Using a Concept of Big Data for effective implementation of Mission "Housing for All by 2022"

Paresh Mistry[1], Mitul Raj[2], Amitkumar Rana[3]

[1] Civil Engineering Department, P P Savani University,
[2] Computer Engineering Department, P P Savani University,
[3] Town Planning and Valuation, Bilimora Municipality,

Abstract- House is a basic need of any people that must be fulfilled. After independence, Government of India (GOI) have launched many housing schemes which provide housing facilities to houseless people or slum dwellers in urban and rural areas. In India, out of 1.21 billion populations nearly 18.78 million of population is still lacking for house. To provide affordable housing to all shelters, GOI has already set a mission "Housing for all by 2022". GOI is finding many obstacles for effective implementation of all the schemes, there were many reasons identified which can be overcome by the concept of Big Data. Big Data can be used as a tool to manage housing schemes. By the use of Big Data, one can trigger decision for housing policies and its operations. In this paper, different policies and schemes for the development of housing sectors and failure of its implementation have been discussed. A model of Big Data has been proposed for effective implementation of "Housing for All by 2022".

Keywords- Housing Schemes, Affordable Housing, Slum Rehabilitation, Big Data, Data Analytics.

I. INTRODUCTION

The three basic needs of every human are food, shelter and clothing. Fulfilling these basic requirements would ensure the wellbeing of a human in physical, mental and social aspects. India with a population of 1.21 billion still lacks housing of nearly 18.78million of its population (NBO report, 2012). This is explaining the scale and importance needed to be given to this sector. In India, ensuring shelter to the poor and needy has been the main aim of the government in all its drafted plans. Although, there are many obstacles in fulfilling which includes the poverty, unemployment, high variation in demand and supply, migration etc. It is thus necessary to analyse these key factors in order to eradicate housing shortage.

Addressing the housing sector not only means constructing dwelling units but also to create and maintain the nearby physical environment. Other integral issues include provision of water supply, drainage, common gathering space etc. in order to maintain its standard.

The Government of India is taking effective steps to achieve a notable progress in this field by framing policies and programmers/ schemes (yojana) for the development of Housing Sector both in the urban and rural areas for various income group of people (Housing Overview - Shortage and Development)

The Government has set for itself the goal of providing "Housing for All" by launching Pradhan Mantri Awas Yojana. In order to achieve this goal, Housing Board, Co-operative Housing Societies, Co-operative Housing Federation and Slum Clearance Board are formulating and implementing schemes to provide reasonable and adequate shelter to people of different income groups.

In our country 450 thousand People at national level are Homeless. Up to Billion Be Living in Inadequate Housing (Census, 2011).

- To cope up with the above shortage about 3,30,00000 needs to be built in the next ten years. (5.5 million houses to be built every year in the next ten years if housing shortage is to be met by 2020).
- Out of which 1,67,00,000 in urban areas, and 1,62,00,000 in rural areas. (Govt. Launched various schemes in 1998 with a target of 20 lakhs/year about 13 lakhs in rural areas and 7 lakhs in urban areas)

In the past urban housing for the poorest of the poor or those living below the poverty line did not receive adequate attention of government.

Today, India is still grappling with unmeant basic housing needs of hundreds of thousands of its citizens. While we represent the world's largest democracy and have a truly remarkable constitution, millions of people are still living in sub human condition on unauthorized slums and are under constant threat of being evicted.

- India is home to over 1.1 billion people.
- In 2004 subsequently with a national agenda of 'shelter for all' a new housing and habitat policy was adopted in 2008.
- In 2011, India's population estimated to be living in slums was 61.8 million (ministry of urban employment, 2013).
- After agriculture, the housing and real estate industry is the second largest employment generator.

The most important problem in all cities has been housing the sudden and large-scale influx of migrants from rural areas to urban areas especially the metropolises and state capitals. Due to lack of housing, in every city almost fifty percent population lives in slums. Slums are actually illegally created colonies of housing on open spaces in the cities. The structures are temporary they are very crowded and rows of such houses are separated by very narrow lanes through which household drainage is allowed to flow. As these are illegal colonies, they do not have any civic amenities like drinking water, sewage, electricity etc.

Usually when a new slum comes up, it is first outside the city at that time but very soon, as the city grows the slums become a part of the city itself. Very often real estate dealers eye such slums for clearance so that they can build luxury apartments and make huge profits both on land value and on the apartments. The slum dwellers are uprooted and resettled in the outskirts of the city far away from their place of work. In addition, the slum dwellers are broken up into groups and resettled in different locations thus causing much misery as the old linkages and mutual dependence are disrupted. On the eve of the elections some of the unauthorized slums are "regularized" by the party in power to garner votes of the residents. Certain civic amenities like public taps, public toilets are provided. These facilities do not make much difference to the slum dweller because after elections, the facilities neglect by the authorities. The slums however gain permanency.

Ideally, slums should be cleared and modest housing apartment buildings constructed by the government to accommodate all the slum dwellers. Preferably the flats should be leased out at affordable rents to the occupants. This way the slum dwellers remain in the area where they used to live and the linkages among the residents retained.

In order to meet this requirement of provision of affordable house and remove the slum from the cities to make slum free city the government has to design various housing scheme such as:

- Pradhan Mantri Awas Yojana- Housing for All 2022 (PMAY)
- Mukhya Mantri Awas Yojana (MMAY)
- Rajiv Gandhi Awas Yojana (RAY)
- Indira Awas Yojana (IAY)
- Jawaharlal Nehru Nation Urban Renewal Mission (JnNURM)

The Hon'ble President of India, in his address to the Joint Session of Parliament on 9th June, 2014 had announced "By the time the Nation completes 75 years of its Independence, every family will have a pucca house with water connection, toilet facilities, 24x7 electricity supply and access."

Hon'ble Prime Minister envisioned Housing for All by 2022 when the Nation completes 75 years of its Independence. In order to achieve this objective, Central Government has launched a compre¬hensive mission "Pradhan Mantri Awas Yojana – Housing for All (Urban)". (PMAY Guideline)

The mission seeks to address the housing requirement of urban poor including slum dwellers through following programme verticals:

- Slum rehabilitation of Slum Dwellers with participation of private developers using land as a resource
- Promotion of Affordable Housing for weaker section through credit linked subsidy
- Affordable Housing in Partnership with Public & Private sectors
- Subsidy for beneficiary-led individual house construction /enhancement. (PMAY Guidelines)

The Affordability is generally viewed as a ratio of price/rent of housing to income of household. The ratio differs for different income groups. Lower income groups can afford to pay much less proportion of their income for housing than that of higher income groups.

TABLE I
AFFORDABILITY RATIO OF DIFFERENT INCOME GROUPS

Income Groups	Size	EMI/Rent Income Ratio	Cost of Housing to Income Ratio
EWS - LIG	300-600 sq. ft	> 30% of household's gross monthly income	> 4 times households gross annual income
MIG	> 1200 sq. ft	> 40% of household's gross monthly income	> 5 times households gross annual income

Source: Censusindia.gov.in (National Resource Centre, SPA, New Delhi)

Taking the income classification of different income groups as defined by the Government of India, the affordability levels would be as follows;

TABLE II
INCOME CLASSIFICATIONS AND CAPACITY TO AFFORD EMI/RENT/MONTH

Income Group (in Rs.)	Affordable EMI/Rent per month (in Rs.)	Affordable cost of the house (in Rs.)
BPL <= 2690	<= 134	<=64500
EWS 2691 - 3300	538 - 660	96,876—1,18,800
LIG 3301 - 7300	990 - 2190	1,58,448—3,50,400
MIG 7301 - 14500	2920 - 5800	4,38,000—8,70,000

Affordability is to be defined not only in terms of purchase price of the house (in case of ownership housing) or rent but must also include other charges/fees (registration charge, search cost etc.) payable at the time of purchase/renting of the

house as also recurring cost over the lifetime of stay in the house. These would include taxes, maintenance cost, utility cost. One may also include cost of commuting to work place or other places of different members of family.

The reason for high (unaffordable) price of housing in the market lies in: -

- High land prices
- Cost of construction
- Transaction cost
- Taxes & legal charges, and
- Profit margins of private operators.

Because of this un-affordability of people, they are not able to purchase a house in urban area and this inadequacy divert people towards the creation of slum/ development of slum

A slum is area consisting of unauthorized construction and unsanitary hutments constructed by migrants and homeless people on various land not necessary under their ownership.

- Dante's statement: He saw hell in the city around him. Cowper once said: God made the country, man made the town
- Wag added: The devil made the slums. This devil that made the slums is avaricious, anti-social, lacks civic sense, and is beyond the ordinary means of control.
- It is disgrace to both the dwellers and the town authorities who allow them to grow. It is therefore a black spot on the city's face.
- These slums create various effects like:
- Unhealthy condition is created due to absence of public facilities like water supply, drainage, sanitation and light etc. the sub human conditions of the slums considerably affect the health and life of the people.
- There is a complete absence of social and cultural life.
- The mental outlook of the slum dweller is affected. He develops low moral character as such he is easily attracted by vice, delinquency, crime and clandestine actives in bootlegging, narcotics, drugs, adulteration, etc.
- The overcrowding area is full of noise, smoke and congestion. This effect the considerably on the working condition of the people in offices, schools, hospitals etc.
- The roads tend to become highway so there is danger from traffic accident.
- All open area being attacked, there is no open space for recreation pure air etc.
- A slum dweller loses his ambition, civic interest as well as whole some neighbourhood spirit.

II.   HOUSING SCHEMES CRITERIA AND FAILURE OF ITS IMPLEMENTATION

A. PMAY Criteria for EWS

Prime Minister's Awaaz Yojna launched in 2015 with the aim of providing Housing for all by 2022, EWS households are defined as households having an annual income of up to Rs.3,00,000. The mission supports construction of houses up to 30 square meter carpet area with basic civic infrastructure, to be registered preferably in the name of the female head.

- Affordable Housing in Partnership with Public & Private sectors: Providing Central Assistance per EWS house in affordable housing projects where 35% of constructed houses are for EWS category. Upfront subsidy @ 6.5% for EWS for 20 years.
- Central Assistance of Rs. 1.5 lakh per EWS house in projects with 250 houses where 35% houses for EWS category (PMAY Guidelines).

B. RAY criteria for EWS

- Affordable Housing in Partnership as part of Rajiv Awas Yojana on 03/09/2013 to increase affordable housing stock, as part of the preventive strategy.
- Central support is provided at the rate of Rs. 75,000 per EWS LIG Dwelling Units of size of 21 to 40 sq. m.
- RAY provides for interest subsidy of 5% on loans granted to EWS. The upper limit for loan is Rs. 5 lakhs for EWS. Under RAY, Economically Weaker Section is defined as households having an average annual income up to Rs. 1,00,000/- (RAY Guideline).

C. IAY criteria for EWS

- The Indira Awaas Yojana (renamed as Pradhan Manrti Grameen Awas Yojana on 20th November 2016) centrally sponsored scheme of Ministry of Rural Employment, Government of India is one of the most important poverty alleviation programme in the country which play a vital role in the upliftment of the living standard of poor people in rural areas. This scheme is being implemented in all the districts of the state through Rural Development Department, Karnataka on 75:25 cost sharing basis between Centre and State respectively since from January 1996.
- The main objective of the scheme is to provide a finance aid to the members of scheduled castes/ scheduled tribes freed, bonded laborers and also to other non-scheduled castes/ scheduled tribes rural poor below the poverty line for the construction of their dwelling units by providing a lump sum amount as financial assistance (IAY Guidelines).

D. Jawaharlal Nehru National Urban Renewal Mission (JnNURM):

Basic Services to the Urban Poor (BSUP) and Integrated Housing & Slum Development Programme (IHSDP) for three years are a part of the JnNURM. The scheme is also an acknowledgement of the strain of BSUP and IHSDP on state budgetary resources, and the need to draw in institutional finance for construction of affordable housing on a mass scale.

- Eligibility - The economic parameter of EWS is defined as households having an average monthly income upto Rs.3,300 and the economic parameter of LIG is defined as households having an average monthly income between Rs.3,301 upto Rs.7,300.
- Loan amount admissible - The scheme will provide a subsidized loan for 15 – 20 years for a maximum amount of Rs.1,00,000 for an EWS individual for a house at least of 25 sq.mts. Additional loans, if needed would be at unsubsidized rates at subsidy of 5% p.a. for a period of 15- 20 years (IHSDP Guidelines).

All these above-mentioned schemes are design for remove or provide the housing benefits for the removal of slums or provision of housing facilities for urban poor. However, such schemes are not able to remove the slums or provide the housing facilities for those urban poor for whom these schemes are design because of following reason.

- **Misuse:**

As the all the above mention schemes are not properly implemented because people are misuse this scheme by doing faulty registration. E.g. in the most of the schemes when beneficiary have to apply for the registration under this scheme, they have to submit a deposit amount as a tocken but this amount is high which is not afford by all slum dweller whose benefits advantage are enjoyed by other higher income group people/ societies. So, the purpose of the schemes to provide housing for all slum dweller is not fulfil.

- **Manipulation:**

Under the scheme it is observed that the who already get the house in one scheme he/she again try to get the advantage by doing the registration in new scheme because under all schemes the allotment of houses are done by Draw process. There is no online record of allocation of house under the old schemes.

Another important fact is that the person who already has a pakka house or good dwelling in urban area though they are applying in such kind of housing scheme and because of lack synchronization of available data the person who already has a good property get the house and then generate the income by giving it on sublet.

Sometimes the beneficiary get the house in such kind of scheme by using the name of another person of his family who doesn't have a property on his name but this person is already enjoy the living standard of good house in urban area which also generate income by giving it on rent. Again, this kind of scenario is created because of lacking in synchronization of data of urban dweller.

It is also fact that the slum dweller person who got the house under the housing scheme instead of living in that house the beneficiary lived in slum and directly earn the money by giving it on sublet to another person and increase the slum in the city. This is happened because of lacking in cross verification of person identity.

Because of such a manipulation the basic aim of the government scheme to provide housing for all and remove the slums from city is not satisfy.

- **Selling of house by agent/ contractor:**

Whenever government launch a new housing scheme for urban poor the housing agent or contractor booked/ reserved number of houses from the schemes and then sell it by using the fake name of slum dweller that might be dead or alive this is also happens because of lacking in verification of submitted documents.

This is the fact that after getting the independence the government launched number of housing scheme to provide housing facility for poor people starting from first five year plan (1951-1956) to till date but government is not able to satisfy the housing shortage and creation of slums is going to be increase with the passage of time. These slums are destroyed the beauty of city and causes the pathology in urban area.

The above mentions are certain problem that actually doesn't satisfy the aim of the schemes to provide housing for all. The effectiveness in implementation of housing schemes defiantly increases by using the application of "Big Data".

III. MODEL OF BIG DATA FOR HOUSING SCHEMES:

In this model, different sources which can generate data in the context of Indian housing scheme is discussed. Huge amount of data is generated by Past Slum Rehabilitation Schemes, Housing Authority of India, Urban Local Body, Unique Identification Authority of India, Tax Authority of India, Regional Transport Office (R.T.O) and Passport Authority of India.

All these data have hidden values, if they are linked together and analysed through Big Data analytics, all hidden values can be extracted and used for further decision making in housing schemes. Below mentioned figure shows different sources which can generate big data and consumers who can use that valuable data.

The brief explanation about how this model will help full for various consumers summarized below.
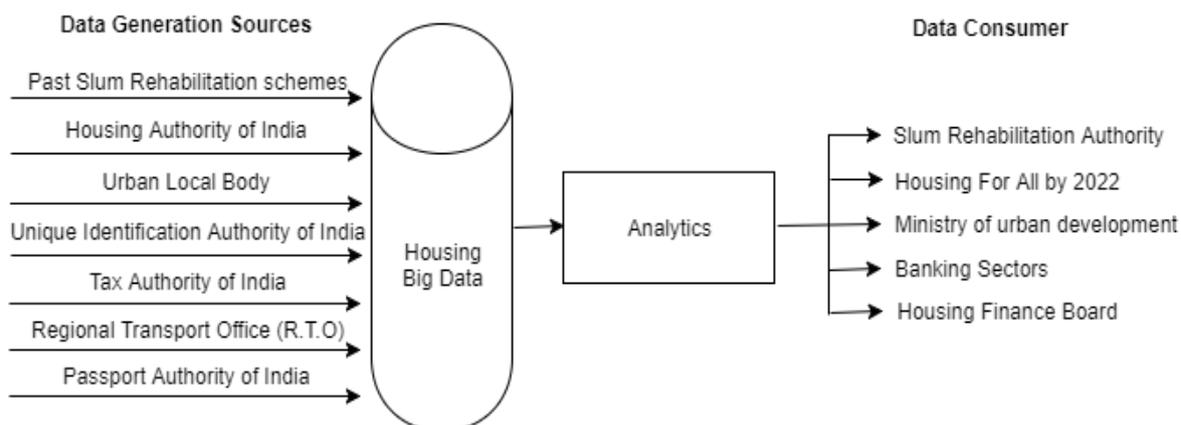
Fig.1 Model of BIG DATA for Housing Schemes

A.   Slum Rehabilitation Authority

For successful implementation of Slum Rehabilitation schemes 'SRA' can use Big data to identify right beneficiary. The gained information by analysing past records from different sources can be used to detect false beneficiary. To ensure identity of authentic beneficiaries SRA can verify linking of "Aadhar" with property, information of tax paid for property to urban local body, information from the Tax authority department, data collected from Housing authority. Data from Regional Transport office and Passport authority of India which were linked to the beneficiary of old schemes will also be useful for authentication of beneficiaries.

B.   Housing for All by 2022

Analysis of Big Data can help different policy makers to modify or change methods of scheme implementation. It also helps to revise estimation of subsidy and for observation of overall implementation schemes.

C.   Ministry of Urban Development

On detection of false beneficiary, the ministry of urban development can use collected information to take action against "Benami" (illegal) property holders. It also helps to take preventive steps against corruptions.

D.   Banking Sector

Presently, banking sectors are limited to the formal sectors which is limited to middle and high income groups. Gained information can help banking sectors to extend housing loan to informal sectors. It also helps to identify the splitting of beneficiaries ownership detail for granting or sanction the loan amount.

E.   Housing Finance Board

Gain information can be used by Central Nodal Agencies to allocate budgets to Primary Lending Institutions especially for Economic Weaker Section (EWS) and newly migrated populations. It also helps to identify authentic beneficiaries for approval of subsidies.

IV.   CONCLUSIONS

As the government is continuously trying to provide housing facilities to all houseless or slum dwellers by making different policies and scheme but some of the reasons which discussed in this paper are not fulfill the aim of the schemes. The numerous data is available with the government but lacking of synchronization other people apart from actual beneficiary are enjoy the scheme but with the help of using the big data model which is shown in this paper will help in proper and effective implementation of scheme and reach its aim to the last user of scheme.

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