



Soft System Methodology as a Tool to Understand Issues of Governmental Affordable Housing Programme of India: A Case Study Approach

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Abstract With the help of a case study, the article has explored current practices of implementation of governmental affordable housing programme for urban poor in a slum of India. This work shows that the issues associated with the problems of governmental affordable housing programme has to be addressed to with a suitable methodology as complexities are not only dealing with quantitative data but qualitative data also. The Hard System Methodologies (HSM), which is conventionally applied to address the issues, deals with real and known problems which can be directly solved. Since most of the issues of affordable housing programme as found in the case study are subjective and complex in nature, Soft System Methodology (SSM) has been tried for better representation from subjective points of views. The article explored drawing of Rich Picture as an SSM approach for better understanding and analysing complex issues and constraints of affordable housing programme so that further exploration of the issues is possible.

Keywords Hard system methodology · Soft system methodology · Affordable housing programme

Introduction

Normally problems which are solvable, are addressed with methodologies with quantitative approaches. The HSM is such a deterministic methodology to address the problems which are real and solvable with quantitative approaches. ‘Hard systems’ approaches involve the selection of an appropriate means to achieve an end, which is defined at the start. These methodologies are structured and can be defined in a concrete way with pre-defined goals.

But, in real world, problems are neither straightforward nor inseparable from the situations and many complex problems cannot be solved using these hard methods [1]. For example: there could be situations where the answers to the question like ‘What is the Problem?’ are not known. So, the difficult and most important part of such analysis is to find out what the real problem is.

The inherent inadequacies of the hard systems approaches towards solving real life ‘messy, complex, unstructured and ill-posed’ problems lead to seek for ‘flexible’ models—in other words ‘soft models’, that would better represent different and subjective points of view. A different line of thinking was felt required to address such questions which were not otherwise possible with end-seeking HSM.

Soft System Methodology (SSM) was published by Peter Checkland in 1981 to address such complex, unstructured and ill-posed problems. Checkland categorizes the systems movement in two streams as hard system methodology, also known as systems engineering and soft system methodology [2–9]. SSM is thinking of 1980s and 1990s whereas HSM is thinking of 1950s and 1960s.

SSM is a system approach that is used for analysis and problem solving in complex and messy situations. SSM uses “system thinking” in a cycle of action research, learning and reflection to understand various perceptions

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that exist in the minds of different people involved in the situation [10]. As quoted by earlier researchers [11], SSM is used as an alternative management science tool for analysing qualitative and subjective data and to interpret people's ideas and preferences as consequences of possible action [12]. The method assumes that people's perceptions are varied and their preferences may differ. The SSM expresses the unstructured problem by using systemic thinking to develop a conceptual model to solve the problem. A soft system is normally used in the 'ill-definable' problem situation [13]. A complex problem is broken down into role, social system and political system analysis.

Background of Governmental Affordable Housing Programmes in India

Internationally there are various measures considered to define affordability and many definitions are available which define affordable housing. Definitions vary from country to country based on emphasis of different parameters. Parameters are from various points of view, like social, economic, physical etc. or even combinations of these aspects.

According to the report on Affordable Land and Housing in Asia, United Nations Human Settlements Programme [14] affordable housing is broadly defined as that which is adequate in quality and location and does not cost so much that it prohibits its occupants meeting other basic living costs or threatens their enjoyment of basic human rights. Thus UN-HABITAT has given more stress on quality and location and also clarified that occupants of an 'affordable house' would be in a position to meet other basic living costs.

Internationally, a basic housing unit that provides a minimum amount of personal space and basic amenities is accessible at 20–40 % of gross monthly household income for either rent or mortgage [15]. 'Affordability' denotes an individual's capacity to exercise choice in the marketplace. However, the term usually denotes the maximum amount of income which households should be expected to pay for their housing [16]. In another definition, "Affordability is concerned with securing some given standard of housing (or different standards) at a price or rent which does not impose, in the eye of some third party (usually government) an unreasonable burden on household incomes" [17].

In order to substantially increase affordable housing stock, since independence, Govt. of India has implemented various affordable housing programmes over the years. Initiation of various programmes and schemes towards urban poor adopted by the Central Government, from time to time, were based on various housing and urban policies. Currently the Ministry of Housing and Urban Poverty

Alleviation (MoHUPA), Government of India., has been implementing various programmes based the National Housing and Habitat Policy (NUHHP) [18]. The policy lays emphasis on Government retaining its role in social housing so that affordable housing is made available to the target group namely "Urban Poor" i.e. Economically Weaker Section (EWS) and Low Income Group (LIG)¹ households as per the income parameters as they lack affordability. Strategy framework is multiple partnerships of States with various stakeholders. Policy instruments include a limited subsidy approach towards housing the urban poor and special and financial incentives for slum redevelopment schemes and in situ up-gradation.

As the affordable housing programmes of government are associated with the word affordability, parameters like 'cost of the house', 'size of the house' and 'Equated Monthly Instalment (EMI)' etc. have been decided based on income category of people. The policy of Ministry is based on a basic assumption that a household can afford a house cost of which is a specific fraction to its annual income and accordingly cost ceilings for housing units in any Governmental Programme are decided. As prescribed by the Affordable Housing Task Force, Government of India in the year 2008, various parameters for affordable housing programme for EWS and LIG were finalised, like carpet area within a range of 28–56 m², cost of house not exceeding 4 times gross household income and EMI/rent not exceeding 30 % of gross monthly income. Ministry considers the absolute, cross-India bench-marks based on the quantifiable aspects as mentioned above to determine the affordability for these two income category groups.

¹ Income Ceilings for Economically Weaker Sections (EWS) and Low Income Group (LIG) have been prescribed vide Circular of National Housing Bank no. NHB (ND)/MRCPD/HPC-74/21092/2012-13 dt. 29/11/2012 on the basis of advice of Ministry of Housing and Urban Poverty Alleviation (MoHUPA), Govt. of India.

EWS—having an annual household income up to INR 1 lakh
LIG—having an annual household income between INR 1–2 lakhs

Subsequent revision in income ceilings as per Scheme Guidelines for Pradhan Mantri Awas Yojna, 'Housing for All (Urban)' by the Ministry of Housing and Urban Poverty Alleviation (MoHUPA), Government of India, definitions for the purpose are as below:

EWS households—are defined as households having an annual income up to INR 3 lakhs
LIG households—are defined as households having an annual income between INR 3 lakhs to INR 6 lakhs.

States/UTs shall have the flexibility to redefine the annual income criteria as per local conditions in consultation with the Centre (MoHUPA 2015).

Income groups	Size	EMI/Rent income ratio	Cost of housing to income ratio
EWS–LIG	28–56 m ² carpet area	>30 % of household's gross monthly income	>4 times households gross annual income

Source: Report of the High Level Task Force by Government of India under the Chairmanship of Deepak Parekh on Affordable Housing for All, 2008

A Case Study: BSUP Scheme at Harijan Basti, Kantatoli, Ranchi, Jharkhand, India

Introduction

The study is to analyse the case from the perspective of providing affordable housing to urban poor against slum up-gradation scheme under Governmental programme. The study identifies certain affordability issues from the perspective of urban poor, the community group and the urban local body.

The programme at Harijan Basti, Kantatoli, Ranchi, Jharkhand is a part of a scheme of Government of India namely Basic Services for Urban Poor (BSUP), a component under Jawaharlal Nehru National Urban Renewal Mission (JnNURM).

Basic Services for Urban Poor

Basic Services for Urban Poor, a sub-component of Jawaharlal Nehru Urban Renewal Mission (JnNURM), launched in December 2005 by Government of India [19], is the national flagship programme during post-independence era for bringing about change for sustainable environment and better quality of life for the urban poor especially slum dwellers. Provision of affordable housing to urban poor has been included as one of the main objectives along with integrated development of basic services, security of tenure at affordable price, improved housing, water supply, sanitation and convergence of services in fields of education, health and social security etc. There was consensus across country that emergence of new slums could be prevented only by increasing availability of affordable housing. The project implementation was the sole responsibility of Urban Local Bodies (ULBs), the third tier of Autonomous Government. The objectives of JnNURM related to affordable housing were:

- Focused attention to integrated development of basic services for the urban poor.
- Security of tenure at affordable price, improved housing, water supply, sanitation.
- Convergence of services in fields of education, health and social security.

- Provision of housing near the place of occupation of the urban poor.
- Effective linkage between asset creation and asset management to ensure efficiency.
- Scaling up delivery of civic amenities and provision of utilities with emphasis on universal access to urban poor.
- Ensuring adequate investment of funds to fulfil deficiencies in the basic services for the urban poor.

The Slum Development Programme

Background

Ranchi is the capital city of the state of Jharkhand having population of 10.73 lakhs as per 2011 census. The city is having establishment of many Central Public Sector Undertakings and important hub of economy and business in the region. The growth of Ranchi is mainly due to immigration. Harijan Basti, Kantatoli (Fig. 1) is an old settlement of the city having an area of 3.233 acres, basically an urban village, identified as slum by the ULB i.e. Ranchi Municipal Corporation (RMC). Here, *Harijan* means tribe and *Basti* means settlement colony. The slum is located in ward no. 11 on a major junction of Hazaribagh Road and Purulia Road. Slum dwellers had migrated during 1930s and settled in this place. They originally belonged to the cobbler community.

As per the survey conducted by RMC during formulation of the project in 2008, the settlement had 159 households with 931 people residing in it.² The primary male earning members are mostly daily wage earners: cobblers, sweepers, rickshaw pullers, hawkers and petty shop keepers having no stable income. An average monthly income of a household was INR 1750. People were either EWS or LIG and the major portion of population was literate. Most of the children from Harijan Basti attend school.

Slum dwellers have parental owned land. This slum had an urban character with an organic layout of plots accessed by streets of varying widths (Fig. 2). Out of 159 households, 127 households owned plots and 32 households used to stay in rented house. Plot sizes vary from 70 to 140 m². The houses were mostly single storied with sloping roofs. Major portion of slum had concrete roads with street lights but without drainage and sewerage facilities. 61 % of the population used to go for open defecation. Due to its locational advantage, it has all facilities available in close proximity. The community has a primary school and health care centre (Fig. 3).

² Detailed Project Report of BSUP scheme prepared by Ranchi Municipal Corporation.

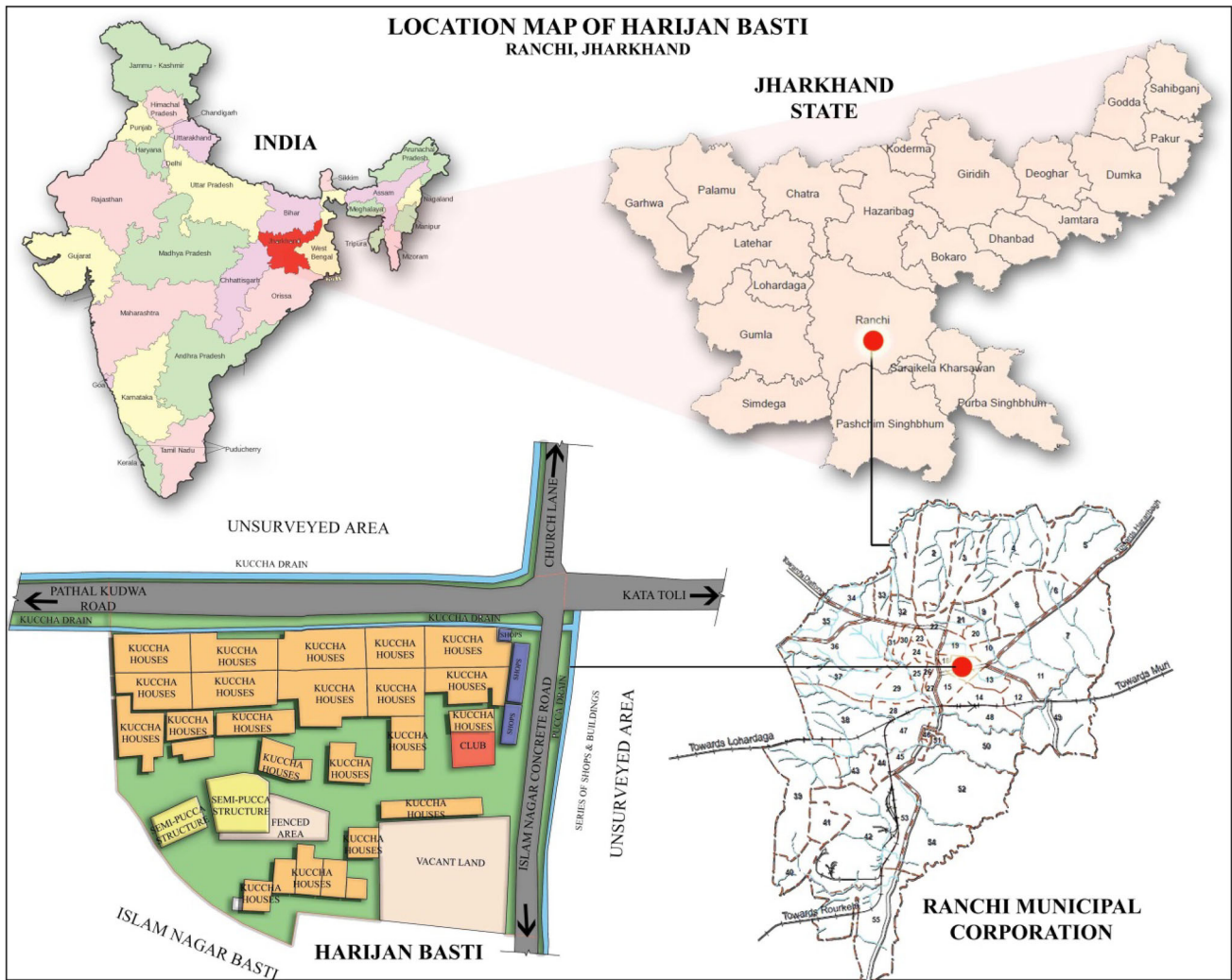


Fig. 1 Location map of Harijan Basti, Ranchi, Jharkhand



Fig. 2 Slum photograph

Typically, slum houses had a room, a kitchen, but no toilet. In traditional houses, sloping roofs were made of asbestos sheet over brick wall (Fig. 4). Most of the houses had mud floors. Some household had improved the floors by paving with bricks or finishing with plain cement concrete. Houses needed frequent maintenance. Considering the small size of rooms, very few houses had windows. The door was the source of light. Windows if present were made of wooden frames and shutters. People used to face various diseases due to severe cold during winter in Ranchi. The households depended on community stand posts and deep tube wells for drinking water. All of the households had access to electricity. People used to have individual meter connection. Municipality had made arrangement for door to door collection of solid waste in the slum.



Fig. 3 Community building



Fig. 4 Traditional house

Formulation of Programme

Slum improvement scheme in Harijan Bastri, Kantatoli was formulated in the year 2008 adopting an in situ whole slum approach to housing and infrastructure development. Construction of houses was proposed as three storied structures. Two types of clusters were planned. One cluster was with four units per floor and a service core and another cluster with two dwelling units per floor with a service core. Design and location of clusters were dependent on site conditions and size of plots available. The clusters were proposed to be laid in such a way that they were in synchronization with already existing features like buildings, trees and wells on the site. Common areas were planned in such a way that maximum open space could be made available. Scheme also envisaged construction of paved pathways, storm water drains, street lights, sewerage etc. Convergence of health care, education and social

security was proposed by dovetailing various programmes of Government.

Each dwelling unit for a household consists of one bed room with a balcony, one multi-purpose room, a kitchen space with separate bath and water closet (Fig. 5). Total area of each dwelling unit was 36.66 m² and estimated cost of INR 1.70 lakh per unit. The project duration was 1 year and 4 months and work was scheduled to be commenced in April 2008 and completed in July 2009. As BSUP houses could not be given to the poor without securing a contribution from them, RMC collected 10 % of the estimated unit cost from each household. Rest was subsidy from Government of India and State Government. However, in reality, in 2011 when the project actually started, the actual construction cost had increased drastically.

Participation of Stakeholders

Greater Ranchi Development Authority (GRDA), a State Government Undertaking, was appointed as Nodal Agency for BSUP by Jharkhand State Government whereas RMC was the implementing Agency. It was decided that both Central and State shares of the approved project cost would be released to GRDA which in turn would release funds to RMC in suitable instalments depending on progress of implementation. GRDA would be responsible for submission of reports regarding utilization of funds to Government of India. A consultant, as appointed by RMC, had prepared Detailed Project Report (DPR). RMC had also appointed contractor by calling tender for implementation of the project. A community organization namely Ravidas Colony Development Committee had been set up in the year 2008 by the residents of the slum for monitoring of BSUP and other developmental works. The executive committee comprised of mostly lady members (Fig. 6).

Expectation of Stakeholders³

By Municipal Corporation RMC tried to implement BSUP housing programme for benefit of the slum dwellers as per its constitutional and legislative obligations. They thought to replace existing temporary/semi-permanent houses with permanent houses including proper water supply, sanitation facility and electricity. Besides, the entire slum would be upgraded with proper infrastructure facilities which would raise the living standard of the slum as a whole. Aim was to provide security of tenure to all

³ First-hand knowledge has been obtained by visiting slum, interaction with urban poor and having focussed group discussion. Opinion of government officials, officials of Urban Local Bodies, Planners and Project Engineer's etc. have been gathered through discussions, interviews.

Fig. 5 Building plan

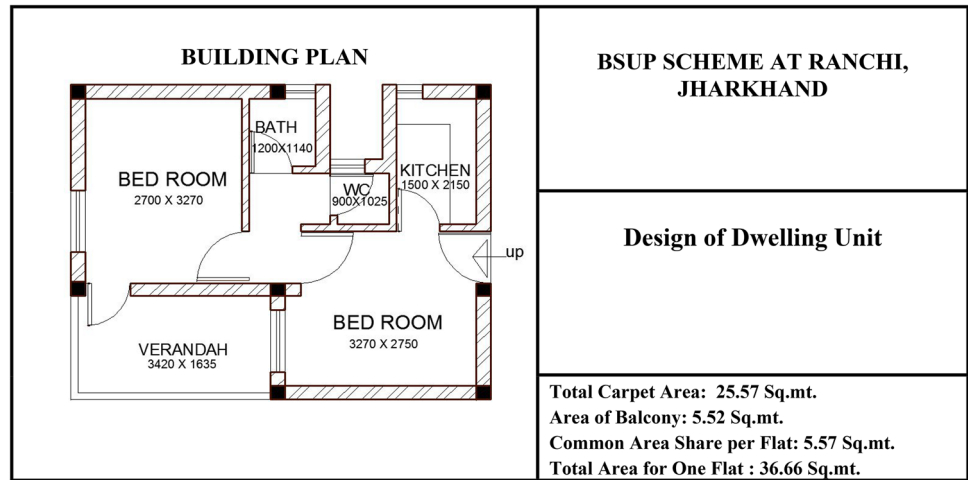


Fig. 6 Register of Colony Development Committee

households covered under the project, irrespective of land ownership status.

By Urban Poor Poor households lived at this place along with their own community and relatives since last 80 years. They preferred in situ development with provision of security of tenure which would facilitate them to have their house in proximity to their original occupation and with minimum living cost. They expected improvements like permanent houses, drains and streetlights. They thought that the units would be constructed with area and design as per their preference and using permanent materials and they would no longer have to spend for house repairs.

Post Implementation Scenario

Initially, households who owned plots were asked to share their plots among themselves including households who were on rent. The target was to provide units having same facilities and area to all families. It was decided that people who did not own

plots would be provided units on upper floor. But in reality, plots were not shared by people and people constructed houses on their own plots by changing the unit design completely.

Out of 158 units sanctioned, only 78 units were taken up under the scheme. 80 units could not be taken up due to land litigation and stringent land act which restricted transfer of land. 78 families who were considered having ownership of land, were found not having land possession in their names. Remaining families, as they could not complete legal formalities in time, were rejected. In reality, total deviation was permitted from the typical design. People objected to get construction done through the contractor appointed by RMC and preferred to construct houses themselves by hiring local contractors or masons. Various types of unit design were finally adopted by people based on area and size of plot. Where plot size was not adequate, upper floor was also constructed. In some cases, two to four units were combined in two floors.

Some of the houses could not be completed due to non-availability of fund. People were asked to finance the construction and claim reimbursements from RMC in four to five stages of construction: (1) plinth, (2) walls up to roof, (3) casting of roof, (4) plastering and (5) colouring. In case of double storied structure, reimbursements were claimed in seven stages. Apparently, people who could complete their houses were having better economic condition than people who could not complete their houses. In some cases, units were completed with much better specification like use of marble in floor etc. No work under infrastructure was taken up by RMC till the study conducted and no convergence of services had been done. The project ended during 2013 after 5 years from its formulation.

Issues Emerged During Implementation

It was later found that project report was prepared without considering ground realities. RMC appointed consultant

and subsequently contractor for construction due to lack of capacity of RMC. The municipality was focused on meeting the BSUP target by delivering a large number of housing units restricting their job within available policy, guidelines and mechanism. Since there is no direct involvement of RMC or participation of urban poor/community, no accurate assessment of land/housing conditions of the poor have been made. In contradiction, a generalized approach of slum redevelopment has been adopted, which was completely varying in nature.

Whole-slum approach was adopted for taking up the project and people had been selected irrespective of their land ownership status. Families who used to stay on rent were also considered under the project. It was presumed that people having land would allow RMC to construct flats on the total available land and the flat would be shared by people. However, in reality people have not shared land and they themselves have constructed house on the land owned by them. In the process, tenants were left out from the project. Moreover, many families could not avail the benefit of the project due to land litigation and could not complete formalities in time.

The programme was unaffordable to many poor families. There was significant cost escalation from the cost of INR 1.70 lakh for a house, estimated during the year 2008. The poorest of the community could not afford to have BSUP houses as they had to bear the increased cost. Also as land was to be possessed by the households, many did not qualify for this project. No financial institution came forward to extend loan to people.

RMC had asked people to pay the service tax i.e. 9.1 % which was paid by the contractor selected by RMC but could not actually take up the work. Since the total modalities for implementation was decided and later on, people opted for constructing houses directly by themselves, RMC and the people had no alternative but to pay the additional amount.

The project was for in situ development on the plots owned by families and hence they had to demolish their old houses to take up construction on the same plots during 2011. It took long time to take up construction on ground and complete houses to make houses liveable. As no alternative accommodation was arranged by RMC, they had to hire houses in the nearby areas by paying rent. A few of them could not even arrange any alternative accommodation and stayed in community buildings. Many of them faced innumerable difficulties including financial burdens. Due to extreme cold in Ranchi, people severely suffered. Households immediately occupied incomplete houses once the roof was laid and other construction works were going on in order to save house rent (Fig. 7). People had to bear the burden of cost of house and work harder to earn money.

Most households had to face huge difficulties due to delay in receiving payment from RMC. Sometimes, they had to wait for more than 6 months to obtain next instalment from RMC. This was due to procedural delay in receiving fund from the Central and State Governments. This increased the financial hardship of the households. People specifically expressed that had there been a target for completion of construction of houses within a specific time period, they would have completed construction with less difficulties. Only the more affluent could afford houses. The municipality had not created linkages with banks. People arranged fund from moneylenders operating in the slums. People also expressed that they had other priorities like daughter's marriage, expenditure on health ground etc. which were to be addressed first due to their unstable income and hence could not complete lengthy formalities to become eligible for BSUP houses.

Understanding Issues with Suitable Methodology

The case study gives an overall idea about Governmental Affordable Housing Programmes for urban poor in slums of India and captures various issues associated with problem situation during formulation and implementation. It identifies base level inherent issues associated with



Fig. 7 Unfinished unit

governmental affordable housing keeping in mind objectives of multiple players. In the aforesaid study, the main focus of RMC was to provide houses at affordable cost. To make the houses affordable, houses might be having same area and design without entering into complication of tailor-made design to suit to individual need. Besides affordability issues, providing security of tenure was also an important consideration to meet the requirement of governmental guidelines for affordable housing programmes. There was also focus on providing basic infrastructural services like water supply, sanitation etc. including other community facilities like health, education, social security etc. While urban poor also desired to have houses at affordable cost, their consideration for affordability has other dimensions too. They were interested to continue with their own livelihood pattern. Other associated issue was their preference to stay with their

own community and relatives/families due to social bondage. Minimum living cost was an issue to be considered along with having new house with permanent materials to save money from regular maintenance cost. Urban poor have also preferred to invest in houses which would fit to their individual need and would be incremental in nature.

To understand the issues of affordable housing programme, the key objective is to take the holistic view of the situation, learning and understanding the problem situation. An appropriate methodology is obligatory to apply in the case study to address the root causes of the problem. As HSM is to address the problem with issues which are real, solvable with quantitative approaches, issues of case study regarding applicability of HSM, have been further analysed below:

Issue	Details	Nature of issue	Whether or not understanding issue through HSM is possible?	
			Yes/	Reasons
			No	
1. <i>Selection criteria of urban poor irrespective of</i>				
Land ownership	Out of 159 households, 127 (80 %) are owners and 32 (20 %) are tenants. All households were proposed to be covered. However, in reality only 78 households (all plot-owners) could be covered under the scheme	Partially quantitative as it reveals that there is a problem associated with ownership but it does not reflect on subjectivities and complexities of the issues	No	1. Providing legal title of land to all within the timeframe of the project is a complex issue and not a straightforward solvable problem and closure of the problem as done by HSM is not possible 2. Willingness to participate in the housing projects depends upon other factors like proximity to employment, cost of transportation, health, education and other consumption expenditures and need for future savings also which are subjective and varying with respect to time
Affordability to pay their share	Estimated unit cost was INR 170,000/- and contribution of urban poor was INR 17,000/- and rest i.e. INR 153,000/- was subsidy from central and state governments. Finally, the cost escalated up to INR 3,00,000/- keeping the subsidy portion unchanged and urban poor had to contribute INR 147,000/-	Quantitative issue as cost of the unit has got direct relation with income of households	Yes	According to Government of India guidelines, cost of house to be within 4 times gross annual income of households. Considering average income of household as INR 1751/- per month (as per project report of BSUP scheme at Ranchi), the total cost of unit arrives at INR 84,048/- and hence contributing INR 147,000/- was not possible for all. The issue being quantitative and conclusive, addressing the issue with HSM possible

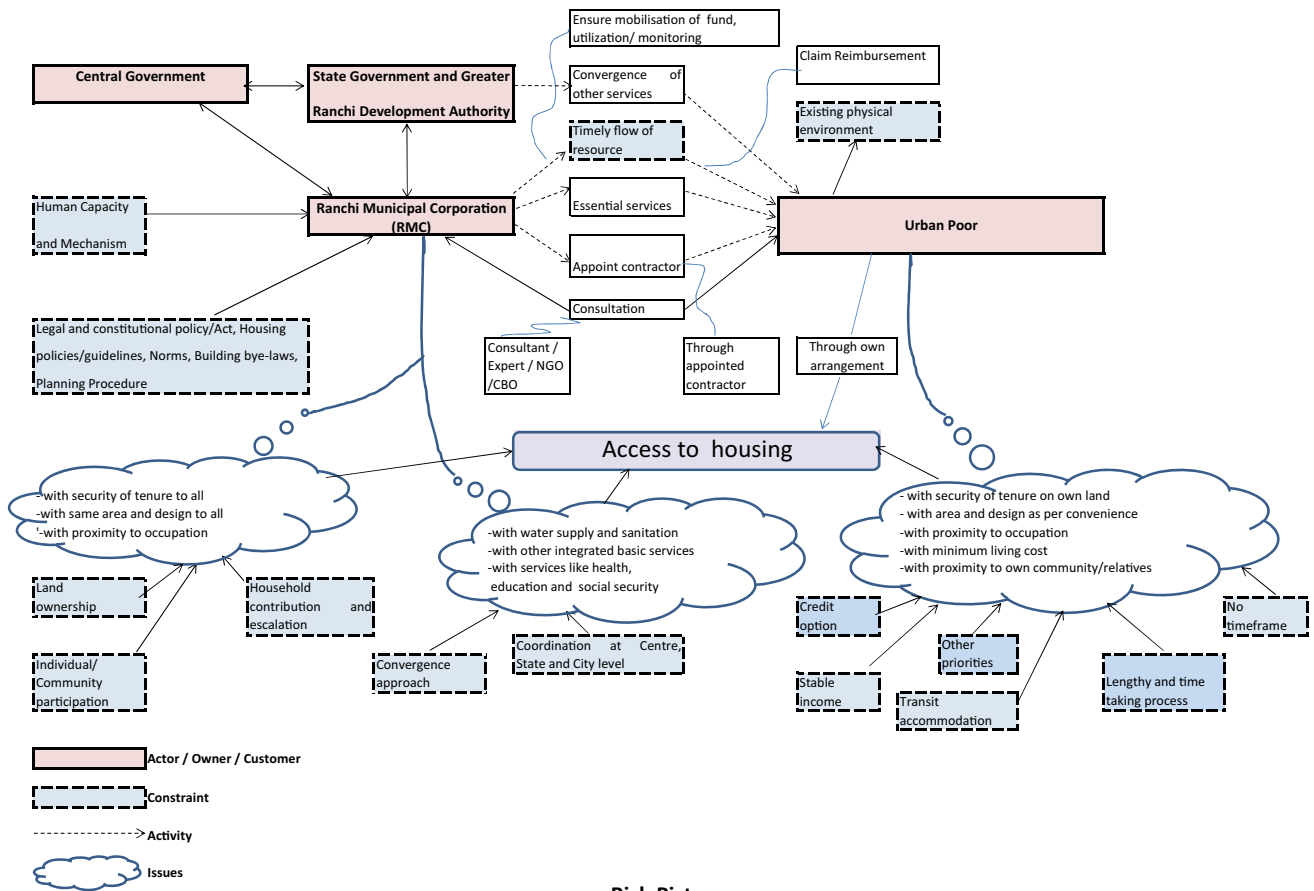
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Issue	Details	Nature of issue	Whether or not understanding issue through HSM is possible?	
			Yes/No	Reasons
<i>2. Process delayed as people were not allowing</i>				
To share land owned by them	Only 78 households who own plots could be covered under the project and they had not shared land with tenants, as initially proposed	Subjective	No	The issue is dynamic as perception of land owners towards sharing land with tenants changed over time and it was never static and clearly solvable
Contractor to execute the work	People objected to get construction done through contractor appointed by RMC and preferred to construct house themselves as per their own designs and requirements	Subjective	No	Exploring human affair with purposeful activity like getting construction done through contractor or not and changing that activity with time span is beyond the scope of HSM
<i>3. Cost of the unit increased due to</i>				
Payment of additional tax to RMC	RMC had asked people to pay the service tax which was paid by the contractor selected by RMC but could not actually take up the work	Partially quantitative as it directly increases unit cost and as well as subjective	No	The issue is unique and complex and could not be defined initially during formulation of the project. It reveals people's preference over the period of the project. HSM cannot address dynamic situation
Delay by RMC to co-ordinate with other departments	RMC took long time to co-ordinate with other state government departments and to release subsidy in time for which people had to wait and there was cost overrun due to time overrun. The project period got delayed and took 5 years (2008–2013)	Partially quantitative as cost of the unit varies with change of materials and labour rates with time The issue is subjective also	No	The issue is messy as there is involvement of many players who are working at multiple levels with various objectives. HSM cannot address an issue which cannot be easily defined and requires critical judgement analysing objectives of various players
<i>4. Urban poor faced difficulties as they</i>				
Were not extended loan	RMC had not created linkages with banks to extend loan facility and people had to work hard to meet the additional amount of unit cost	Subjective	No	Complexities associated with the issue seek players to work together for accommodating interest of everyone. True appreciation of the issue and understanding complexities are beyond the purview of HSM.
Lad to arrange for transit accommodation	People had to demolish old houses for new construction to be done. As no alternative accommodation was arranged by RMC, people had to seek for own accommodation	Subjective	No	However, financial eligibility to avail loan from banks can be decided on the basis of quantitative parameters which can be estimated based on monthly income of households

The above issues are mainly subjective and there are complexities associated with these issues. The inherent inadequacy of HSM is that it cannot address real life complex problems. As an alternative, SSM can be tried as a tool for analysing qualitative and subjective issues as mentioned above. As SSM assumes that people's perceptions are varied and their preferences may differ, it can help addressing issues through its systemic thinking process.

SSM Approach to Case Study and Forming Rich Picture

Attempt has been made to express the situation of the case study by building up the richest possible picture as an SSM approach. A Rich Picture is a communication tool which is used while discussing the perceived problem situation, not of the 'problem'. The term "problem situation" is used to



Rich Picture
BSUP Scheme of Harijan Basti, Ranchi, Jharkhand

Fig. 8 Rich Picture. BSUP scheme of Harijan Basti, Ranchi, Jharkhand

describe the specific problem and its environment. Rich Picture is prepared by collecting various perceptions of the problem situation from which further study of the problem can be made.

The thoughts are represented as pictures, not words. There is no strict rule for creation of Rich Picture. It is a schematic tool to understand the problem situation. It has rich predicative value. If well used, Rich Pictures are very strong language for soft system description. This is done by collecting as many perceptions of the problem situation as possible from a wide range of people with roles in the problem situation. It is also important to try and understand the values that different people in the situation hold.

A Rich Picture has been framed based on the case study involving different players by collecting various perceptions of the problem situation which is illustrated at Fig. 8.

The following details are known from the Rich Pictures as per the process of SSM:

Structure	Structural hierarchy and role played by different players are known. So it has been learnt that what are the elements of structure? what is their hierarchy? who is/are the authority(s)? who is/are the facilitator(s) in the process?
Processes	what are the activities? what are the roles of different players? what kinds of resources are used in the process?
Climate	what is the neighbourhood of the system which can affect it?
People	who are the beneficiaries of the programmes?
Issues	what are the issues expressed by urban poor or other players?
Conflicts	what are the conflicts/constraints emerged during analysis?

As an outcome, the Rich Picture has developed access to certain issues and constraints of the case study. Interestingly, constraints can now be identified separately from the issues. Moreover, Rich Picture has not only expressed the issues but also segregated the issues viewed from the perspective of RMC and urban poor as given below:

Issues from the perspective of RMC	Issues from the perspective urban poor
Security of tenure to all irrespective of land ownership with provision of affordable housing	Affordable housing on own land Unit with acceptable area and design as per individual need
Unit with same area and design to all	Proximity to occupation
Proximity to occupation	Proximity to own community/relatives
Integrated basic services (Water supply and sanitation) etc.	
Services like health, education and social security	

Issues identified and listed are non-exhaustive only. There could be further analysis of issues. Precise identification of issues will be dependent on availability of detailed survey data. As illustrated above, issues will vary based on particular slum community with different socio-economical, demographical, cultural, environmental, geographical profile etc.

In the study, RMC and urban poor have played their respective roles and taken part to achieve their own objectives. Issues may be same or different but achieving the respective objectives is the basic purpose of two different players.

The Rich Picture has also explored constraints as follows:

- Land ownership.
- Existing physical environment.
- Timely flow of resource.
- Household contribution and price escalation.
- Stable income.
- Credit option.
- Other priorities.
- Transit accommodation.
- Human capacity and mechanism of ULB.
- Laws, policies/guidelines, norms and procedures.
- Coordination at centre, state and city levels.
- Convergence approach.
- Individual/community participation.
- Lengthy and time taking process.
- No timeframe.

Constraints have been analysed not in isolation but along with issues as addressed in depth.

Outcome of Rich Picture

The process shows how successfully SSM can be used for understanding of various issues of housing projects under governmental affordable housing programmes through a clearer understanding of the base level inherent complexities associated with issues.

SSM has seven stage analysis processes and Rich Picture is formulated at the initial stage. Rich Picture ensures capturing a balanced view of the situation. It also justifies that further study of the problem situation can be made in the next stages of SSM which can facilitate to satisfy diverse needs of stakeholders for achieving their objectives in the process of taking up and implementation of affordable housing projects.

Conclusion

The issues of governmental affordable housing programme are subjective and not fully quantifiable. Unless these qualitative and intangible issues are understood, successful implementation of governmental affordable housing programme for urban poor is difficult. So, there is a need for better understanding of the problem situation to address the root cause by using suitable methodology as quantitative approaches are inadequate to understand subjective issues which may be non-quantitative in most of the cases.

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. Further, SSM can be simultaneously used with connections to other methodologies also. For example, HSM can be used in the economy side of affordable housing, mathematical formulas and empirical data while in case of behaviour, aspects like social, political and cultural etc., SSM can be used.

References

1. L. Davies, P. Ledington, *Information in action: soft systems methodology* (Macmillan Education Ltd, Basingstoke, 1991)
2. P. Checkland, *Systems thinking, systems practice* (Wiley, Chichester, 1981)
3. P. Checkland, From optimizing learning: a development of system thinking for the 1990s. *J. Oper. Res. Soc.* **36**(9), 757–767 (1985)

4. P. Checkland, achieving desirable and feasible changes: an application of soft system methodology. *J. Oper. Res. Soc.* **36**(9), 821–831 (1985)
5. P. Checkland, The Case for “Holon”, Guest Editorial. *Syst. Pract.* **I**(3), 235–238 (1988)
6. P. Checkland, Entry “Systems” (International Encyclopaedia of Business & Management, London, 1997), pp. 667–673
7. P. Checkland, The relevance of soft system thinking. *Hum. Resour. Dev. Int.* **3**(3), 377–383 (2000)
8. P. Checkland, Soft system methodology: a thirty year retrospective. *Syst. Res. Behav. Sci.* **17**(1), S11–S58 (2000)
9. P. Checkland, New Maps of Knowledge Some Animadversions (Friendly) on: Science (Reductionist), Social Science (Hermeneutic), Research (Unmanageable) and Universities (Unmanaged). *Syst. Res. Behav. Sci.* **17**, S59–S75 (2000)
10. T. Maqsood et al. *Five case studies applying Soft Systems Methodology to Knowledge Management*. <http://eprints.qut.edu.au/27456/1/27456.pdf>
11. C. Susilawati, L. Armitage, M. Skitmore, Multi-stakeholder partnerships in affordable rental housing: an investigation using soft systems framework, in: *International conference on engaging communities*, Brisbane, Australia (2005)
12. M. Pidd, *Tools for thinking: modelling in management science* (Wiley, Chichester, 1996)
13. K.C. Bausch, *The emerging consensus in social systems theory* (Kluwer Academic/Plenum Publishers, New York, 2001)
14. UN-HABITAT, *Affordable land and housing in Asia* (United Nations Human Settlements Programme, UN-HABITAT, Nairobi, 2010)
15. McKinsey Global Institute, *India’s urban awakening: building inclusive cities, sustaining economic growth* (McKinsey and Company, India), 2010)
16. M. Gabriel et al., *Conceptualising and measuring the housing affordability problem*, National Research Venture 3: Housing Affordability for Lower Income Australians, Research Paper 1, Melbourne: AHURI, RMIT-NATSEM Research Centre (2005)
17. D. Maclennan, R. Williams, *Affordable housing in Britain and America* (Joseph Rowntree Foundation, York, 1990)
18. MoHUPA, *National urban housing and habitat policy 2007* (Ministry of Housing & Urban Poverty Alleviation, Government of India, New Delhi, 2007)
19. MoHUPA, *Jawaharlal Nehru National Urban Renewal Mission Towards Better Cities Guidelines of Ministry of Housing & Urban Poverty Alleviation* (Government of India, New Delhi, 2005)