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Sriwijaya international Conference on Science, Engineering, and Technology IOP Conf. Series: Materials Science and Engineering 620 (2019) 012003 IOP Publishing doi:10.1088/1757-899X/620/1/012003 1 The shift of zoning in the architectural adaptation of stilt house W.F. Febriati Anwar1, Z. Angkasa2 1 Architecture Engineering, Faculty of Engineering, Sriwijaya University of Palembang; 2Architecture Engineering, Faculty of Engineering, Universitas Muhammadiyah Palembang E-mail: zuber_angkasa@um-palembang.ac.id Abstract.

Io's ciethas cac oscietbause f he ogergrup interest than personal interests. It is reflected on the architecture of traditional stilt house particularly on its space order. However, the modern life brings the concept of individualism in the society and some changes in space order of stilt house. This paper aims to understand how the stilt house adapts to the space demand in responding the collective culture in current context. Study hypothesize that there is a change in applying the collective culture that influence the adaptation of the stilt house.

In order to achieve that, this study observed the space used of nine old stilt houses in Palembang which were built in the period of 1928 to 1964. This study used the theory of collectivism and individualism to examine the origin and current space usage. Paper founds most of stilt houses use the space under the stilt structure as a part of its inner space. Furthermore, that there is a shift in the zoning of the space under the stilt house. For first use, the space change from collective function to individual as it bordered the space as inner side the house. Then the bordered space was arranged as public zone, shifted again to the collective function.

Paper concludes that the shift reflect the life orientation changes in the society. 1.

Introduction The stilt house is a residence with the support of a number of pillars over the surface of soil or water. Stilt houses are often found as vernacular architecture in Southeast Asia to South China [1] The stilt house over the ground was built as response to the tropical climate and livelihoods of rice farming. It was originally a general form of granary, which later adapted into a residential area [2]. Stilt structure prevents direct contact between soil and rice which can decay the rice.

The stilt house also protected its residents from wild animal attacks, especially for those who made a living from hunting. Meanwhile, the stilt house on the water responded the wet land area, especially for people whose lives rely on fishing [3]. As one of vernacular architecture, the stilt house still survives until now. Currently, social and physical developments threaten its existence. Stilt houses are sometimes a symbol of extreme poverty. This symbol comes from the reason of staying and low affordability to renovate [4,5]. For some people, the reason to stay at stilt house is because of being forced to inhabit the decaying old houses or no place to go [4].

The inability of its inhabitants to renovate houses with stronger materials also lead [5] to this degradation of social value for living at stilt house. In addition, the modern economic activities make more diverse livelihoods, not only limited to farming, fishing, and hunting. This situation leads to high growth of physical development. The development of the city and the increment population number make vacant land filled with new buildings with modern non-stilt construction [3]. Sriwijaya international Conference on Science, Engineering, and Technology IOP Conf.

Series: Materials Science and Engineering 620 (2019) 012003 IOP Publishing doi:10.1088/1757-899X/620/1/012003 2 Physically, the old stilt houses are also required to adapt to current conditions. Some adaptations can be very extreme, by c hanging the structure of the building. Some houses have minor changes and maintain the stilt structure. The adaptation depends on the location where the house stands. The stilt house which is located on wetland area, the adaptation depends on the frequency of flood under the stilt structure. For example the house at riverside area, the stilt structure is always submerged in water.

Therefore its adaptation is minor and only occurs at the top of the stilt structure. For the house that is located at wet land areas with less frequency of flood, the adaptation is minor and occurs at the space under the stilt structure. These changes are in the form of additional space. For the stilt house that is located dry land areas, the adaptation is major and occurs in most of the space under the stilt structure or the whole building. Adaptation is extreme by changing the building into modern style or adding more space outside the space under the stilt structure. [6] Most of the adaptations of stilt house

occur at the space under the stilt structure.

The ground under the stilt structure was reclaimed to get a dried space that can be used for activities such as open garage or closed inner space [7,8]. Originally, the pillars had function to support the protection from flood and wild animals. The space under the structure was not a part of residential inner space. By adaptation, the space under becomes residential inner space due to the addition of new functions or expansion of existing inner space. In turn, the change can be seen as a change of zoning. The space under the stilt structure turns into a public or private zone. In fact, this space is the uniqueness of of the stilt house. The changes influence the authenticity of the stilt house.

For this reason, this study aims to examine changes in space under stilts structure in terms of functions and zoning arrangements. This research will be useful for the conservation of stilt houses in tropical countries that are now increasingly disappearing 2. Theory and Hypothesis 2.1. Collectivism and individualism Collectivism can be interpreted as a concept that puts focus on the group. In collectivism, one's personal goals are in accordance with the group's goals and make it as priority.

High loyalty to groups occurs in collectivism society. On the contrary, individualism is a concept that focuses on oneself. Personal individualism goals can be in accordance or not with group goals. Personal goals are the top priority. From these differences it can be concluded that the thoughts of collectivism are marked by attributes that show a high commitment to the interests and values of a group. On the other side, individualism has attributes that show that a high self-concept. [9,10] The thought of collectivism arose at the beginning of the formation of society. Modern life brings a culture of individualism in collectivistic society. Persons in these two types of society have different characters.

In collectivism, the integrity of society is important, so that every individual maintain the harmony with other individuals. In individualistic societies, an individual emphasizes his self-concept. Therefore, individuals also focus on personal ambition [11]. Table 1 shows the differences in collectivistic and individualistic societies. 2.2. Collectivism and individualism in living space In general, space in architecture is divided into three types, public, private and service spaces.

Above these three types, the spaces that related to level of social interaction within a building are the public and private space. These two spaces arranged in the hierarchy by the concept of public private sphere [12]. In this concept, there are seven spaces, namely personal space, exclusive space, intimate space, interpersonal space, communal space,

methaspatial public space and impersonal space of the city. For the scope of building, the type of space described is the first four spaces. Personal space is the first sscope of space that is related to the body and personal space of user. Exclusive space has larger in scope and clear physical limits.

Only the authorized person can enter this space. Intimate space is a larger environment scope in a house, which is owned by a group (in this case the family) and protects its members from the public outside. Interpersonal space is the largest scope in building that allows outsiders to interact with family members. The concept of public private sphere also addresses the application of collectivism-individualism in the building space. The character of individualism is high in personal space and decreases in intimate space. In the intimate space, the collective characters begin Sriwijaya international Conference on Science, Engineering, and Technology IOP Conf.

Series: Materials Science and Engineering 620 (2019) 012003 IOP Publishing doi:10.1088/1757-899X/620/1/012003 3 t intper spache hin these f spache conce" ihe private and public spheres. Table 1 Character differences in collectivistic and individualistic society. Collective Individualist Emphasis on community integrity Emphasis on individuality or independence Focus on community welfare or cooperation (mutual cooperation) Reflection on hedonism or competition Care for others or support the community Emphasis on self-improvement or self-realization Focus on the relationship of mutual need with others Emphasis on the benefits of something for someone Referring to the harmonious relationship Focus on ambition Focus on shared goals Focus on personal goals Consider other people's opinions Don't consider the opinions of others The degree of collectivism in a building can be observed from the social function of the space. The more social function in a space shows the higher level of commitment to the group.

If the social function of a space shows a high commitment to community members, in this sense that anyone can enter the room, the degree of collectivism is high. If the social function selects and limits members who can enter a space, the social function of the space has moderate commitment to community members. If there is no social function or a low commitment to the community, i.e only personal persons can enter the space, the space is a personal space. By having this degree, long as the social function of a space allow the space in a building to have (parochial), both as semi-private or semi-public.

In terms of dimensions, the level of application of collectivism and individualism in residential spaces cannot be generalized. The collectivism and individualism are cultural attributes that are dynamic [13]. This dynamic is influenced by historical heritage and

shaped by social process. The more a society is unable to express itself, the stronger collectivism in that society. On the other hand, the more individuals in society are able to become autonomous from society collectively, the stronger the culture of individualism.

The change from collectivism to individualism can be caused by economic growth, production, mobility, education, and mass media [14]. If the changes occur in a fast time then there will be potency of social conflict. In order to avoid that, the changes are generally slowly. It can be realized or not by someone [15]. The dynamic change of collectivism and individualism in culture influence the order of space in the building. For people with more collective cultures, public spaces will be wider than private spaces, as found in traditional homes or old houses. As times develop, people become more individualistic.

Therefore, private space will become a priority and have wider dimension. The stilt house is a traditional house that still survives in the modern era and undergoes a change, especially in the space under its stilt structure. Therefore, this study hypothesizes that the space adapt in the hierarchy of space from public to private following the change from collectivism to individualism. Sriwijaya international Conference on Science, Engineering, and Technology IOP Conf. Series: Materials Science and Engineering 620 (2019) 012003 IOP Publishing
doi:10.1088/1757-899X/620/1/012003 4 3.

Methodology In order to test the hypothesis above, this study conducted a case study on a settlement area in the city of Palembang which has a lot of old stilt houses. The chosen study location was Seberang Ilir II sub- district, 9 Ilir village. The number of stilt houses in this area is quite a lot in various dimensions. The total sample of the study was nine houses (Figure 1). The variables in this study included the physical condition, activities of user and zoning. The physical aspects included the physical boundary of the space above and under the stilt structure. The activities included both the original and current activities. Zoning included the current zoning and space order of the house spatial.

Data was collected by field observations and survey questionnaire. The analysis was carried out descriptively by comparing the research hypotheses and research findings. House no.1 House no.2 House no.3 House no.4 House no.5 House no.6 House no.7 House no.8 House no.9 Figure 1. The observed stilt houses 4. Results and discussion 4.1. Changes in function The change in the house on stilts is notices by the use of the space under the stilt structure. The space was originally an outside space. By the time goes by, the wall joined with pillar bordered the space to become an additional inside space. The

occupancy of space under the stilt structure reaches more than 100% [6].

This means that the use of space is not only behind the border made by pillar, but it also exceeds the walls for more additional room. Therefore the function of the space had changed, more accommodated for residents rather than an open or outside space. Some of rooms were used by residents for interacting with their neighbor. Therefore, the zoning division at stilt house is not only horizontal, but also vertical. The study examined nine stilt houses to examine the adaptation of its zoning. The adaptation was noticed by the use of space under the stilt structure by bordering and dividing the space. After bordering the space, the next change was dividing the space into more rooms by made partition.

This division is done because of a change in function. Table 2 shows the time span of adaptation. 4.2. Collectivism-individualism at space under the stilt structure In the context of living place, space under the stilt has public and private functions. The public function is indicated by the use of space for collective activities such as gathering or just sitting area for outsider or guests. Public functions become semi-functional when space use is limited but serves socially or has a lower commitment than before e.g usage for food stall. Private functions are indicated by the residential usage e.g

room for residents, storage for goods or garage. In this case, the space has low commitment to society and become an extension of the private space of the owner. Among the nine spaces under stilt house, there are five houses has initial function as storage area which means the personal space. These houses are house number 3,4,5,6 and 7. The other four houses (number 1, 2, 8 and 9) have the social function as its initial usage at the space under stilt structure. After Sriwijaya international Conference on Science, Engineering, and Technology IOP Conf.

Series: Materials Science and Engineering 620 (2019) 012003 IOP Publishing doi:10.1088/1757-899X/620/1/012003 5 35 year, house No. has change of function from collective to social-individual (1980 - 2015). At first, in addition to the social function of the gathering place, the space under stilt structure of House No. 1 had also been used for private space, e.g. living place and storage of household goods. The next changes occurred when the number of family members decreased. The space under the stilt becomes unused. Then the owner made it as rental unit for a family.

In this explanation, the space shifts from the collective-private, because the space is owned by the homeowner and can be used to gather, place to live and store goods. After became a rental house, the owner's power on the space is more limited. Then, the space remains not only as a private but also as social space. This social-private is more

collective rather than a previous one. However, the community is completely blocked from entering this space. The social-private space became not collective entirely. Therefore the first house did not move towards the public nor in the private.

There is an orientation towards the private sector, but then it returns to the middle between the private and the public because the space is rented to other individuals. In other words, this house also has balanced character between public and private. The changes to individualism occurred at stilt house No. 2, 8 and 9. Initially, these houses used their space under the stilt as a place to gather and storing goods. Changes to individualism occurred when the space is converted into rental unit and stalls. The previous public-collective usage becomes limited, shows the increment of individualism. Table 2.

The time span of observed stilt house adaptation House number Built year Bordered year Initial function Partition added year Final function 1 1930 1980 Living place, gathering place, storage 2015 Rental unit (house) 2 1964 2014 Gathering place, storage Not changed Rental unit (house), stall, storage 3 1938 1988 Storage 2012 Rental unit (house), stall 4 1938 1999 Storage 2001 Living place, stall, storage 5 1935 1993 Storage Not changed Living place 6 1948 1994 Storage 2004 Rental unit (house), storage 7 1933 1997 Storage Not changed Rental unit (house), storage 8 1938 1989 Gathering place 2001 Rental unit (house), stall 9 1928 1987 Gathering place 2002 Living place, rental unit (office) From the results, the zoning in the space under the stilt complements the Ma's concept of public private sphere [10]. The application of collectivism and individualism in the space under the stilt also resulted in different types of zoning from the initial zone built under the space.

In this observation it can be seen that private functions are divided into two types, namely personal and social private. Personal privacy is a private function that is given to individual residential owners individually with very high self concept applications. Social private functions are private functions given to others in the sense of low commitment to the group. That is, social private is a space that is intentionally designed for the personal benefit of others other than the inhabitants of the house and cannot be accessed freely by the public. This can happen if the pit is used for a rented room or rent.

Social private is classified as a private space because it cannot be accessed freely by the public and deliberately designed for the benefit of someone, even though the person is not a resident of the house. The zoning shift in these findings is shown in the public private spectrum shown in Table 3. This study hypothesizes that the space adapt in the hierarchy of space from public to private following the change from collectivism to

individualism. The result rejects the hypothesis because the Sriwijaya international Conference on Science, Engineering, and Technology IOP Conf. Series: Materials Science and Engineering 620 (2019) 012003 IOP Publishing
doi:10.1088/1757-899X/620/1/012003 6 orientation to the individualism pole is only confirmed by three cases, namely houses 2, 8 and 9. The cases at house number 1 shows orientation to the midpoint of the spectrum as social private or semi- public.

One case is not experienced a change in function (house no. 5). Only four cases changed the orientation of the space from private to public, which shows more tendencies to collectivism pole (houses 3, 4, 6, 7). This is shown in Table 4 Table 3 Spectrum of Public-Private Space Collectivism pole Public Semi public Private social Private personal Individualism pole Purpose For the community For personal interaction with the community Purpose for personal interaction with other individuals For personal use Purpose Freedom level Fully free Limited at certain times Fully closed Fully closed Freedom level Social interaction Individual social relations Individual society Individual Individual Social interaction Attribute High commitment to the group Mediocre commitment to the group Low commitment to the group Focus on self concept Attribute Table 4 Changes in the collectivism-individualism application at space under the stilt structure House number Function Zoning Tendency Initial Final initial Final 1 Living place, gathering place, storage Rental unit (house) Public Private-personal Private-social Midpoint of spectrum 2 Gathering place, storage Rental unit (house), stall, storage Public Private-personal Semi public, private social, private personal Individualism pole 3 Storage Rental unit (house), stall Private-personal Semi public, private social, Collectivism pole 4 Storage Stall, living place, storage Private-personal Semi public, private personal Collectivism pole 5 Storage Living place Private-personal Private personal Individualism, unchanged 6 Storage Rental unit (house), storage Private-personal private social, private personal Collectivism pole 7 Storage Rental unit (house), storage Private-personal private social, private personal Collectivism pole 8 Gathering place Rental unit (house), stall Public Private-personal Private social semi public Individualism pole 9 Gathering place Rental unit (office), living place Public Private-personal Semi public private personal Individualism pole Sriwijaya international Conference on Science, Engineering, and Technology IOP Conf. Series: Materials Science and Engineering 620 (2019) 012003 IOP Publishing
doi:10.1088/1757-899X/620/1/012003 7 5.

Findings From the analysis, study finds that the space under the stilt structure is shifted from individualist to collective function. This finding is against the hypothesis. Theoretically, the shift should occur in the opposite direction, because the public space at the bottom of the house will be used by the owner for various non-public usages. This phenomenon can be explained by two possibilities. Firstly, the economic reasons

are dominantly lead to change of the space function. Economic reasons are more collective because economic activities involve social interaction between seller (the owner) and buyers (community).

These characteristics are caused by low or middle socio-economic status of homeowners. the shift from collectivism to individualism is caused by economic growth. Secondly, the collective society cannot leave collectivism completely in a short time. It is very difficult to make fast changes since the collectivism - individualism is a cultural feature. Cultural features are embedded in the mindset and need long time to change from one cultural mindset to another. This also confirms the opinion from Dohi and Fooladi on cultural change.. 6. Conclusion This study examines the adaptation of the stilt house, particularly the function change at the space under the stilt structure.

Study shows that the function of the space tend to shift from private functions to more public functions, contrary to the hypothesis. The shift reflects the life orientation changes in the society. This is due to the people are still in the transition phase. When the economic level of society increases, the residents of the house will become more individualistic. Then, more space will be individualist at the space under the stilt house. References [1] Gao, Y. 1998. The Dai vernacular house in South China: tradition and cultural development in the architecture of an ethnic minority. Doctoral Dissertation. Edinburgh University. [2] Widodo, J. 2009.

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