

# Assessing the Quality of Low Income Group Houses in India: Identification of Indicators

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## ABSTRACT

*A house is essentially an expression of people's way of life and culture. It is a symbol of pride, an identity of one's social affiliation to different groups and communities. It is expected that a good - quality housing shall be responsive to a wide variety of human needs. Hence, the need of a house ought to be seen through the prism of both quantitative as well as qualitative attributes by the policymakers and providers of houses. Although literature on housing in India, nay of different countries is replete with different aspects of affordable housing, such as affordability of house, area, volume, amenities, location, household income, policy aspects of housing, etc. there has been no study so far to assess the Quality Standards for LIG Housing Projects in India or elsewhere. This study therefore seeks to identify the set of Housing Quality Indicators (HQIs) for quality assessment of LIG housing in India. It is expected that such an identification of HQIs would help assess housing quality either through a participatory process (comparing end users' expectation and perception about the quality of housing) or by any independent organisation.*

**Keywords:** *Housing quality, Housing quality indicators, SERVQUAL*

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## HOUSING QUALITY – THE BACKDROP

A house is not merely a shelter to protect oneself from the vagaries of nature and various socio environmental threats emanating from the society. It essentially is an expression of people's way of life and culture. It is a symbol of pride, an identity of one's social affiliation to different groups and communities. It is a reflection of one's preferences and prejudices. It is an indicator of one's economic standing in the society. Therefore, a house represents one's preference for a particular design choice which s/he would not only cherish as a living icon of way of life, but would also prefer to be associated with its attendant values (Blauw PW, 1994; Bhatti and Church, 2004). People associated with the provision of housing, namely – the architects, planners, and builders ought to appreciate that a home is not simply an area to live in, it must necessarily ensure a variety of functions for the occupants. It is expected that a good - quality housing shall be responsive to a wide variety of human needs (Heywood, 2004; Dwijendra, 2013). Hence, the need of a house ought to be seen through the prism of both quantitative as well as qualitative attributes by the policymakers and providers of houses. Housing should not be considered simply as an infrastructure as it facilitates the formation of a settlement which subsequently enables people to identify and communicate with the neighbourhood, society, and the natural environ. As shelter, housing represents levels of living, besides the welfare and culture of the residents. Hence, housing could be a means for self-realization of the residents and their integration with the surroundings.

An analogy can be drawn between a house and a human heart (Hanson, 1999; Heywood, 2004). A house protects the privacy and safety of its occupants and supports their occupational and recreational needs. A house is a place of retreat, relaxation, and at times a place of work as well. It secures autonomy and independence. It is the manifestation of the self and his / her social rank. A house is, therefore a composite whole which not only satisfies various human needs, but also embodies human aspiration and cultural values. Acknowledging the significance of house as one of the primary human needs, it has been incentivised both from the demand as well as the supply side. Since Independence, although various housing schemes have been taken up by the Government, the major thrust has been on housing for the poor. In the post-Independence period, the immediate focus of housing was on the Economically Weaker Sections (EWS), industrial workers, and the Low-Income Groups (LIG) by way of subsidised housing. Such housing schemes by the Government have resulted in the massive addition to the housing stock. However, assessment of housing qualities in India for EWS /

LIG housing, nay, all types of housing has been a formidable exercise in view of the general lack of definitional consensus on what 'good' quality housing is and the absence of a single overarching regulatory body responsible for superintending housing quality issues. Hence, this paper makes an attempt to identify housing quality indicators for Low Income Group housing for whom the choices are very limited.

#### HOUSING QUALITY - LITERATURE REVIEW

Good-quality housing could be a major component for guaranteeing a healthy neighbourhood. Poor-quality housing may cause several health issues and is often related to contagious diseases (such as tuberculosis), stress, and dejection. Thus, good-quality housing should be made accessible to every household and satisfactory environs both within and around the house should be ensured to make one contented and happy. Housing quality has several components, each of which may be outlined in many ways. An unambiguous definition of housing quality takes into consideration both the interior and exterior structural elements of the house besides the aspects of its internal and external environ. A much more comprehensive definition might incorporate the neighbourhood characteristics as well as the perception about environmental sustainability. Housing quality is also regarded as housing condition and / or housing habitability, both evaluated through the lens of objective and subjective appraisal. Housing quality assessed through subjective lens holds quality as a dimension of housing that has several implications for its occupants (Heywood, 2004; Apparicio, Séguin and Naud, 2008). Quality on its own does not adjudicate between the efficiency and deficiency of a house. In fact, the quality aspects only ensure whether the minimum standards are met to make the house acceptable to its occupants. (Duncan, 1971; Feijten and Mulder, 2005; Dwijendra, 2013). It appears that housing qualities have been interpreted in varied ways by various attributes or by the extent to which a given community is afflicted by the housing problems (Blauw PW, 1994). It has also been seen that although housing quality is susceptible to the socio-economic and political distinctiveness of the communities, most of the quality assessment exercises take into account different amenities and physical structures of the dwellings, namely, – water, electricity, toilet and bath facilities, size, area of rooms, convenience of rooms etc. besides the location. It is intriguing to find that although extensive research on affordable housing have been undertaken in developing countries, none of these researches points out the necessity of a standard definition of housing to ensure the provision of good-quality housing (Batley, 1996; Godish, 2001, 2016; Heywood, 2004; Karsten, 2007; Dwijendra, 2013). Such a shallow conception of housing leads to the creation of sub-

standard housing units that are not functional. The builders / real estate developers must necessarily appreciate that housing is an expression of human wants, and therefore they must be emphatic on the specific needs of the potential occupants of the house and the concomitant customised design for such houses. In making the provision for housing, builders are expected to face numerous constraints, some of which can well be unavoidable. But this should not deter the builders in providing good quality housing that underscores the basic human needs, crucial to promoting the well-being of its residents.

Adams (D. Adams, 1995; O. A. Adams, 1995) observes that 'Good quality housing should be able to reckon with the diversity of human needs and the ever-changing needs of individuals'. Qualitative analysis has used 'cultural probes' to decipher the distinctive values and lifestyles of individuals (D. Adams, 1995; O. A. Adams, 1995; Adams, 2000). Therefore, quality of the house is not simply the final product, it very appropriately begins with the design elements ensuring and incorporating the autonomy and power for the end-users in every step of the design (Harrison, 2004; Wentling, 2017). Urban housing regulator in the developing countries would consider a house sub-standard from the house-quality point of view if the house does not satisfy the statutory housing standards and byelaws (Hanson, 1999). Thus, a house shall be considered satisfactory if it is constructed with permanent building materials and provided with supporting infrastructures and amenities. Any endeavour to assess the housing quality ought to be linked to the physical qualities of the house and its utility (value-in-use) to the occupant(s). Waterson argues that the utility of a house lies in its suitability for the end users, aligning to their life styles and fulfilling their cultural values as well (Waterson, 1990; Janowski and Waterson, 1996). Besides the widening gap between supply of and demand for housing, lack of quality housing, cultural inappropriateness of the design of social housing, etc. also afflict the housing sector very badly (Wakely, Schmetzer and Mumtaz, 1976).

It is often seen that the massive construction of affordable housing projects has hardly ever met the requirements of the users and hardly ever built taking into consideration the cultural identity of the occupants. Moreover, most of the houses are found to be bereft of quality design and adequate basic services, let alone the small plot size (Turner, 1976). Quite regrettably, such affordable houses for the urban poor are found to have been built like un-habitable boxes and allocated across the poor urban households without caring whether such housing caters to the expression of way of life for its occupants and their cultural ethos. It appears that affordable housing has not only gone beyond the reach

of affordability of urban poor, it has also not taken into cognisance the cultural appropriateness and / or housing quality while conceiving the design of the housing project and subsequently implementing it.

Good-quality housing should be able to surmise the diversity of peoples' aspiration and needs and the ever-changing wants of individuals. Subjective (qualitative) analysis has taken recourse to the 'cultural probes' to decipher the distinctive lifestyles as well as values of simply the final product, it very appropriately begins with the design elements ensuring and incorporating the freedom, liberty, and authority for the end-users in every step of the dwelling-design (Wentling, 1995; Harrison, 2004). While breaking down the different facets of housing, quality of housing constitutes a prominent facet as expected (Figure 1).

**Fig. 1: Various Facets of Housing**



Source: Prepared by the Authors.

In India, literature is replete with different aspects of housing sector. Extensive researches have been made on different aspects of affordable housing, such as affordability of house, area, volume, amenities, location, household income, policy aspects of housing, etc. but there has been no study so far to assess the Quality Standards for LIG Housing Projects in India. Though one can assess the housing quality in India indirectly through the Norms and Standards of minimum requirement as per building bye-laws such as provision of windows, light and ventilation, minimum width and height of the room, minimum width of passage, toilet etc., but such assessment cannot capture the broad quality aspects of housing. Also, the building bye-laws do not have any spatial indicators such as distance to various amenities, access to public transport, etc. (location aspects), and also do not take into account the environmental, aesthetic and many services indicators that come under the physical infrastructure. Considering the constraint of non-availability of more options for buyers and limitations in the number of providers, it is essential to assess the LIG housing quality preferably through end users' perception in order to ascertain whether the housing, provided as per existing building bye-laws on the site, does meet the

expectations of end users. This study, therefore seeks to identify the set of Housing Quality Indicators (HQIs) for quality assessment of LIG housing in India. It is expected that such an identification of HQIs would help assess housing quality either through a participatory process (comparing end users' expectation and perception about the quality of housing) or by any independent organisation. This study excludes Middle- and High-Income Group housing (MIG, HIG, Ultra HIG) which have wider choices available for the buyers who can afford luxury at different income levels.

#### HOUSING QUALITY - IDENTIFICATION OF INDICATORS

Since attributes of a normative affordable house differs across countries and although such differences are also observed across the zones of a country, the contextual perspective for the present study is the typical affordable housing made under government initiatives and private enterprises in India. The present study shall therefore customize the housing quality indicators that are developed in other countries as well as recommended by researchers in India taking into account the differential socio-economic and physical conditions between India and western countries. Affordability being relative, level of minimum area, specification may vary with the context and hence the present study shall take care of the difference in affordable housing (A.H.) / low cost housing between India and western countries. The conceptual perspective for study on the other hand shall enquire: (a) are the quality standards used in various countries for housing applicable in Indian context? (b) What is the comprehensive set of indicators to assess quality of housing? (c) What considerations are needed in selecting the indicators? (d) How to deal with the dynamism in the indicators in Indian context?

Johnsand Howard (1998), in their study point at the different connotations that are beset with the word 'service' which naturally results in great degree of confusion around the word since 'service' in management literature could indicate a performance, a product, an industry, an offer or a routine process. Since the last three decades, service qualities are being examined as key issues confronting the service providers (Ladhari, 2009). Quality service provision begets civic confidence for the service providers (Cronin and Taylor, 1992). Consumers are no longer ignorant these days, rather they are more informative and proactive as well as empowered to make the service providers comply with the commitment towards meeting the assured service qualities (Donnelly *et al.*, 1995). Berry and Parasuraman (Parasuraman and Berry, 2004) assert that the understanding of client's expectations towards service quality is fundamental to measure the

service quality. Based on a basket of expectancy theories, expectations are interpreted as partial assessment and subsequent benchmarking of the standards (or reference points) of a certain product or service against which the product or service is judged (Zeithaml, Berry and Parasuraman, 1993). Therefore, service quality can be claimed to have been ensured satisfactorily, provided customer satisfaction have been attended to. Taking into consideration customers' expectations, quality can thus be linked to the variation between the expected quality and perceived quality (Parasuraman, Zeithaml and Berry, 1985). Service Quality (SERVQUAL) Model was developed as 'Gaps Model' by Parasuraman (Parasuraman, Zeithaml and Berry, 1985a) to assess the gap between users' expectation(s) and perception(s). Bigger differences between expectation(s) and perception(s) have been viewed as low-quality service and vice versa (Parasuraman, Zeithaml and Berry, 1988).

Although HQIs are identified to assess the quality of housing and although such quality - assessment can best be done through the above mentioned SERVQUAL model, this study restricts its scope to the identification of HQIs only. Towards this aim, the following references on quality indicators of housing have been consulted for the identification of housing quality indicators for this study.

- U.S. Department of Housing and Urban Development
- Welsh Housing Quality Standard (WHQS)
- Scottish Housing Quality Standard (SHQS)
- Sacramento Housing and Redevelopment Agency (SHRA)
- Housing Choice Voucher Program Guidebook
- Homes and Community Agency- Government of United Kingdom
- Housing Quality Indicators (HQI) used by Nelson Okehielem
- HQI used by Dr. Sudhi Mary Kurian and Dr. Ashalatha Thampuran

Since the SERVQUAL instrument has 5 dimensions, namely, - empathy, assurance, responsiveness, reliability, and tangibility (Ham and Hayduk, 2003; Mursaleen, Ijaz and Kashif, 2014), the identification of HQIs should be so aligned as to be grouped across these five dimensions. These five dimensions of SERVQUAL model are briefly defined as follows:

- (i) Tangibility: The availability of physical facilities, equipment and tools, etc. namely, signage, furniture, etc.;

- (ii) Reliability: The consistency in providing flawless services on a sustained basis over a period of time by the agency;
- (iii) Assurance: The knowledgebase of the agency staff about the service being provided by the agency and their being courteous;
- (iv) Responsiveness: The responsive demeanor of agency staff in the delivery of the service by the agency; and
- (v) Empathy: The agency executives' and staff's dexterity to pay personalized attention to each customer.

Although these five dimensions of SERVQUAL are not applied towards the identification of HQIs in this paper, it is held that such dimensions of housing qualities shall be hugely relevant in constructing the framework for assessment of housing qualities as well as categorizing the HQIs between Product Quality and Service Quality taking into account the original categories of each HQI.

Following stages have been followed in the identification of HQIs:

- (i) *First stage*: listing of HQI taken from various literatures and various Housing Boards' norms regarding HQI.
- (ii) *Second stage*: group-wise shortlisting of HQI.
- (iii) *Third stage*: first filtration of shortlisted HQI (through focus group discussion) taking into consideration the contextual differences in order to fit the indicators in contextual framework.
- (iv) *Fourth stage*: final filtration (finalization) of HQI through expert opinion survey.

A host of HQI studied under the first stage from various literatures and various Housing Boards' norms regarding housing quality are given below.

**(i) U.S. Department of Housing and Urban Development**

Under the U.S. Department of Housing and Urban Development Inspection Checklist, there are various housing quality indicators, distributed across eight components, namely - (a) Living Room, (b) Kitchen, (c) Bathroom, (d) Other Rooms Used for Living and Halls, (e) All Secondary Rooms (Rooms not used for living), (f) Building Exterior, (g) Heating and Plumbing, and (h) General Health and Safety. Several sub-indicators under the aforesaid eight components have been read in detail to identify and formulate an ideal, all comprehensive set of housing quality indicators for the present study.



**(ii) Welsh Housing Quality Standard (WHQS)**

First introduced in 2002, the WHQS intends to ensure that all dwelling units are of good-quality standard and appropriate for the requirements of the present as well as the future occupants. In the Welsh Housing Quality Standards (WHQS), forty-one sub indicators are given under seven different components, such as: (a) State of repair, (b) Safety and security, (c) Adequate heating, fuel efficiency and well insulation, (d) Modern kitchens and bathrooms, (e) Well managed (for rental housing), (f) Attractive location and safe environments, (g) Suitable for specific requirements of the household (e.g. specific disabilities). WHQS also contains ten key aspects which are linked to the abovementioned seven components and forty-one different sub indicators.

**(iii) Scottish Housing Quality Standard (SHQS)**

A synopsis of the five comprehensive criteria (A to E) involving 55 elements and 9 sub-elements of the Scottish Housing Quality Standard (SHQS) are furnished in Annexure-7 (Scottish government). Scottish Housing Quality Standard (SHQS) consists of five broad criteria, namely, - (a) Compliance with the current tolerable standard, (b) Free from serious disrepair, (c) Energy efficiency, (d) Presence of modern facilities and services, and (e) Healthy, safe and secured environ. Under these five broad criteria, fifty-five elements and 9 sub elements are incorporated.

**(iv) Sacramento Housing and Redevelopment Agency (SHRA)**

SHRA envisages a neighborhood that is an excellent place to reside, work and carry out business where each household has access to a decent, safe, secured and affordable house. Constituted under a Joint Powers Agency Agreement (JPAA) on April 20, 1982 by the City Council and County Board of Supervisors, Sacramento, SHRA mobilized both financial resources and manpower to invigorate low-income communities, generate opportunities for affordable housing, besides serving the public housing residents.

**(v) Housing Choice Voucher Program (HCVP) Guidebook**

The objective of HCVP is to ensure a decent, safe, secured and hygienic housing at an affordable price to LIG families. To achieve this, HCVP regulations stipulate a set of crucial housing quality standards which all dwelling units must comply with minimum criteria required for the health, hygiene, security and safety of the programme participants before assistance can be awarded on behalf of a family and at best annually during the term of the assisted occupancy. HQS regulations stipulate performance standards and suitability criteria to fulfil each

performance prerequisite. HQS contains requirements for various types of housing, including individual and multi - family houses, as well as precise requirements for a particular type of housing, namely - constructed homes, assembled housing, single room occupancy, shared housing and group housing.

**(vi) Housing Quality Indicators used by Nelson Okechielem**

Nelson Okechielem (2011) sets forth HQIs having four main impact factors because of their significant roles in the 'critical successes' of affordable housing quality in the UK. These impact factors are: sociological, economical, technological and environmental. Also identified were the indicators and criteria under them, which are all relevant for the development of a quality benchmark model.

**(vii)** Kurian and Thampuran (Kurian and Thampuran, 2011) perceive that the usability of a house is dependent not only on its size but also on whether it can be organized to suit the way the residents wish to live in. The authors have recognised that larger dwellings have implications of cost and land use, and consequently sustainability. Site design characteristics are mostly evaluated when client requirements indicate the overall objective and these are used in conjunction with a site-specific brief, allowing particular relevant features to be emphasised. The cost of regular maintenance and of making changes to a unit as new living patterns emerge over time is an important part of the quality of the unit.

**(viii) Aesthetic Quality Indicators**

Aesthetic quality indicators have been used by Jack L. Nasar (Jack L. Nasar, 1994). He examines three kinds of aesthetic variables: formal, symbolic and schemes. It highlights the importance of enclosure complexity and order as a formal variable of style as symbolic variable having a typical relation to schemes.

After studying all these above mentioned HQIs, eighty-seven indicators are shortlisted and broadly categorized group wise (Table 1) in five different sets, namely, (i) Physical Quality Indicators, (ii) Spatial Quality Indicators, (iii) Economy and Design Efficiency Based Indicators, (iv) Environmental Indicators and (v) Aesthetic Quality Indicators. These are outcome indicators considering housing as a physical infrastructure along with services since House plus Neighbourhood Services constitute Housing.

TABLE 1: PRELIMINARY CATEGORIZATION OF HQIS

| <b>A</b>                       | <b>PHYSICAL QUALITY INDICATORS</b>                  |
|--------------------------------|---|
| <b>BUILDING LEVEL</b>          |   |
| <b>Building- Internal Unit</b> |   |
| 1                              | Accessibility (building level)                      |
| 2                              | Area of tenement (space)/ unit size                 |
| 3                              | Unit layout   |
| 4                              | Accessibility (unit level)                          |
| 5                              | Unit noise level                                    |
| 6                              | Unit light quality                                  |
| 7                              | Unit ventilation                                    |
| 8                              | Presence of window                                  |
| 9                              | Presence of ventilator                              |
| 10                             | Window condition                                    |
| 11                             | Ceiling condition                                   |
| 12                             | Wall condition                                      |
| 13                             | Floor condition                                     |
| 14                             | Presence of sink in kitchen                         |
| 15                             | Space for storage, preparation, and serving of food |
| 16                             | Presence of bathroom and condition                  |
| 17                             | Presence of toilet and condition                    |
| 18                             | Electrification (available points)                  |
| <b>Building- External</b>      |   |
| 19                             | Condition of structure                              |
| 20                             | Condition of stairs, rails, and porches             |
| 21                             | Condition of roof/ gutters                          |
| 22                             | Condition of exterior surfaces                      |
| 23                             | Condition of chimney                                |
| 24                             | External finish                                     |
| 25                             | Presence of compound Wall                           |
| 26                             | Building facing direction                           |
| 27                             | Distance between buildings                          |
| <b>Building Services</b>       |   |
| 28                             | Drinking water supply                               |
| 29                             | Water supply for use                                |

(contd.)

|          |   |
|----------|---|
| 30       | Electricity availability                              |
| 31       | Plumbing  |
| 32       | Sanitation- sewer connection                          |
| 33       | Garbage collection                                    |
| 34       | Garbage disposal                                      |
| 35       | Fire safety   |
| 36       | Other services  |
| <b>B</b> | <b>SPATIAL QUALITY INDICATORS</b>                     |
| 37       | Location  |
| 38       | Accessibility (site level)                            |
| 39       | Proximity to bus stop                                 |
| 40       | Proximity to school                                   |
| 41       | Nearness to market place                              |
| 42       | Proximity to hospital                                 |
| 43       | Proximity to bank                                     |
| 44       | Nearness to post office                               |
| 45       | Nearness to place of worship                          |
| 46       | Park / play field within 1 km                         |
| 47       | Public water supply system                            |
| 48       | Garbage disposal facility                             |
| 49       | Public drainage system                                |
| 50       | Common waste disposal facilities                      |
| <b>C</b> | <b>ECONOMY AND DESIGN EFFICIENCY BASED INDICATORS</b> |
| 51       | Subsidy- free housing                                 |
| 52       | Use of economical materials/local materials           |
| 53       | Water optimization                                    |
| 54       | Energy optimization                                   |
| 55       | Structural stability                                  |
| 56       | Lesser repair cost                                    |
| 57       | Low-cost building techniques                          |
| 58       | Design by architect                                   |
| 59       | Role of contractors                                   |
| <b>D</b> | <b>ENVIRONMENTAL INDICATORS</b>                       |
| 60       | Eco-friendly materials use                            |

(contd.)

|  |                                      |
|--|--------------------------------------|
| 61   | Lesser pollution levels              |
| 62   | Health and safety                    |
| 63   | Waste recycle and disposal           |
| 64   | Water recycle and reuse              |
| 65   | Circulation                          |
| 66   | Transportation                       |
| 67   | Use of wood                          |
| 68   | Use of PVC material                  |
| <b>E</b>                                     | <b>AESTHETIC QUALITY INDICATORS</b>  |
| <b>Formal Aesthetic Quality</b>              |                                      |
| <b>Enclosure</b>                             |                                      |
| 69   | Openness                             |
| 70   | Spaciousness                         |
| 71   | Density                              |
| 72   | Mystery                              |
| <b>Complexity</b>                            |                                      |
| 73   | Diversity                            |
| 74   | Visual Richness                      |
| 75   | Ornamentation                        |
| 76   | Information rate                     |
| <b>Order</b>                                 |                                      |
| 77   | Unity                                |
| 78   | Order                                |
| 79   | Clarity                              |
| <b>Symbolic Aesthetic Quality</b>            |                                      |
| 80   | Naturalness                          |
| 81   | Upkeep                               |
| 82   | Intensity of use                     |
| 83   | Style                                |
| <b>Specific Aesthetic Quality Indicators</b> |                                      |
| 84   | External finish                      |
| 85   | Well defined compound wall           |
| 86   | House facing definite direction      |
| 87   | Central courtyard for house/building |

First filtration of the above mentioned eighty-seven HQIs has been carried out through focus group discussion, taking into consideration the contextual differences in order to fit the indicators in contextual framework. Focus Group Discussion (FGD) requires assembling people from comparable milieu or experiences together to deliberate on a specific subject of interest. It is an oft used tool of qualitative research where questions are asked to the members of the group about their observations, views, attitudes, ideas or beliefs. In FGD, participants are free to engage themselves in intense interactions with other members of the group. Unlike other qualitative research methods, it promotes intra group deliberations both intensively and extensively. A focus group discussion was conducted by inviting people from various backgrounds such as academicians, practicing architects, town planners, civil engineers, other professionals, builders, developers and also research scholars. The topic under focus group discussion was to figure out the most relevant HQIs for this study from amongst the eighty-seven HQIs identified through literature survey. Approximately forty participants were involved in the process who gave their views towards reducing the numbers of HQIs considering the contextual and conceptual framework of this study.

Participants shared their views about the indicators of Housing Quality and filled the Google forms provided to them for marking the importance of each discussed indicators on a 5-point Likert scale where one represents least important parameter and five represents most important parameter. Google form was created used for focus group discussion. With the help of focus group discussion, the eighty-seven indicators originally selected from literature survey were brought down to fifty-three (Table 2), which are suitable in Indian context, and helpful for assessment of housing quality (contextual differences are considered in order to fit the indicators in contextual framework). Focus Group Discussion (FGD) also helped to enrich and widen the perspective of housing quality and housing studies.

The indicators filtered through FGD were further taken for Expert Opinion Survey for further reduction and confirmation (finalization) of indicators in order to prepare the SERVQUAL questionnaire for field surveys towards the participative assessment of housing quality based on users' expectation and perception. Following steps were adopted while finalising the FINAL indicators:

- (A) All fifty-three indicators filtered through FGD are put to Likert scale of 1 to 7 where 1 is the least important and 7 is the most important parameter for this study. Survey form was created with the help of Google form and results of ranking and scores of various indicators are furnished in Fig. 2 and 3.

TABLE 2: SHORT LISTING OF HQIS THROUGH FGD

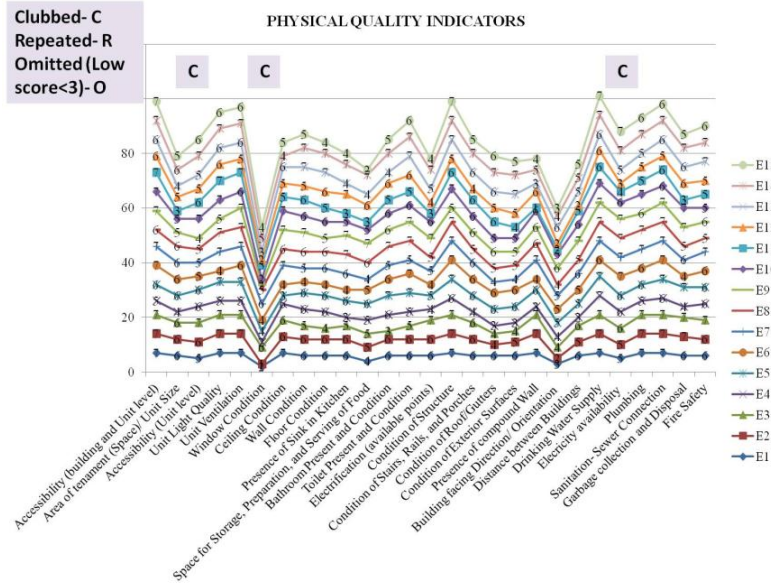
| SL. NO.                        | INDICATORS  |
|--------------------------------|---|
| <b>A</b>                       | <b>PHYSICAL QUALITY INDICATORS</b>                  |
| <b>BUILDING LEVEL</b>          |   |
| <b>Building- Internal Unit</b> |   |
| 1                              | Accessibility (building and unit level)             |
| 2                              | Area of tenement (space)/ unit size                 |
| 3                              | Accessibility (unit level)                          |
| 4                              | Unit light quality                                  |
| 5                              | Unit ventilation                                    |
| 6                              | Window condition                                    |
| 7                              | Ceiling condition                                   |
| 8                              | Wall condition                                      |
| 9                              | Floor condition                                     |
| 10                             | Presence of sink in kitchen                         |
| 11                             | Space for storage, preparation, and serving of food |
| 12                             | Presence of bathroom and condition                  |
| 13                             | Presence of toilet and condition                    |
| 14                             | Electrification (available points)                  |
| <b>Building -- External</b>    |   |
| 15                             | Condition of structure                              |
| 16                             | Condition of stairs, rails, and porches             |
| 17                             | Condition of roof/ gutters                          |
| 18                             | Condition of exterior surfaces                      |
| 19                             | Presence of compound wall                           |
| 20                             | Building facing direction/ orientation              |
| 21                             | Distance between buildings                          |
| <b>Building Services</b>       |   |
| 22                             | Drinking water supply                               |
| 23                             | Electricity availability                            |
| 24                             | Plumbing  |
| 25                             | Sanitation- sewer connection                        |
| 26                             | Garbage collection and disposal                     |
| 27                             | Fire safety   |

(contd.)

|  |   |
|--|---|
| <b>B</b>                                     | <b>SPATIAL QUALITY INDICATORS</b>                     |
| 28   | Location of house from CBD                            |
| 29   | Accessibility (site level)                            |
| 30   | Proximity to bus stop                                 |
| 31   | Proximity to school                                   |
| 32   | Nearness to market place                              |
| 33   | Proximity to hospital                                 |
| 34   | Proximity to bank                                     |
| 35   | Nearness to place of worship                          |
| 36   | Nearness to park / play field                         |
| 37   | Public water supply system                            |
| 38   | Garbage disposal facility                             |
| 39   | Public drainage system                                |
| <b>C</b>                                     | <b>ECONOMY AND DESIGN EFFICIENCY BASED INDICATORS</b> |
| 40   | Use of economical materials/local materials           |
| 41   | Structural stability                                  |
| 42   | Low cost building techniques                          |
| 43   | Design by architect                                   |
| <b>D</b>                                     | <b>ENVIRONMENTAL INDICATORS</b>                       |
| 44   | Eco-friendly materials use                            |
| 45   | Lesser pollution levels                               |
| 46   | Waste recycle and disposal                            |
| 47   | Water recycle and reuse                               |
| <b>E</b>                                     | <b>AESTHETIC QUALITY INDICATORS</b>                   |
| <b>Formal Aesthetic Quality</b>              |   |
| 48   | <b>Enclosure</b>                                      |
| 49   | <b>Openness</b>                                       |
| 50   | <b>Complexity</b>                                     |
| 51   | <b>Order</b>  |
| <b>F</b>                                     | <b>SYMBOLIC AESTHETIC QUALITY</b>                     |
| <b>Specific Aesthetic Quality Indicators</b> |   |
| 52   | External finish                                       |
| 53   | Well defined compound Wall                            |

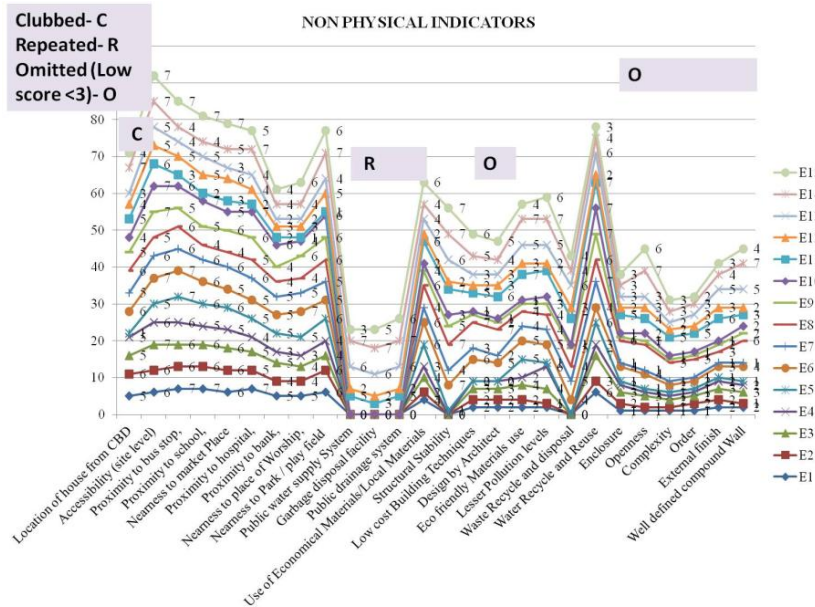


**Fig. 2: Physical Quality Indicators' ranking as per Expert Opinion Survey**



Source: Analysis by Author

**Fig. 3: Non-Physical Quality Indicators' ranking as per Expert Opinion Survey**



Source: Analysis by Author

- (B) Fifteen experts across various fields, namely – academics, architecture, civil engineering, State Town Planning Department and PWD, researchers etc. had been consulted under the expert opinion survey in order to further reduce the number of indicators through outright exclusion, clubbing, removing and grouping.

The results of Expert Opinion Survey are furnished in Fig. 2 and 3. Each line in respective figure represents the weightage given by the experts across each Housing Quality Indicators on a scale of 1 to 7.

- (C) Consequent upon the brainstorming, out of the 53 indicators, some of the indicators, found to be proximate to one another, are clubbed with each other; some repeated indicators under different heads were removed and kept under one domain in order to avoid the confusion of respondents; indicators scoring less than 3 (three) as modal value have been omitted considering their less importance to this particular study; and, some original indicators have been kept ‘as it is’ in response to the modal value of scoring. The clubbed, repeated, and omitted indicators are shown in Table 3.
- (D) In all, thirty indicators have finally been selected for this study as shown in Table 4.

TABLE 3: CLUBBED, REPEATED, OMITTED HQIS THROUGH EXPERT OPINION SURVEY

|  |
|--|
| <b>Clubbed Indicators</b>  |
| Accessibility (building and unit level)                                  |
| Window condition (unit light and ventilation)                            |
| Electrification (available points), Availability of electricity          |
| Garbage collection and disposal  |
| Location (proximity to the various public amenities)                     |
| <b>Removed Indicators because of repetitiveness in different aspects</b> |
| Public water supply system   |
| Garbage disposal facility  |
| Public drainage system   |
| Structural stability   |
| Waste recycle and disposal   |
| External finish  |
| Well defined compound wall   |
| <b>Omitted Indicators</b>  |
| Aesthetic quality indicators (all set)                                   |
| Design by architect  |
| Low cost building techniques   |

TABLE 4: FINAL HOUSING QUALITY INDICATORS

| <i>Sl. No.</i> | <i>Indicators</i>                                   | <i>Sl. No.</i> | <i>Indicators</i>   |
|----------------|---|----------------|---|
| 1              | Accessibility (building and unit level)             | 17             | Building facing direction   |
| 2              | Area of tenement (space)/ unit size                 | 18             | Distance between buildings  |
| 3              | Unit light quality                                  | 19             | Drinking water supply   |
| 4              | Unit ventilation                                    | 20             | Electricity availability  |
| 5              | Ceiling condition                                   | 21             | Plumbing  |
| 6              | Wall condition                                      | 22             | Sanitation - sewer connection   |
| 7              | Floor condition                                     | 23             | Garbage collection and disposal   |
| 8              | Presence of sink in kitchen                         | 24             | Fire safety   |
| 9              | Space for storage, preparation, and serving of food | 25             | Accessibility (site level)  |
| 10             | Presence of bathroom and condition                  | 26             | Proximity to public transport   |
| 11             | Presence of toilet and condition                    | 27             | Proximity to the public amenities such as school, market place, hospital, bank, playfield/park, place of worship etc. |
| 12             | Condition of structure                              | 28             | Use of economical materials/ local materials  |
| 13             | Condition of stairs, rails, and porches             | 29             | Waste water recycle and reuse   |
| 14             | Condition of roof / gutters                         | 30             | Obnoxious activities  |
| 15             | Condition of exterior surfaces                      |                |   |
| 16             | Presence of compound wall                           |                |   |

## CONCLUSION

It has been argued in this study that notwithstanding the affordability of the house owner, area of the house, housing quality should also be factored into the evaluation of any housing scheme. In its bid to identify the HQIs, this study surveys both foreign and Indian literature. Considering the various aspects of housing, this study adopts the SERVQUAL method for grouping the HQIs under five dimensions although these dimensions were not retained in the finally selected thirty HQIs. As has been explained, this identification of HQIs has been put through rigorous filtration process. Housing quality has several components, each of which may be outlined in many ways. An unambiguous definition of housing quality takes into consideration both the interior and exterior structural elements of the house besides the aspects of its internal and external environ. A much more comprehensive definition might incorporate the neighbourhood characteristics as well as the perception about environmental sustainability. Housing quality is also regarded as housing condition and / or housing habitability, both evaluated through the lens of objective and subjective appraisal. However, this study submits that the quest for even more sound HQIs should ensure that:

- Future study be extended to other income groups considering their requirements, lifestyles and demands.
- Aesthetic quality indicators should be incorporated under the listed housing quality indicators made in this study.
- Other aspects such as climate, locations, impact of housing policies, durability, etc. can be factored in while assessing the housing quality.
- Tenure security as a separate aspect may be considered while assessing housing quality. Future study can underscore the importance of tenurial security, if such an aspect is found to be crucial in determining the legal status of a house.
- Unlike in the present study where LIG house owners have not been consulted while choosing the HQIs (it has been restricted to experts and other stakeholders) because of their perceived unawareness about different HQIs, future study can even make the selection of HQIs participatory, especially in the cases of MIG / HIG housing since these segments are believed to be fairly informed about a host of HQIs including even the specific indicators (e.g. aesthetics, interior spaces, etc.) and are

also expected to influence the choice of HQIs because of their higher affordability.

- Since both years of occupation and the quality of previous occupation could impact the expectation – perception gap of the respondents about the quality of their present house, future research can be done by taking into consideration both these aspects.
- SERVQUAL model should be applied in the identification of HQIs through a participatory process since the five dimensions of SERVQUAL, namely, empathy, assurance, responsiveness, reliability, and tangibility shall surely facilitate the identification of HQIs on the part of the house owners.

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