

Housing Satisfaction in Core Area of Kathmandu: Case of Yetkha Bahal

Shristi Joshi ^a, Sushil B. Bajracharya ^b

^{a, b} Department of architecture, Pulchowk Campus, IOE, Tribhuvan University, Nepal

✉ ^a 078march017.shristi@pcampus.edu.np, ^b sushil_bajracharya@ioe.edu.np

Abstract

The historic core area of Kathmandu has been undergoing rapid urbanization since the 1950s causing a great impact on the traditional structure of the city. Traditional buildings have been continuously demolished and new ones were erected in modern style. Housing satisfaction studies in these historic environments have limited attention. This study aims to investigate the perception of local inhabitants and identify key factors influencing housing satisfaction in the traditional neighborhood of Yetkha bahal that is located in the core area of Kathmandu. A qualitative approach has been undertaken to study the views and perception of the local inhabitants regarding their experience living in their dwelling to understand the housing satisfaction. The data were derived from semi structured and in-depth interviews with local residents as well as field observations. Findings suggest that residents living in mixed type houses were comparatively more satisfied with their house. The majority of residents living in modern buildings were dissatisfied with the modern materials such as cement, marbles and tiles which had negative implications on the indoor environment as well as the health of the inhabitants. The research has established various factors that influence housing satisfaction under physical, environmental, psycho-social and cultural dimension such as physical quality/ cleanliness, number of rooms and toilet, size of room (crowding), height of room (ergonomics), access to toilet, staircase, building height, building modification for maintenance and facilities, indoor environment comfort, aesthetics and so on. The study concludes that integration of these factors in the policy-making, planning as well as for future research would be beneficial to make a socially, culturally and environmentally sustainable traditional housing neighborhoods.

Keywords

Housing satisfaction, core area, traditional architecture, neighborhood environment

1. Introduction

The historic core areas of Kathmandu Valley has a unique agglomeration of indigenous urban settlements. The medieval urban culture that characterized the Kathmandu Valley until 19th century has been replaced rapidly by the new modernity, which penetrated urban landscape of the Valley and the lifestyle of its residents in the last four to five decades [1]. With such rapid population growth and modernization, the historic core of Kathmandu has also been affected undergoing rapid urbanization since the 1950s, with the use of modern building materials causing a great impact on traditional structure of the city. Many old buildings within the city core have been continuously demolished and new ones were erected with modern style. Old fabric of the core are being seriously eroded by new buildings resulting in rapid degradation of the physical environment. As a result, the traditional value of the city is in the verge of elimination. According to Tiwari (2001), the heritage activities have only been limited to the conservation of monuments in Kathmandu and the spatial aspects of the city such as town level heritage, community spaces, cultural routes, streets, squares as reflected in the built spaces have never been addressed [2].

The unplanned growth has degraded the urban environment of Kathmandu threatening the health and quality of life of the people. With the transforming urban environment it is necessary to understand the satisfaction of the residents especially in the historic urban areas since the living standards

may not satisfy the contemporary needs of residents. Housing, as a component of the environment, has a significant impact on the community's overall welfare as well as its health, efficiency, social behavior, satisfaction and general welfare [3]. Housing satisfaction is described as a subjective judgement derived from the overall perception of what a person perceives as an essential element in a housing environment at a given moment. As the result of suitability of housing preferences, housing satisfaction contributes to the improvement of resident's well-being and quality of life [4]. Housing satisfaction is therefore a crucial aspect of urban living.

There has been considerable body of researches conducted to explore the factors influencing residential satisfaction across different countries and contexts, including private housing, neighborhoods, public housing, and mass housing. However, limited attention has been paid specifically in the historic environments, particularly in developing countries [1, 5].

Hence this research is conducted to understand the satisfaction of the residents of the core area and also understand the key factors that contribute to housing satisfaction in order to improve the design and policies of the residential neighborhoods of core area of Kathmandu. The study investigates the perception and views of local inhabitants living in the core area of Kathmandu regarding their satisfaction with their current housing environment and dwelling.

2. Objective

The aim of this research is to explore the housing satisfaction of the inhabitants to understand their quality of life in the current living environment of core area of Kathmandu.

- To identify the key factors influencing housing satisfaction in traditional, mixed and modern buildings.
- To investigate the satisfaction with respect to physical, psycho-social and cultural aspects of residential environment.

3. Literature review

3.1 Housing Satisfaction

Housing Satisfaction is referred as a person's cumulated emotional response towards the inhabited house [4]. It is described as a subjective judgement derived from the overall perception of what a person perceives as an essential element in a housing environment at a given moment [6]. As defined by Galster, housing satisfaction is the "perceived gap between respondent's needs and aspiration and the reality of the current residential context" [7].

Housing satisfaction aims to capture the influence of one's dwelling characteristics on subjective well-being. Among factors associated with housing satisfaction are: the construction quality, plan, and design of the dwelling; the dwelling size; the adequacy of interior space; the housing amenities; and the price of the dwelling [8]. According to various theories, the quality of housing and its functional spaces are influential factors in determining quality of life. The literature suggests that functional spaces in tune with the socio-cultural and environmental aspects results in high quality of life [9].

3.1.1 Concept of Housing Satisfaction

The concept of housing satisfaction lies on the composite of the overall physical and social components that makeup of the housing system rather than the individual building. Housing satisfaction is characterized by three factors: the objective characteristics of the household, the objective features of the housing environment and the subjective well-being defined by their own perceptions, values and aspirations. The objective features include the dwelling unit size, number of rooms, spatial organization, and so on, while objective features of the housing surroundings can be access to the dwelling unit, number of parking spaces, proximity and the size of green areas, social services, etc. The theory of housing adjustment is the most frequently cited theory in the study of housing satisfaction. The founders of this theory were E. W. Morris and M. Winter (1975) which bases its analysis of housing satisfaction on cultural and familial norms and begins with maintaining the housing balance in the household. The satisfaction in this theory focuses on housing norms which includes housing structure, the type and quality of dwelling unit, the allocation of space, the expenditure resulting from the use of housing and satisfaction with the neighborhood. The theory is hence closely associated to the

subjective experience of an individual or a family about their housing satisfaction. The theory of housing adjustment is based on the concept of the family life cycle, which means that satisfactory norms are not constant and they change across different family cycles. For instance, small children of different sexes sharing the same bedroom is one example of spatial deficit in the quality of housing where the space does not correspond to the prescribed standards indicating an individual's current or permanent dissatisfaction [6].

3.1.2 Measurement of Housing Satisfaction

Measuring housing satisfaction can either be subjective or objective. Subjective measures are concerned with psychological aspects that measures perception, emotions, attitude and aspirations which can be influenced by age and other social factors. Whereas the objective measures of housing satisfaction relate to the physical characteristics, facilities and environment. Although there is no universally accepted measurement scale of housing or residential satisfaction, various researchers have attempted to provide a basis for measuring housing satisfaction. In the research on housing satisfaction conducted on Nigeria, the study examined the influence of various socio-cultural experiences on resident's housing satisfaction highlighting its importance in local communities [3]. In the context of this research, housing satisfaction is measured based on three main components such as dwelling features and socio-demographic characteristics and socio-cultural perception of inhabitants.

Dwelling unit features Factors related to the dwelling and spaces in the dwelling are: quality of spaces, physical comfort, spatial organization (quality and functional relation between spaces), size of house, location of the house and dwelling aesthetics [3].

Socio- demographic features The demographic factors affecting housing satisfaction are: age, family size, gender and education level among others. As humans progress through their life course, changes in aspirations including housing occur, hence age and age groupings contribute to overall housing satisfaction at different stages.

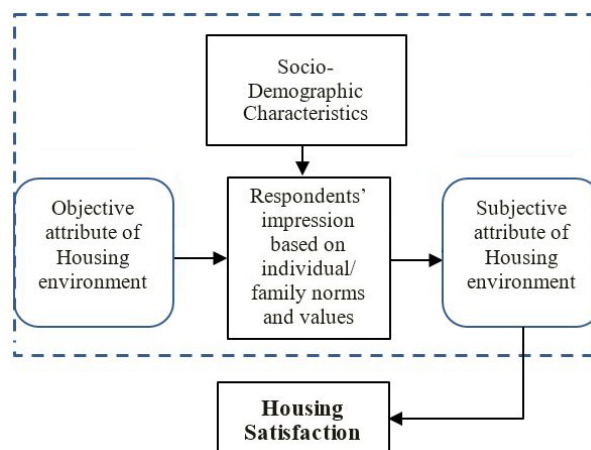


Figure 1: Housing satisfaction measurement
Source: Author

Socio- culture perception Thaman [3] states culture as a comprehensive notion whose meaning has been drawn covering three major areas influencing residents' satisfaction and socio- cultural experiences of people in housing. The first aspects is its artistic dimension which covers the fine arts, popular culture, and performing arts and so on. The second aspect refers to the cultivation of mind and spirit which includes knowledge, belief, religion and ideologies. In the house, this is associated with the availability of praying area and the proximity of worship area in the neighborhood. The third dimension is the anthropological perspective: the way of life which pertains to the social aspect of human behavior. This is attributed to the existence of privacy within the functional area in the house and the neighborhood area.

3.2 Traditional Newari Town

The traditional urban form of the Malla towns is characterized by a fine grained network of urban blocks with a collection of series of interconnected squares and courtyards. According to Hosken (1974; cited in [12], 'the urban design of towns of Kathmandu Valley, the relationship between narrow streets and open spaces, the placement of houses and monuments tell of a remarkable understanding of visual and functional principles, related to social needs.' The historical traditional cities prioritized the development of forming a collective identity by creating built forms for sociocultural, defensive and ornamental requirements [13]

The Newar society exhibits a predominantly communal character and the Newari people are gregarious having deeply rooted beliefs in social values and norms. Every day public life in a traditional neighborhood appears ordinary where children play and grow up together; women wash their utensils, laundry nearby a source of water. Likewise, adults or elderly people can be found engaged in conversations with their fellow neighbors sitting on the plinth of the pati nearby [12].

3.2.1 Characteristics of Traditional Newari dwelling

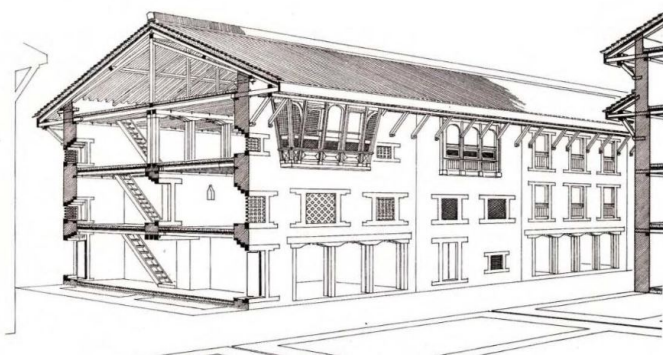


Figure 2: Traditional Newari House
Source: A

A characteristic and universal feature of this design is the vertical room arrangement independent on the size of the house due to the security considerations and the need to use as little irrigable land for building purposes. The arrangement of Newari house is based on a gradient of privacy and purity.

Various degrees of privacy are achieved throughout the different storeys by the type of window that face the street [10].

Table 1: Newari house features

Form and Facade	Rectangular in shape ,3 to 4 storey, with pitched roofing. Uneven number of richly ornamented windows attaining symmetry
Walls	Thick walls made of burnt (inner walls) and sun dried bricks (outer walls) and mud mortar serve as a good insulator
Roofs	Slope with tile roofing locally called 'jhingati', large overhang for shading
Structure	Timber posts and beams
Ground floor (chedi)	usually moist and cold, used as storage, shop or workshop
First floor (Mattan)	bedrooms and room for visitors, small lattice window for privacy and safety reasons
Second floor (Chota)	Living room with larger window (san jhya); most active floor with better light and ventilation
Attic floor (Baiga)	Kitchen and puja kuthi (shrine) placed for privacy, purity and religion

3.3 Transformation of residential built forms

The process of urbanization beyond the historical urban form started after 1950 with the end of the autocratic Rana regime and the start of the democratic movement [3]. The decade-long political conflict after the 1990s contributed to the rapid and autonomous urban growth of Kathmandu with significant pressure from the migratory influx. In the urban core, the transformation of residential built forms can be observed through interventions made with added floors in brick concrete works, replacement of sloped roofs with flat terraces, and vertical division of houses due to property division. Floor storeys mostly changed from three storeys to five or more, either by replacing sloped roofs with additional floors or by new construction, while floor height changed from the traditional height of 7 feet to a height of 9 feet. This resulted in the change of the skyline of the urban core, which intervened with traditional physical forms. These residential developments reflect individual identity driven by choice and decision of the owner [11].

4. Methodology

This research falls under non-exact science as it largely studies human perception and views. The quantification of people's subjective opinion cannot be understood with only objective approach. This research therefore conducts a qualitative investigation to understand the perception of inhabitants regarding the satisfaction with their housing environment in the context of core area of Kathmandu. The realities are multiple and socially constructed. Hence this research lies under non exact science and constructivist paradigm.

The research aims to explore the dimensions of housing satisfaction from the perspective of inhabitants of the core

area of Kathmandu. This exploratory research was designed as a Case study in Traditional neighborhood of Yetkha Bahal. The research includes various research methods such as literature review, observation, field work research and in depth interviews.

The residences with local residents still residing in the bahal were identified with the help of interview with key informants then survey mapping was carried out to locate those residences in the bahal. Among those houses purposive sampling was conducted to select the mixed type and modern residences for building analysis and interview. The data for traditional houses were obtained from those respondents who had previously or currently living with the features of traditional house. In-depth interviews were conducted involving 12 participants, who were identified after the field observation and the survey mapping. The respondent's willingness to participate were also taken into serious consideration for the interview. The interviews were transcribed and data analysis was done through content and thematic analysis using Nvivo tool to obtain the result.

5. Limitation

The study is limited to Yetkha bahal, hence the findings of the research may be specific to the studied area since the dynamics of each areas within the core area have unique characteristics and may not be directly applicable to other regions or context. Interviews were conducted on Newari residents because of the selection criteria for the research.

6. Study Area

Yetkha bahal, one of the ancient neighborhood of Kathmandu, is located in the western section of Kathmandu two blocks north-west of the Kathmandu Durbar square. The word 'yatka' is made up of two words; 'yei' + 'takha' where 'yei' refers to Kathmandu and 'takha' refers to big in Nepal Bhasa. It was the biggest courtyard when built in Kathmandu, hence it was named 'yetkha Bahal' [14]. A Buddhist Chaitya (stupa) is present in the center of the courtyard representing a mini Swayambhu Maha Chaitya.

There has been a significant changes in the urban fabric with the passage of time and modernity. The figure shows a comparative view to the historical photo from year 1965 to the



Figure 3: Location map

present demonstrating the transformation of the urban built fabric with the introduction of modern buildings.



Figure 4: Historical image of Yetkha bahal
Source: Ganesh(1890)

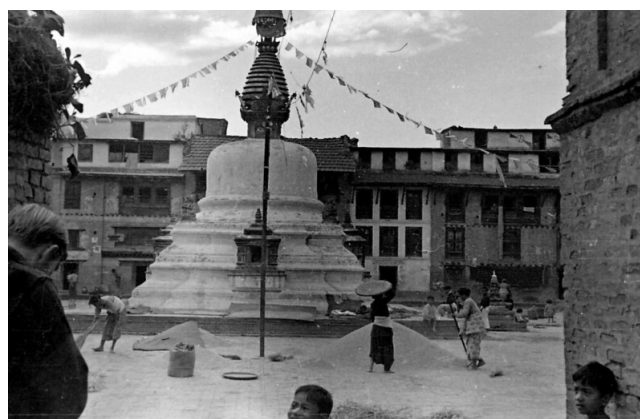


Figure 5: Yetkha bahal at 1965
Source: sajha.com



Figure 6: Yetkha bahal at present
Source: author

7. Site Study and Observation

The bahal consists of about 70 households comprising 7 residential courtyards and many small chowks within the area. Most of the local residents in the neighborhood have relocated to other places and the houses are utilized for rental purpose. Presently, only around 20 houses continue to be occupied by local residents. The bahal previously had two accesses, one from the southern direction as well. However, the southern

pathway was closed about 20 years ago due to the concern of safety of the people.

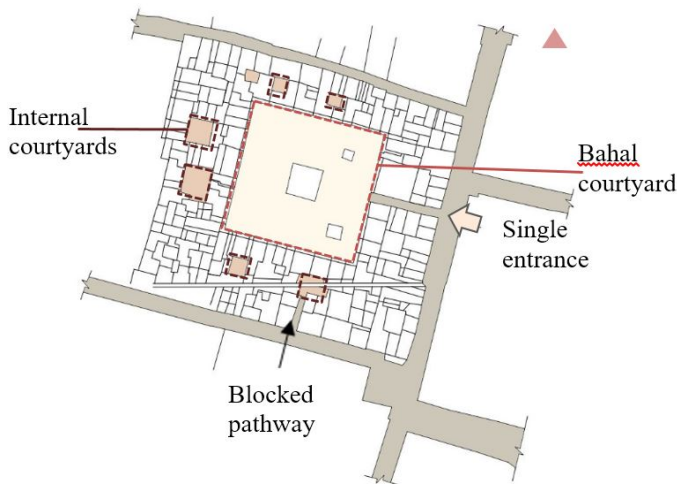


Figure 7: Site plan

7.1 Classification of Building Types



Figure 8: Site plan showing building types

Traditional House: Among the total houses, only 2 were traditional house having minor changes. These are typical traditional Newari residence having 4 story height with the floor height of 5'6" to 6'. The buildings used local materials such as brick and mud for wall construction and timber for structure and doors and windows of the house. For the roof covering however, the traditional jhinganti tiles have been replaced by CGI sheet in this area.

Mixed Type House: Mixed Type houses are those buildings which are partially transformed and in the transition phase between the traditional and modern houses. These houses are either renovated, characterized by addition of floors and plastered walls in the traditional house or reconstructed with the same traditional construction technique.

Modern House: Modern houses types are those houses which are totally transformed from the traditional building and constructed using modern constructed techniques and modern materials. They are typically built of frame structure using bricks and reinforced concrete. Therefore, the buildings are usually 5 to 7 storey tall with the floor height of 9 feet. The building facades have their own style mostly plastered finished typically with large modern windows.



Figure 9: Traditional, Mixed and Modern house
Source: Author

8. Analysis and Findings

8.1 Comparative analysis of Buildings

The analysis was done to understand the satisfaction and dissatisfaction of the residents with respect to the dwelling features of traditional, mixed type and modern houses. Their views and perceptions with living in the bahal environment were also explored.

Indicators	Traditional House	Mixed Type House	Modern House
Building structure	Load bearing	Load bearing	Frame Structure
Building storey	4	4-5	5-7
Wall thickness	22"	22" or 9"	9"
Mortar	mud	mud and cement	cement
Plaster	lime	cement	cement
Flooring	Dalan and mud	Dalan with mud and cement plaster	Rcc slab
Floor height	5', 5'6"	6' to 8'	8' to 9'
Roofing	Slope roof with jhingati tiles	slope/ flat roof with CGI	Flat RCC slab
Functional arrangement	Slope roof with jhingati tiles	slope/ flat roof with CGI	Flat RCC slab
Staircase	Single flight timber stairs	Single flight timber stairs	Dog legged RCC stairs

Location of Toilet	Ground floor	Ground floor and/or upper floor	Ground and upper floors/ Each floor
Location of Kitchen	Top floor	Any floor according to requirement	Any floor according to preference
Doors and windows	Timber framed Lattice and Decorated window (tiki Jhya and sanjhya)	Combination of traditional and Modern windows	Modern large windows
Façade/ Aesthetic	Brick Exposed, symmetrical, details and decorations	Brick exposed or plaster finished Hybrid style in facade	Individual modern design with own preference

8.2 Factors influencing Satisfaction

8.2.1 Space for social and cultural activities

Bahal environment was one of the important factor that contributed to the satisfaction of its residents with its environmental, social, cultural as well as psychological benefits. The bahal area as well as chowks located in different parts of the area allowed light and natural ventilation to enter in the buildings. Resident's stated that it was not only pleasant to look at but also provided them with security, socializing place as well as playing area for children.



Figure 10: Residents socializing during the evening

In addition to the social activities, the bahal area is also significant for different cultural and religious activities. According to past resident Prof. Tamrakar, "From the religious perspective as well yetkha bahal has great importance. The tradition of pancha daan has already been done twice here, which is a huge practice in the Buddhist religion for achieving fame and prosperity. There is even an old photograph of 100 years old during that period. Additionally, during the festival of indrajatra, chariots of Ganesh and Bhairav comes inside the bahal and puja is done. And due to its large space, it is easy to carry out special activities."



Figure 11: People celebrating dhime baja

8.2.2 Privacy and security

Residents were also very satisfied with the privacy and security factor of the bahal. According to the residents there hasn't been any theft in the area. The single entrance to the bahal allowed for proper control of visitors or outsiders. Earlier there were entrance in the southern gate as well but it was closed in order to avoid drunkards to enter the area.

8.2.3 Modification of traditional building

Various modifications that have been made to the traditional building through either renovation or reconstruction in order to increase satisfaction.

- Replacement of Jhingati tiled roof with CGI roof has been one of the earliest modifications of traditional house which was done for the functional purpose of drying clothes, sun basking, doing laundry etc.
- Replacement of mud plaster with cement plaster: One modification involves replacing the traditional mud plaster with cement plaster in the walls and flooring. Also the ground floor had telia tiles finishing. This helped reduce the need for frequent maintenance.
- Addition of floors: Another modification is the addition of floors to the existing structure increasing the number of rooms having 4 to 5 storey. Residents living in mixed type houses did not give rent, the house was enough for single family.
- Increased floor height: Added floors had increased floor height of 7' to 8' because people were unsatisfied with the low height of traditional buildings

8.2.4 Indoor Environment comfort

Building Materials Almost everyone who were interviewed stated that they were satisfied with the thermal comfort in traditional building and mixed building. Despite having small room sizes, they were satisfied that it gave them thermal comfort necessary for their well being. This shows that thermal comfort is an integral part for their satisfaction criteria in traditional or mixed building. However, in case of modern buildings, with the use of modern materials such as cement, concrete and reinforcement, the buildings had no thermal comfort features as it emitted heat inside the building

in the summer and did not store heat in the winter seasons. A respondent, Mr Keshav Maharjan who lived in reconstructed mixed type house built with traditional material and construction technique, had mentioned that his friends who lived in modern houses say that it was much better to stay in his house. "When living in Mud building there is a lot of facility because it is cool in summer and warm in winter months; it gives a lot of difference. People from outside, who live in concrete house also say that they feel much better when they come here."

Health concern Another respondent, 67 year old past resident Mr Laxmi Narayan Maharjan additionally even talked about the biological benefits of mud to our body as opposed to cement or concrete as he quoted, "mato pachcha cement pachdaina" The residents who had the experience of living in both the traditional and modern building mentioned that modern materials had negative impact on their body causing joint ache and body ache from cement and marble. People living in modern house preferred to live in traditional house because of this.

Safety concern The elderly members have raised concerns regarding the slippery nature of modern tiles as well, expressing their unease and discomfort.

Light and Ventilation In case of the light and ventilation inside the house, it was observed that there was absence or insufficient natural light in the certain parts of the residences especially in the staircase and lobby areas in some of the mixed house. Artificial light was used in such areas. Natural lighting was however present in the habitable areas such as bedroom and living room. Lighting in modern house was comparatively better due to the large windows.

8.2.5 Interior quality

In terms of cleanliness factor, residents said that traditional or old houses was not clean while modern house is comparatively cleaner and sophisticated. Traditional houses were coated with mud in the walls and floor which required frequent maintenance. "In traditional house, it was not clean, there would be exposed wires and dust everywhere."



Figure 12: Use of Plaster and telia tiles in flooring

However, women did express that it was harder to clean modern house as opposed to traditional house due to the additional built up area and modern materials. They reminisced "We had to clean the traditional house with mud, it did seem like a hassel but I still prefer it more." In case of residents of mixed used building however, inhabitants were satisfied with the cleanliness or house quality of their house due to the modifications carried out such as use of telia tiles or cement plaster as floor finish, cement plaster and paint in the walls etc.

8.2.6 Location of Toilet

The findings also suggests that when it comes to locating toilets within the houses, functional requirements are given more priority than following the vastu principle. The study revealed that toilets were found to be located in each floors of modern house including the top floor where the kitchen is placed. This is contrary to traditional belief of placing toilet only in the ground floor or rather outside of the house originally. This placement was the result of ease of access to the toilet which is especially important for the elderly people.

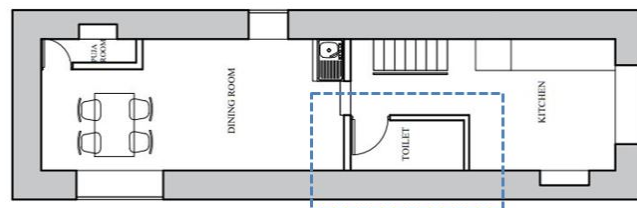


Figure 13: Toilet located next to the kitchen

Elders were satisfied with this facility, however it is important to note that not all respondents were satisfied with placing toilet next to the kitchen. Mr Hira Ratna Shakya who had bought the mixed type house in the neighborhood stated, "The toilet was already built when we bought this house. There was an old lady living here previously and for her it was hard to use ground floor toilet so they built another one in the 5th floor. However, I had thought of keeping the toilet only in the ground floor and thought of removing the toilet above. But my wife did not agree and she said that although we were healthy now but later it might be difficult to come all the way downstairs, so I did not remove it. However, I am not fine with it because kitchen and dining room is in the 5th floor and according to vastu Shastra, it is actually not right to place near the cooking and eating place. I just had no choice."

8.2.7 Staircase

It was observed that staircase in traditional or mixed type houses after the property divisions had steep single flight staircases which was uncomfortable for the residents. Anjali Shakya says, "New house is better than before because in old house there would be steep single flight staircase which made it uncomfortable, but now modern staircase is comfortable to use." However, a resident of mixed house had built a metal railing in the wooden stairs for the purpose of safety and ease of function while using the stairs.

8.2.8 Floor height (Ergonomics)

Floor height was one of the dissatisfaction factor of traditional house especially for males due to the ergonomic requirement. From the finding, middle aged men were mostly dissatisfied with the low floor height of traditional house. Mr Tamrakar stated that the traditional house typically only had a floor height of about 5' to 5'6" in order to maintain warm indoor temperature. Although the proportion of the building created a good aesthetic façade, however, it disturbed the air circulation resulting in an unfavorable indoor environment. Not only had that he also mentioned that the small height was uncomfortable which may also face back ache issue in the long run. Although the height was enough for the typical height of Nepalese, they said that future generations would have problems.

8.2.9 Number of room and room size

Majority of the traditional residences had vertical divisions done in their houses due to the property division among family members which caused lack of sufficient space. Due to this, the interior space were insufficient for a single family and therefore people had to add floors to their existing house or newly construct tall modern house. Those residents who had less area said that they had difficulty doing daily activities due to insufficient space. The people were satisfied with the number of rooms for respective daily activities in their houses. It was found that one of the cause of transformation of the traditional buildings was due to property division which led to vertical division of houses. It was also found that due to the small room size of bedroom, residents usually used the bedroom only when sleeping and most of the daily time would be spent in the living room which was bigger in size and with proper indoor environment such as light and ventilation.

8.2.10 Building height

Modern buildings were found to be 5 to 7 storey tall with typical floor height of 8 –9' height. Resident's expressed that the tall modern buildings required more effort going up and down and it was difficult. Especially women and elderly expressed their difficulty while going up to their tall house. Moreover, elderly residents who were disabled or had leg or joint issues did not descend the stairs altogether. An 80 year old elderly woman of a mixed used building said that she rarely came down her house even from the 3rd floor.

8.2.11 Traditional aesthetics

It was observed that modern buildings do not follow the proportional standard of traditional Newari architecture which can be seen in the facades of added floors of mixed type houses and most modern houses. With the trend of modernization, people adopted modern materials as well as modern designs which were influenced by the western style. Typically plastered surface can be found in traditional buildings as well and use of large windows for the purpose of allowing more natural light into the building. Despite the benefit with natural light from these large windows, residents concern with the overall urban aesthetic of bahal was apparent as they expressed their concern with the gradual loss of Newari architecture identity. Thus, findings also

demonstrated lack of satisfaction with the aesthetics of the modern building and the overall urban environment, as it did not represent the character and identity of Newari house. Although the locals were living in modern houses themselves, they stated that it was due to their lack of option as it was expensive to construct like before. They stressed that government had to be responsible regarding this matter.

9. Discussion

The findings of the research suggests various factors that influence housing satisfaction of the residents living in core area of Kathmandu. The indicators for housing satisfaction have been obtained both from literature as well as the context. Bahal environment was one of the important factor that contributed to the satisfaction of its residents with its environmental, social, cultural as well as psychological benefits. Literature suggests that community bonding and social relations have positive impact on housing satisfaction. The open area of the bahal functioned more than just a physical space. It has played a crucial role in fostering sense of community with the residents having opportunities to engage in regular interactions. The size of bahal is 47x47 meters accommodating around 4 ropani area. This created sufficient space for various social and leisure activities such as interaction with neighbors, children playing area etc providing a sense of relaxation to the residents. Moreover, with the blockage of secondary pathway from the south, the safety and security in the bahal were ensured due to the presence of a single entrance which helped in controlling of potential thieves as well. Additionally, this also prevented outsiders from frequent visits inside the residence area enhancing privacy. Therefore, the bahal environment i.e. communal space was an important factor for satisfaction for the residents.

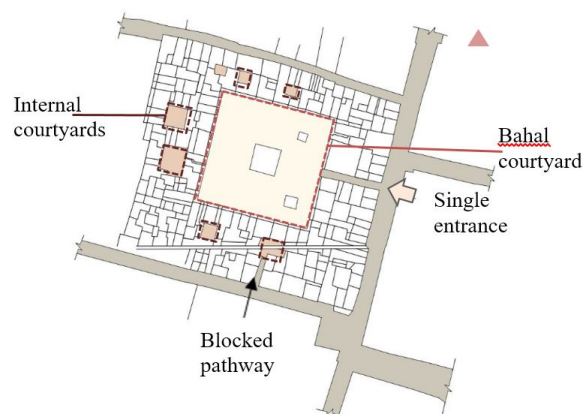


Figure 14: Site plan showing single entrance

Housing modification: From the field observation and analysis of buildings it was found that people did various modifications to the building features of their traditional house after the renovation or reconstruction. These modifications were conducted in order to address their needs and requirements such as addition of floors to increase room numbers, addition of toilet in the upper floor to improve facility etc. These modifications in the house have been mainly been guided by their need for functional improvement

and ease of maintenance. Residents were satisfied with their houses after the modifications.

The study also demonstrated indoor environment comfort as an important indicator in the resident's satisfaction with their housing preference. Particularly, residents were more concerned about the thermal comfort of their house. Mixed type residences built with traditional methods, i.e. thick walls using brick and mud mortar were more suitable according to the residents and they were more satisfied with their houses despite of the small room sizes. Moreover, residents who experienced living in both the modern as well as traditional house were more inclined to live in traditional or mixed type houses built with local materials. However, residents said that it was a challenge to build houses using traditional materials specially mud, due to the fact that they are difficult to obtain with the lack of agricultural lands. Findings also demonstrate that even from the government level, the buildings reconstructed with mud are not an encouraged due to the restrictions in the building height. There has not been a scientific study related to the strength risk of mud houses building more than a 3 storey height according to the officials of KMC. Findings reveal that the height of the modern buildings in core area is governed by financial benefit as opposed to the family size and requirements. However, the dissatisfaction with the increased number of floor which exceeds four storey, stems from the issue of health and safety concerns. Expert states that buildings with more than 4 storey results to lungs problem in the long run to its inhabitants. Additionally, the tall buildings also have a greater risk of navigating the stairs during the earthquake due to the seismic forces.

Housing adjustment The room sizes in the mixed type houses were observed to be insufficient to the standard requirement due to the vertical division of the house after property division. The space is especially lacking during the festivals when family gatherings occur. According to housing deficit theory the family and cultural norms have influenced the lack of space leading to dissatisfaction. However, the lack of space has been compensated with the availability of the open space in the bahal.

In cases where the household size was greater, the family members used the living room as their sleeping space as well. The theory of housing adjustment aligns with the observation that family members used the living room as a sleeping space when household size was larger. This adaptation strategy reflects how people adjust their living arrangements to accommodate the number of occupants and the available space. Traditionally the chota or living room of the house was an open planning with flexible and a multi-functional space as well.

9.1 Socio- cultural aspect

It was observed that unlike the typical Newari house where the kitchen was placed on the top floor, here it was found in the first floor as well as the second floor. The reason behind this was due to the internal family dynamics. Although the family size was of joint type, the members were living as a nuclear family system with two separate kitchens. This also shows that

the socio- cultural condition of purity of placing kitchen away from the outsiders have changed. Although the literature states that lower caste were not allowed to the house due to the concept of purity, the research found the underlying meaning behind the culture. The conception of that old houses are dirty can also be argued through this because traditionally, the reason for not allowing certain castes people to enter the house was because of the consideration of hygiene and cleanliness. According to Prof. Padma Jeev Tamrakar, in the past, the socio-cultural system provided occupation to different castes meant that they had to work in the specific region. For instance, podes worked in the cemetery where they get in contact with bacteria and virus. Therefore, they were only allowed to go in ground floor (chedi). Likewise, Maharjans or jyapu used to work in the fields, so they were allowed till the living room and not the kitchen. Now, the occupation system is not strictly followed, therefore people are not hesitant to allow outsiders inside their house. It was also observed that modern houses typically do not follow the traditional vastu principle in case of location of toilet which is placed next to the kitchen as well. Toilet were considered impure and placed outside the house traditionally. Whereas now, functional aspects are given more priority when it comes to locating the toilet in the house rather than acknowledging the vastu principle. However, according to Prof. Tamrakar, it is important to acknowledge the impacts of vastu dosh and try to incorporate its teachings in our building design in the present times as well.

10. Conclusion and Recommendation

10.1 Conclusion

This research provides an insight on the perspective of the local inhabitants residing in Yetkha bahal about their housing satisfaction. Based on the data gathered from the open ended interviews, the analysis was done to identify the key factors that were found to influence the satisfaction with their respective dwellings. These factors have been identified through thematic analysis of the data that were identified through literature as well as the research. This research provides an insight on how Newari people view the housing transformation from traditional to modern through their living experiences.

It was revealed that the residents who were living in mixed type buildings were generally more satisfied than those living in modern buildings. Mixed type buildings were modified version of traditional building. It was found that various modifications of traditional houses to improve the function, facility and maintenance requirements were carried out which increased the satisfaction of the residents. The majority of residents living in modern building were dissatisfied with the modern materials such as cement, marbles and tiles which had negative implications on the indoor environment as well as the health of the inhabitants. Research also revealed that increased height of modern buildings were not suitable for the residents and had an impact on the inhabitant's housing satisfaction. Residents living in mixed type building were generally more satisfied due to the fact that those houses were constructed with the use of traditional materials and

construction technique. Research has also attempted to provide relation on housing satisfaction with respect to the socio-demographic features of the residents such as age, gender, household size etc.

This research contributes to the housing satisfaction studies in the core area of Kathmandu proposing the factors and indicators for the further comprehensive study in the traditional towns. The research has established various factors under physical, environmental, psycho-social and cultural dimension. The physical dimensions include factors such as physical quality/ cleanliness, number of rooms and toilet, size of room (crowding), height of room (ergonomics), access to toilet, staircase, building height, building modification for maintenance and facilities. The environmental dimension incorporates indoor environment comfort including thermal performance, lighting and ventilation. The psycho-social dimension include factors such as safety, security, privacy and space for social/leisure activities, whereas cultural dimension include aesthetics corresponding with local identity, vastu principle and space for religious or cultural activities. Furthermore, this research has also attempted to understand the psychological aspect of resident's housing satisfaction in terms of culture where it has delved into the traditional values of the Newari culture.

10.2 Recommendation

This research was done to understand housing satisfaction with respect to the changing aspects of residences from the traditional to modern buildings. On the basis of housing satisfaction of the local residents living in the bahal, this research attempts to provide recommendations for future efforts of constructing the domestic architecture in the core area of Kathmandu. According to the findings it is important to preserve the identity of historic private houses of Kathmandu especially in the core areas in order to increase housing satisfaction among residents. The newly built houses can incorporate features of the traditional house rather than following the western style completely. Moreover, the research has highlighted the importance of using traditional local materials such as mud instead of concrete. For this, measures from various sectors is necessary. The use of local materials must be prioritized by the government such as mud and timber instead of cement and concrete. Extensive research on the use of local building materials and traditional construction technique should be conducted to make it feasible in the present context. Additionally, implementation of strict building codes and guidelines for traditional façade is required to ensure the preservation of urban aesthetics in the traditional heritage area. Establishing specific and detailed building guidelines specifically for residential buildings within the core area should be initiated addressing the issues faced by the residents, ensuring they are tailored to the unique context of the core area. Preservation of local heritage should be prioritized while also addressing the current needs and requirements of residents while offering incentives and resources.

The study proposes areas for future research with an approach of mixed method for a more comprehensive analysis encompassing inhabitants of diverse backgrounds as well as

neighborhood characteristics. The research could be conducted based on the indicators proposed in the study in terms of various dimensions such as physical, functional, psycho-social, socio-cultural, and so on. This research provides an understanding of how the local people views modernization and their experiences of living through the change and transformation which may provide an insight on determining the future of domestic architecture of core area of Kathmandu based on their housing satisfaction.

Acknowledgments

The authors extend sincere gratitude to Prof. Padma Jeev Tamrakar for his insights and experiences. The authors are also thankful to all the respondents for their kind cooperation and everyone who has been a part of this research.

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