Spatial Development of Lao Urban Dwellings along the Mekong River

Vongpraseuth Thanousorn\(^1\) and Kiyoaki Oikawa*\(^2\)

\(^1\) Lecturer, Faculty of Architecture, National University of Laos, Laos
\(^2\) Professor, Department of Architecture and Urban Design, College of Science and Engineering, Ritsumeikan University, Japan

Abstract

This study investigates the domestic spatial use patterns, trends, and organization of inner city dwellings in the Vientiane Capital Province of the Lao Peoples Democratic Republic (Lao PDR), focusing on the Mekong River residential areas. The results clarify the various issues related to house modification and expansion that can be applied to city planning and urban design strategies. To accomplish this, a field survey was conducted in nine randomly selected villages within the Sisattanak District of the Vientiane Capital Province. The samples were classified into four defining periods from 1945 to the present: (A) French Colonial (1945-1954), (B) American Colonial (1955-1975), (C) Post-Independence (1976-1986), and (D) Modern (1987-present). Discriminant analysis was used to classify the ratio into groups to support the multiple discrimination function of HAYASHI (Suryuka Riron II). Furthermore, an analysis of variance (ANOVA) was used to find size homogeneities within the residential areas.

Keywords: spatial development; discrimination function; dwelling transformation

1. Introduction

Vientiane City was founded along the Mekong River in 1895, and has seen continuous development since then. The recent growth in the city can be seen from the enlargement plan of 1994-2002. The city has expanded as follows: (1) in 1994, 100 villages were incorporated into the city, (2) in 1995, the city was expanded by the inclusion of 160 villages, and (3) from 1999 to the present day, the city has absorbed 189 more villages\(^3\). The conditions of the growth in the number of dwellings in the residential zone of the inner city justify an enhanced form of regulation enforcement\(^4\). Simultaneously, traditional lifestyles and living conditions have resulted in various socio-culture reactions and the lifestyles of the urban people have changed based on the uses of their dwellings and economic conditions. The never-ending evolving needs of the populace indirectly resulted in contradictions between the environment of the city and the living quality of the population\(^5\).

This research investigates the trends of modification and expansion associated with domestic spatial use and the organization of dwellings in the inner city areas (Fig.1.). It focuses on the residential area along the Mekong River of the Vientiane Capital Province over four periods beginning from 1945 to the present day as follows\(^1\): (A) French Colonial (1945-1954), (B) American Colonial (1955-1975), (C) Post-Independence (1976-1986), and (D) Modern (1987-present).

2. Space Use and Extensions

The study of dwellings (objects) and dweller (users) characteristics is essential to determine the actual reasons behind developments. User behaviors were predicted in actual situations by examining the responses to the questions asked in a psychological interview. Through an investigation into the uses of space, it was possible to learn, for instance, the

Fig.1. Map of the 100-189 Villages Project, Vientiane Capital Province, Lao PDR
background behind the transformations in the spatial organizations in the four dwelling types. This will be discussed in the sections below.

2.1 Characteristics of Space Use

Among groups of dwellings that were selected randomly from nine villages in the Sisattanak District, 100 sample dwellings (Fig.2.), split among the four types (A, B, C, and D) mentioned above, were selected and examined. It was determined that the physical features of each dwelling type were similar, based on a simple pattern, and were mono-functional. According to the data collected, Type A dwellings, which were made of wood, were constructed on pillars in a traditional style and were two stories tall.

Originally, the form of type A (Fig.3.A) consisted of three simple zones: front zone, middle zone, and back zone on the main floor area (first floor). The outstanding characteristic of the living room area was its large scale, which was a result of its multi-purpose nature and semi-public functions. Traditionally, public space existed on the ground floor underneath the dwelling.

The middle zone of the dwelling included bedroom space and was a private zone without any interior partitions. This was also the location where the Buddhist altar or shrine was located. The last part was the rear zone where the kitchen and washing areas were located, sometimes in the form of outdoor verandas. The Lao word for this zone is "Xannam."

In type B dwellings (Fig.3.B), the same simple pattern was found, but the scale of the form was narrower than in the previous period. The compression of form resulted in the front zone and middle zone being combined on the first floor. The kitchen and washing space was on the ground floor, where the underneath was situated. Usually, the physical features of the facade element were simple wooden walls.

Concrete pillars were commonly used in this type of dwelling, and only a few using wooden pillars were found. For type C dwellings, the form and pattern were similar to type B dwellings. The development phase from the previous period was reflected in the permanent wall that enclosed the underneath. The first floor of this type was set aside as private space and reserved for sleeping and other family uses (Fig.3.C). The underneath, which was modified into an enclosed space, was used for receiving guests and as relaxation space for family members during the daytime.

The dwellings of the present era, type D dwellings, are the most modern among the four sample groups. These dwellings are characterized by concrete
columns, brick walls, and permanent partitions (Fig.3.D). The type of roof tiles used reflects the family's socio-economic condition. The plan pattern of this type of dwelling is more complicated than the others and includes interlocking faces (Fig.4. and Fig.5.). This combination form allows the creation of separate zones for specific purposes. The upper floor space is private and consists of bedrooms, bathrooms, and a bathroom adjacent to the master bedroom. The staircase is moved inside and is now part of the main dwelling. Despite the complex conditions found in this type, the traditional sensitivities of the Lao people are still reflected in the living room, the scale of which is large to accommodate multi-purpose activities. These include, for example, traditional Lao celebrations ("Baci", housing ceremonies, etc.).

The four dwelling groups belong to different users and were constructed during different periods and under different spatial organization conditions. However, the use of a similar pattern scale based on 2-5 m widths and 2-5 m depths for each grid of the pillar arrangements was found. Their spatial articulations are somewhat dissimilar. In the dwellings of the first and second periods, a single room that encompasses over 70% of the semi-open space is constructed on the ground floor. In the third and last periods, almost all the underneath areas have been enclosed by walls.

2.2 Extension trends

In general, due to the dissimilarity in conditions and the spatial organization present in the original stage of the dwellings, their transformation though distinct in appearance have the same principle characteristics. Through the field survey section, this research determined four types of extensions (Fig.6.). The first type is the extension of the front zone of an existing dwelling that is found in 20% of the dwellings. The second type is the extension of the rear zone that is found in 65% of the dwellings and is the most prevalent. The third type is a sideways extension (usually for room enlargement or a garage) that accounts for 37%. The fourth and last type comprises partitions installed for the purpose of creating additional privacy zones that is found in 60% of the dwellings (traditionally in A, B, and C type dwellings). These transformations are in response to the dwellers’ needs. For example, private spaces and larger floor areas support dweller convenience and comfort conditions. Consequently, open space and semi-open space are becoming less prevalent with these areas being converted to private spaces by enclosing them with walls.

However, conversion of open space into private enclosures reduced natural lighting and inhibited ventilation to some parts of the dwelling6). This can also result in the lack of outdoor space for activities such as washing, drying clothes, etc., and the lack of greenery, which are important for the maintenance of the living conditions in inner city areas such as those found in the Vientiane Capital Province.
3. Discussion on the Causes behind the Transformations

This investigation was mainly based on interviews, questionnaires, and recorded measurements. The survey was applied to dwellers who own their properties. The measurement and observation sections were attached to the interview forms. To obtain useful results regarding the circumstances pertaining to the changes made to the dwellings, it was necessary to distribute the questionnaires to the architects and architectural students of the Faculty of Architecture (FOAr) of the National University of Laos (NUOL), who as the main builders in the country, have in-depth knowledge of the architectural and environmental issues.

Logical analysis methods were used to analyze the collected data to find the results using the described method from the target value on the percentile. The discriminant analysis was done by classifying the ratio value into groups to support the multiple discriminant function of HAYASHI (Suryuka Riron II). Moreover, an analysis of variance (ANOVA) was also applied to find the homogeneity of the dwellings among the four groups.

For the categorizing process, the explanations on the No.1 axis and the No.2 axis are based on the nine factors as shown in Fig.7. and Fig.8. In accordance with the combination value for categorizing between groups A and B/C/D, we can find the main parameters resulting in the dissimilarity condition — such as ancestral occupation — that show the highest value for farming activities, dwelling size, living room size, and bedroom size. These appear on the side of the type A priority. In contrast, the income and age parameters appeared on the side of the B, C, and D type priorities.

As can be seen in Fig.8, the factors behind the differences in the B, C, and D type dwellings were run on the No.2 axis, to explain why the factors related to the occupation of dwellers, the occupation of ancestors, family members, and bedroom size show high values for type B dwellings. The C and B type dwellings have different income levels; further, the C type dwellings
have larger living room areas than the B dwellings. Type D is seen in the combination of Type B and C as linkage and change from era to era.

One purpose of the interview section was to identify the main development modifications and expansions. The results show that a significant majority of the modifications were self-designed, and only a small number of modifications (8-20%) were done under the supervision of architects (Fig.9.). Hence, it can be said that the modifications and expansions were carried out by the dwellers to support their daily activities, and were based on the prevalent economic and social conditions.

4. Conclusions

Various results on dwelling spatial development are presented based on a combination of user needs and environmental circumstances. Through the analyses, this research draws the following conclusions:

1) Modifications and expansions were created in four areas: front, back, side, and interior partitioning. The most popular modification was created in the back zone where additions were installed to support traditional kitchens, storage areas, toilets, and washing areas.

2) Changes were found to be the result of both internal and external factors. The internal factor was the interaction between the builders and users; the external factors included the economic, socio-culture, and regulatory conditions that were reflected by the internal factors.

3) The homogeneities and dissimilarities among the four types of dwellings provide the variables for room size, dwelling size, and dweller status.

The recommendation section includes suggestions on ways to create a sustainable city in the future. In the primary stage of development, it is necessary to encourage and promote the understanding not just among architects (builders) and controlling players (regulatory agencies) but also directly among the users, that such changes are associated with the creation of a sustainable city in the future.

References

1) Chayphet Sayarath, (2005), Vientiane, portrait d'une ville en mutation, Pankham Hightech, Lao PDR.
2) MTCPC, (2007), The Regulations of Vientiane City Management, Vientiane, Lao PDR (Lao).
3) Ricardo Garcia-Mira, David L. Uzzell, J. Eulogio Real, and José Romay, (2005), Housing space and quality of life, Ashgate Publishing.
4) Thongsai Xaiyavongkhamdy, Bounkong Thongsavath, Daeng Phomsavath, Soumth Phothisan, Singthong Singhapaphaya, Viengvichith southhideth, (1990), Lao History II from 1893-present, Vientiane (Lao).
5) Sophie Clement-Charpentier, Pierre Clement, (May 2003), Huan Lao I, Vientiane, Laos (Lao).
6) Robert B. Bechtel, (1980), Environment & Behavior, New York.
7) V. Maliene, N. Malys, (Feb 2009), High quality of housing a key issue in driving sustainable community, Journal in Building and Environment Volume 44, Issue 2, pp.426-430.