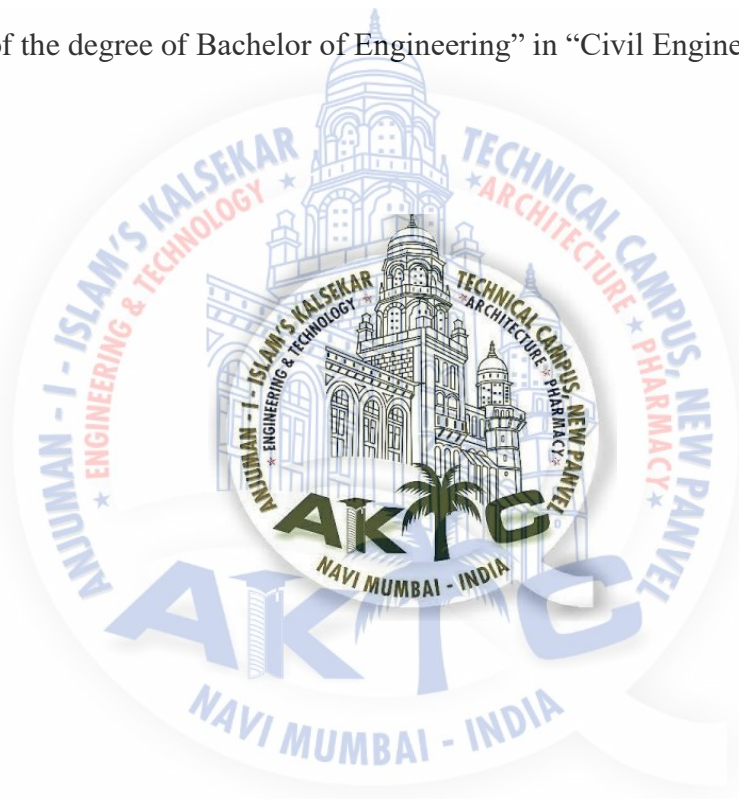


CERTIFICATE

This is to certify that the project entitled “**AFFORDABLE HOUSING TO CLEAR SLUMS FROM THE CITIES**” is a bonafide work of **Mr. SHAIKH MOHAMMED RAHIL MD. AFZAL (15DCES89), MR. SHAIKH SHAHRUKH M AULIYA (15DCES92), MASTER MUFADDAL MOHSIN (13CES30), SHAIKH MD. SHARIF MD. RAFIQUE (15DCES88)** submitted to the University of Mumbai in partial fulfilment of the requirement for the award of the degree of Bachelor of Engineering” in “Civil Engineering”.



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APPROVAL SHEET

This project report entitled “**AFFORDABLE HOUSING TO CLEAR SLUMS FROM THE CITIES**” by **Mr. SHAIKH MOHAMMED RAHIL MD. AFZAL (15DCES89), MR. SHAIKH SHAHRUKH M AULIYA (15DCES92), MASTER MUFADDAL MOHSIN (13CES30), SHAIKH Md. SHARIF Md. Rafique (15DCES88)** Khan is approved for the Bachelor’s degree of “Civil Engineering

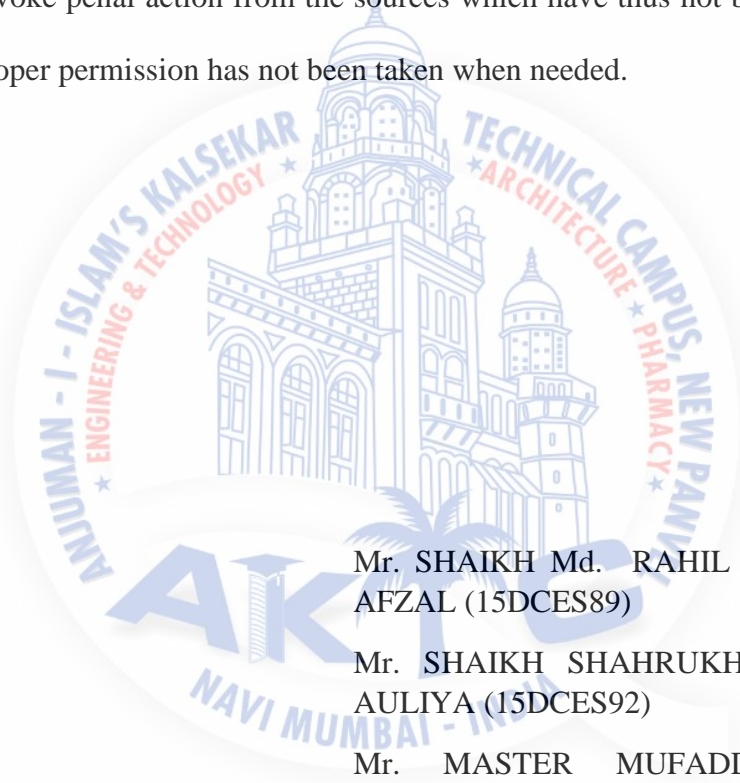


Date:

Place: Panvel

DECLARATION

We declare that this written submission represents my ideas in our own words and where others ideas or words have been included; I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.



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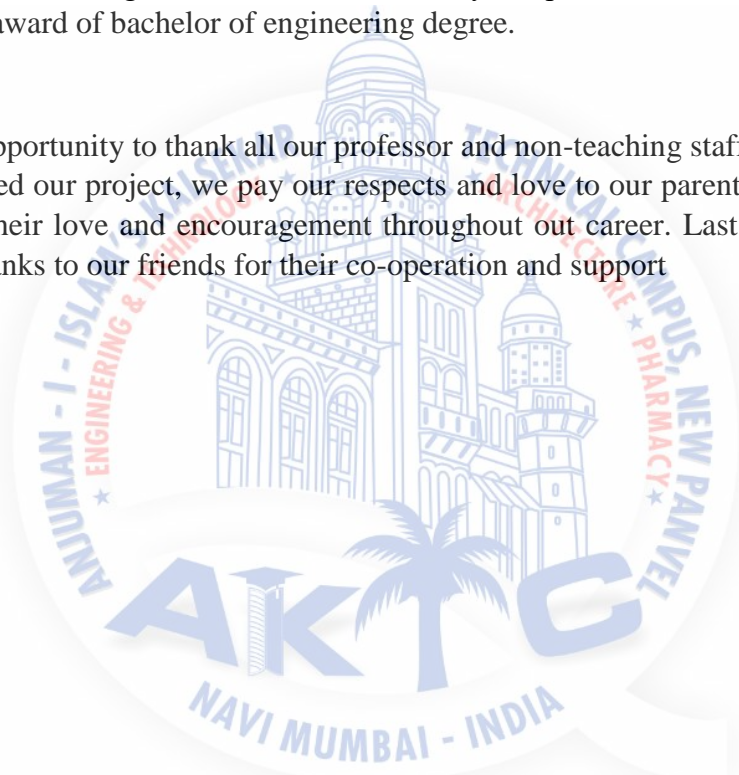
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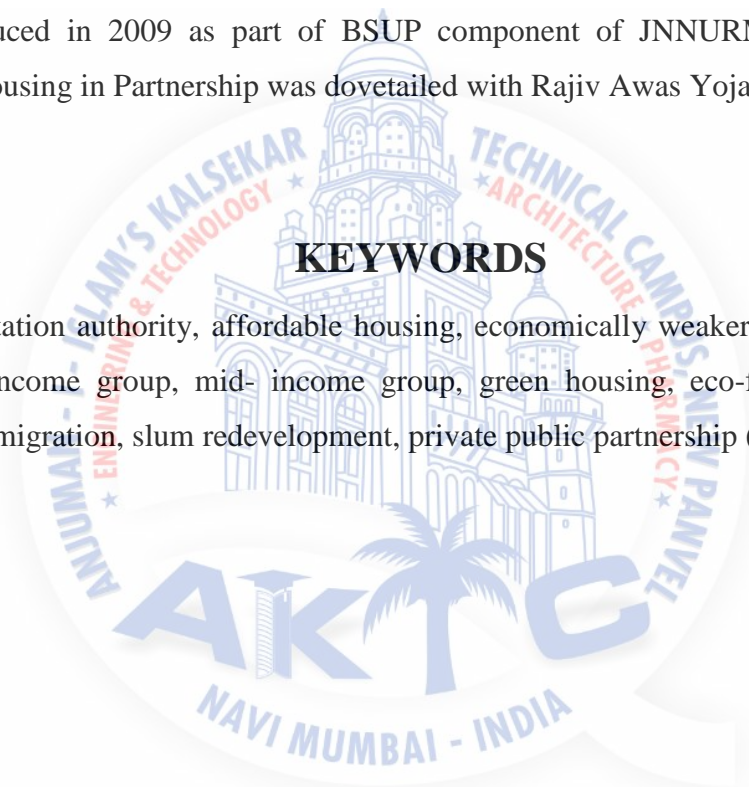
NAVI MUMBAI

ABSTRACT

India's Urban Population has grown over the past 3-4 decades from 109 million in 1971 to 377 million in 2011 and is expected to grow to almost 600 million by 2030. While rapid urbanization and growing cities provide various opportunities, there are Fallout in terms of proliferation of slums, high prices of land and building materials Which render houses unaffordable for the segment at the bottom of the pyramid? The scheme of Affordable Housing in Partnership aims to encourage private sector participation in creation of affordable housing stock recognising that mere efforts of Government would be insufficient to address the housing shortage. It was earlier introduced in 2009 as part of BSUP component of JNNURM and subsequently, Affordable Housing in Partnership was dovetailed with Rajiv Awas Yojana (RAY) in 2011.

KEYWORDS

Slum rehabilitation authority, affordable housing, economically weaker section, low income group, high income group, mid- income group, green housing, eco-friendly, economical, urbanization, migration, slum redevelopment, private public partnership (PPP).



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Abbreviations Notation and Nomenclature

ABSH	Annuity based Subsidized Housing
EWS	Economically Weaker Section
MIG	Middle Income Group
HIG	High Income Group
LIG	Low Income Group
SRA	Slum Rehabilitation Authority
AGSH	Annuity-cum-Capital Grant based Subsidized Housing
AHP	Affordable Housing in Partnership
CALF	Capital Advance Leasing Facilities
Capex	Capital Expenditure
CLSS	Credit Linked Subsidy Scheme
CLU	Change of Land Use
CMP	Community Mortgage Programme
CRE	Commercial Real Estate
DLC	District Level Committee
DROH	Direct Relationship Ownership Housing
DRRH	Direct Relationship Rental Housing
DSCR	Direct Relationship Ownership Housing
EMI	Equated Monthly Instalment
EPC	Engineering, Procurement, and Construction
EWS	Economically Weaker Section
FAR	Floor Area Ratio

Chapter 1

Introduction

1.1. General

Affordable housing is housing which is deemed affordable to those with a median household income as rated by the national government or a local government by a recognized housing affordability index. Most of the literature on affordable housing refers to mortgages and number of forms that exist along a continuum – from emergency shelters, to transitional housing, to non-market rental (also known as social or subsidized housing), to formal and informal rental, indigenous housing, and ending with affordable home ownership. The notion of housing affordability became widespread in the 1980s in Europe and North America. In the words of Alain Bertaud, of New York University and former principal planner at the World Bank,

"It is time for planners to abandon abstract objectives and to focus their efforts on two measurable outcomes that have always mattered since the growth of large cities during the 19th century's industrial revolution: workers' spatial mobility and housing affordability

1.2. Background of study

Household income and wealth

Income is the primary factor—not price and availability, that determines housing affordability. In a market economy the distribution of income is the key determinant of the quantity and quality of housing obtained. Therefore, understanding affordable housing challenges requires understanding trends and disparities in income and wealth. Housing is often the single biggest expenditure of low and middle-income families. For low and middle-income families, their house is also the greatest source of wealth.

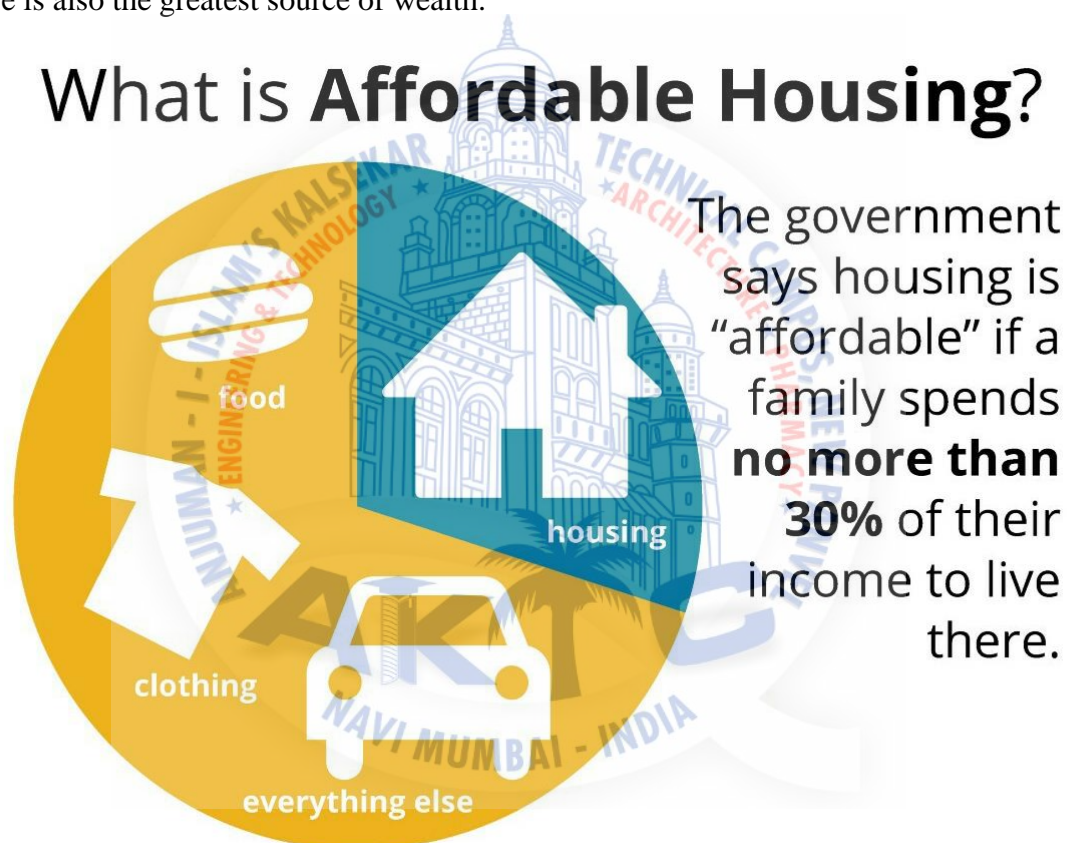


Fig 1: graphical representation of expenditure of EWS and LIG

The most common approach to measure the affordability of housing has been to consider the percentage of income that a household spends on housing expenditures. Another method of studying affordability looks at the regular hourly wage of full-time workers who are paid only the minimum wage (as set by their local, regional, or national government). The hope is that full-time workers will be able to afford at least a small apartment in the area where they work.

Some countries look at those living in relative poverty, which is usually defined as making less than 60% of the median household income. In their policy reports, they consider the presence or absence of housing for people making 60% of the median income.

1.3. Causes and Consequences of Rise in House Prices

- Costs are being driven by a number of factors including:
- demographics shifts
- the declining number of people per dwelling
- Growing Density Convergence, Regional Urbanization
- solid population growth (for example sky-high prices in Australia and Canada as a rising population pushes up demand).
- supply and demand
- a shortfall in the number of dwellings to the number of households
- smaller family size
- the strong psychological desire for home ownership,
- shifts in economic policies and innovations in financial instruments
- reduced profitability of other forms of investment
- availability of housing finance
- low interest rates
- mortgage market innovations
- public policy
- deregulation
- land use zoning
- significant taxes' levies and fees by Government on new housing.

1.4. Supply and Demand

In some countries, the market has been unable to meet the growing demand to supply housing stock at affordable prices. Although demand for affordable housing, particularly rental housing that is affordable for low and middle-income earners, has increased, the supply has not. Potential home buyers are forced to turn to the rental market, which is also under pressure.

An inadequate supply of housing stock increases demand on the private and social rented sector, and in worse case scenarios, homelessness.

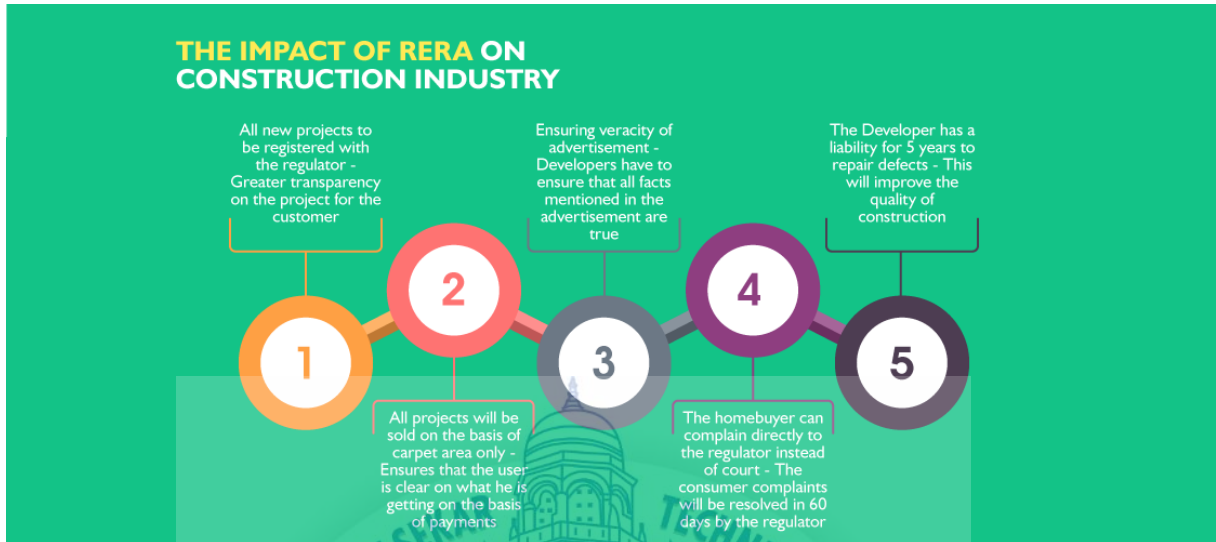


Fig 2: impacts of RERA

RERA and **GST** in real estate, according to a study by realty consultant Cushman & Wakefield, covering the top eight cities of India.

In 2017, the prices of around 44% of the total launches across top seven property markets, or 55,000 residential apartments units, were below Rs. 40 lakhs.

The decrease in the average size of apartments across all top seven cities is a clear indication that realty developers are focused to offer affordable housing for customers.

RERA comes to the rescue of consumers

- Informing the buyer at the time of booking
- Booking amount
- Ongoing projects
- Registration of projects
- Online information
- Home buying advertisement
- The quality of instruction
- Delayed delivery

Fig 3: The RERA act

According to the **Ministry of Housing and Urban Affairs**, a total of 2,97,183 housing units are occupied by beneficiaries as on March 2018. However, earlier the housing shortage was proposed at 18.78 million in the year of 2011, has been revised downwards to about 10 Mn units as of the last year through later estimation carried out by the **MoHUA**.

1.4.1 Some of The Factors Affecting the Supply and Demand

- Demographic and behavioural factors
- Migration (to cities and potential employment)
- Increased life expectancy
- Building codes
- A greater propensity for people to live alone
- Young adults delaying forming their own household (in advanced economies).
- Exclusionary zoning

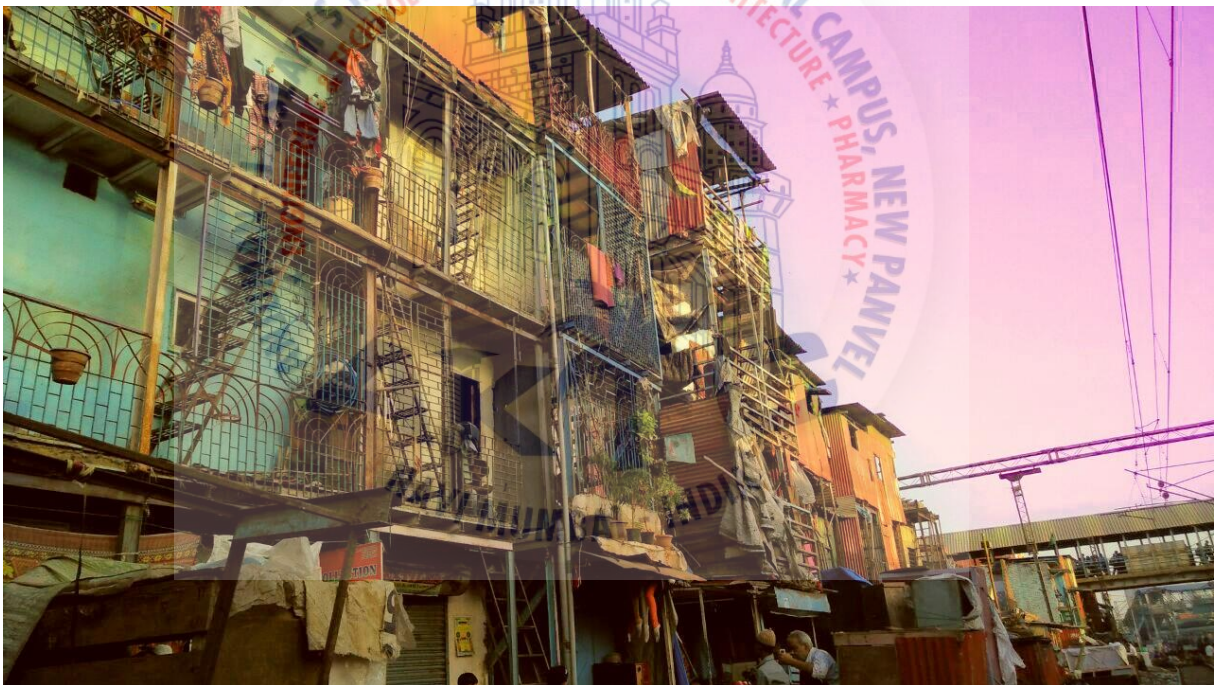


Image 1: Storeyed Slum settlement in Thane

1.5. Background of study

- **Women and Girls:** Women and girls are not afforded time for education, as they are burdened with carrying water long distances and caring for sick family members. And, in

slums with poor (or non-existent) sanitation facilities, going to the toilet at night increases their risk of sexual assault.

- **Health and Child Mortality:** Illness and disease spread like wildfire in slums; in the Kibera slum in Kenya, HIV infection is twice the national average, and diarrhoea is the leading killer of children under five.
- **Education:** Social and cultural barriers deny children from slums the opportunity to receive an education. Many children never receive any formal education and few complete a primary education.
- **Finance:** Banks often refuse residents of slums because they are considered 'unbankable.' Without the support of a financial institution, slum dwellers must incur interest charges from loan sharks, which serve to further impoverish them.
- **Political and Social Exclusion:** Governments often ignore slum dwellers; they are excluded from voting, city development plans, and full protection under the law. Without the rights and voice that other citizens have, people living in slums constantly face political and social exclusion.
- **Disasters:** Many slum dwellers in developing countries live in danger of a rise in sea level. Storms, earthquakes, and other disasters affect city slums more seriously than other areas, as substandard houses crumble or poor drainage systems promote prolonged flooding. The focus of our project will be to eliminate these effects and fulfil the given objectives, and to provide each and everyone at least a basic standard of living and a healthy environment.

Chapter 2

Literature Review

2.1. General

India like some major economy, has been witnessing major civilization changes and urbanization. As per the census of India in 2001, about 72% of the population lived in rural areas, and 28% in urban areas. By 2011 these figures have changed to 69% rural population and 31% urban population. According to estimates, around 600 million people are expected to make urban India their home by 2031, a whopping 59% growth over 2011. 80- 90% of These people will be from EWS and LIG group. Listed below are some research papers published by govt. Of India and various economist and state govt. And some reputed authors in which they have discussed about the future scope and importance of affordable housing scheme and also the planning part of this scheme initiated by government of India as well as abroad as this is a worldwide phenomenon.

2.2. Review of Literature

Jones Lang lasalle's wrote an article "Affordable Housing in India" which was published in Magazine of Affordable housing system in India 2007, he said, Additionally, the National Slum Dwellers' Federation (NSDF) Works actively with Mumbai authorities to develop and implement resettlement plans and ensure that the most vulnerable sections of society are not marginalised. Whilst assessing affordability of the buyer, the cost of the House should consider not only the purchase costs but also the maintenance costs of the dwelling unit. Lower operational and maintenance costs using sustainable features is key to any affordable housing project.

Juli Ponce wrote an article "Affordable Housing and Social Mix: comparative approach" which was published in Magazine of journal of legal affairs and dispute resolution in engineering and construction 10 March 2009, he said, this article deals with European and American legal techniques used to provide affordable housing and promote social mix in communities using a comparative approach. The article analyses the role of affordable housing in society. Taking as a reference the case study of Spain and considering France, England and the American inclusionary zoning, the article concludes that public intervention should promote social mix, which could be a useful antidote for urban segregation, according to current available data.

Sahil Gandhi wrote an article "Economics of Affordable Housing in Indian Cities –The Case of Mumbai" which was published in Magazine of ASCE 2012, he said, focusing on the case of Mumbai, it is estimated that at the Present income distribution and institutional rates, only 5–6 per cent of households can afford a house in Mumbai. The article demonstrates that the failure of policies to adhere to basic economic principles results in massive distortions in the land and housing markets, leading to failure in resolving problems of affordable housing and slums. Thus, for cities to ameliorate affordable housing delivery whilst keeping a check on the growth of slums, it is essential that policies ensure the satisfaction of certain core economic principles in particular, the household stock and flow principle that are instrumental in efficient functioning of land and housing markets. The article advocates that the success of Rajiv Awas Yojana would depend upon its ability to understand the informal institutions in place, given the extant distortions in the land and housing markets.

India Brand Equity Foundation & ANARCA wrote an article "Affordable housing in India - Budding, Expanding and compelling" which was published in Magazine of ASCE, he said, this report analyses Indian affordable housing market & its growth in past decade and demand & supply of the affordable units. It also attempts to find out opportunities in this segment. Affordable housing has great potential In Indian market due to its robust demand and growth story and this report shows ways to capitalise on this potential.

Govt. of India published an article "Housing on PPP (in situ Redevelopment of Slums) under Smart City Mission, Surat Urban development" which was published in Magazine of Project report on growth of affordable housing solutions in Surat - Government of Gujarat:

8th Global summit 2017, March 2017, he said, this report analyses the affordable units mass appeal in Gujarat. It says that affordable housing segment is forecasted to grow about 1.5 times from an estimated 25 million households in 2010 to 38 million in 2030. Affordable housing market in Surat in the next five years, demand for housing in Surat is estimated at 2.30 lacs residential units during 2016-2020 Nearly 80% demand is derived from lower income and middle-income group. It then gives a clear idea as what kind of demand will be generated which can be used to estimate demands in other states and helps authorities plan accordingly and be ready to bridge the Gap between demand and supply.

Neil Thompson and Jay Yang wrote an article “Developing Affordable and Sustainable Housing through Energy, Transport, and Building Utility Integration” which was published in Magazine of ASCE September 2015, he said, this paper examines the potential of initial construction cost and ongoing utilities and transport cost reduction, through the integration of sustainable housing design and transit-oriented development principles in a commuter energy and building utilities system (CEBUS).

Government of India published an article on “Affordable Housing in Partnership Integration” which was published in Magazine of Ministry of Housing and Urban Poverty Alleviation December 2013, he said, the scheme of Affordable Housing in Partnership aims to encourage private sector participation in creation of affordable housing stock recognizing that mere efforts of Government would be insufficient to address the housing shortage. Scheme shall be implemented in the following manner Projects with at least 250 DUs would be eligible under the scheme. Dwelling units can be a mix of EWS/LIG/MIG and others. States may use the services of TPIMA appointed under RAY to monitor the quality and progress of the projects.

Deidre E. Paris, M.,¹ and Roozbeh Kangari wrote an article “Multifamily Affordable Housing: Residential Satisfaction” which was published in Magazine of ASCE 2005, he said, Sources were drawn from the literature on residential satisfaction in affordable housing and urban communities, residential satisfaction in the United States, and quality of life in urban environments. Network layout is how satisfied residents are with property management’s level of friendliness toward residents. Residents’ willingness to recommend their friends to live in their apartment complex. How residents feel about the improvement of their quality of life after renovations. How satisfied residents are with the quality of the apartment buildings on their property. A neural network model was developed. The model was trained in 49 s using Defoors Ferry Manor data. During training, 79 hidden neurons were developed. After the network was trained using Defoors’ data, the network was validated by running the trained network on the Moores Mill test data and observing how efficient the network was in making predictions on resident’s satisfaction level.

Nand Kishore Gupta, Anil Kumar Sharma, Anupama Sharma wrote an article “Quantifying Embodied Energy Using Green Building Technologies under Affordable Housing Construction” which was published in Magazine of Open Journal of Energy Efficiency, Nov 2013, he said, the building construction industry is a major contributor of environmental pollution. To reduce a study was done & a ground floor row housing project was constructed under the Affordable Housing project by Madhya Pradesh Development board, Bhopal using the concept of green building. The use of alternative building units like hollow Concrete blocks for masonry construction reduces energy consumption by 69%. The

RCC filler slab roof saves 31% energy as compared to RC roof. Almost 99% of embodied energy can be saved using Pre-Cast RCC Door Window frame or Wood Plastic Composite frame with respect to conventional steel door window frame.

Suvarnic Roy, manas kumar wrote an article “Soft System Methodology as a Tool to Understand Issues of Governmental Affordable Housing Programme of India” which was published in Magazine of The Institution of Engineers (India) September 2016, he said, The HSM is deterministic methodology to address the problems which are real and solvable with quantitative approaches. The Hard System, Methodologies (HSM), which is conventionally applied to address the issues, deals with real and known problems which can be directly solved. But, in real world problems from the situations and many complex problems cannot be solved using these hard methods The SSM can be tried as a tool for analysing qualitative and subjective issues with help of SSM, issues of affordable housing programmes for urban poor can be interpreted in a variety of ways and further analysis of the issues can be made. In this regard, the philosophy of SSM can be made helpful due to its flexible approach of tackling complex issues and experiential learning.

Government of India wrote an article “Affordable Housing in Partnership” which was published in Magazine of Ministry of Housing and Urban Poverty Alleviation December 2013, he said, the technical committee has estimated housing Shortage at 18.78M during the 12th FYP period of which over 95% of this housing shortage is estimated in the (EWS) and (LIG) categories. They show that estimated 27.5% of the urban Population is living in rented houses. This paper has given various guidelines on affordable housing Schemes of government. Central financial assistance of rs 75000/- per DU will be given to for housing and internal development components. In this paper they have discussed all the guidelines that can be used to attract contractors and those that will be used to allot the houses to EWS, LIG and MIG.

Omar El- Anwar, A.M. ASCE¹ Tamer Abdel Aziz² wrote an article “Integrated Urban-Construction Planning for Slum Upgrading Projects” which was published in Magazine of ASCE 2014, he said, slums are usually unplanned and extremely crowded, which limits the accessibility of construction equipment to site and limits the availability of material storage areas Collecting Data -The execution of slum upgrading projects is faced with construction and social challenges. This paper presented an integrated urban construction planning framework to identify optimal slums upgrading plans, which are capable of Maximizing the benefits of slums upgrading projects by accelerating the delivery of the urgent projects; Controlling and minimizing the total projects costs.

Dr. Sandeep Pendse wrote an article “20 Years of SRA: A Review of Slum Rehabilitation in Mumbai” which was published in Magazine of Blog URK Jan 2017, he said, In the last 20 years, ever since SRS’s establishment in 1997, its success rate has been less than 13 percent. As many as 1,524 projects were started out of which 1,100 are still being developed and only 197 projects have been completed. It has created an atmosphere where the entire city is looking more inequitable and segregated in rich – low density –low Floor Space Index (FSI) and poor □high density high FSI city. More importantly, SRA has also opened opportunities for meandering around building codes and norm by paying premiums to planning authorities. Additionally, it has also impacted other redevelopment scheme like the MUTP and MUIP for Mumbai, CESS and dilapidated building redevelopment, MAHDA colony redevelopment in Mumbai and the other national scheme of BUSP.

Komal rastogi wrote an article “Slum Rehabilitation Programs and Laws in Mumbai” which was published in Magazine of Blog of nirma University Ahmedabad 2015, he said, In the year 1971, the Slum Improvement Programme was initiated in which state recognizes the resettlement of the slum dwellers who were displaced by the earlier scheme. This acwrote an article “Management and Maintenance of Tenements” which was published in Magazine of Support to National Policies fort made a major change in the Slum policies. The state recognized that it is a very inadequate step to clear all the slum area, so the state makes sure that the slums are no danger to the health and safety to the people. In the year 2013, the high court asked the government of Mumbai to develop slums into a township and project as clustered development project s. Court also ordered to take consent from 75% of the slum dwellers for this purpose. The concept worked well and had allocated 1,524 slum redevelopment project s, out of which only 197 have yet been completed.

Shweta Gupta, Dr. Mukesh Kanaskar, Dr. Sudha Kashelika wrote an article “Management and Maintenance of Tenements” which was published in Magazine of Support to National Policies for Urban Poverty Reduction August 2012, he said, this case study has a predominant focus on highlighting crucial role women can play in the context of the theme under consideration. Moreover, the specific redevelopment case covered here dates back to 1998, long enough a time span to derive learnings from. Mahila Milan- which was established more than 30 years back has domain of activity spread much beyond India in lot many other countries. It had its Pune chapter started in year 1994 as a Community Based organisation (CBO) of group of women from slums working for the betterment of slum dweller women. By now, it brought together 3500 women across the Pune city slums. Mahila Milan was initiated to empower women through Bachat Gats (SHGs). It works in 56 slum settlements of Pune with the thrift and credit activity. Mahila Milan then steadily started to work towards slums development by first learning about the benefits that the slum dwellers are entitled to receive and then disseminating it to other slums. In past the organization has worked on slum relocation projects in Pune. The organization is currently working across the slums in the city to facilitate redevelopment of slums under Basic Services for Urban Poor (BSUP) projects. For the same they have collaborated with the Pune Municipal Corporation (PMC) and other social organisations. For every slum redevelopment/ resettlement project the organisation forms a team from the residents that address the settlement issues that come up. They have a team of 22 members that work from inception to implementation and monitoring. The Mahila Milan has also formed a network in every slum where they select a few women residents to form Bachat Gats.

Jockin Arputham wrote an article “For a better Mumbai, fix the slums” which was published in Magazine of Fixing Mumbai 2005, he, said, even today, 40 per cent of people in Mumbai don’t have access to a toilet. In Dharavi, 33–35 per cent of people live in 60-sq-ft areas. We’re talking about five-member families living in that space. Everyone is talking about Swachh Bharat, but how many toilets have been constructed in slums under this project? The government could have claimed it had cleaned Mumbai, so working with smaller cities.

Shuruti shiva wrote an article “lessons from a successful slum upgrading project” which was published in Magazine of Web page pdf. Com 2015, he said, The Yerwada project is part of the Jawaharlal Nehru National Urban Renewal Mission, a revitalization initiative that wrapped up last year and carried the goal of envisaging a “sustainable and slum-free city.” It was led by Prasanna Desai Architects in collaboration with the Society for the

Promotion of Area Resource Centres, an NGO that works on housing for the poor. Most important, unions from the slum-dwellers' communities themselves were key players.

Sneha Rao, Yash Shah wrote an article "Addressing Slum Redevelopment Issues in India" which was published in Magazine of Dow Sustainability Fellowship 2015, he said, Dharavi is one of the most widely studied informal settlements in the world. Situated in Mumbai it represents all the pressures that are faced by informal settlements in large developing cities. In 2015 the Urban Design Research Institute (UDRI) proposed an international competition called "Reinventing Dharavi" as a challenge for fresh thinking in response to the current proposal for developers to provide housing through vertical through the SRS scheme "Reinventing Dharavi" aimed to advocate for a more equitable development of its home city which would not only address the increased amenities, such as toilets, of current redevelopment schemes but also the fabric of the community from micro entrepreneurship.

Rohit H. Jagdale wrote an article "An Overview of Slum Rehabilitation Schemes in Mumbai, India" which was published in Magazine of 2014, he said, Slum Rehabilitation activities have increased the density of construction in Mumbai. The state should be careful of not overloading the already strained infrastructure and environment of the city. Some still argue that the kind of scheme implemented in Mumbai, steers away from its intention of rehousing and focuses more on the profits for the developers. This makes the success of the schemes entirely dependent on the price differential between the sale price of the additional apartments built and the construction cost of the rehabilitated apartments. This is a deterrent as developers only pick up-scale locations where profits through sale are a surety. (Burra, 2005) This creates the risk of slum-dwellers being used as a tool for rapid redevelopment. The impact of these schemes on the beneficiaries should be closely studied. If development regulations can be modified, and if it leads to entrepreneurial initiatives by the slum-dwellers, the city might become a powerhouse of innovations in housing improvements.

Mellisa Bilec wrote an article "Sustainable Development and Green Design Who Is Leading the Green Initiative" which was published in Magazine of Sustainable Development and Green Design Who Is Leading the Green Initiative, he said, Three areas that may be contributing to the low level of effort in sustainability are interdisciplinary experiences, reasoning techniques, and quantification Applications The inductive approach, which "depends on creative insight into observed phenomena," may be more applicable to creating new solutions or analysis methods related to sustainable design Misact and Morey 1998. Two laureates, Barbara Mc-Clintock genetics and Albert Einstein, used inductive and collaborative approaches in their scientific research. Furthermore, both researchers stressed the need for a connection to living ecosystems. Encouraging this connection helps develop a comprehensive understanding of the global community.

Tamer Abdul mazid wrote an article "Integrated Urban- Construction Planning Framework for Slum Upgrading Projects" which was published in Magazine of Journal of Construction Engineering & Management of American Society of Civil Engineers, he said, representation that enables analysing and utilizing this data. To this end, this phase consists of the following four main modules this module is designed to implement four important initial steps for any upgrading project, including, collecting initial set of data; Dividing the slums area into zones with homogenous characteristics Identifying the needed intervention strategy for each zone; and Assigning an urgency factor for each zone based on its current condition.

Cushman & Wakefield wrote an article “Affordable housing in India” which was published in Magazine of Ministry of Housing & Urban Poverty Alleviation June 2011, he said, the Government of India has recently taken major initiatives to provide a boost to affordable housing in India, complemented by a number of measures by the Reserve Bank of India (RBI). In view of the increased attention received by affordable housing in the recent period, an attempt has been made in this article to study various dimensions of Affordable housing Expenditure Method or Housing Cost Burden: The ratio of housing expenditure to household income is used to measure affordability. Housing expenditure covers all the costs related to housing including rentals, mortgage repayments, utilities and maintenance costs. Housing units can be classified as affordable if the ratio is less than some cut-off value. The choice of this cut-off is judgemental; however, as a thumb rule, it is taken to be 30 per cent. Median Multiple Indicators: Under this approach, the median house price is divided by median household annual income to derive housing affordability. Demographic International, an organisation which conducts survey across countries for affordable housing, considers price to income ratio below 3 to classify housing units as affordable. Housing and Transport (H+T): In this method, transport costs are also included with housing costs to measure affordability. The underlying idea is that congestion in cities has led to rise in human settlements at long distances from the city centre, which has resulted in increase in and time spent in commuting (Hamidi et al., 2016). Affordable housing can accelerate economic growth through its linkage with the other sectors of the economy.

Dr. B. Shankar wrote an article “Impact of Slum Rehabilitation Project in Bangalore” which was published in Magazine of International Journal of Engineering and Innovative Technology (IJEIT) Volume 4, Jan 2015, he said, Pantharapalya slum is situated in Ward Number 31 (Nayandanahalli Ward) of Bruhath Bangalore Mahanagar Palike. The slum existed for more than 30 years. It occupied in an extent of 20000 sq.mts. It is bounded by Bangalore-Mysore State Highway on eastern side, storm water drains on western and southern sides and 5.5mt wide road on northern side. The condition of housing was most vulnerable and the majority of the people lived in kutchha and semi-pucca houses (see fig.2). The situation in terms of socio-economic condition and physical infrastructure namely water supply and sanitation were in vulnerable conditions. People were erected houses according to their wishes and there was no security of land tenure. The slum rehabilitation project was initiated in the Pantharpalya Slum under JnNURM project. The in-situ rehabilitation, which was carried out in Pantharpalya Slum has contributed for improving the quality of housing. The project has benefitted largely to the urban poor though, certain dissatisfactions in terms of quality of construction, sustenance of infrastructure and its maintenance including community involvement. The outcome of the impact study is that the project has yielded good result in benefitting the urban poor to improve their quality of life. The impact results have scope improve in rehabilitation projects.

Riya verma wrote an article “BMC clears 8-acre slum sprawl near Bandra (E) station” which was published in Magazine of Times of India may 2013, he said, the on-Thursdays reed up eight acres of land outside station (east) by razing the tightly packed illegal shanties, many of them three-storied high, and rendering thousands of people homeless. A civic official said the land reed up was below the Bandra skywalk on one side and a large sprawl going towards the Bandra rail terminus on the other. These eight acres were taken on lease by the BMC from the railways to lay water pipelines many years ago. The two-acre plot belonging to the railways, which is also heavily encroached, was left untouched. The BMC now plans to widen the existing congested road outside Bandra east station to 90

feet for BEST buses to manoeuvre easily and make the area more pedestrian-friendly. The land will also be used for a proposed cycle track parallel to the Tansa pipeline, which starts from the Bhandup water filtration plant, to Malabar Hill. The demolition drive left several hundred families displaced; the authorities, who razed 325 hutments, have no rehabilitation plans for these people as they are considered unauthorized occupants of this municipal land. Only 35 hutments have been declared “legal” and are eligible for alternate accommodation. Officials fear that since they have no place to go, these evicted people may encroach upon adjoining public open spaces. The civic demolition squad was racing against a Bombay high court deadline to remove 16,409 hutments on the city’s water pipelines from Borivali to Mahim. The ones which proliferated near the Bandra station (called Garb Nagar) were precariously built on top of each other and have been a constant threat to thousands of commuters in the event of a disaster. This Bandra east slum cluster has caught fire several times over the past decade with the latest blaze just last month. The railways still hold about two acres of encroached land. Civic officials complained about the “slow response” of the rail authority. “We would have removed the shanties on the two acres today itself if the railways had shown some initiative,” said the BMC official. He added “When we asked them to remove the remaining structures, they replied negatively stating that they needed to discuss about it with their seniors. Now we are waiting for them to remove the remaining structure.

2.3. Aims and objective

- 250 plus millions of Indians does not have their own houses.
- To make Mumbai free from slum.
- To help people caught in crisis.
- To provide basic amenities to the rehabilitated people.
- To ameliorate the problems related to slum dwellers
- To increase standard of living of people
- To improve economic efficiency of national transport system to promote community well-being through better provision of housing to meet diverse community needs.
- To promote a range of housing that is affordable to households of varying financial capacity, including an adequate supply of housing that is affordable for very low, low and moderate-income households.
- To provide housing choice by encouraging housing of different types, size and tenure in suitable locations, at a range of prices within the reach of households of varying financial capacity.

- To provide housing choice by encouraging housing of different types, size and tenure in suitable locations, at a range of prices within the reach of households of varying financial capacity.
- To encourage adaptable and accessible housing that can respond to the changing needs of residents
- To eradicate the effects of slums on environment.
- To make sure each and every person gets basic services and amenities provided by the governmentt.



Chapter 3

Methodology

3.1 GENERAL

Planning approaches for affordable housing may be conceptualized along a spectrum, involving:

- Planning to protect existing sources of affordable housing which may be at risk due to redevelopment;
- Planning to promote new affordable housing; and
- In some cases, using the planning system to generate or produce new sources of housing, affordable to low and middle-income groups.

3.2 METHEDODOLOGY

Location Survey

Location of survey has been finalized as areas having low to moderate number of slums. Under jurisdiction of SRA (THANE)

We are going to study the data that we got from SRA and survey any area given in the documents that we got from SRA. We will survey two such areas, one area will be the slums

where the rehabilitation is proposed and other will be already rehabilitated buildings. From here we can get the idea of what's causing delay in the initialization of projects. Problems that the rehabilitated people are facing needs to be solved so that's such delays do not happen in future. These problems will come to notice after the survey and after talking to the people living in the slums. Once this is done we will be proposing a model and solutions to bring this whole rehabilitation process on fast track and on transparent level. Entire rehabilitation process can be made smooth and easy.



Image 2: Pottery industry in slums of dharavi

3.3. Feedback of residents

This is what slum rehabilitation residents have to say

Vasant Kamble (62) used to live in a slum at Worli with his family before the slums went under rehabilitation scheme. “Earlier, the area had a high crime rate of petty offences like

theft, eve teasing, local fights and brawl between women and others. After our area was redeveloped the standard of living of all the tenants has improved drastically. Nearly 2500 families have moved to high quality permanent houses constructed by Larsen & Toubro and are today leading a quality life.



Image 3: Nullas near residing houses of slum dwellers in Dharavi

Kasare Ashok (60), a Bhoiwada resident stated that cleanliness was a major issue in the slums and diseases used to make the children suffer. “Random quarrels used to take place for water usage as there were hardly any water taps in the slums. I have a daughter and two sons in my family. We live in a two-room flat. Electricity and water facilities are quite good in this building. However, there are problems of blackouts sometimes. My daughter got married in a good family which is also a reason we appreciate living here.”

Arun Dhadve, a resident of the same building faced the worst incident while living in slum when his brother got stabbed over a small issue of water shortage. “Life has become secured now, the rooms provided are spacious and our children are getting good education and space to play. There are some issues like cooperation between all the residents but no major disagreements or security problems.”

So, this was an average overview of what slum residents had to say. But not all stories have a happy ending. Some rehabilitations projects were not so responsive and so we have to study the loopholes causing such projects to fail.

Chapter 4

Case Study and Data Collection

4.1. General

We have studied the number of literature regarding affordable housing system in india as well as abroad and slum rehabilitation system in India.

Distribution of Estimated Urban Shortage in India (Millions) - 2012

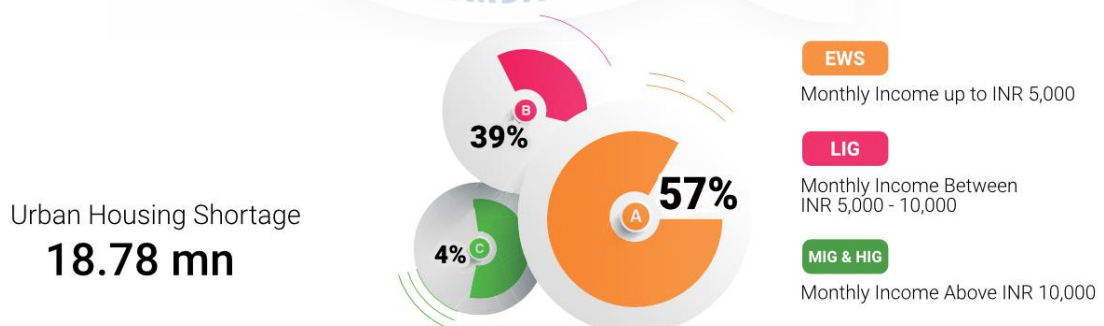


Fig 4: Estimated housing shortage in millions (2012)

4.2. Who is the Affordable housing customer and what does he/she want?

Decent, affordable housing is fundamental to the health and well-being of people and to the smooth functioning of the economy. Against the backdrop of impending large-scale urbanization in India over the next few decades, it is important to identify, evaluate the needs of, and address the challenges faced by the largest chunk of urban housing consumers with the most pressing needs – the Affordable Housing customer. In India, it is appropriate to define affordability in housing as being a function of three broad parameters - the monthly household income (MHI) of prospective buyers, the size of the dwelling unit and the affordability of the home buyer (the ratio of the price of the home to annual income or the ratio of EMI to monthly income). First and foremost, the Affordable Housing customer seeks a strong value proposition.



Image 4: MHADA dwelling units mass construction (Mankhurd)

Limited income and difficulty in access to credit mean that a home will most likely comprise the most important asset/biggest investment in his/her lifetime and will form the starting point for the long-term welfare of his/her family. A well-constructed home in a planned development with adequate sanitation, security, privacy, play areas for children, and uninterrupted water & electricity supply holds significant aspirational value for this customer, whose current living conditions are likely to be compromised. Good connectivity to places of work in urban centres and the presence of social infrastructure such as schools and hospitals are also key.



Image 5: Discussing responses we got from dwellers in Thane residing in demolished shanties in slums

4.3. Observations

- We have come through shocking facts during our field survey. Here are some facts
- 12.44 million people live in slums.
- Around 60 - 40% people lives on 25% of land that's 5.2 Million people and increasing.
- 35% of slums are 60 sq. ft area. Here we are talking about 5 members of family living in that space.
- Also 30% of total land has been devoted to garden sand areas for recreation.

- 40% of people don't have access to toilets in Mumbai this worsens the situation even more and demands immediately attention.
- No development in Slum areas since past 15 years
- Rehabilitation costs around 100 - 200x more than laying of sewers.
- Slums pockets have increased from 600 - 3000 since 80's.
- In 1856 8% people lived in slums
- In 2015 prime minister Modi announced housing for all and aims at 1.9 million houses of which 0.8 will be Mumbai for LIC and MIC
- 0.15 million houses were delivered for rehabilitation in past 2 decades
- Whereas 1 million was target in 1st decade.
- 1524 projects were started in 1997 of which 197 only are complete and around 1.53 lakh units instead of 5-6 years

4.4. Important Facts You Should Know About Affordable Housing

- **Infrastructure status to affordable housing**

Union Budget 2017-18 has granted “Infrastructure” status to affordable housing and this step is aligned with the government’s agenda of ‘Housing for All by 2022’. This status reduces the cost of borrowing for real estate developers, provides easy access to finance and spur investments, opening of external commercial borrowing (ECB) route and taxation benefits for the developers.

- **Increase in participation from private players**

So far, affordable housing segment had seen limited participation from private developers despite high demand. An increase in budget allocation under PMAY from Rs15,000 cr to 23,000 cr, revising the size of carpet for low-income group houses, boost in home loan are likely to result in increased participation from private players. Profit-linked exemption along with the infrastructure status for affordable housing will push developers to undertake more affordable housing projects, thus increasing private player’s participation in the sector.



Image 5: Slums settlement in Bandra near Naupada village

- **Easy availability of loans and income tax deduction for buyers**

With the announcement of interest subvention of 4% and 3% on loans up Rs 9 lakh and Rs 12 lakh, respectively, there is a boost in the home buyer's confidence. The proposed deduction of the income tax rate to 5% for taxpayers having income less than Rs. 5 lakh per annum will increase the disposable income of the common man and this will in turn raise spending power and increase investment in the affordable segment.

- **Major deals**

About Rs 7,296 crore has been allocated for two central schemes – Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and 'Smart Cities' Mission with focus on provision of clean drinking water, setting up of sanitation and solid waste management systems, efficient mobility and public transportation and affordable housing. Data Value Homes, a 100 per cent subsidiary of Tata Housing Development Company, has raised \$25 million, i.e. Rs 168 crore for construction of affordable housing projects through CDC, UK's Development Finance Institution (DFI) and IFC, a member of the World Bank group.

- **Carpet area and project completion time**

For affordable housing purpose instead of the built-up area of 30 and 60 sqm, the carpet area of 30 and 60 sqm will be counted. The 30 sqm. limit will apply only in case of municipal limits of 4 metropolitan cities while for the rest of the country including the peripheral areas of metros, limit of 60 sqm will apply. The government has extended the time of completion of such projects from 3 years to 5 years.

- **Demand for affordable housing units on property portals**

There are two common trends seen for buying and moving in to a new house are: movement of people and upgrade in similar locality. These trends are resulting in property portals witnessing high demand for affordable housing units. The price brackets Rs 0-30 lakh and Rs 30-60 lakh are the most preferred ones in the country because of private sector employees who are in search of affordable housing units which offer decent amenities rather than luxury and ultra-luxury properties.

- **Advantages for woman home buyers**

According to the government's Housing for All Mission, women should be either co-owners or sole owners of affordable houses. This is to empower women from low-income households. Also, compared to their male counterparts, women are entitled to lower rates of interest on home loans.

We visited slum rehabilitation office in thane and collected no. Of data regarding the project completed now we are studying the total number of project allotted on paper matches with reality.

Below is some important document sample that we occupied from SRA's office

झोपडपट्टी पुनर्विकास प्राधिकरण, ठाणे
ठाणे महानगरपालिका क्षेत्रातील झोपडपट्टी पुनर्विकास योजनांची सद्यस्थिती

क्रमांक	सद्यस्थिती	पात्र/अपात्र झोपडीधारक	स्लम सदनिकांचे चर्टई क्षेत्र २२५.०० चौ.फुट असलेल्या योजना	स्लम सदनिकांचे चर्टई क्षेत्र २६९.०० चौ.फुट असलेल्या योजना	एकूण योजना
I	O.C प्रदान	५२३	५	निरंक	५
II	काम पूर्ण O.C. बाकी	२७६५	२०	४	२४
III	काम सुरु	७४६३	४	२६	३०
IV	प्रगती नसलेल्या योजना	४५३४	निरंक	८	८
	एकूण	१५२८५	२९	३८	६७

Table No 1 – Data of Number of Completed and Ongoing Projects

झोपडपट्टी पुनर्वसन प्राधिकरण, ठाणे
योजनांचा संपादन
स्लम सदनिका क्षेत्र - २२५ चौ.फुट (२०.५० चौ.मी.)

अनु.क्र.	विकास प्रस्ताव क्र.	झोपडपट्टीचे भाग	कार्ये क्र.मधील	सोनी अंतिम कागदपत्रे होडवक (चौकी)	अंतिम उद्योग दिवस	पात्र/अपात्र सदस्य संख्या	LOI दिनांक	संसाधनेचे भाग/ विकासकार्येचे भाग संपता	सद्यस्थिती
१	१५/११९	अन्वयन नगर, पांचपाखाडी	सोने पांचपाखाडी इ.मं.३५ अ (प) ३१.५ चौ. अन्वयन नगर, मुंबय अन्वयन शीट, कामे (प)	२३२२.३१	१३-०५-१९९५	१८	१२-०३-१९९६	नवनीत भागत स. गृह. संस्था	II
२	१८/००४	घाटन शीत	दिवस नं.१-५/११८.स.मं.१२, ३, २ घाटन शीत, सोने-शेवट, कामे (प)	११११.८१	०२-०२-१९९६	७८	०९-०६-१९९८	नवनीत को.अपे.श्री. सोसा.	II
३	१८/०१०	घोसा कावरासन	अभिलेख १३-४२, घोसाको, घोरणी, कामे (प)	१११३.६८	३०-०४-१९९७	४४	२६-१२-१९९७	निर्मलपथन को.अपे.	II
४	१९/०२१	विधवाशाला, कावरा	सोने-कावरा, कामे (प)	७४९.२५	१९-०८-१९९७	५७	०४-०२-१९९७	पावोळी रत्नाकराई असेटडमन स.गृह. संस्था	II
५	१८/०२३	सारवली इलियास शाहीसमोर, पांचपाखाडी	अनु.क्र. २६६, स.मं.३६, सोने-पांचपाखाडी, कामे (प)	२०४७.५८	२३-०६-१९९६	१००	१८-०२-१९९८	साहीनी को.अपे.श्री. सोसा.	II
६	१८/०६६	घावरी शाही	सट नं.७० चर्चें/घावरीशाही, घावरी, कामे (प)	६३६५.७७	१५-०२-१९९७	३४५	१४-०७-१९९८	दिल्ली को.अपे.श्री. सोसा.	I
७	१८/०८५	अन्वयन नगर, पांचपाखाडी	स.मं. २९ अ (चौकी) सय पणत सो अन्वयननगर, मुंबई अन्वयन शीट, कामे (प)	१७२७.००	०३-०२-१९९६	६७	०८-०८-२००२	एम्मा साकल्प को.अपे.श्री. सोसा.	II
८	१८/०९४	सहज बंधवली, कामे (प)	दि.नं. ०६, सि.स. २१७ (घाट) सय ११८ अ (घाट), घोरणी कामे (प)	१३४४	३०-०४-१९९७	४८	०९-०६-१९९८	नवनीत को.अपे.श्री. सोसा.	II
९	१९/०३४	घोसा कावरासन	सो.टी.ए. म. ३२ घाट ४३ अ घाट दिवस नं.१७, २३ घोसाको, कामे (प)	११३२.००	०६-०३-१९९६	५८	०४-०२-१९९६	प्रयात नगर को.अपे.श्री. सोसा.	II
१०	२०००/३१	इन्दुरी, कामे (प)	नाराचे क्र.९, अंतिम मूळद क्र.११८/१२९, इन्दुरी, पांचपाखाडी, कामे (प)	४०७७.८७	१८-०६-२०००	३९१	०६-०३-२०००	आनंद कृपा को.अपे.श्री. सोसा.	II
११	२०००/५२	कंधाळी तालव	अंतिम मूळद क्र.३५३, कंधाळी तालव, दि.ए.म.का. म्हा बागुलत शीट, कामे (प)	१९०७.५	३०-०४-१९९७	४८०	०३-०८-२०००	सरोवर दर्शन को.अपे.श्री. सोसा.	II

Table No 2 – Detailed of Completed Projects

Chapter 5

Result and Discussions

5.1 General

Statistics reveal that India leads the housing shortage with a shortage of 20-25 million houses. However, the Modi government's mission to achieve 'Housing for All by 2022' has given the affordable housing sector a much-deserved share of limelight. Added to this, the demand for affordable housing has gained substantial momentum in the recent past and with the Reserve Bank of India lowering its minimum risk weight on home loans, banks are now able to extend more funds for affordable housing projects

5.2 Solutions

5.2.1 Tax on luxury construction

We suggest that there should be some specific amount of tax on luxury constructions.

Basically, the amount collected from builder would go for providing affordable Housing in city, the amount would range from 1% to 3% depending upon the expected cost of project.

1% for projects < 500 crore

2% for projects < 1000 crore

3% for projects > 1500crore

Any luxury projects like ultra-luxury residential tower, multiplex, mall, hotels & resorts are liable to pay this amount at the time of Getting approval of authority. The rate of slums in city is at peak and to ensure each & everyone affordable housing

Is not an easy task but it can be achieved along with large constructions like high rise towers has very high sqm rate

Small amount from this profit can be utilised for development of slums and houses in affordable sector.



Image 6: Dosti Luxury township construction (Thane) near Natyagrah

For example: in France this idea has already been implemented & around 2-5% of cost is taken by the authorities.

In South Mumbai imperial tower is an example of slum rehabilitated construction which today has rate of about 900cr was constructed on a land which was fully covered by slums. Imagine a small land can attain such a high profit, large one is out of calculation!!!!

Each conidium costs about 3.3million USD = 28 cr rupees.

5.2.2 Town planning

We suggest that in any city a major construction plan like planning of towns or any townships should be carried out along with slum rehabilitation authorities, the idea is to have an Aff-H projects tied with mass construction.

The role of architecture in planning would be to plan a portion of total construction area i.e. 5.-10% of the total plot area should be reserved for construction of affordable housing by the builder on his cost for betterment of society.

5% for area of projects < 5400 sqm.

6% for area of projects < 7000sqm

8% for area of projects <10000sqm

10% for area of projects > 15000sqm

At backside or any suitable side can be used for constructing affordable housing for slum dwellers.

5.2.3 Built Operate Lease

This one is a little sophisticated. The government will hire a private developer promoting the public private partnership for the construction of buildings. The government will only give 30% - 40% cost of construction to the developer rest all will be upon him and government will also provide a piece of land on which he will have to construct the building.

**PPP projects in India by sector
(Total number of projects: 758)***

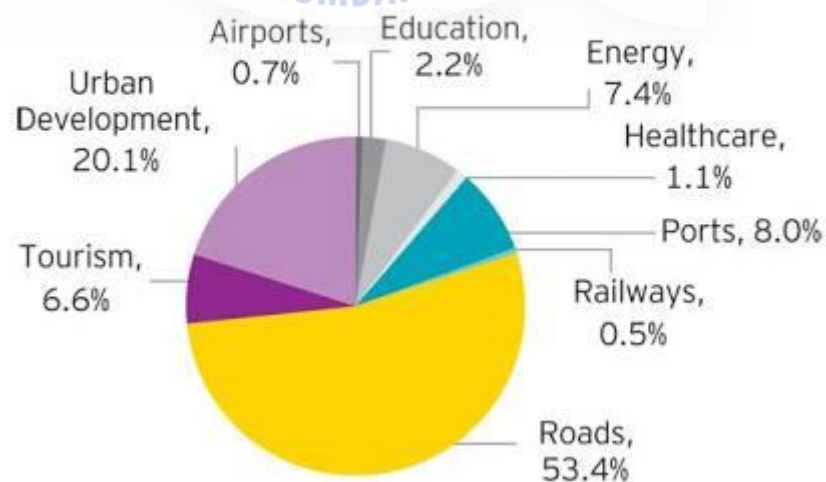


Fig 4: PPP contribution in construction industry in 2011

Ground floor will have commercial shops. These shops will generate revenue for the builder. The ownership of the land will be with the government and the shops will be leased to developer for a certain period of time (for ex. 10 – 25 years) depending upon the contracts

5.3 The Ultimate Benefits of Affordable Commercial Shops in Township

The affordable shopping complex is a one-stop solution to a person's daily needs right at their doorstep. Providing a clear example of peaceful, sustainable and high-quality living, people choose to live in those townships where they can avail the bountiful of facilities provided by the developers.

The real estate sector is among the most dynamic sectors; it never remains the same. Newer trends in the sector beat the older trends. What is in vogue these days is the trend of affordable commercial shops in townships. Yes, it has become a buzzing word in the real estate industry.

Nowadays, most of the realty developers and the companies are launching such projects to cash in on the rising demand. The reason why it became so popular because they have good business prospects as well as they catered to the challenges of urbanization in India i.e., overcrowding and unplanned development.

5.3.1 Advantages of an affordable shopping complex in a township

The major advantages of the affordable shopping complex in townships are as follows:

Great value to end users

Shopping complex in townships offers tremendous value to end users since every possible daily requirement facility is available nearby. Likewise, the presence of shopping facilities in the form of shopping complex also helps its residents to significantly save time, which otherwise would have been spent in travelling to overcrowded places. These are in sync with those urban couples who are living a fast-paced life, for whom time is precious.

Solution to Urban Challenges

Such projects promise a congestion-free environment for residents, as traffic congestion is a major problem due to urbanization these days. If there is a shopping complex in the township, they don't need to commute anywhere else and they will get all essential items right at their doorstep. Hence, it solves all the urbanization issues and meets all civic needs of its residents.

Solution to peripheral locations challenges

Most of the townships are generally developed in peripheral areas because of the availability of large parcels of land. However, being far off from the main city, it cuts off the residents so buying in their shopping complex eliminates this problem

Develop long-term relationships

It develops loyalty and meaningful relationships by giving their residents what they want and when they want it.

The shopping complex is actually a great deal

Affordability is another factor that is drawing buyers to the shopping complex. When you see the price list of items in a shopping mall, you'll find the shopping complex prices are often lower – more than 50% difference in pricing.

Yet, it is an idea which will leave a significant impact on the Indian realty sector in the near future



Calculations for Redevelopment plans of slums in Thane

We went to thane for surveying slums. This slum had an area of 4200 sq.m. The slum was very congested as well as unhygienic. People were living in very poor conditions and the rooms were as small.

Slum area 4200 sq.m

Each room in slum = 8 x 10 sq m

Total approx.. number of slums (shanties) 65

Proposed PLAN

FSI 3

Each flat area 6.7 X 5.1 sq m = 367 sq. ft.

Above given is the built-up area

No of floors 10

No of flats on each floor 7

Total buildings 6

Total number of developed flat 420

Note: Drawing of redevelopment plan is provided in annexure

Chapter 6

Summary and Conclusions

6.1. Summary

Problems and loopholes in the system

- The beneficiaries need to pay 20% of the total amount of the house for documentation of the room and paper works.
- They have to pay 5 times the charges for basic amenities to what they were paying earlier. Do we really expect the slum rehabilitated people to pay that much? Basic amenities for them should be free.
- The rehabilitation units do come in standard size from 269sq.ft to 305sq.ft depending upon the people in the room.
- Now the people residing in slums see themselves just as a vote bank and refuse to trust even the genuine offers of developers.
- Bigger slums like dharavi also have job opportunities for the dwellers inside the slums to they don't need to travel for jobs and there are lots of such small-scale industries in dharavi. So why would they want to rehabilitate to a building where they will be charged

for what they are getting here for free and also their jobs will be taken away from them. Also, dharavi has recently been known to have waste recycling units inside it.

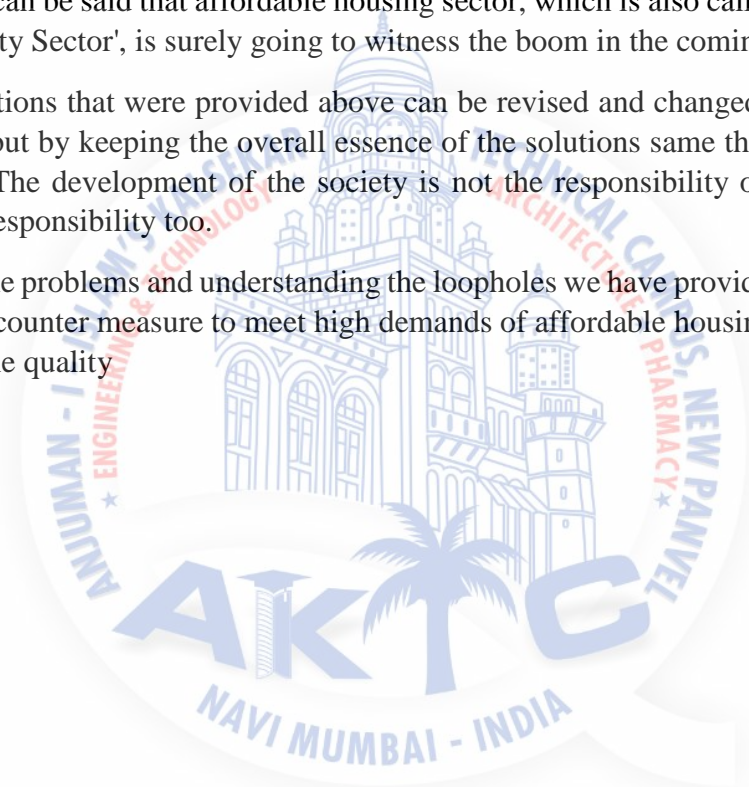
6.2. Conclusions

With this rising demand for affordable housing, it is likely to be the main focus for the government as well as the real estate industry in years to come. The central government's financial and regulatory support, growing urbanization, and increasing affordability is converting a huge demand for affordable houses into a commercially feasible opportunity.

In nutshell, it can be said that affordable housing sector, which is also called the 'growth engine of Indian Realty Sector', is surely going to witness the boom in the coming months

Also, the solutions that were provided above can be revised and changed to meet demands of the contracts but by keeping the overall essence of the solutions same the required results can be achieved. The development of the society is not the responsibility of the government all alone its our responsibility too.

By studying the problems and understanding the loopholes we have provided such sophisticated solutions and counter measure to meet high demands of affordable housing as soon as possible maintaining the quality



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