Need based approach: a perspective for sustainable housing

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Abstract. Population growth and urbanisation have been causing tremendous stress on urban housing. Over the years, housing construction has emerged as an industry and became a major contributor to pollution, environmental issues and resource depletion. There is a threat of exhausting resources with respect to housing construction. A quick glance at the housing scenario, it can be observed that there is a huge disparity in demand and supply of housing, which is more evident across the less affordable classes of society. While there is shortage in supply for the urban poor, there is over utilisation of resources to satisfy the requirements of those who could spend beyond their affordability confines. This need to be addressed with respect to the resource allocation and such an attempt requires an understanding of human requirement for housing beyond the basic desires and needs. Various studies in social science and economics have put forward theories to explain the human needs, which can be found useful in understanding the housing needs also. This paper attempts to understand such theories and frameworks on human needs and develop a sustainable approach to refine the housing requirements across different socio cultural and economic categories. Based on the studies, a broad framework is proposed categorizing human housing needs into normative, comparative, felt and expressed which can be analysed based on personal economic and socio cultural attributes. Such a framework shall help the society address the conditions of imbalance in a broader standpoint with long-term benefits.

1. Introduction

With the world becoming more urban and people migrating from rural to urban, the demand for urban housing is ever growing. There are formal and informal players in urban housing and housing construction has emerged as an industry over the years. Housing construction industry consumes considerable resources and has also been a major contributor to environment pollution. There is a need to shift to more sustainable approaches in the larger interest of population. These can be applied across different levels starting from project conception to construction practices. Essentially, it should start with the fundamentals of finalizing a design program for a house incorporating the honest requirements of an individual in particular or a community at large. Human needs with respect to housing require a better examination based on which a framework for optimized consumption of resources can be evolved.

2. Urban Housing Scenario

World is developing at a fast pace with high rate of global population growth in general and urban population in particular. According to the ‘2018 Revision of World Urbanization Prospects’ produced by the Population Division of the UN Department of Economic and Social Affairs (UN DESA)’ world
population is expected to reach 9.8 billion by 2050 from 7.8 billion in 2020 out of which 68% will be living in urban areas in 2050 from 55% in 2020. This would result in many countries facing issues in housing, infrastructure, transportation, energy systems, healthcare, education, employment etc. Understanding the seriousness of the issue, the United Nations have come up with sustainable development goals (SDGs) to address 17 integrated areas and ensure overall development which is balanced in terms of social, economic and environmental sustainability.

Coming back to the urban population explosion, rapid urbanization is leading to a greater number of people living in cities and towns, which results in higher demand for urban housing or accommodation in various forms, whether it is individual houses or group housing depending on their socio economic circumstances. Involvement of Governments has been limited in housing sector and it was left to the private players mostly to deal with the demand for housing solutions. Dr. Joan Clos, Executive Director of the UN Human Settlements Programme (UN-Habitat) has admitted in 2017 that leaving it to the market to respond to the housing requirements have proved a failure worldwide.

According to Global Wealth Data Book 2019, 45% of the world's net wealth belongs to the top 1% of adults, top 10% of adults hold 85% wealth, while the bottom 90% hold the remaining 15% of the world's total wealth (figure 1). The housing sector is broadly divided into many groups mainly based on the affordability or economic background of the people involved. Most of the formal and informal real estate market players respond to those groups, which could give them good profit and hence ignored the most deserving groups. Hence, they ended up providing more than the basic necessities as components of houses including many amenities and luxuries, which were either demanded or provided to market the product.

According to a study, many of the houses, which were constructed, are lying vacant as these houses were looked upon as an investment by those who could afford it. There appears to be an oversupply for the people belonging to the higher income classes whereas there have not been enough efforts to provide solutions for the deserving less affordable classes. According to UN data in 2020, 1.6 billion of urban population lives in inadequate living conditions wherein around 1 billion lives in slums and informal settlements. It is worth mentioning here that distribution of wealth is non-uniform and uneven across global population.

A reasonable allocation of resources should ensure that this gap across classes of varying affordability should be arrested. As a first step, this paper attempts to look at whether the currents approach in design of houses needs a change in strategy so as to bring down the impact on resources and promote sustainable development goals.
3. **Need for a Sustainable Approach in Housing**

Traditionally, housing construction involved local materials, vernacular methods and unskilled/semi-skilled local labourers. The overall volumes of construction activities were also comparatively on the lower side due to the smaller population. However, over the period of time the demand increased due to the increase in population and efforts to satisfy the demand also increased. Instead of individual houses, solutions included more of group housing, which meant a greater number of houses put together. The house construction techniques have also moved on to manufactured/artificial materials, global technologies involving various machineries and tools and highly skilled labourers.

Housing construction evolved as an industry and construction processes became highly energy dependent through manufacture and transport of materials. The extraction of raw materials and the production of materials may also be energy and/or labour intensive and very costly, and the extraction of materials may lead to land use changes and related environmental impacts. At an urban level, increase in housing construction activities eventually results in increased load on city level infrastructure, which again affects the resource utilization and its efficiency. The exhaustive nature of resources has been observed and studied by many experts and environmentalists and this has resulted in promotion of concepts like sustainability, energy efficiency, green architecture etc., which have gathered much momentum over the recent decades. Sustainability talks about the need to optimize our consumption so as to ensure that our future generations will also get access to these resources. With the population curve not likely to flatten, the demand supply volumes are not likely to be brought down. Therefore, a change in approach is necessary to optimize the component programming of housing units. Conventionally these are influenced by socio cultural and economic factors.

4. **Socio Cultural and Economic Influences**

Providing shelter being a primary requirement, house constructions spread across a wide spectrum ranging from small huts to sprawling luxuries villas and apartments. They are broadly grouped based on their economic standing or affordability as low, middle or high-income categories. While the houses for lower income categories tend more towards satisfying the primary requirements at a limited space, the other categories would be more liberal in terms of space and include more facilities and amenities. As we move up further from bottom to the top of the societal class in terms of affordability, the requirements keep increasing drastically and it shifts from basic to luxury. At some point, it acts as a status statement for many house owners.

It can be seen that financial capability or affordability of a person is not the sole basis of deviation from the basic requirements. It is often argued that architecture is the physical expression of one’s personality. There are several situations’ where buildings are embodiment of men’s ego. Many examples can be pointed out from history to substantiate the above argument. A paradigm shift from the eco-centric vernacular architecture to egocentric modern architecture has made a volte-face from sustainability. In this context, an understanding of different approaches in human life and their relationships is necessary to guide the professionals in the right direction to attain sustainability goals.

5. **Studies on Human Behaviour**

Experts in human psychology, social sciences and economics have come up with theories to explain human behaviour. These theories could be very well used in housing sector also because of its close association with the desires involved as well as the resource management issues. Sometimes the concepts of ‘need’, ‘want’, ‘survival’ and ‘greed’ are generally used to explain the human behaviour by experts. A broad understanding of the definitions of these words is given below.

- ‘Need’ is defined as something essential or very important that you must have so that you can live a healthy life. It can have a personal and social significance even though sometimes these are closely interrelated.
- ‘Survival’ represents a state of being alive and requires all the basic essentials or necessities for the purpose.
• ‘Want’ is defined as something that people desire to have that they may or may not obtain, which is not essential to live a healthy life.
• ‘Greed’ denotes an excessive or extreme desire for something often more than ones proper share. It is uncomplimentary in implication and is many times used in a negative sense.

In human life, the fulfilment of desires is always found oscillating between basic needs, elementary survival, wants/desires and boundless greed.

5.1. Maslow’s hierarchy of needs
Maslow’s hierarchy of needs is a motivational theory in psychology proposed by Abraham Harold Maslow (1908 –1970), an American psychologist. The five-tier model of human needs suggested by Maslow is found to be a good reference for need-based theory. The human needs are organized in hierarchical levels within a pyramid broadly in three groups namely basic, psychological and self-fulfilment (figure 2). Majority of the human beings find place in the lower tiers of the pyramid and satisfaction of basic needs are a strict requirement. As we climb up the pyramid, we move away from the basic needs towards self-actualization needs. Human beings may or may not climb up the ladder due to personal or societal reasons, Hence the population towards the top diminishes.

Figure 2. Maslow’s Pyramid of Needs

Another detailed representation of Maslow’s needs is as follows. Physiological needs like air, water, food, shelter, sleep, clothing and reproduction are the most important needs for a human being. These basic needs are very important for one to exist. Once these are fulfilled, he looks for next set of needs which are broadly defined as safety needs which includes personal security, employment, resources, health and property. Further to satisfying these needs, he craves for friendship, intimacy, family and a sense of connection with the society. Next layer outlines two categories of needs, namely esteem for oneself (dignity, achievement, mastery, independence) and a desire to have recognition from the society (status, prestige, power etc.). Maslow indicated that the need for respect or reputation is most important for children and adolescents and precedes real self-esteem or dignity. Self-actualization needs are those, which seek personal growth and peak experiences and are a desire to become everything.

It is not always necessary that human beings look at the needs in order. Depending upon personal character, he may opt for any of the needs out of turn. It is not rare for a man deficient of other needs to attempt self-actualization. Hence, the hierarchy put forth by Maslow may not be applied across everyone.
Table 1. Expanded Hierarchy of Needs

| Sl. No | Needs                        | Description                                                                 |
|-------|------------------------------|-----------------------------------------------------------------------------|
| 1     | Biological and Physiological Needs | Air, food, drink, shelter, warmth, sex, sleep, etc.                          |
| 2     | Safety Needs                 | Protection from elements, security, order, law, stability, etc.              |
| 3     | Love and belongingness needs | Friendship, intimacy, trust & acceptance, receiving & giving affection & love. Afiliating, being part of a group (family, friends, work). |
| 4     | Esteem needs                 | (i) Esteem for oneself (dignity, achievement, mastery, independence) & (ii) desire for reputation or respect from others (e.g., status, prestige). |
| 5     | Cognitive needs              | Knowledge and understanding, curiosity, exploration, need for meaning and predictability. |
| 6     | Aesthetic needs              | Appreciation & search for beauty, balance, etc.                              |
| 7     | Self-actualization needs     | Realizing personal potential, self-fulfilment, seeking personal growth and peak experiences. |
| 8     | Transcendence needs          | A person is motivated by values, which transcend beyond the personal self (e.g., mystical experiences, experiences with nature, aesthetic experiences, sexual experiences, service to others, the pursuit of science, religious faith, etc.). |

(Source: https://www.simplypsychology.org/maslow.html)

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5.2. Manfred Max-Neef Model of Fundamental Human Needs

Max Neef responded to the limitations of Maslow’s theory and created a model called Model of ‘Human Scale Development’ in which he tried to bring about a connection between the various factors and the satisfaction of needs. He constructed the human scale development based on the satisfaction of human needs with respect to self-reliance, technology, activities, social communications, planning etc. He tried to distinguish the needs from satisfiers. He outlines that human needs are few, finite and classifiable (as distinct from the conventional notion that "wants" are infinite and insatiable) and they are present across all human cultures and civilizations. A table prepared based on the taxonomy of human needs developed by Max Neef is given below.

Table 2: Max-Neef’s Fundamental Human Needs

| Fundamental Human Needs | Being (qualities)                   | Having (things)            | Doing (actions)          | Interacting (settings) |
|-------------------------|-------------------------------------|----------------------------|--------------------------|------------------------|
| Subsistence             | physical and mental health care, adaptability autonomy respect, sense of humour, generosity, sensuality | food, shelter work social security, health systems, work friendships, family, relationships with nature | feed, clothe, rest, work co-operate, plan, take care of, help share, take care of, make love, express emotions | society social environment, dwelling privacy, intimate spaces of togetherness |
He states that the way of getting a need satisfied changes, but not the need itself. In contrary to what Maslow stated, Max Neef argues that there is no hierarchy of needs apart from the basic need for survival or subsistence. Other needs can have personalization and vary from one human being to another. Max Neef lists the fundamental human needs as subsistence, protection, affection, understanding, participation, recreation (in the sense of leisure, time to reflect, or idleness), creation, identity and freedom. He attempted to define needs according to the existential categories of being, having, doing and interacting. Max Neef sees unsatisfied needs as poverties thereby expanding the meaning of disparities from purely financial terms.

5.3. Bradshaw’s taxonomy of Needs
According to Jonathan Bradshaw, a need can be described as a problem experienced by people and which generates some particular kind of response. His framework helps to understand the different ways in which various needs are assessed. He argues that there is a relationship between the problems and the responses. Hence it is possible to prepare a framework for assessment of Need and delineated a combination of four different categories namely normative need, comparative need, felt need and expressed need.

- Normative needs are basically evaluated based on a set of norms or standards set for the purpose by experts. It is measurable and is professionally defined.
- Comparative needs are evaluated based on a possible scenario where such a need or may not bring in any value addition or benefit.
- Felt needs are those needs, which are demanded by the customer, or the user based on his impression of the requirement.
- Expressed needs can be taken as a demand for a certain thing, which is unmet.

5.4. Understanding Greed
Greed in pure and simple terms is defined, as the desire to acquire more than one requires. Greed may or may not be reflective of the financial status but is connected more to the mental inability to control
the wants beyond what is defined as need for basic survival and comfort. Actions taken under the influence of greed may result in depriving others of the opportunity to access basic necessities. Greed can also be associated with acquiring wealth, fame, power or material possessions. Applying this to Architecture and construction, it can be stated that it goes against the concept of sustainability. Greed based actions result in acceleration of depletion of resources and degradation of environment. Concept of equitable distribution of resources and freedom of access across population is disturbed by such actions.

6. Using the Studies to Understand Housing Needs
The theories on human needs put forward by Maslow and Max Neef guide us in understanding personal and societal level expectations of a human being. We may look at how the requirements of housing can be structured based on this learning.

Broadly organizing needs based on Maslow’s theories, we can see that the requirements to be incorporated in a house arising out of physiological needs remains more or less similar across a society (the only differentiator being the affordability factor) whereas the psychological and self-actualization needs varies in intensity from person to person without much influence from the economic standing of the human being. A lot is dependent on his perceived views and interactions with the society when it comes to his psychological and self-actualization needs. Hence, this theoretical framework may help understand human needs not limiting it to the economic terms or materialistic terms.

As suggested by Max Neef, needs remain same across societies while the satisfier varies from place to place. Hence, the broader framework or a template is possible to be prepared which may require refinement based on the socio cultural aspects, which impose considerable influence on the satisfiers. The understanding the housing needs at depth may help us optimize the resources and energy required to be spend on satisfying the housing requirements. Accordingly, an assessment of needs is required which is discussed in the following section.

7. Housing Need Assessment
A proper assessment of the needs is the most practical way out to arrive at what is best suitable for the human being in a particular context. It involves the process of evaluating the desires and wants and identifying the gaps, also drawing a line differentiating need from greed. We can adopt Bradshaw’s categorization of needs as a basis for preparing the framework for need assessment. This includes the process of enlisting needs and carrying out an evaluation, ranking their importance, and building design programs based on the ranking and prioritization. Such a process would help to optimize the requirements, which may tend to grow out of the framework of sustainable approach. A system to gather data may be a prerequisite for such an approach. The following subsections will broadly discuss various categories of needs to form part of a need assessment approach towards housing.

7.1 Normative Needs for housing
Generally defined for a community, these are needs, which can be categorized based on a set of norms or standards already in practice for housing sector of a region. The regulating agencies and funding agencies normally would have categorized housing sector according to affordability or similar parameters.

7.2 Comparative Needs for housing
Comparative needs can be identified in when groups or communities with similar socio-cultural, economic or religious backgrounds elsewhere are already acknowledging this need. If a set of needs are seen prevalent among such groups it can be noted and made part of the requirements for housing on the basis of an evaluation or an assessment. This would ensure that a balance among similar communities.
7.3 Felt Needs for housing
Felt needs are often inadequacies/deficiencies identified on the basis of a thorough study on the community or group of people. These are products of a past to future progression. The use of such needs in housing scenario involves the process of a spatial analysis of their physiological and psychological requirements and prioritizing the same.

7.4 Expressed Needs for housing
These are needs equivalent to a demand from a human being. Such needs require a proper evaluation or assessment to ensure that the expressed needs are actually genuine and not expressed without a proper requirement for the same.

8. Need Assessment Framework for Housing and Sustainability
Based on the above understanding, a broad framework is prepared for the assessment of Housing needs. This may be used as a base for preparing a detailed program. The normative needs can be clearly defined for a class of people and is useful in arriving at a basic set of requirements, which depend on primarily the affordability and living standards. It will be guided by the prevailing rules and regulations of the region. Comparative needs are identified based on what is happening to similar communities. It is easier to prepare as we have quantifiable examples from around the region to get a clearer picture. Hence, we can see that normative and comparative needs will be more or less similar for human beings across different communities. Felt needs and expressed needs are characteristics of an individual and his position in the society and hence can drastically vary when it comes to housing requirements. This may grow from being a necessity to a luxury by incorporating wants, which needs a thorough assessment. From the point of view of sustainability, assessment of felt and expressed needs demands utmost attention when it comes to housing for optimization of requirements.

Table 3: Housing Need Assessment Framework

| Needs                | Inclusions                     | Influences                                   | Remarks                      |
|----------------------|--------------------------------|----------------------------------------------|------------------------------|
| Normative Needs      | Finite-physiological            | Affordability, Living standards, Rules/Bylaws| Easier to prepare a framework|
| Comparative Needs    | Finite-physiological            | Affordability, Living standards, Rules/Bylaws| Easier to prepare a framework|
| Felt Needs           | Infinite-physiological/self-fulfilment | Personal attributes, Socio cultural aspects | Need an in-depth analysis    |
| Expressed Needs      | Infinite-physiological/self-fulfilment | Personal attributes, Socio cultural aspects | Need an in-depth analysis    |

9. Conclusion
Human Needs can be categorized into normative needs, comparative needs, Felt needs and Expressed needs. While normative needs and comparative needs can be evaluated based on socio cultural and economic assessment, felt needs and expressed needs requires a more detailed analysis based on personal and socio cultural attributes. Taking a cue from the wealth pyramid and the present housing market where the upper categories are served more than the deserving lower categories, the need assessment must be strictly practiced by the decision makers in order to have a more balanced approach to housing shortage. This shall help the society to address the conditions of poverty in a broader standpoint with long-term benefits. However, the need assessment only becomes a significant
starting point towards the sustainability goals and should be followed up with design decisions like selection of appropriate selection and sizing of materials, relevant technology and an efficient climate response.

References
[1] Maslow, A. H 1943 Hierarchy of Needs:A Theory of Human Motivation Psychological Review.
[2] Max-Neef 1991 Human scale development: conception, application and further reflections The Apex Press.
[3] Bradshaw, Jonathan 1972 Taxonomy of social need McLachlan, Gordon.
[4] Simply Psychology, Maslow's Hierarchy of Needs, http://www.simplypsychology.org/maslow.html
[5] Jerry L Wade 1989 Felt Needs and Anticipatory Needs: Reformulation of a Basic Community Development Principle Journal of the Community Development Society Vol. 20 Issue 1
[6] Dasa, Satyanarayana 2012 Need or Greed? https://www.jiva.org/blog/2012/01/28/need-or-greed/