

Morphological Patterns of Dwelling Units in Informal Settlements of Bhopal, India

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Abstract—*Informal settlements have long been an area of interest for many researchers. While there is considerable amount of literature available on morphology of informal settlements, most of these identify phenomena at settlement or neighbourhood level, but discussions about morphological characteristics inside the dwelling unit remain limited.*

This paper presents various insights developed using grounded theory research methodology for identifying patterns related to morphology of dwelling units. Primary question to which this research seeks to answer is 'how the morphology of dwelling unit is a reflection of dwellers requirements and living circumstances?'

Primary mode of data collection was semi structured interviews and photographs of the dwellings in informal settlement of Bhopal. Responses of the interviewee were transcribed and the three types of coding i.e. open coding, focused coding and axial coding was done to identify categories and sub-categories. Some patterns or concepts observed during identification of relationships between categories and subcategories have been presented as outcome of this work.

Keywords: *Grounded Theory, Informal Dwellers, Informal Settlements, Morphology*

1. INTRODUCTION

Informal settlements have been of great interest to researchers owing to unique and non-conventional morphological relationships between dwellers and the environment. The term informal settlement refers to a range of dwelling conditions. Jhuggis, patra, chawls, basti, jhopparpatti and so on are the names given for informal housing types that define most of the informal settlements in India [3]. Favelas, gekecondus are synonymously used for such settlements in other countries. The three terms namely Informal settlements, Slums and Squatters are often used casually without paying attention to specific domain to which they refer [4]. One advantage of above mentioned classifications is that they help us use these three terms in right sense. Raharjo clearly defined these terms and specified the suitable use as well as their interrelationship. He defines slums as settlements which lack in conditions for decent living, infrastructure, services, construction safety etc. Informal settlements cover a broader range than squatter settlements. Raharjo also recommends that squatter may best be used as a subset of informal settlement which might later get legal tenure status. He finally summarizes that these three

terms differ from each other. Slums refer to socio-spatial quality, while using term squatters or informal settlements is a matter of tenure.

Many researchers have already highlighted the reluctance in documentation of form, structure and parts of dwelling units and its relationship with dwellers skills and activities. Despite been quite well documented on political, economical and social issues, informal settlements are still barely known for their morphological features [6]. It is however well accepted that detail study of architecture created by these self-builders will help various scholars and practitioners in understanding the ground realities.

Professionals of built environment often assume that they are well aware of the requirement of slum dwellers. Bhatt asserts that the same is not true unless the circumstances and responses are studies from the perspective of slum dwellers. Priorities of the slum dweller are frequently not those of municipal authorities. Space takes precedence over permanence. A porch may be built before a bathroom; a workplace may be more important than a private bedroom [5].

2. RESEARCH DESIGN

The intent behind this research is to identify phenomena of importance as we read the morphological characteristics of dwelling made by informal settlers. Why and how the informal dwellers construct a certain type of enclosure to house their daily life? How is this process of building and frequent repair informed by the circumstances common to slums? To conduct this research, a grounded theory approach was adopted. This approach is considered appropriate when little is known about the area of study. Being an Inductive methodology, it provides the researcher with an opportunity to develop theory as discovered with the observation from empirically collected data [2].

Due to emergent nature of grounded theory research process, sampling and data collection is a recurring process [1]. Without having much of preconceived notions, the research started with a general curiosity and 10 slum dwellers from Bhopal were interviewed. Keeping in line with the aim of

research, following conditions were to be satisfied before deciding the dwellers to be interviewed.

Table 1: Sampling Criteria.

Sampling criteria	Acceptance conditions	Rejection conditions
Constructed by	Self Built/partly self Built/built by friends, relatives Without the help of Mistry	Built by Mistry, designed by architect,
Stage of Evolution	Infancy/consolidation/maturity	
Construction material	Mud, stone, bricks, tiles or any material construction that lacks the evidences of finishes and techniques typically found in construction practices in formal system of housing.	Pucca construction with finish masonry in cement mortar. Walls in plumb, casted roof.
location	Within the city area	Rural settings

Data collected from these interviews were coded and categories of importance were identified. These categories were taken as core categories.

3. INTERVIEWS

Interview questions revolved around two major areas of interest. First being the *space-use program*, this establishes a connection between the spaces and their suitability as per activities or vice versa. Second being the *resources* which are accessible to a self-builder in informal conditions. A semi-structured interview guide was developed to facilitate the interview where the questions were rather talking points and respondents were able to steer from one topic to another, while researcher was only an observer recording the interviewee opinions. Interview questions however were framed to ensure that following research questions are well touched open during the interviews.

What are the impacts of following factors on the morphology of dwelling units in informal settlements?

1. Unique needs of the users
2. Personal preferences and acceptability
3. Daily life(activities of daily living)
4. Safety, privacy and social interaction

How is the morphology of these dwelling units being informed by following factors?

1. Land characteristics
2. Access to material
3. Workability of material and skills

4. CODING AND CATEGORIZATION

Interviews were audio-recorded and transcribed without any editing. During the first step of initial coding, responses were assigned line-by-line a word or phrase that best describes what is of importance for the interviewee as he shares his views related to the ongoing discussion. Everything in the transcript is data at this initial stage and nothing is discarded. Repetition of codes started to appear in the first set of transcripts. As some codes shared few properties, grouping of codes became a useful tool to identify major emergent categories as the transcripts were being coded. Memo writing was a parallel process to ensure that researcher's thoughts and rationale for coding is consistent throughout the process of coding. Another layer of coding used was focused coding where codes were provided for the overall point of emphasis in each paragraph instead of line-by-line code. Various codes were grouped to identify major categories and observations were made. These observations are being presented in the same categories identified by coding.

5. OBSERVATIONS

As the coding started to present some similarities, observations were grouped into following categorized based on the properties.

5.1. Aesthetics and Emotions

Planters are often seen in the patio areas as a statement for beautification of dwellings. In some cases colors are used on walls, utensils are displayed on shelves and occasionally one can notice decorations from the recent celebrations.



Fig.1: Utensil as Display Items.



Fig.2: Plants in Patio.



Fig.3: Toilet without a Roof.

5.2. Beliefs, Traditions and Values

Plants and trees are used for many purposes other than aesthetics. Tulsi is worshipped, mango leaves are used in celebrations and plants are also used to keep snakes away. Skill and knowledge possessed by these people reflect their rural connect. Such knowledge and skills are transferred from one generation to another as all participate in the process of building or repairing the shelter. Some activities belong to one gender. Such as cow dung finishing is done by female members only. Female are well versed in skills required for repairs. Female being the one staying at home does most of the regular maintenance as the male member goes out for living.

Some also discredit the use of latest construction technology against traditional way of building. Some of the interviewees argued that they find traditional ways feasible and more climate-responsive.

5.3. Privacy and Safety

Notion of privacy and safety for informal settlers appear to be less stringent as opposed to conventional housing. Most of the informal dwellers are less concerned for having a roof on wet areas such as bath and toilet.

Side enclosures provide them with enclosure required for privacy purposes. However female are considered more vulnerable and in most cases outside sleeping areas are used by male members while female sleep in semi covered areas or inside the rooms. Female spend most of their time at home but they are more concerned about the damage to the shelter caused by stray cats. Often the roof leakages are a result of holes in the plastic roofing layer. None of the respondents showed a concern towards safety from possible crimes. Some of the dwellers do not mind street dogs around their houses.

5.4. The Process of Building

To build is a recurring practice while repair and maintenance is part of daily activities. As oppose to conventional housing scenario, dwellers are the self-builders who start with a minimum and extend, divide, add or remove as the dwelling consolidates over time. A consolidation occurs in many stages using spontaneous and custom designed solutions. Most of such solutions are informed by availability of material and knowhow. Rarely is the self builder seeking a long term measure as the recurring maintenance and repair is acceptable as a regular chore.

5.5. Materiality

As opposed to common belief, informal settlers were content with the lesser strength in structure.



Fig. 4: Ongoing Repairs at Dado.

Most of the interviewees find it acceptable because repairs and maintenance are considered part of routine activities. Preference for locally available inexpensive material is obvious. Although frequently used, corrugated iron sheets are not preferred due to overheating of space in summer.

5.6. Changeability

Changeability in space, structure and program is one of the key requirements for informal settlers. Seasonal changes, changes in personal preferences, changes in number of occupants including domestic animals and also constant consolidation of dwelling demand changeability as a fundamental characteristic.

5.7. Self Builder's Skills and Concerns

Architecture of dwellings reflects the skills of the self-builder. While sharing some commonalities, each dwelling is unique reflection of available material and improvisation in quest of putting together a shelter suitable to dwellers needs. Mostly, all adult members of the family are comfortable with construction and occasional repairs. They are well aware of the possible damages over time, to be dealt with experience and learning from others in the community. Some respondents however mentioned the concern for lesser strength of structures which fail to survive damages caused during heavy rains and winds.

5.8. Spaces

Limited space available results in overlapping of activities. A space may be used for cooking, eating or sleeping at different times as needed. Cooking is primarily an outdoor activity as mostly used fuel is wood and smoke will blacken the insides of walls and roof. Also there is a possibility that wooden members, plastic sheets or other light materials may catch fire. Floor is considered suitable and sufficient for eating, sitting, sleeping. Dwellers prefer not to use furniture as it will scratch the cow-dung floor finish. The free floor space is also preferable so that more people can be accommodated. As a result, walls and under sides of roof are commonly used for storage.

Patio or verandah is one of the key features for informal dwellers, it not only provides a multipurpose space, but also serves as a transition space between rooms and access street. It is the most desired space to be used for cooking, parking, outdoor storage, social space, livelihood activities, food preparation, and utensils cleaning and so on.

Interestingly, a small worship arrangement is present in all the dwellings in the innermost rooms. Mostly arranged on a shelf hung from roofing members or fixed to the wall, and is the most decorated place in the dwelling. Objects considered valuable such as stainless steel or brass utensils are kept in the same area.



Fig. 5: Multipurpose Patio.



Fig. 6: Worship or Pooja place Inside the Room.

Toilets are generally detached from the main dwelling rooms. While some dwellers find them unsightly, few prefer this segregation to avoid smell.

5.9. Storage Areas

At first sight the enclosed spaces such as rooms appear to be storage areas for clothing, utensils and water containers. Most of such storage is on strings hanging from the roof or tied to a nail to the wall. Spaces or gaps between the roofing members serve as easy to reach anchors. Electric wiring is also fished through these gaps to provide power supply to fans and lights inside the rooms. Number of small water containers of about 20 liters capacity point at lack of water supply connections. As many informal settlements occupy land on slopes, installation of gravity fed water distribution network is rarely possible. Water is to be brought from a distance source which is possible only in the form of small water buckets. This results into number of small containers as opposed to individual water tank common to conventional water supply.



Fig.7: Water Storage in Small Containers.

6. CONCLUSION

While many research approaches have been used by researchers interested in informal settlements, grounded theory presents a research with an opportunity to start with an open mind without any preconceived notion related to phenomena of importance. In this study, this approach is helpful as every next step is being guided by the data previously collected. Observations delineated above clearly reflect the discovery of the unexpected or overtly hidden realities. While one may see informal settlements as areas full of issues and unlivable environment, interviews of dwellers paint a different picture that highlights the qualities in their dwelling architecture and adaptability of users in response to circumstances common to informal settlements.

REFERENCES

- [1] Birks, M., & Mills, J. (2011). *Grounded Theory: A practical Guide*. London: Sage Publications.
- [2] Jones, M., & Alony, I. (2011). Guiding the use of Grounded Theory in Doctoral Studies – An Example from the Australian Film industry. *International Journal of Doctoral Studies*, 95-114.
- [3] MCGM, M. C. (2008). *Urban Basic Services in Slums*. Mumbai: Municipal Corporation of Greater Mumbai.
- [4] Raharjo, W. (2010). *Specuative Settlements: Built Form/Tenure Ambiguity in Kampung Development*. Melbourne: Melbourne School of Design.
- [5] Rybcznski, W., & Bhatt, V. (1984). *How The Other Half Builds: Space*. Montreal: Center for Minimum Cost Housing, Mc Gill University.
- [6] Sobreira, F. J. A., 2009. *Favelas, barriadas, bidonvilles: the universal morphology of poverty*. UNICEUB – Centro Universitário de Brasília.