roles and responsibilities GLSH (MoHUA, 2017)

Model 2: Mixed Development Cross-subsidized Housing (MDCH)

The developer isn’t compensated by the government for producing an affordable dwelling supply is the striking variation from the previous model. Instead, individual contractors are permitted to construct a quality dwelling on the given property and sell them later. The individual contractor is permitted to use all of the government-owned lands for quality dwelling in return for providing low-cost dwellings in a different site, on property arranged by the private developer, as long as the other land's characteristics are similar to those provided by the government (MoHUA, 2017). Higher FAR/FSI shall be determined by the prevailing legislative conditions/provisions in the case of Transfer of Development Rights (MoHUA, 2017).

Value generation for the individual contractor may be additionally be improved via granting greater TDR, FAR, and fast-paced permissions for high-end home buildings. The private developer will be forced to give free affordable homes in exchange for all of this value creation. A compensation package by the Public Authority for each dwelling approved and compensated by the owner who qualifies may be included in the agreement to motivate the private developer to share hazards and to reward the development of the top standard, attractive layout, supply of dwelling units on schedule, and any other terms of the contract (MoHUA, 2017).

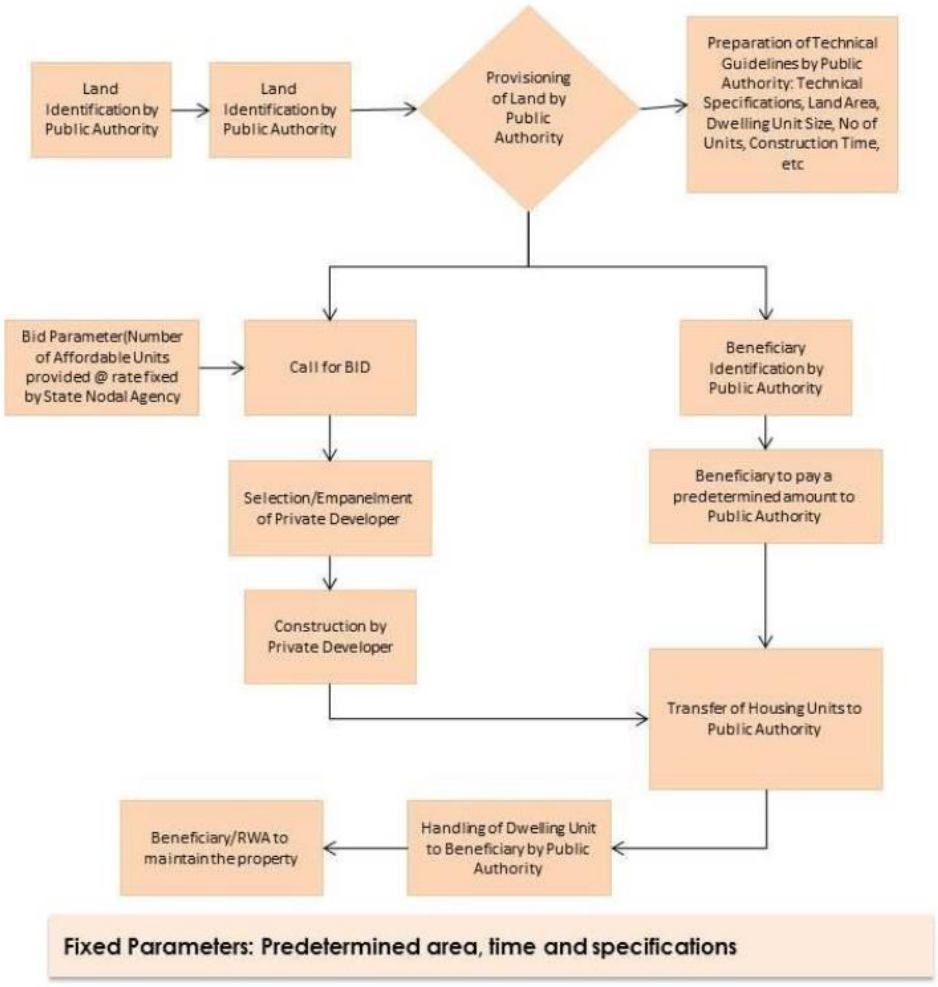


Figure 13:MDCH activity flowchart (MoHUA, 2017)

Important Characteristics

Land as Subsidy: Under this approach, public authorities will lease land to a selected private developer for a fair time (ideally at a nominal lease rental) that coincides to the duration of the contract. It'd be state funding for businesses. (MoHUA, 2017).

Technical guidelines: The public authority must establish technical procedures for development execution that include technical specifications, property vicinity, apartment component dimensions, number of apartments, development period, and any other relevant information (MoHUA, 2017).

Design-Build and Finance: The private sector will be responsible for planning, constructing, and funding low-income housing stock and related services to defined criteria, at a specified price, and within a specified time frame (MoHUA, 2017).

Maintenance by the Beneficiary: Following the handover of units to allottees, neither the private sector nor the government is involved in the maintenance of the units. For the care of common amenities and public spaces inside the Group Housing premises, a Resident Welfare Association (RWA) may be formed, with members from all economic classes of residents (MoHUA, 2017).

Expense Retrieval by Private Segment Collaborator: The individual contractor yearns to recoup the price of cheap accommodation by generating income from high-end housing that is built as a side project (MoHUA, 2017).

Beneficiary Identification by Public Authorities: The government will be responsible for determining whether or not recipients are eligible. Before the project's execution, the same will be announced. The government would choose the allottees fairly and equitably from among the qualified beneficiaries. This might be accomplished either precisely by state authorities or in partnership with civil society and non-governmental organizations (MoHUA, 2017).

Distribution: The private sector will surrender the housing stock to the government or an agency designated by the government (MoHUA, 2017).

Payments by Allottees: At the time of handover, there is a payment of the fixed amount for the housing segment made by the allottees. Alternatively, the Allottees might be obliged to pay the public authority specified equivalent monthly amounts for a fixed period (MoHUA, 2017).

Financial Assistance to Allottees: For this aim, corporations that fund development or other agents might make loans to allottees at a reasonable rate of interest and for a reasonable period. A financial subsidy system might also include an interest subsidy for allottees (MoHUA, 2017).

Public-Private Partnerships for Trunk Infrastructure: The public sector will have responsibility for the trunk infrastructure and connections. The government, on the other hand, may finance and implement the project directly or via discrete PPP measures (MoHUA, 2017).

Risk Sharing: Government takes the responsibility for the property, subsidies, and higher development, whereas individual contractors are accountable for accomplishment. Financial entities – public or private – or government agencies take the risk of giving the appropriate loan to the allottee (MoHUA, 2017).

Bid Parameter: Rates are set by the State Nodal Agency, which assists in the delivery of low-cost housing on a given site. It is the bidding criteria used to accomplish the state authorities' primary aim of maximizing low-cost housing. For each dwelling unit, it would be required to pre-determine the space, technical requirements, and building time frame, among other things (MoHUA, 2017).

Risks	Risk Allocation			
	Govern-ment	Private De-velopers	Financial Institution	Beneficiary
Land				
Design				
Construction				
Maintenance				
Financing				
Cost Recovery				
Off-take				
Trunk Infrastructure				
Credit Risk				

Table 2:Risk Matrix for MDCH adopted from MoHUA (MoHUA, 2017)

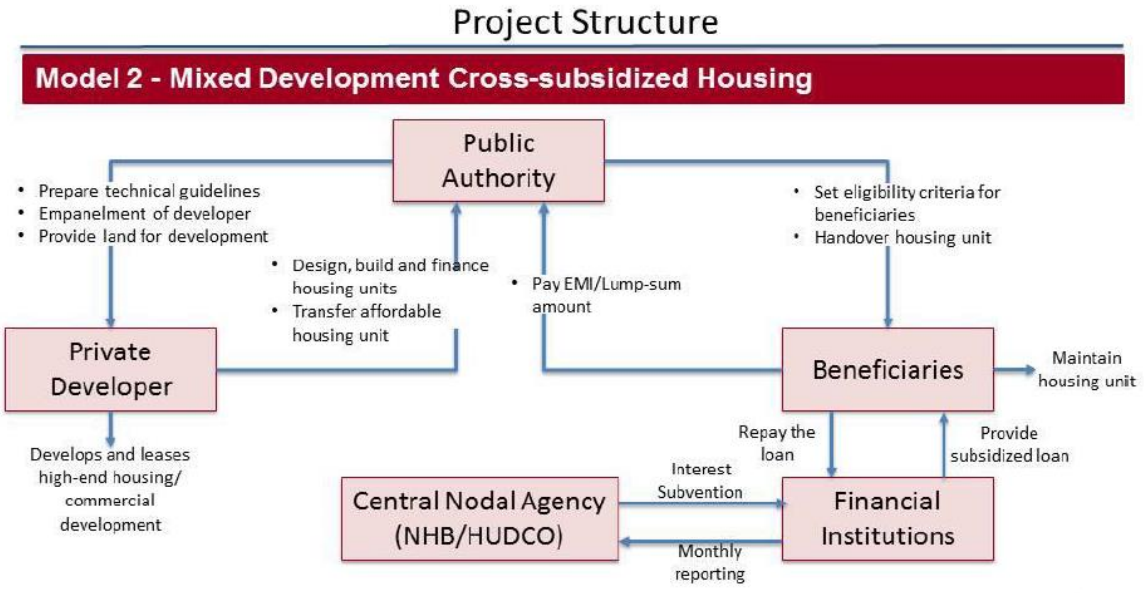


Figure 14:Stakeholder roles and responsibilities MDCH

Model 3: Annuity Based Subsidized Housing (ABSH)

The government will give the land in this model. The main difference in this model is that as an alternative to receiving a flat amount payment when it comes to handing it away, the contractor would get income from the administration as recurring annuity fees for some period (up to 10 years). This long-term relationship with the development will also oblige the contractor to uphold the properties throughout that time and return the apartment units to the municipal segment or its applicants (MoHUA, 2017). The quality of the upkeep will be monitored by the government, and incentives and punishments will be tied to the tenants' long-term satisfaction with the service. These incentives and penalties will be reflected in the annual annuity payments (MoHUA, 2017).

The major goal of this approach is to transfer the maintenance risk to the private sector in addition to the building risk. Also, because the developer is now responsible for the asset's long-term performance, it is predicted that the building quality would increase. Furthermore, under this approach, the government's duty to reimburse the Developer is stretched out over a long period due to the annuity structure (MoHUA, 2017). Of course, the developer would retain responsibility for generating and servicing the financial investment. Individual developers are given incentives by the government for each unit that has been approved and paid for by the allottee. This is done to inspire contractors to continue their outstanding job of improved quality development, enhanced design, and project completion within a specified time frame (MoHUA, 2017).

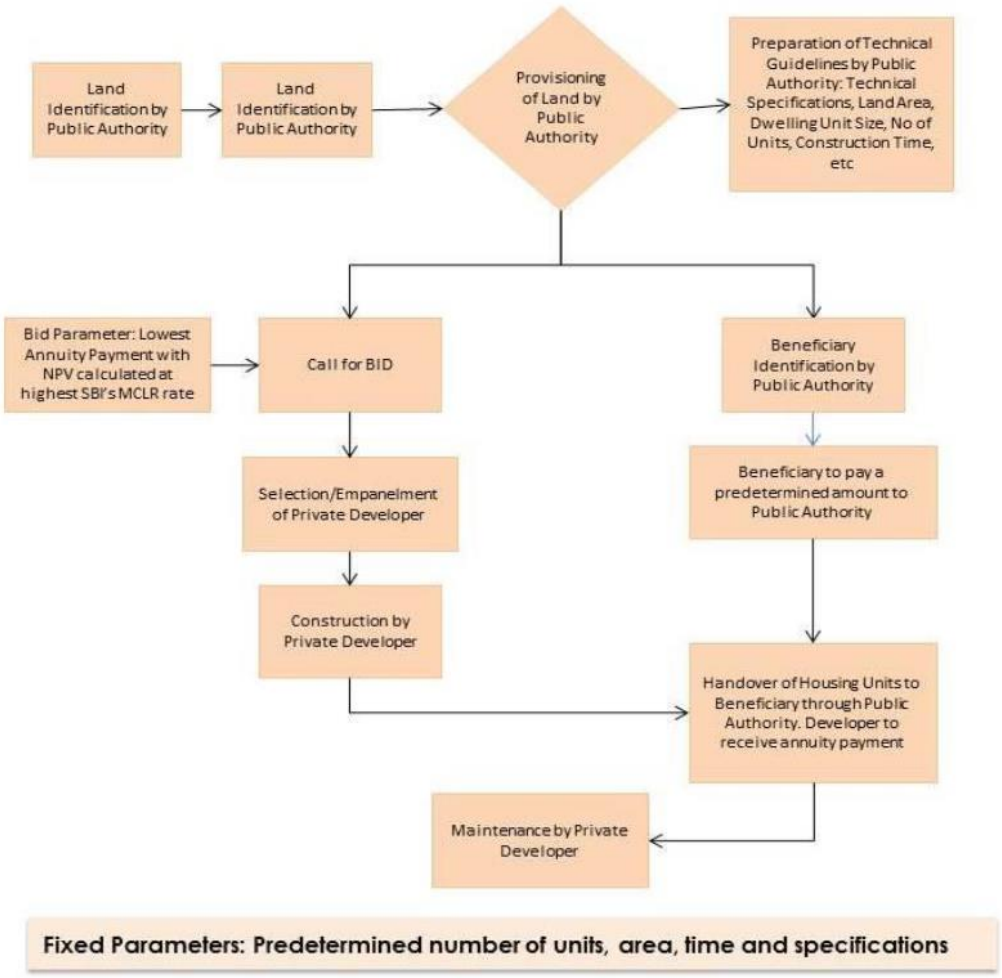


Figure 15:ABSH activity flowchart (MoHUA, 2017)

Important Characteristics

Land as Subsidy: In this approach, public authorities would offer land to the selected private developer on a long-term lease that will run concurrently with the agreement duration. This would essentially be a government subsidy for the enterprise (MoHUA, 2017).

Technical guidelines: The public authority must establish technical guidelines for project execution that include technical specifications, property vicinity, apartment component dimensions, number of apartments, development period, and any other relevant information (MoHUA, 2017).

Design-Build and Finance: The private sector will be responsible for planning, constructing, and funding low-income housing stock and related services to defined criteria, at a specified price, and within a specified time frame (MoHUA, 2017).

Private Developer accountable for Maintenance: The individual contractor is in charge of not only the construction of the housing units but also their medium- to long-term maintenance. If maintenance criteria are not maintained, annuity fees to the personal division may be affected. Because the annuity term is long (up to ten years) and the developer's maintenance duties are passed to him, and they are permitted to include such expenses in the development expenditure and the annuity calculated appropriately (MoHUA, 2017).

Public Agency to recompense the Private Segment Partner: The civic corporation agrees to reimburse the individual contractor for the accommodation stock through a milestone-based payment plan if the units are completed and handed over according to the stipulated specifications, costs, and timelines. The expense retrieval would take the shape of a public authority annuity fee to the individual contractor (MoHUA, 2017).

Beneficiary Identification by Public Authorities: The government will be responsible for determining whether or not recipients are eligible. Before the project's execution, the same will be announced. The government would choose the allottees fairly and equitably from among the qualified beneficiaries. This might be accomplished either precisely by state authorities or in partnership with civil society and non-governmental organizations (MoHUA, 2017).

Distribution: The private sector will surrender the housing stock to the government or an agency designated by the government (MoHUA, 2017).

Payments by Allottees: At the time of handover, there is a payment of the fixed amount for the housing segment made by the allottees. Alternatively, the allottees might be obliged to pay the public authority specified equivalent monthly amounts for a fixed period. The public authority's one-time pay or equated monthly installments will be escrowed to a private business (MoHUA, 2017).

Financial Assistance to Allottees: For this aim, corporations that fund development or other agents might make loans to allottees at a reasonable rate of interest and for a reasonable period. A financial subsidy system might also include an interest subsidy for allottees (MoHUA, 2017).

Public-Private Partnerships for Trunk Infrastructure: The public sector will have responsibility for the trunk infrastructure and connections. The government, on the

other hand, may finance and implement the project directly or via distinct PPP provisions (MoHUA, 2017).

Risk Sharing: Government takes the accountability for the property, subsidies, and higher development, whereas individual contractors are accountable for accomplishment. Financial entities – public or private – or government agencies take the risk of giving the appropriate loan to the allottee (MoHUA, 2017).

Bid Parameter: The annuity sum required charged annually would be the bid parameter in this situation. The government's annuity payments to the private developer for project costs will consist of the following:

Payment of the construction costs, as well as the interest element of the credit taken out by the individual contractor to fulfill the grant's construction cost component, and/or payment of any additional overhead expenditures (MoHUA, 2017).

The bidder that offers the lowest annuity amount is the chosen bidder. The NPV period should be determined by the public authority, with annuity interest computed at the highest Marginal Cost of Lending Rate of the State Bank of India (SBI) (MCLR). Of course, the number of dwelling units to be given, as well as the area, technical requirements, and construction time frame, would have to be determined a priori (MoHUA, 2017).

Risks	Risk Allocation			
	Government	Private Developers	Financial Institution	Beneficiary
Land	■			
Design		■		
Construction		■		
Maintenance		■		
Financing		■		
Cost Recovery	■	■		
Off-take	■	■		
Trunk Infrastructure	■			
Credit Risk			■	

Table 3:Risk Matrix for ABSH adopted from MoHUA (MoHUA, 2017)

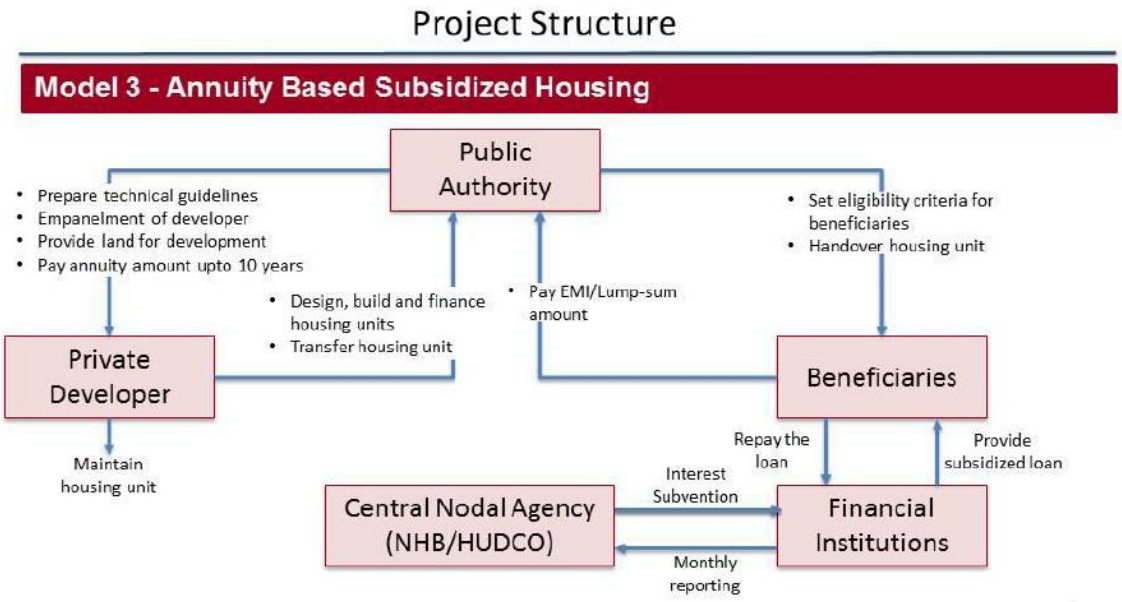


Figure 16:Stakeholder roles and responsibilities ABSH (MoHUA, 2017)

Model 4: Annuity cum Capital Grant based Subsidized Housing (AGSH)

During the construction phase of a project, the individual contractor receives a significant portion of the contract, around 40 to 50 percent. The balance as an endowment for up to ten years after the project is completed successfully. Because the developers will also get a capital grant, the annuity amount will be smaller in this model than in Model 3. The grants given to the developer are based on project targets (MoHUA, 2017). Payment can be arranged depending on the percentage of work completed for parts of contracts that do not have specified milestones (MoHUA, 2017).

Developers will continue to be responsible for both construction and upkeep, and their compensation will be heavily influenced by the asset's long-term success. The annuity payments are contingent on the asset's performance and the supply of maintenance services (MoHUA, 2017). Individual developers are given incentives by the government for each unit that has been approved and paid for by the allottee. This is done to inspire contractors to continue their outstanding job of improved quality development, enhanced design, and project completion within a specified time frame. However, to the degree that the government would fund a portion of the building costs, the private sector's financing costs and risk will be lowered. This is also projected to reduce the project's overall cost (MoHUA, 2017).

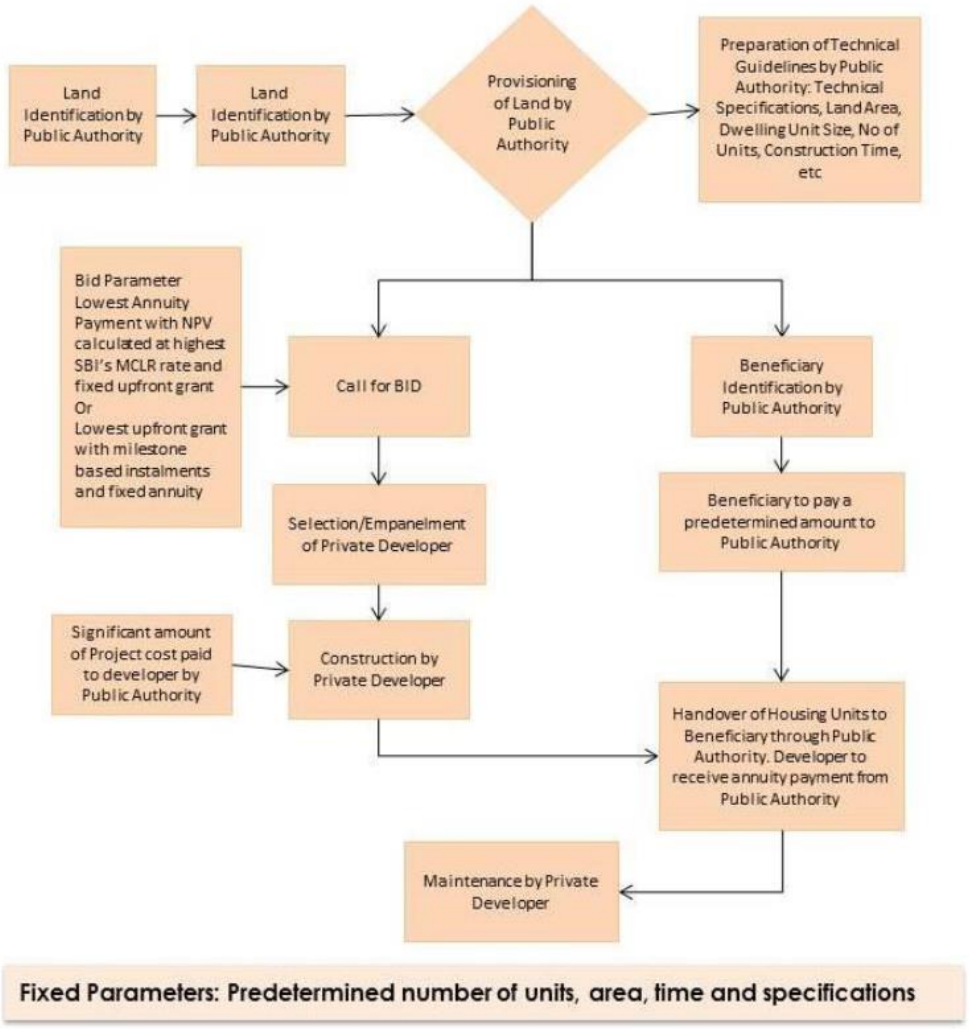


Figure 17:AGSH activity flowchart (MoHUA, 2017)

Important Characteristics

Land as Subsidy: Land will be granted to the selected private developer on a long-term lease (ideally at a minimal lease fee) by public authorities, which will run concurrently as per contract duration. This would essentially be a government subsidy for the enterprise (MoHUA, 2017).

Technical guidelines: The public authority must establish technical guidelines for project execution that include technical specifications, property vicinity, apartment component dimensions, number of apartments, development period, and any other relevant information (MoHUA, 2017).

Design-Build and Finance: The private sector will be responsible for planning, constructing, and funding low-income housing stock and related services to defined criteria, at a specified price, and within a specified time frame (MoHUA, 2017).

Maintenance by the Individual Contractor: The contractor is responsible not just for the building housing units, but also for their medium- to long-term upkeep. If maintenance criteria are not maintained, annuity payments to the private sector may be affected (MoHUA, 2017).

Public Agency to recompense the Private Segment Partner: The civic corporation agrees to reimburse the individual contractor for the accommodation stock through a milestone-based payment plan if the units are completed and handed over according to the stipulated specifications, costs, and timelines. The expense retrieval would take the shape of a public authority annuity fee to the individual contractor (MoHUA, 2017).

Beneficiary Identification by Public Authorities: The government will be responsible for determining whether or not recipients are eligible. Before the project's execution, the same will be announced. The government would choose the allottees fairly and equitably from among the qualified beneficiaries. This might be accomplished either precisely by state authorities or in partnership with civil society and non-governmental organizations (MoHUA, 2017).

Distribution: The private sector will surrender the housing stock to the government or a government-designated organization (MoHUA, 2017).

Payments by Allottees: At the time of handover, there is a payment of the fixed amount for the housing segment made by the allottees. Alternatively, the Allottees might be obliged to pay the public authority specified equivalent monthly amounts for a fixed period. The public authority's one-time pay or equated monthly installments will be escrowed to a private business (MoHUA, 2017).

Financial Assistance to Allottees: For this aim, loans with a reasonable rate of interest and a reasonable period might be made accessible to allottees through home finance institutions or other intermediaries. A financial subsidy system might also include an interest subsidy for allottees (MoHUA, 2017).

Public-Private Partnerships for Trunk Infrastructure: The public sector will have responsibility for the trunk infrastructure and connections. The government, on the

other hand, may finance and implement the project directly or via distinct PPP provisions (MoHUA, 2017).

Risk Sharing: Government takes the accountability for the property, subsidies, and higher development, whereas individual contractors are accountable for accomplishment. Financial entities – public or private – or government agencies take the risk of giving the appropriate loan to the allottee (MoHUA, 2017).

Bid Parameter: The bidder that offers the lowest annuity amount is the chosen bidder. The NPV period should be determined by the public authority, with annuity interest computed at the highest Marginal Cost of Lending Rate of the State Bank of India (SBI) (MCLR). Of course, the number of dwelling units to be given, as well as the area, technical requirements, and construction time frame, would have to be determined a priori. Alternatively, the annuity amount might be determined ahead of time and the capital grant used as the bid criterion (MoHUA, 2017).

Risks	Risk Allocation			
	Government	Private Developers	Financial Institution	Beneficiary
Land	■			
Design		■		
Construction		■		
Maintenance		■		
Financing	■	■		
Cost Recovery	■	■		
Off-take	■	■		
Trunk Infrastructure	■			
Credit Risk			■	

Table 4:Risk Matrix for AGSH adopted from MoHUA (MoHUA, 2017)

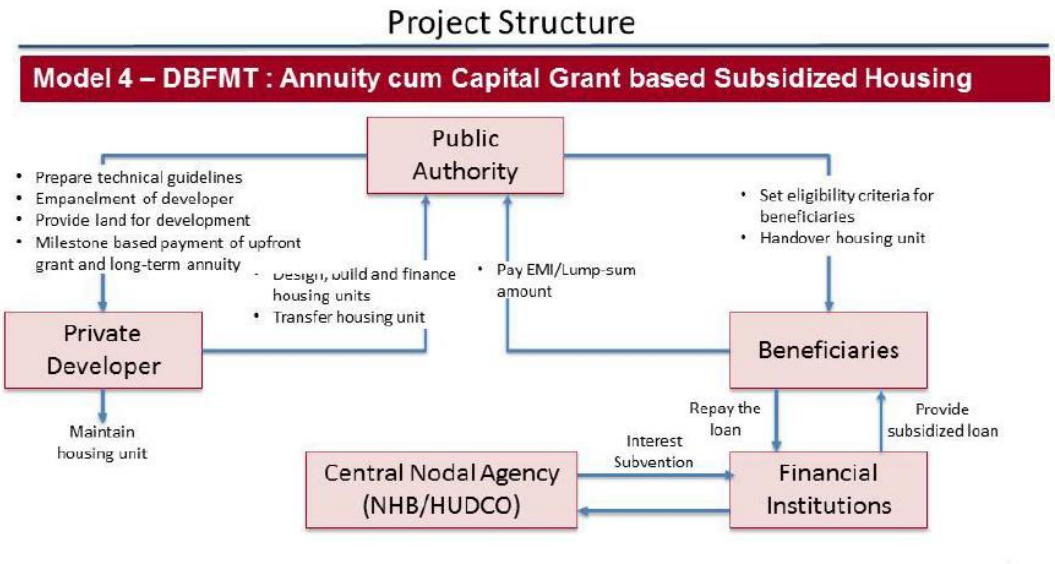


Figure 18:Stakeholder roles and responsibilities AGSH (MoHUA, 2017)

Model 5: Direct Relationship Ownership Housing (DROH)

The Developer and the Allottee will have a direct financial connection as per this model. The government will allocate the land, which will be a considerable subsidy. Allottees, on the other hand, would be forced to pay the developer directly for the cost of the dwelling unit. EWS and LIG units would be the only types of building authorized under this concept. As a result, the individual contractor will take steps to recoup the expense of low-cost housing from the allottee directly (MoHUA, 2017). The said payment is done as a one-time payment during the handover of the accommodation, or as an equated monthly installment for a specific duration before the allocation of the accommodation. The developer handles the risk of cost recovery. For a certain period, which may be the same as the cost recovery period, the contractor is liable to maintain- the accommodation units (MoHUA, 2017).

Among the four models, this one has the largest amount of risk allocation to the private segment. To recoup expenditures, the developer must have qualified consumers capable enough to make the payment. The interests of the contractor are therefore associated with the customer's desire for a well-built and well-maintained home. If correctly executed, this should yield positive results (MoHUA, 2017). However, just like in Model 1, the government can continue to determine and publish the recipients' eligibility before the project's execution. The government or public authorities, in conjunction

with the developer or NGOs and civic organizations, can choose the allottees from among the qualified beneficiaries (MoHUA, 2017).

Regular fees as in equated monthly installments are a substantial threat that the developer must bear under this arrangement. This risk can be mitigated by enabling the contractor to apply fair fines resulting in the delay of the payment. This approach will also need quick dispute settlement between the developer and the allottee (MoHUA, 2017).

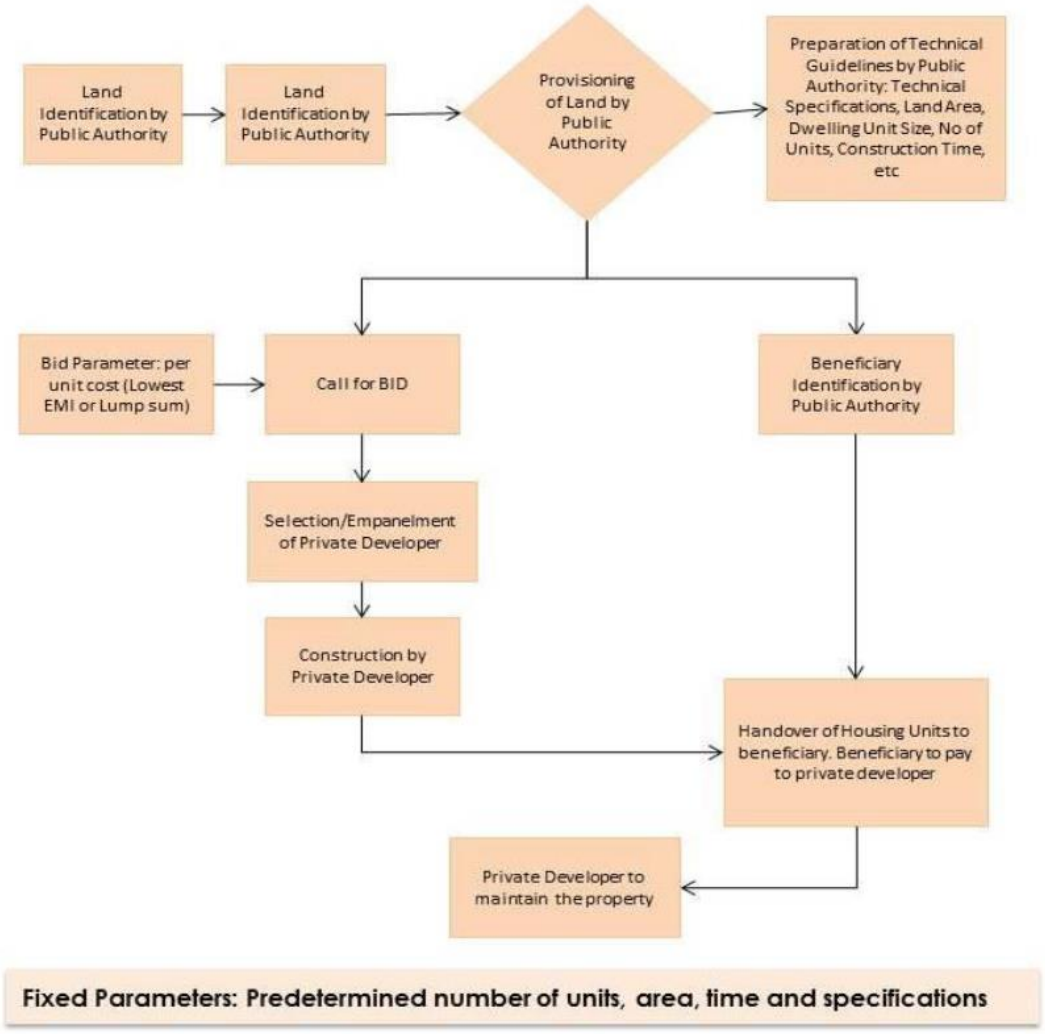


Figure 19:DROH activity flowchart (MoHUA, 2017)

Important Characteristics

Land as Subsidy: In this approach, public authorities would offer land to the selected private developer on a long-term lease that will run concurrently with the agreement

duration. This would essentially be a government subsidy for the enterprise (MoHUA, 2017).

Technical guidelines: The public authority must establish technical guidelines for project execution that include technical specifications, property vicinity, apartment component dimensions, number of apartments, development period, and any other relevant information (MoHUA, 2017).

Design-Build and Finance: The private sector will be responsible for planning, constructing, and funding low-income housing stock and related services to defined criteria, at a specified price, and within a specified time frame (MoHUA, 2017).

Maintenance by the Individual Contractor: The individual contractor is in charge of not only the construction of the housing units but also their medium- to long-term maintenance (MoHUA, 2017).

Expense Retrieval by Private Segment Collaborator: The individual contractor must agree to recoup the expense of low-cost accommodation from the allottee directly payment can be done as a one-time payment or via equated monthly installments as per specified period before the handover of the accommodation units. Rental housing, which is contractors still hold but might be assigned to allottees based on monthly rental payments, could represent a significant subset of such developments (MoHUA, 2017).

Beneficiary Identification by Public Authorities: The government will be responsible for determining whether or not recipients are eligible. Before the project's execution, the same will be announced. The government would choose the allottees fairly and equitably from among the qualified beneficiaries. This might be accomplished either precisely by state authorities or in partnership with civil society and non-governmental organizations (MoHUA, 2017).

Distribution: The private sector will surrender the housing stock to the government or government-designated allottees (MoHUA, 2017).

Payments by Allottees: At the time of handover, there is a payment of the fixed amount for the housing segment made by the allottees. Alternatively, the Allottees might be obliged to pay the public authority specified equivalent monthly amounts for a fixed period (MoHUA, 2017).

Financial Assistance to Allottees: For this aim, loans with a reasonable rate of interest and a reasonable period might be made accessible to allottees through home finance institutions or other intermediaries. A financial subsidy system might also include an interest subsidy for allottees. (MoHUA, 2017)

Public-Private Partnerships for Trunk Infrastructure: The public sector will have responsibility for the trunk infrastructure and connections. The government, on the other hand, may finance and implement the project directly or via distinct PPP provisions (MoHUA, 2017).

Risk Sharing: Government takes the accountability for the property, subsidies, and higher development, whereas individual contractors are accountable for accomplishment. Financial entities – public or private – or government agencies take the risk of giving the appropriate loan to the allottee (MoHUA, 2017).

Bid Parameter: Depending on the per-unit costs individual developers are selected. The equated monthly payments are given to the developer by the allottees, will be based on the per-unit cost. Of course, the number of dwelling units to be given, as well as the area, technical requirements, and construction time frame, would have to be determined a priori (MoHUA, 2017).

Risks	Risk Allocation			
	Government	Private Developers	Financial Institution	Beneficiary
Land	■			
Design		■		
Construction		■		
Maintenance		■		
Financing		■		
Cost Recovery		■		■
Off-take	■	■		
Trunk Infrastructure	■			
Credit Risk			■	

Table 5:Risk Matrix for DROH adopted from MoHUA (MoHUA, 2017)

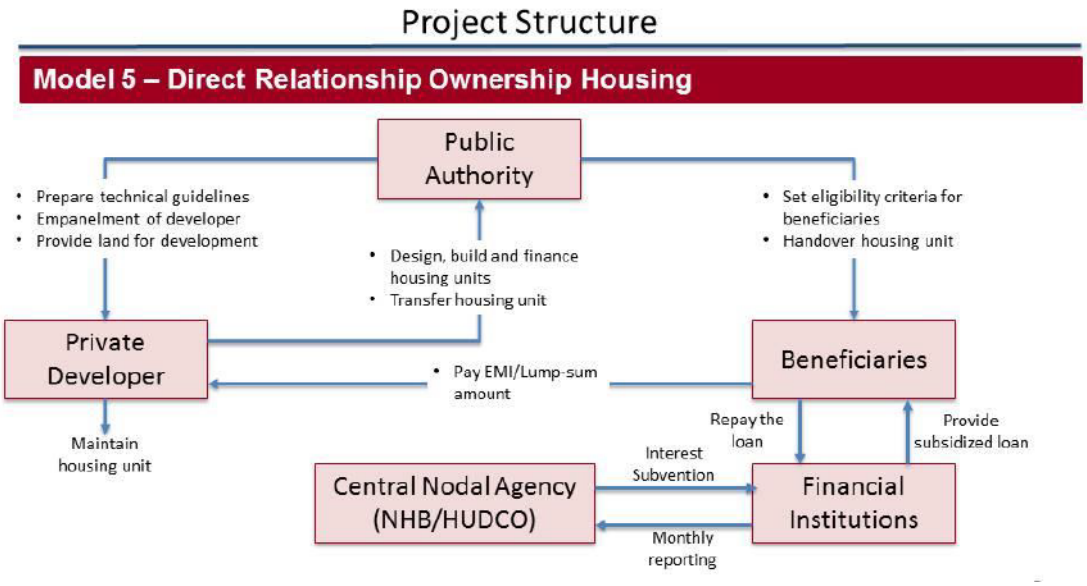


Figure 20:Stakeholder roles and responsibilities DROH (MoHUA, 2017)

Model 6: Direct Relationship Rental Housing (DRRH)

The way this model differs from the previous one is that, as per this process, there are rental fees paid by the allottees to use the accommodation units, whereas the developers would continue to own the units. EWS and LIG units would be the only types of units permitted under this paradigm. As a result, the individual contractor will take steps to recoup the expense of low-cost housing from the allottee directly. It is the responsibility of the developer to maintain the units for a predetermined duration (MoHUA, 2017).

Among all the models, this one involves the most risk transfer to the private developer. To recoup expenditures, the developer will require qualified consumers who are prepared to pay the required rent. If the current tenants vacate their apartments, the Developer will have to use its resources to locate new tenants. In the event of an economic downturn, the developer may be unable to locate qualified consumers to inhabit the housing units, extending the cost recovery time (MoHUA, 2017). However, as in Model 5, the public authority can continue to determine and publish the beneficiaries' eligibility before the project's execution. The public authorities, in conjunction with the developer or NGOs and civil society, can choose the allottees from among the qualified beneficiaries (MoHUA, 2017).

Under this arrangement, the developer bears the risk of collecting monthly fees. This threat is mitigated by empowering the contactor to apply fair fines for late or non-payment of rent. The developer will set a deadline for consumers to pay their rent. The developer has the authority and power to remove consumers if they did not pay their rent within a specific time frame. For this approach to be acceptable to the private developer, admittance to swift disagreement motion amongst the developer and the Allottee will be necessary (MoHUA, 2017). It is crucial to note, however, that the risk of EWS not paying rent is greatly exaggerated. Small borrowers have a low risk, according to the bank and other financiers' experience, as long as promising circumstances for implementation and disagreement settlement exist, and the procedure remains free of unjustified constitutional influences. In many Western countries, the rental model for cheap housing is the favored option (MoHUA, 2017).

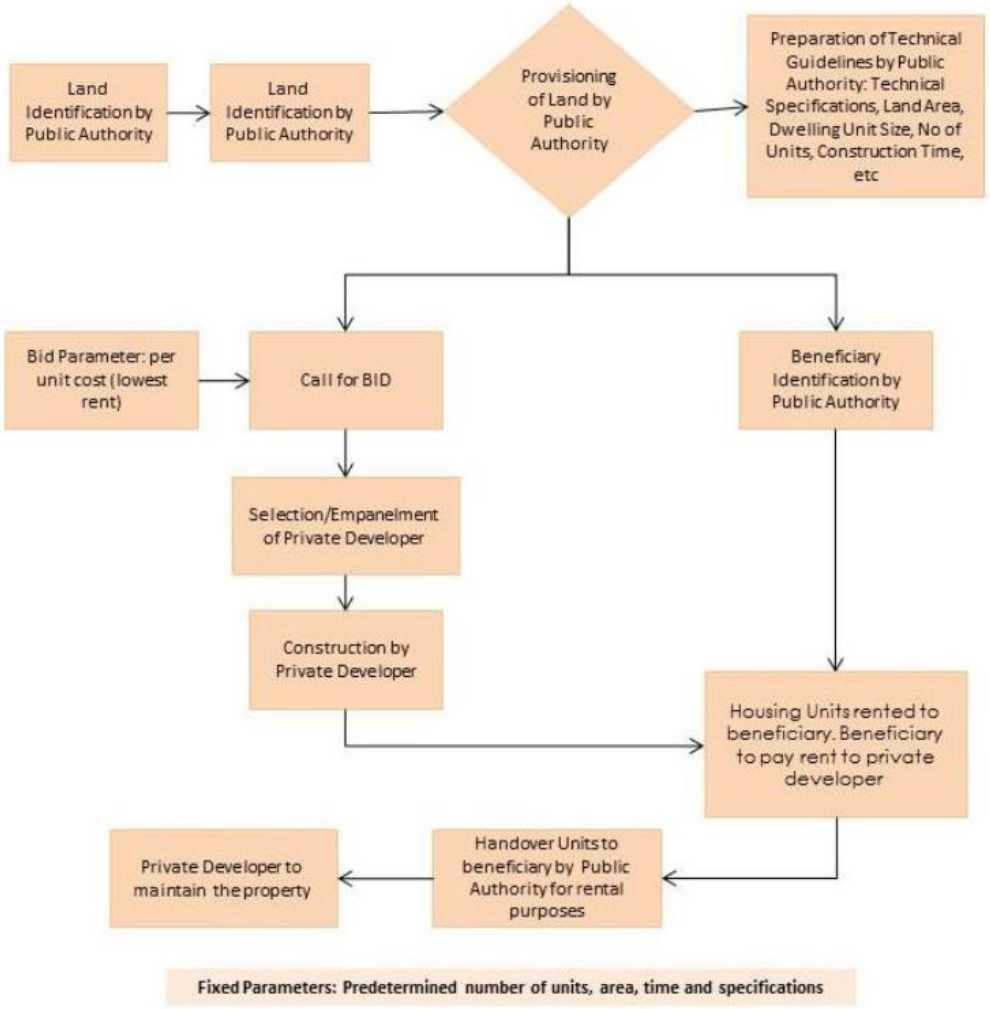


Figure 21:DRRH activity flowchart (MoHUA, 2017)

Important Characteristics

Land as Subsidy: In this approach, public authorities would offer land to the selected private developer on a lease for long-term that will run concurrently with the agreement duration. This would essentially be a government subsidy for the enterprise (MoHUA, 2017).

Technical guidelines: The public authority must establish technical guidelines for project execution that include technical specifications, property vicinity, apartment component dimensions, number of apartments, development period, and any other relevant information (MoHUA, 2017).

Design-Build and Finance: The individual division will be accountable for planning, constructing, and funding low-income housing stock and related services to defined criteria, at a specified price, and within a specified time frame (MoHUA, 2017).

Maintenance by the Individual Contractor: The individual contractor is in charge of not only the construction of the housing units but also their medium- to long-term maintenance (MoHUA, 2017).

Expense Retrieval by Private Segment Collaborator: The individual developer will assume responsibility for recovering the cost of affordable homes from allottees directly. This payment might be made every month for a set length of time. Rental housing, which is still held by the contractors but might be assigned to allottees based on a monthly payment, could represent a significant subset of such developments (MoHUA, 2017).

Beneficiary Identification by Public Authorities: The government will be responsible for determining whether or not recipients are eligible. Before the project's execution, the same will be announced. The government would choose the allottees fairly and equitably from among the qualified beneficiaries. This might be accomplished either precisely by state authorities or in partnership with civil society and non-governmental organizations (MoHUA, 2017).

Distribution: The private sector will surrender the housing stock to the government or government-designated allottees (MoHUA, 2017).

Payments by Allottees: At the time of handover, there is a payment of the fixed amount for the housing segment made by the allottees. Alternatively, the Allottees

might be obliged to pay the public authority specified equivalent monthly amounts for a fixed period (MoHUA, 2017).

Public-Private Partnerships for Trunk Infrastructure: The public sector will have responsibility for the trunk infrastructure and connections. The government, on the other hand, may finance and implement the project directly or via distinct PPP provisions (MoHUA, 2017).

Risk Sharing: Government takes the accountability for the property, subsidies, and higher development, whereas individual contractors are accountable for accomplishment (MoHUA, 2017).

Bid Parameter: Depending on the per-unit costs individual developers are selected. The equated monthly payments are given to the developer by the allottees, will be based on the per-unit cost. Of course, the number of dwelling units to be given, as well as the area, technical requirements, and construction time frame, would have to be determined a priori (MoHUA, 2017).

Risks	Risk Allocation			
	Government	Private Developers	Financial Institution	Beneficiary
Land	■			
Design		■		
Construction		■		
Maintenance		■		
Financing		■		
Cost Recovery		■		■
Off-take	■	■		
Trunk Infrastructure	■			
Credit Risk	Not Applicable			

Table 6:Risk Matrix for DRRH adopted from MoHUA (MoHUA, 2017)

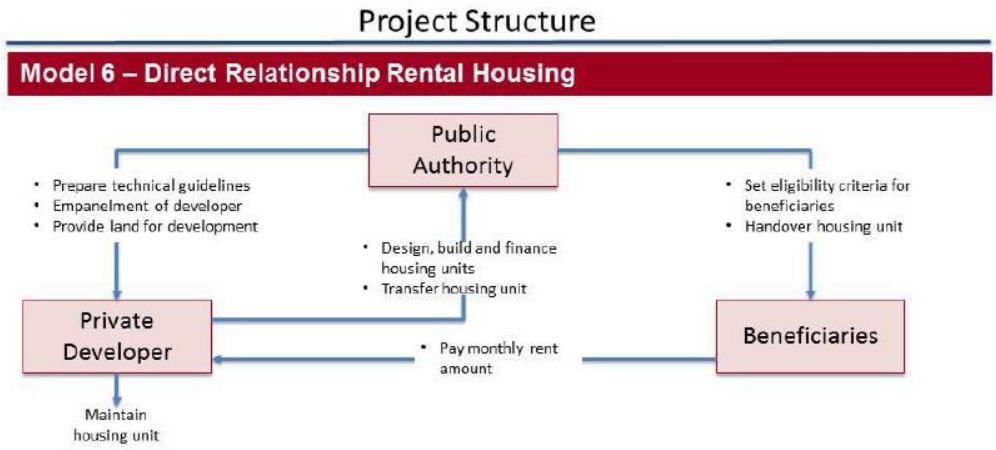


Figure 22:Stakeholder roles and responsibilities DRRH (MoHUA, 2017)

4.4 Comparative Assessment Among Models

A comparison of the major features of the implementing agency that differ across the various affordable housing PPP models is conducted.

Scope of Work

Parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Designing and Building of Units	Private Partner	Private Partner	Private Partner	Private Partner	Private Partner	Private Partner
Maintenance of Units	Beneficiar-ies	Beneficiaries	Private Partner	Private Partner	Private Partner	Private Partner
Distribution of Units	Private partner to Public au-thority	Private partner to Public authority	Private partner to Public au-thority	Private partner to Public au-thority	Private partner to Beneficiar-ies	Private partner to Beneficiar-ies
Development Mix	Affordable housing	Affordable hous-ing and high-end housing/ commer-cial development	Affordable housing	Affordable housing	Affordable housing	Affordable housing
Responsibility of Trunk Infrastruc-ture	Public au-thority	Public authority	Public au-thority	Public au-thority	Public au-thority	Public au-thority
Implementation of Trunk Infrastruc-ture	Separate EPC or PPP arrange-ment	Separate EPC or PPP arrangement	Separate EPC or PPP arrange-ment	Separate EPC or PPP arrange-ment	Separate EPC or PPP arrange-ment	Separate EPC or PPP arrange-ment

Table 7:Comparative Analysis based on the scope of work (MoHUA, 2017)

Project Structure

Parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Land provision	Public authority	Public authority	Public authority	Public authority	Public authority	Public authority
Lease period	30 to 99 years for affordable housing	30 to 99 years for affordable housing and commercial component	30 to 99 years for affordable housing	30 to 99 years for affordable housing	30 to 99 years for affordable housing	30 to 99 years for affordable housing
Contract period from conditions precedent	2 to 4 years	2 to 4 years	15 to 20 years	15 to 20 years	15 to 20 years	15 to 20 years
Bid parameter	Per unit cost (lowest lumpsum amount)	No. of affordable units to be provided on a given plot	Per unit cost (lowest annuity payment)	Lowest annuity amount or lowest upfront grant	Per unit cost (lowest EMI or lowest lumpsum)	Per unit cost (lowest rent)
Offtake responsibility	Public authority	Public authority	Public authority	Public authority	Private authority	Private authority
Performance Risk	Private partner	Private partner	Private partner	Private partner	Private partner	Private partner

Table 8:Comparative Analysis based on project structure (MoHUA, 2017)

Financing Arrangements

Parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Financing	Private partner	Private partner	Private partner	Public authority and Private partner	Private partner	Private partner
Recovery by developer	Govt. pays private partner lump sum amount on completion	Revenue generated from high-end housing	Govt. pays a long-term annuity to private partner on completion	Govt. pays upfront grant an annuity to the private partner	Beneficiaries pay (lump-sum or EMI) to the private partner	Beneficiaries pay the monthly rent to the private partner
Support/subsidy for developer	Land	Land	Land	Land	Land	Land
Cross subsidy for developer	Not Applicable	The land provided for high-end housing	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Offtake related performance bonus for the developer	10% - 15% performance bonus linked to the no. of units sold	10% - 15% performance bonus linked to the no. of units sold	10% - 15% performance bonus linked to the no. of units sold	10% - 15% performance bonus linked to the no. of units sold	Not Applicable	Not Applicable

Table 9:Comparative Analysis based on financing arrangements (MoHUA, 2017)

Beneficiaries

Parameters	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Beneficiary eligibility	Public authority	Public authority	Public authority	Public authority	Public authority	Public authority
Beneficiary identification	Public authority	Public authority	Public authority	Public authority	Private partner	Private partner
Payments by beneficiaries	Lump-sum or EMI to Public authority	Lump-sum or EMI to Public authority	Lump-sum or EMI to Public authority	Lump-sum or EMI to Public authority	Lump-sum or EMI to Private partner	Rent to the private partner
Sourcing of funds by beneficiaries	Financial Institutions/Monthly income	Financial Institutions/Monthly income	Financial Institutions/Monthly income	Financial Institutions/Monthly income	Financial Institutions/Monthly income	Monthly income

Table 10:Comparative Analysis based on the beneficiary (MoHUA, 2017)

5. Case Studies

Various affordable housing case studies from throughout the world are represented in this chapter. In 2014, the McKinsey Global Institute performed research on the provision of affordable housing throughout the world, identifying four main factors: unlocking property in the appropriate place, lowering building costs, improving operations and maintenance efficiency, and lowering buyer and developer finance costs (Shelter, 2018).

These case studies reflect the European Union's affordable or social housing framework. Though each nation has its approach to social housing, it typically falls under the umbrella of broader policy directives aimed at making housing more accessible.

5.1 Vienna, Austria

For almost a century, Vienna has maintained housing inexpensive by controlling a large amount of the property and employing civic advancements to maintain rental rates low. The successful Limited-Profit Housing Associations in Austria have a long history of supply-side homes subsidies directed largely single-family apartment and multi-story segment (LPHA). This is based on a rich heritage of social rental dating back to the 1920s' ‘Red Vienna' period. These sociological customs continue functioning, but as the City's property resources shrink and people's expansion puts strain on the remaining housing stock, pressure on home prices is growing (Shelter, 2018).

Key Lessons

- Decentralizing housing policy to municipalities gives municipalities more freedom and control over housing market management and affordability (Shelter, 2018).
- Austria's expenses on community accommodation as a proportion of GDP is lower than that of the United Kingdom and various EU nations, with demand-side subsidies benefiting primarily the poorest households (Shelter, 2018).
- Aspern Seestadt's transportation-oriented development is a fantastic illustration of the advantages of such a plan (Shelter, 2018).

- The “Mietermitbestimmungsstatut” strategy offers LPHA tenants a feeling of control over their surroundings, resulting in distinctive, well-used areas and more cost-effective upkeep (Shelter, 2018).

Housing today

- Today, there are 220,000 municipal housing units and another 200,000 housing units that are subsidized (Shelter, 2018).
- To keep up with the projected population growth, the city plans to build 11,000 new housing units per year (Shelter, 2018).
- In 2013, the Aspern Seestadt transportation-oriented development project resulted in the construction of 10,500 high-quality affordable dwelling units (Shelter, 2018).
- In 2016, the City of Vienna funded 18,000 residential units for an overall financial expenditure of 1.3 billion euros and about 720 million euros (Shelter, 2018).
- As of 2018, the new ‘Housing Offensive' plan is supporting 13 property developer contests totaling over 11,000 residential units (Shelter, 2018).
- With housing costs hovering around 25% of income, Vienna has generally escaped home price inflation (Shelter, 2018).

Social housing

With 220,000 rental units, Vienna is Austria's most populous city. Social housing is financed by input from both the state and national budgets, in the condo property and the market for discounted landlord and separate homes. Income from taxes is divided among the 9 regions according to a complicated commercial contract, with 450 million euros allocated to Vienna every year for accommodation purposes, giving it a financial plan of 600 million euros. Even though there have been many cuts in this sector across Europe, it nevertheless offers a solid foundation for community shelter programs that would not be viable under a business strategy. The overall spending on community shelter as a percentage of GDP (0.16 percent) is much lower than other nations where demand-side subsidies are prioritized (Shelter, 2018).

Supply-side subsidies, rent caps, and limited-profit housing associations

Apart from social housing, the bulk of the residual accommodation is provided by non-profit housing groups under various legal structures (composed of 650,000 homes). The national Limited-Profit Housing Act governs how these organizations operate, requiring them to reinvest any profit they generate from rental income and limiting them to only charging cost-based rentals (Shelter, 2018).

Furthermore, to decrease funding expenses for modern development, contractors need a 12.5 percent down payment from potential residents, which is limited to the total building expenses. When a renter moves out, these funds are repaid to them with interest, while families with less income are given low-interest community credits or are occasionally completely excluded out of the initial deposit (Shelter, 2018).

Participatory processes and balanced neighborhoods

The collaboration between social landlords and inhabitants is an excellent example of a well-functioning policy, with the Vienna municipality's "Mietermitbestimmungsstatut" (tenant participation legislation) governing the conditions of collaboration concerning the City of Vienna and its about 220,000 renters. It provides tenants' participation rights in maintenance expenses, elevator installation, and maintenance, shared services, and accommodation controlling, enabling their influence on the residing ecosystem and maintaining a feeling of belonging. It was established in 2000 and updated in 2015 (Shelter, 2018).

The Wohnsfond Wien policy, which assures mixed-tenure housing complexes to preserve an urban social balance, has resulted in Vienna having among the lowest levels of social discontent in the EU (Shelter, 2018).

Accessibility

- Together, municipal social housing and LPHAs account for more than half of Vienna's housing stock, which is largely rented to low-income people, but 80-90 percent of the population is theoretically eligible (Shelter, 2018).
- The rent for social flats is set at cost, but extra subsidies can bring the price down to 20-25 percent of a family's income (Shelter, 2018).

- Housing for low-income (Shelter, 2018) people, refugees, and students is set aside in defined amounts by the policy. Because just 5000 apartments are created each year, waiting lists are small (Shelter, 2018).

Drawbacks

- The municipality may have incurred significant debt as a result of majority land ownership and the risk it entails, as well as adopting a mixed-tenure policy (Shelter, 2018).
- They are now faced with the task of developing privately held property, which is a contentious political issue (Shelter, 2018).

Nordhaven: An outdated goods facility is being redeveloped.

The town has made it a priority in terms of improving station-related initiatives, with the central station, which covers 100 acres, being renovated to house 13,000 people and generate 17,000 jobs. The development and construction of Nordbahnhof started in 1994 and are expected to be completed by 2030. It will house 20,000 people and provide them with the same amount of work opportunities, all centered across a big a beautifully designed garden with children's play areas. Aspern Seestadt blocks are diversified, with industrial space on the bottom level, community accommodation compromising 4 floors, privately owned apartments of 2 floors. (Shelter, 2018).

Figure 23:Apartments in Nordbahnhof with lively landscape (Shelter, 2018)

Aspern Seestadt: An old airport has been transformed into a modern settlement
Over the last decade, Vienna's U2 subway route has been swiftly stretched by 4.5 kilometers, paving way for the new Aspern Seestadt development, which is 25 minutes by train from the city center. It intends to house 20,000 people on a 240-hectare disused airport that was developed following a developer competition in 2005. The structure is diversified with innovative design throughout, with a robust urban-nation accent. The concentration is moderate-rise, of approximately 6 floors, also the housing units have varied and creative panorama. It has become popular among young families as a result of this. This project is a fantastic illustration of the advantages of transportation-focused expansion, in addition to the high standard of building that the Vienna model offers while yet keeping costs low and connections high (Shelter, 2018).

Figure 24:Medium rise modern apartments with green spaces (Shelter, 2018)

5.2 Copenhagen, Denmark

Since 1980, when unemployment was 17.5 percent and many sites were unoccupied, Denmark's capital, Copenhagen, has turned into one of the world's most desirable places to live and work in. The Copenhagen City and Port Development Company, which combined the entire municipal-region property into one entity for the main vision of developing the initial Metro service to the airport, assisted this. The new town of Ørestad in Copenhagen, as well as an urban expansion in Aarhus, both of which are examined in this case study, have taken a similar strategy. While other Scandinavian nations have excellent social programs supported by higher taxes, Denmark stands

out for its usage of associations to maintain expenses down and assure people's full participation (Shelter, 2018).

Key Lessons

- Housing construction is kept cheap by locating it in strategic locations (Shelter, 2018)**.**
- When renters participate in management, such as cooperatives, there are benefits to the public domain (Shelter, 2018).
- It is cost and time advantageous to use Public Asset Corporations to fund property that is freely held but privately operated (Shelter, 2018).
- The increase in land value as a result of advancement can be utilized to support public services (Shelter, 2018).
- Property charges can be effective and aid in the mobilization of underutilized land (Shelter, 2018).

National housing context

- Privately owned dwellings account for 53% of the total, while privately rented homes account for 15% (Shelter, 2018).
- People living in low-cost housing accounts for a fifth of the population (Shelter, 2018).
- 25% of the latest accommodation must be low-cost, with a third of it going to the most disadvantaged and being administered as social housing (Shelter, 2018).
- A National Building Fund credit is a long-term credit with a 3 percent interest rate that is payable after 30-40 years (Shelter, 2018).

Housing co-operatives

The co-housing concept, which originated in Denmark, allows a mass of individuals to have their own houses while sharing shared amenities such as dining meals regularly. This attracts young families in particular, but it also appeals to elderly individuals who do not wish to live alone. Common gardens are maintained by neighborhood groups, which is one example served 200 apartments across two blocks (Shelter, 2018).

Shared spaces assist newcomers in integrating and bringing people together in peaceful and beautiful environments - what the Danes refer to as Hygge. Grants from city councils assist in the cooperative process. These types of housing systems are popular across the country and account for a total of 40% in terms of accommodation units in some areas of Copenhagen, but they are being dismantled as individuals seek to own their own houses (Shelter, 2018).

Tenant engagement

Residents are urged to participate to save expenditures and gain skills that will help them to obtain better employment. Bringing nature into town and establishing balanced communities have been popular themes in recent years, allowing individuals to spend additional time with their family or leisure pursuits rather than traveling to the workplace. One accommodation organization in Aarhus, for example, is dedicated to 'creating a balance between man and environment' (Shelter, 2018).

Public asset corporations

Several cities, like Copenhagen and Hamburg, employ a fusion funding strategy for metropolitan growth and public services that depends on combining public property holdings. It is important to have access to low-cost financing to develop properties quickly and in ways that fulfill community requirements. The company can cause a considerable perspective and engage in initiatives that the individual segment would consider too uncertain because it is governed by a board of business leaders, government officials, and local politicians (Shelter, 2018).

Accessibility

- Refugees, the disabled, young students, single parents, the elderly, and people in need of resettling due to metropolitan restoration are given priority in social housing. Apart from that, it's first come, first served. However, to avoid the creation of compartments of deprivation and enhance the socioeconomic blend, a different strategy has enabled the working group and students to bypass the waiting register for select vulnerable social housing buildings (Shelter, 2018).

- During the 2016 refugee crisis, special attention was paid to housing the inflow, with substantial government subsidies being used to build a huge number of new social housing units (Shelter, 2018).

Drawbacks

- Each community accommodation unit's price is determined by the initial construction budget, which is often cheaper in older 1960s and 1970s structures and higher in newer construction. This has put a strain on older social housing stock, which is generally better positioned and has resulted in waiting for lines (Shelter, 2018).

Ørestad: A new town that salvages property cost

The Danish government (55%) and the municipal council of Copenhagen (with 45%) established the Ørestad Development Corporation in a joint venture. This was started as a rescuing measure for the city. The city changed the authorized uses from protected heathland to business, housing, retail, and education when the national government gave the property, that was utilized by the armed forces. The ‘Finger Plan,' which is the Danish analog of the British green belt, was established by Ørestad (Shelter, 2018).

The development began with the construction of a Metro line in Ørestad with six stops and four districts. Developers have been given enough land to construct 120-150 apartments. Few structures, that are claimed to be undifferentiated from personal ones and have received international acclaim, were built by social housing enterprises. The town is anticipated to have 20,000 people when it is finished in 2025, and it already has the largest retail center, which is connected to Malmo, Sweden, through the Oresund Bridge. Because roughly 70% of people take public transportation to work, the requirement for parking has been reduced by half (Shelter, 2018).

Figure 25:BIG has created an award-winning residential housing plot in Ørestad New Town (Shelter, 2018)

Aarhus: A sustainable urban extension

Aarhus is the second biggest city in Denmark and home to one of the country's most prestigious universities. People are encouraged to move to the city, and anybody is welcome to register with one of the city's 45,000 housing organizations. Priority is given to students and people who work for the town, as well as a few other categories. As a result, renting is not stigmatized, even if some of the older social housing projects are being remodeled. The laws provide for a great deal of flexibility, such as when it comes to transferring tenancies, and also encourage residents to participate (Shelter, 2018).

The Municipality assists housing associations in building additional dwellings by acquiring property on the outskirts of town and then making serviced plots accessible. Individuals or collaborative parties find it feasible to construct houses as the entire site is separated into small and big areas. Availability of the property can be found on the municipality website (Shelter, 2018).

The Expropriation Law permits the state to purchase land in the public interest, such as constructing sports grounds, schools, and roads, at its current use price. It then

rents it back to the farmers until it's needed again. The innovative contribution of Aarhus was highly obvious in the way offices and homes facing the Harbour were constructed. At a negotiated price, the City purchased the property from the Port. The company then created a design and prepped the property so that it could be built as a succession of lots with water views (Shelter, 2018).

Figure 26:Cooperative community gardens, pedestrianized high streets, the Aarhus skyline (Shelter, 2018)

5.3 Almere, Netherlands

After WWII to accommodate the expanding populace, a new town called Almere in the province of Flevoland was built. The city's first house was completed in 1976, and it presently boasts a population of 200,000 people, with plans to add 60,000 additional people and also create over 100,000 work opportunities until 2030. The city's plan was based on a new program structure for self-development, and it has been recognized globally as a self-development model (Shelter, 2018).

The self-building framework

Almere was developed on municipal land, making the goal of providing affordable accommodation for low-income families earning less than €20,000 per year much more achievable. The local government originally master-planned the region, dividing it into separate districts for diverse demographics. The infrastructure and utilities were then built by the local authorities, and every property was offered at a set meter square cost and with a "passport" including a list of constraints for individual developers complying with development rules (Shelter, 2018). Building height, style, relationship to adjacent plots, and materials were all governed by these laws, but each homeowner retained a considerable deal of creativity and choice, allowing dwellings to be adapted to their individual needs and family size. This has the significant advantage of creating flexible and diversified communities at cheaper prices that inhabitants are proud of, but there are also drawbacks, such as lengthier and more irregular construction schedules (Shelter, 2018).

Figure 27:High-quality housing with integrated living spaces (Shelter, 2018)

5.4 Singapore

Currently, the population living in publicly governed and developed housing is over 80%, also as compared to international standards the prices of the houses have remained relatively stable. Singapore has been lauded for its efforts to promote housing for all via various governmental leadership in the property market. The success of Singapore's strategy may be credited to the combined efforts of the Housing and

Development Board's (HDB) unique governance structure, the Land Acquisition Act's execution, and the Central Provident Fund's funding method (CPF). Owners occupy 95 percent of Singapore's public homes. This has been effective in terms of national stability, but it raises concerns about the long-term sustainability of housing prices, as well as its accessibility to lower-income and younger demographics (Shelter, 2018).

Lessons

- A good illustration of legislative procedures that enable public housing to be produced on a big scale when public development bodies are given appropriate authority and resources (Shelter, 2018).
- The introduction of a 15 percent Additional Buyer's Stamp Duty for foreign homebuyers demonstrates how house price inflation may be controlled by reinvesting it as a housing subsidy (Shelter, 2018).
- In reaction to the global financial crisis of 2008, the government enacted a series of "property market cooling measures." By curbing speculative buying, preventing overborrowing, and releasing land for private development, have successfully moderated demand for residential properties while increasing supply (Shelter, 2018).

Land Acquisition Act

Following Singapore's independence in 1965, the government faced a critical shortage of land to carry out its development initiatives. The Land Acquisition Act was founded on two main ideas articulated by Lee Kuan Yew, the Prime Minister at the time (Shelter, 2018).

- No private landowner should profit from projects funded by the government (Shelter, 2018);
- The price paid for public purposes on land acquisition should not be more than what the land would have been worth if the government had not planned for development in the region (Shelter, 2018).

By 2002, the government-controlled 90% of the land, allowing the HDB to construct subsidized homes at a faster rate (Shelter, 2018).

Figure 28: Highrise HDB Housing Units (Shelter, 2018)

HDB and CPF framework

The HDB-CPF structure was developed in the 1960s and has altered Singapore's urban shape, with over one million elevated housing units erected since 1961 to accommodate 90% of the inhabitants, and it is still in use today (Shelter, 2018).

Residents who meet specific income and asset ownership requirements can purchase flats at a reduced price on a 99-year non-renewable lease. These flats can be sold at a controlled price after a set length of time, and a second, generally bigger property can be purchased at a subsidized price. A third option would be a privately constructed flat, which is generally reserved for the highest earnings (Shelter, 2018).

Residents can borrow money from their CPF accounts (a required individual savings program connected to their job) to assist pay the purchase of these apartments, to use the money to support their retirement (Shelter, 2018).

HBD's market-cooling policies have been among the most successful in the world, thanks to a 15 percent Extra Buyer's Stamp Duty levied on international buyers, and an additional 5% for Singapore's permanent residents for their first home and 10% for their second and subsequent properties. The money raised from this tax goes towards the HDB housing subsidy, which amounts to 7% of the national GDP (Shelter, 2018).

Accessibility

- **Low-income subsidies:** The Additional CPF Housing Grant Scheme was established in 2006 to assist low-income families in purchasing their first house. The age, relationship status, job status, and family income requirements for such a subsidy vary (Shelter, 2018).
- **Family housing:** In 2013, ‘3-Generation' flats were introduced to meet the needs of multi-generational families looking to live under one roof. Each of these flats has four bedrooms and three bathrooms with a total interior floor space of around 115 square meters. In 2015, the Proximity Housing Grant (PHG) was launched to assist families in purchasing a resale property to live with or near one another for mutual care and support (Shelter, 2018).
- **Elderly housing:** To meet the needs of an aging population, a quota-based Senior Priority Scheme was established to allow the elderly to remain in familiar and central locations while still receiving the required care (Shelter, 2018).

Drawbacks

- The homeownership-based pension scheme necessitates that public housing prices outperform inflation and rising living costs. However, this must be balanced with managing new buyer affordability, resulting in a political balancing act that jeopardizes long-term viability (Shelter, 2018).

- Land shortages are causing a geographical gradation of citizenship, with lower-income households being pushed to less desirable areas on the outskirts of the island, unable to achieve the national goals promised (Shelter, 2018).

Figure 29:Landscaped greenery and playgrounds within each courtyard (Shelter, 2018)

5.5 Zurich, Switzerland

Cooperative housing has been utilized for over a century in one of the world's most costly and attractive cities to enable a wider spectrum of individuals to obtain cheap homes. Despite enormous wealth disparities, income levels are more evenly distributed, allowing virtually everyone to afford to live in Zurich. Zurich is home to 141 cooperatives, accounting for 40,000 of Switzerland's 140,000 cooperatively operated units. There has a long history of invention and revolution in Zurich, with figures like Einstein,

Lenin, and the Dadaists. There is also a national culture of toleration within norms and accountability, which was fostered by Protestant reformer Zwingli in the 16th century (Shelter, 2018).

Now, housing cooperatives with 1500 members, such as Mehr Als Wohnen (More Than Housing), are being utilized to rehabilitate abandoned industrial zones (in this example, an old cement plant) and create a balanced way of life to fulfill the demands of the twenty-first century. They take advantage of places that others may overlook, such as Kalkbreite, which is constructed atop a 400-unit tram depot with a half set aside for the workplace. The project is known for its architecture and features a prominent Lebanese restaurant on the ground level. The squatters movement and the upheavals in the 1980s, when the city was considered as "boring," inspired another named Kraftwerk, where INURA is based (Shelter, 2018).

Lessons

- Working together has long been a tradition in Switzerland, and cooperatives benefit from a larger range of inhabitants who are chosen by the community (Shelter, 2018).
- ‘Cooperatives aren't just for the impoverished; they're also for those who want to live on their own terms' (Shelter, 2018).
- The city's policy is that one-third of all housing be cheap or "cost-priced" (Shelter, 2018).
- New cooperatives can only exist because they grab possibilities in underserved areas (Shelter, 2018).

National housing context

- More than 31% of people are not Swiss, and the country is built on diversity and collaboration in the face of far more powerful neighbors. Foreigners are only permitted to stay for six years, and housing is a major stumbling block, but once you're in, you have a lot of freedom (Shelter, 2018).

- Renting is common (90 percent in Zurich and 70 percent nationally), with one of the highest rates in Europe, but thanks to low loan rates, buying has become more affordable (Shelter, 2018).
- A quarter of Zurich's 210,000 residences are owned by non-profit organizations, such as foundations or collectives (Shelter, 2018).
- If you buy a home, you must pay a Wealth Tax, and renting is more flexible, which supports the labor market. Residential property can only be owned by Swiss citizens. Switzerland manages a third of the world's wealth, much of it in Zurich (Shelter, 2018).
- The majority of people reside in the city center and make use of the well-integrated public transportation system. As forests and mountains, the entire surrounding region is protected (Shelter, 2018).
- By expanding the city and the area together, the Spatial Development Strategy for 2020 strives to protect business and guarantee long-term prosperity. To keep prices down, buildings are typically under 25 meters tall, however, housing towers are already being constructed (Shelter, 2018).
- Finding a place to live in Zurich is difficult, with a vacancy rate of 0.22 percent in 2014. However, between 2004 and 2013, rents only increased by 13%. A single person lives in 45 percent of homes, and the average living area per person is 35m2, with 39m2 in non-profit housing compared to 53m2 in private housing (Shelter, 2018).

Key factors for success

- The Swiss have relatively tight socioeconomic groups, especially when it comes to money (Shelter, 2018).
- Working together has long been a tradition in Switzerland, and cooperatives benefit from a larger range of inhabitants who are chosen by the community. Originally associated with a profession, these are now accessible to anybody who wishes to join and purchase shares (Shelter, 2018).
- Progress is contingent on local backing rather than selling land to the highest bidder (Shelter, 2018).

- In Zurich, cooperatives get a lot of help from the city council in terms of obtaining property and organizing themselves. A referendum in 2011 decided to expand the share from 25% to a third by 2050, with 76 percent of the people in favor. The share funded by Social Welfare, on the other hand, is 1.3 percent and is located in either cooperatives or municipal facilities (Shelter, 2018).
- It also helps to have a stable administration, with strong independent cities wielding authority (Shelter, 2018).

More Than Housing

In an outstanding analysis sponsored by the Swiss Federal Office of Housing, cooperatives are viewed as "providing a third approach." The project began in 2003 to commemorate a century of cooperatives with a competition for concepts that received 26 submissions and was just finished. There was a Dialogue Phase to fine-tune the proposal first (Shelter, 2018). The municipality held the 4-hectare site, which was located near a major railway line and a highway. The cooperatives were able to enlist the help of other cooperatives and grow their membership. Due to their innovative ideas, two young offices were chosen after a competition. There are 380 units in 13 buildings, each with its unique layout, ranging from one-bedroom flats to "cluster apartments," which allow groups to share utilities (Shelter, 2018).

- The ground-level flats are either used for communal or commercial purposes (Shelter, 2018).
- Waste heat from a neighboring data center is used to keep energy usage below 2,000 watts (currently 5,500 kilowatt-hours, compared to the national average of 8,000 kilowatt-hours) (Shelter, 2018).
- Within the project, there is little vehicle parking for homeowners, but 106 places for companies. Instead, carpooling and a bike share were pushed (Shelter, 2018).
- The inhabitants were chosen using a computer algorithm to represent the city's demographic profile, and rents are computed on a cost-rent basis (Shelter, 2018).
- Twenty percent of the apartments are subsidized to allow individuals on assistance to live in them (Shelter, 2018).

Figure 30: More Than A Housing Scheme (Shelter, 2018)

6. Conclusion

Housing is not only a financial issue; it is also a significant social issue. The already rapid urbanization is putting significant strain on the housing industry, particularly low-income housing. This industry has a lot of demand but relatively little supply. This makes the research of affordable housing all the more essential since it can solve problems, tap into massive demand, and close the demand-supply gap in this area.

Both industrialized and developing nations have a tremendous challenge ahead of them in establishing a stronger and more acceptable housing policy framework to convene the requirements of the population. Various affordable housing plans and policies have been established in various nations, however, they are far from ideal solutions, but they are a useful instrument for addressing housing difficulties.

The study topics of present housing conditions in India in terms of affordable housing and what are the key obstacles of sustaining inexpensive housing in India are addressed in Chapters 2 and 3. It is critical to recognize that inexpensive or social housing has a broad reach in India and that the Indian government has made economic arrangements for it through laws, subsidies, and yearly budgets. The fourth chapter seeks to answer the issue of how various PPP arrangements may help solve the difficulties of affordable housing.

After examining the Indian government's policies and programs, it reflects a wide range of things that the government will accomplish, or rather, what the program claims the government will do. However, assessing what has been done on the ground to have a better understanding of each effort is a very different matter.

Although there is a growing body of information about sustainable development across the world, one key aspect of metropolitan accommodation issues is that there is still a need for widespread acceptance of sustainable housing in India. The main reason for this is the amalgamation of the previously discussed concept of the interconnection of environmental, economic, and social aspects.

Similarly, in a setting where housing requirements are still pressing, a balance must be struck between uniformity and community design. Understanding the size at which community engagement may be a component of both effectiveness and success is a critical consideration. It's also important to look for ways to inculcate such procedures.

India is making steady progress toward its aim of accomplishing the ‘Housing for All Mission 2022,' but it still has a long way to go. The rules governing affordable housing have established the groundwork for making the entire process of incorporating diverse stakeholders at various stages easier. The government should create SMART goals for each policy and learn from the successes and failures of previous initiatives to apply what has been learned to new, more successful programs. In the affordable accommodation segment, there is a huge commercial and industrial opportunity that may be accessed by many stakeholders to help fulfill the goal by 2022.

A country like Sweden, which made historic progress in delivering affordable housing with the Million program, has not only set a benchmark for the globe but also demonstrated how these tasks can be accomplished with the right structure and policies in place. This was one of the world's largest housing developments in human history. When it comes to a specific place, it's critical to design and strategize policies based on local demands and availability rather than the standard framework.

To create a decent picture of the excellence of the private reasonable accommodation supply within the country, more documentation on the quality of private affordable housing projects is required. New methods for monitoring the quality of such projects are needed since it is becoming clear that they've become the important index for delivering cheap housing in India.

There are several examples of global housing projects and initiatives that provide solutions to India's current and developing problems. After learning about different policies and initiatives implemented by the Indian government and others across the world, a co-housing project might be one solution to the problem of affordable housing that is both sustainable and long-term. A group of people from a specific community getting together and establishing the groundwork for project design, planning, development, and implementation based on the needs of individual families and groups in that area would be helpful to the community as well as the bordering neighborhood. For such initiatives, the government can provide financial help. This would assist in not only analyzing the area of growth but also the basic requirements of individuals.

There is a need to build a global ecosystem within India that can address not only affordable housing requirements but also skill development and employment possibilities for the low-income and economically disadvantaged. The government should take

steps to establish partnerships with various training and educational institutions to convey information and competencies to real estate professionals. Sustainability and affordable housing are difficult to accomplish, and they can only be achieved via collaboration between individuals, the public and private sectors, government and policymakers, and the three realms of sustainability, namely social, economic, and environmental factors.

Declaration of Authorship

I hereby declare that the attached Master's thesis was completed independently and without the prohibited assistance of third parties, and that no sources or assistance were used other than those listed. All passages whose content or wording originates from another publication have been marked as such. Neither this thesis nor any variant of it has previously been submitted to an examining authority or published.

Berlin, 30.07.2021

Location, Date

Signature of the student

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