Houses of Homes? The Patterns of Design

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Abstract
Following the tsunami of 26 December 2004 the construction of new houses for beneficiaries in the southern coastal areas of Tamil Nadu in India was undertaken by aid agencies according to the very specific guidelines set by the Indian Government. These guidelines left very little room for deviation from a basic plan if aid agencies wanted to work in India. The result was a 'one size fits all' house. This study focuses on a sample of 109 of these new houses in seven villages which have been inhabited for between 3 and 18 months. House owners are modifying their houses to meet their needs subsequent to handover by donor agencies. These alterations or additions are initiated and funded by the beneficiaries.

The idea of 'home' and how through modifications these houses meet that is explored through the use of Jacobsen's text *Patterns of Home: the ten essentials of Enduring Design*. This text is used as a framework to analyze 'home'. To analyze the data about the houses a matrix has been developed which includes the ten patterns of home according to Jacobsen in relation to the modifications made by beneficiaries to different parts of the house. Through analysis of the modifications made the appropriateness of a 'one-size-fits-all' house and whether or not these patterns are relevant in an aid situation is questioned.
Keywords: patterns, modification, post-occupancy studies, tsunami

Introduction

When the tsunami of December 2004 hit the southern coast of India small coastal fishing villages made up of mainly thatch huts were hit. Many of these villages were completely destroyed and lives were lost. These fisher folk were poor in relation to other locals pre-tsunami and now post-tsunami they were also without homes. Aid agencies stepped in to build new houses for these villagers according to the strict guidelines of the Indian Government (fig 1 & 2). The houses were built in concrete block or mud brick but the resulting new villages were foreign in many ways to the beneficiaries in their

materiality and layout. The 'one size fits all' approach led to monotone villages each house indefinable from the next.

Modification is the way in which house owners take the base they have been given and create a home and it is these modifications which this research examined.

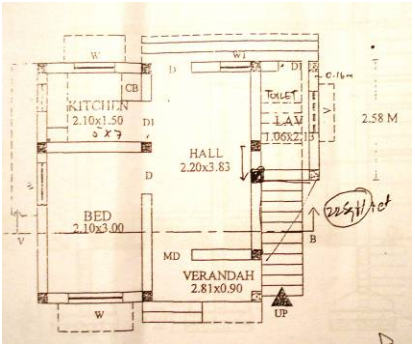

Fig.1. example of house plan

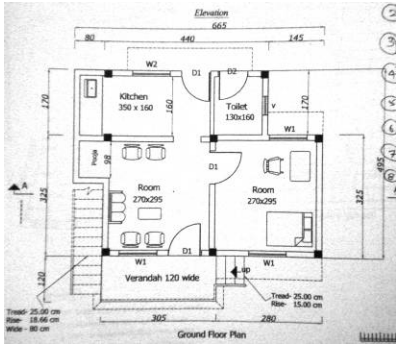

Fig.2. example of house plan

Research Methodology.

Given this starting point of a "one size fits all" house, how does one ascertain how this design could or should be modified? Such a question could be addressed by any of the following standard approaches[1]:

- Ask beneficiaries what they want in a house.
- Study the demographics of families and then review the present house plans and develop alternatives.
- Study existing low cost housing of the area and then review the present house plans and develop alternatives.
- Ask locally based experts in practice and at universities
- Some combination of these.

However, the approach adopted in this study was to "talk to the houses". An unusual approach grounded in the work of Cooper[2] but based on the existence of patterns as suggested by Alexander[3] and later by Jacobson et al.[4] and in the work of Brand[5]. Such an approach had potential advantages that included the following:

[1] Birkman J, Wisner B (2006). *Measuring the Un-Measurable: The Challenge of Vulnerability*.
[2] Cooper C. (1995) *House as a Mirror of Self. Exploring the Deeper Meaning of Home*.
[3] Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I. and Angel, S. (1977) *A Pattern Language*.
[4] Jacobson M, Silverstein M, Winslow B. (2002) *Patterns of Home: The Ten Essentials of Enduring Design*.
[5] Brand, S. (1994) *How Buildings Learn: What Happens After They're Built*.

- Buildings don't "lie".
- There appeared to be a gap within the tools presently available and the possibility to develop new tools
- Such tools could be trans-cultural and therefore usable in other geographic areas.
- No need for language translators in the field
- It has 'appeal'

And consequently, this strategy was adopted.

Cooper's seminal work first published in 1974 (and then later in 1995) is based around a role playing exercise. She describes it that "…after the person had described what they had put down, I would place the picture on a cushion or chair about four feet away and would ask them to speak to the drawing as if it were their house, starting with the words, "House -- the way I feel about you is . . ." At an appropriate moment, I would ask them to switch places with the house, to move to the other chair and speak back to themselves as if they were the house. In this way, I facilitated a dialogue between person and house, which often became quite emotional, sometimes generated laughter, and occasionally brought forth statements beginning, "Oh, my God . . . ," as some profound insight came into consciousness"[6]. And her conclusion based on 60 in-depth interviews over 20 years was that "…the key seems to be in the personalization of space: More and more, I found in the stories I heard that it is the movable objects in the home, rather than the physical fabric itself, that are the symbols of self."[7] And for Cooper it is this alignment with self that makes a house a home.

On the other hand, for Alexander and Jacobson "home" does exist in the physical fabric of the house. The original 250 patterns suggested by Alexander et al in 1977 were trimmed back to what Jacobson describes as 10 essential patterns "..that form the essence of home"[8]. Jacobson et al suggested that "practice has made us realize that the really crucial patterns are far fewer in number than we had previously thought; and that this smaller group of patterns is more powerful than we had previously imagined"[9]. They go on to state that "While there may be many dozens, even hundreds of patterns that go into the making of homes, there are only a handful that we now say are essential"[10]. While their patterns could be in Cooper's "movable objects" it is clear that they are also found in the building "fabric". These 10 patterns are tabulated in table 1 appendix.

A third approach suggested by Brand is that "buildings learn"[11]. He suggests a "six S" level of hierarchy with changes occurring at different times for each of these 6 levels as follows:

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[6] Cooper C. (1995) *House as a Mirror of Self. Exploring the Deeper Meaning of Home*.
[7] Ibid.
[8] Jacobson M, Silverstein M, Winslow B. (2002) *Patterns of Home: The Ten Essentials of Enduring Design*. pg10
[9] Ibid.,pg4
[10] Ibid.,pg5
[11] Brand, S. (1994) *How Buildings Learn: What Happens After They're Built*.

- Site such as the geographical setting, its urban location and legal description is eternal and does not change.
- Structure ranges from 30 to 300 years (Brand comments that few make it past 60)
- Skin changes every 20 years due to technology and fashion
- Services (wiring, plumbing, kitchen appliances, heating and cooling) change every seven to 15 years
- Space Planning which includes the interior partitioning and pedestrian flow, changes every 2 to 3 years in offices and perhaps every 30 years in homes
- Stuff (furnishings) change continually.[12]

For Brand "Age plus adaptivity, is what makes a building come to be loved. The building learns from its occupants, and they learn from it."[13] And thus a house becomes a home over time and through adaptation. Something that resonates with Cooper at the “stuff” level of Brand’s six S’s.

Mapping each of these three approaches as separate dimensions of an effective 3D spread sheet against the spatial areas within the house produced the final tool used to map the modifications within the houses that were surveyed. The spatial areas were the outside front of the house, the porch, the alleyway (on both sides of the house), the outside back, the lounge, kitchen, bedroom, toilet and rooftop. The final tool used for this research is shown in table 1 appendix. The work required to apply Cooper’s dimension meant that the spreadsheet was effectively 2 dimensional for this research.

This paper deals with the patterns according to Jacobsen while another paper by Feng deals with Brand’s approach of adaptation (refer to Feng V, Potangaroa R, Russell A, ‘Can houses learn?’ I-rec Conference 2008 Christchurch, New Zealand, April 30 – May 2 in press). In all 109 houses from 7 villages in the Tamil Nadu area of south east India were surveyed and the results analysed.

Research Results

The results that follow address the three most commonly found patterns (see appendix table 1) in detail and the other patterns in brief.

Inhabiting the site

“If the form of the house doesn’t begin by responding to the site, house and site may well end up in conflict with each other.”[14]

Due to the rigid layout of the new villages the houses did not inhabit the site on handover. The houses were identical, painted identically, and were handed over prior to the roads being laid (or water or sewage connections being put in). The first modification people made to their houses was in respect to the site and consequently this was the most common modification

[12] Ibid., pg 13
[13] Ibid., pg 23
[14] Jacobson M, Silverstein M, Winslow B. *Patterns of Home: The Ten Essentials of Enduring Design*. pg 23, 24

seen (followed by 'creating rooms inside and out' and 'places in between'). By far the greatest number of modifications was occurring outside the houses. A range of approaches was used by house owners to inhabit the site and these usually marked the boundaries of their home by planting or fencing (fig 4).

The planning of the sites was to fit the houses in rather than to relate to the site in any way, there was no regard to orientation or natural features (fig 3). People created the boundaries to their home themselves. The villages did not relate to the area as a whole with its natural or manmade features. It has been up to the beneficiaries to make a connection to the site. Inhabiting the site gave boundaries to house owners' property and provided a place to make a home. Agreed boundaries between properties were clearly important both from the spreadsheet analysis and from what was seen on site. Fences of various designs were common thus underlying the importance of place, even in (and perhaps more importantly) in post disaster reconstruction.

Creating rooms outside and in

The base house did not create rooms, outside and in. As noted above modifications have been necessary to inhabit the site, following this modifications have then created external rooms. A relationship with the site first has to be set up before outside rooms can be created. "A lively balance of indoor and outdoor rooms"[15] is specified by Jacobsen's text to meet the needs of a home. There were examples where beneficiaries very successfully created rooms inside and out, and the outside rooms have added value to the internal rooms by a series of rooms emerging. In the in-situ houses (those that were rebuilt on the original site amongst the surviving buildings) creating rooms was very successful as there was already a relationship with what is on the site.

In the new villages it has taken longer to create rooms outside and in due to the rigidity of the layout. In some villages more than others external rooms have been created at the sides and to the back of the house (fig 5, fig 6). Because of the structure of the houses the majority of beneficiaries have not been able to modify their internal rooms in any way apart from decoration (fig 10).

Places in between

"Places that allow you to inhabit the edge, that offer enough exposure to make you aware of your surroundings, and that provide just enough protection to make that awareness comfortable."[16]

The economy of the house provided did not provide places in between. It was modifications that provided places in between in their relationship to the house (fig 4,5,9). There are difficulties in making places in between where houses are in a layout which provides identical houses in a linear arrangement with a lack of gradation from public to private areas. Where houses were modified with additions places in between existed in greater

[15] Ibid., pg 11
[16] Ibid., pg 16
[17] Ibid., pg 17

abundance – outside in particular, in relation to the thatch kitchens, in the alleyway or in front. Places in between provided spaces for many activities to occur.

Results for the other patterns

The sheltering roof pattern is clearly visible in vernacular thatch hut architecture in Tamil Nadu which most of the beneficiaries of the houses lived in pre-tsunami. The base house supplied post-tsunami which was a uniform cladding all over did not give a feeling of sheltering roof; the roof is there, but it provides no feeling of a sheltering element.

"More than any other single element, the form of the roof – as experienced both outside and in – carries the look and meaning of shelter, of home."[17]

A frequent alteration beneficiaries made was to build a shelter usually in thatch or corrugated metal out front of their house – these varied in size from a small porch to a shelter that extends along the whole of the house frontage and out to the boundary. What these extensions had in common was that they all provided a sheltering roof with slope that encloses and defines the space (fig.5). Extensions out back to create an outdoor kitchen also usually had a sheltering roof. The structure inside the thatch roof structures was visible and this combination of structure and skin provided shelter as well as the feeling of contentment created by being sheltered. Where another level was built on top of the base house the pattern of traditional thatch housing was followed. The sloping surrounding roof provided enclosure and protection, and the only opening was at the top of the stairs (fig 7&8).

"Good homes capture light – filter it, reflect it – in ways that, no matter the season or time of day, delight their inhabitants."[18]

In a tropical climate is capturing light a relevant pattern in design? Providing shelter from the sun is a vital characteristic of a house in southern India. The original base house does not capture light; the one model is placed at different orientations in a rigid layout with complete disregard for sun light capture or avoidance (fig 3). There were no alterations seen which purposefully tried to "gather light"[19] as is discussed in the text by Jacobsen. Modifications do not attempt to do this – a sheltering roof seems preferable to capturing light where the two cannot happen simultaneously. This was the pattern which happened least. Other extensions often cancelled out the entry of sunlight from one side into the house, leaving only one direction of entry of light. For example, in extensions out front of the house all sunlight from that direction was blocked leaving only light entering from the openings at the back of the house (fig 6).

[18] Ibid., pg 12

[19] Ibid., pg 12

"A home is a hierarchy of Parts in Proportion"[20]. The base houses had the potential to have a hierarchy of parts in proportion with modification; this happened successfully in the houses in Pillumedu where the enclosed verandah gave definition to the hall space (fig 10). In Pillumedu the beneficiaries had a say in the final design, and the specifics of the internal porch were part of their suggestions. The in-situ houses in Puddukupam had parts in proportion where they had been placed adjacent or perpendicular to the original house creating a courtyard in between.

To create the flow through rooms pattern the porch was of great relevance. Pillumedu was a more successful base model of a house, with its internal porch working to encourage an initial pause on entry into the house. This led to the hall working better as a room in itself rather than a thoroughfare (fig 10). Without decoration or modifications outside effecting the house the hall did not create any reason to pause, so walking straight through the house was instinctively the path taken. "Movement through a room affects the room itself"[21]. These halls did not function as a room as movement through them was the immediate response on entry. Additional kitchens at the back of the site behind the house affected flow from this direction and made some alternate paths to and from the house and areas which were used by different members of the household for different purposes.

There was not much room for private edges in the basic house layout. The bedroom was most commonly used as a storeroom with clothes, washing being dried or a cupboard, with the family sleeping in the hall which gets cross-ventilation (and sometimes had a ceiling fan). There were many additions where private edges occur, for example a kitchen outside became a semi-private sheltered space. The roof, where it was used, became a semi-private space, used mostly by women for the drying of washing and/or the storage of firewood. Where extensions have been made to the front of the house a sheltered place occurred on entry, going from the public street to the private interior (fig 5,6,9).

"A good home balances private and communal space throughout"[22]. The hall emerged as the centre and a range of activities with varying levels of privacy occurred around it. It was the way the hall was furnished or decorated which made it into a common core, standing alone without modification it was just a space to pass through. 'Home' was more a state of mind expressed in house decoration rather than spatial planning and design in the case of those who were most poor. Painted markings at the entry and outside signified home.

Refuge is described by Jacobsen as "at its simplest we are inside looking out." [23] Modifications giving refuge and outlook included the following:

[20] Ibid., pg 13
[21] Ibid., pg 14
[22] Ibid., pg 14
[23] Ibid., pg 16

- Fence at front and/or around alleyway and back
- Thatch shelter extension at front
- Planting of trees
- Thatch covered outdoor kitchen at back
- Addition of another level on the roof

Community dynamics affected the desires of the beneficiaries as to how much outlook and refuge they wanted – in some places safety and security was more important than outlook; in Kalaigner Nagar village the back yards were defined but open to each other, this village had a strong sense of community, while in Pudukkupam village tall fences and walls closed one house off from another. In some modifications in Pudukkupam outlook was completely blocked from even the porch (fig 11&12). The community surrounding has a big role to play in what modifications are made and why - a feeling of vulnerability was addressed with protective fences or walls.

The roof space provided refuge and outlook – where another level has been added to the roof it is refuge rather than outlook that is provided (fig 7&8). As an unmodified space used for the storing of firewood and hanging of clothes to dry most commonly the roof served as a place of outlook. Several families also discussed sleeping on the roof during the dry season, and there were small structures built on some roofs which provided both refuge and outlook.

The houses in their base state did not compose with materials; they were a box created with one material and gave an impression of safe solidity rather than of a composition. Extensions, using local materials were in thatch, corrugated metal sheet, mud brick with thatch roofing, or a combination of these materials.
“Choosing its materials – to support, frame, fill, cover, color and texture space – is the act of composing the home.”[11]

Discussion and Conclusions

Community involvement in the process of design and construction promotes ownership.
If home owners know which house is theirs from the onset of the construction process this means they can be thinking already about the way they will inhabit it and consider modifications they want to make. This involvement through-out the process also gives room for local customs and ceremonies to take place which affect the attitude which home owners have towards their house. For example in southern India where most people are Hindu there are procedures followed before building starts as well as on first entering the house for making it auspicious for the family. This provides a good start to owners’ relationship to their house and reinforces that it is theirs.

In Pillumedu village where suggested design changes from beneficiaries were taken into account and adjustments made to the model house the result was a successful community. In Pillumedu people knew which house was going to be theirs from the onset of construction, rather than having houses being allocated by lottery as happened in other villages. All the members of this village had an obvious sense of pride in their houses and had personalized them.

Roads, water and sewage connections are all vital for the village to be made into a new home.

The importance of infrastructure being put in cannot be underestimated. In the majority of villages visited there were no roads, water supply or sewage system in place. This meant that the toilets supplied to each house were neglected or used as a storeroom. Infrastructure is very important for any major modifications to begin; where people were waiting for roads to be laid or water or sewage connected beneficiaries were less likely to be making major changes or additions to their houses. The road being laid would change the levels so they waited.

The patterns of home according to Jacobsen are relevant in humanitarian response and can be utilized both in research and potentially in future aid responses.

In post-disaster housing the patterns of home and the ease of modification by beneficiaries to make a house a home is relevant. Permanent housing provided needs to consider housing a great number of people in need. That response which is often a 'one size fits all' can consider in particular the site so that each has an identity as a house within a village, within the surrounding natural and manmade environment. The potential for the other patterns to be developed through modifications could also be a way to evaluate a core house and its suitability.

This research goes only up till 18 months after handover of houses. Five or ten years later more information on the way houses are being lived in and made into homes, modified and adapted for the lives of the occupants would be visible. Humanitarian response through thoughtful design can promote livelihoods and chances for the future at the same time as providing necessary housing. By learning from what has been done before better responses can happen in the future.

Evaluation of the 'one size fits all' approach

The one-size-fits-all approach is often used in humanitarian housing developments for the reasons that it is logistically easier and more economical to build this way. This approach can provide beneficiaries with a base to modify and personalize to meet their needs. This will happen whether the base is designed to be easily built on or not - in the case of southern India the houses have not been built as core houses but they are being modified to meet owners' needs. Modifications are ways to take ownership of a house, in the act of making changes beneficiaries make their houses homes. Where a 'one size fits all' approach is used but future changes considered in the design of the base a versatile house can be provided which gives occupants options.

Evaluation of the matrix

The matrix as a tool of evaluation for the post-tsunami housing was an effective method to use. Although initially it was uncertain as to whether the ten patterns would be relevant in a humanitarian situation, they provided a coherent way of "talking to the houses" and analyzing modifications. All of the patterns except for the 'capturing light' pattern were clearly visible in modifications. As such the matrix worked as was hoped to give a tool to analyse houses without relying on interpreters or other factors, and could be used in other geographical areas. It is a tool which can be explored further in future post-occupancy studies and in the design of core houses.

Appendix

Table 1. Matrix Used

Pattern:	outside front	porch	alleyway	outside back	lounge	kitchen	toilet	bedroom	Rooftop	totals
inhabiting the site	54	46	42	78	42	28	3	23	13	**329**
creating rooms	33	30	32	68	15	13	2	14	7	**214**
sheltering roof	29	17	10	51	1	2	0	1	5	**116**
capturing light	10	5	5	12	8	13	5	2	1	**61**
parts in proportion	25	19	13	29	2	5	1	3	1	**98**
flow through rooms	25	28	12	40	18	3	2	3	2	**133**
private edges, common core	26	8	21	37	27	4	1	11	4	**139**
refuge and outlook	28	44	24	26	21	2	0	2	9	**156**
places in between	38	32	32	59	5	3	2	15	4	**190**
composing with materials	31	15	20	43	3	3	1	3	3	**122**
totals:	**299**	**244**	**211**	**443**	**142**	**76**	**17**	**77**	**49**	

Fig 3 Keelapattinachery pre-occupation

Fig 4 Pillumedu extensions

Fig 5 house 29 and 28 Pillumedu

Fig 6 House 41 Palayar

Fig.7 House 29 Pillumedu

Fig.8 House 29 Pillumedu

Fig 9 House 140 Keelapattinachery

Fig 10 House 60 Pillumedu

Fig.11 Kalaigner Nagar

Fig.12 House 65 Puddukupam new village

Acknowledgements
Thank you to CARE (Australia) for providing the opportunity for us to conduct this research in India.

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