



TYOLOGY AND FUNCTIONS OF COURTYARD IN
MALAYSIAN TERRACE HOUSE

BY

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ABSTRACT

Housing is a microcosm of a civilization where human are nurtured under a specific environment. In Malaysia, due to the urbanization phenomena, terrace housing scheme adopted from Great Britain were introduced. The need of the space becomes a major consideration in utilizing the limited land plot for housing development. Through the evolution of the houses design over more than 56 years, several issues were highlighted such as poor ventilation, low indoor quality and poor day lighting. Design intervention by re-introducing the courtyard into the terrace housing scheme seems to be partly unsuccessful attempt. The core problem lies on generalization of courtyard design in Malaysian terrace house which lead to the failure in courtyard function. This study infers that the function of courtyard might be influenced either by design typology or by the users. In identifying the said factors the research uses two approaches by investigating the tangible factor through the observation process and the intangible factors through the feedback from the user's perception. Adoption of three methods of analysis which are the space syntax analysis, semantic differential analysis and statistical analysis are aimed to investigate the factors influencing courtyard function. Traditionally, Malaysian terrace courtyard houses have more than one courtyard within a house. In the analysis of the present terraces courtyard house, the finding found 3 distinctive typology of courtyard house; front, middle and rear courtyard. The study also shows relationship between courtyard type and courtyard function. As far as Malaysian terrace courtyard house is concern, the front courtyard is used for public space while the middle courtyard is for family gathering space and the rear courtyard serve as service courtyard.

ملخص البحث

الإسكان هو قسم صغير من الحضارة، وهو مكان خاص أنشأ فيه الناس في بيئة خاصة. وفي ماليزيا، بسبب ظاهرة تطوير المدن، فقدّم مشروع إسكان الشرفة المأخوذ من المملكة المتحدة. فالحاجة إلى المسافة تكون سبب رئيسي في استخدام أرض محدد لتنمية الإسكان. وعبر التغييرات في تصميم البيوت لمدة أكثر من 56 سنة، لوجد بعض المشكلات مثل ضعف التهوية وقلة جودة الداخل وضعف الإنارة النهارية. إن التدخل التصميمي بإعادة تقديم الساحة في مشروع إسكان الشرفة هي شيء غير ناجح. والمشكلة الرئيسية تبدأ من عمومية تصميم الساحة في بيوت الشرفة الماليزية التي تؤدي إلى فشال وظيفة الساحة. فهذا البحث استدل على أن وظيفة الساحة يمكن أن تتأثر سواء كان بنموذجة التصميم أو بمستخدم. فإن البحث يستخدم منهجين لاكتشاف السبب المذكور سابقا، وهما البحث عن السبب المحسوس عبر عملية الملاحظة والسبب غير المحسوس عبر الاستجابة من ملاحظة المستخدم. وتطبيق ثلاثة مناهج التحليل وهي تحليل تركيب المسافة وتحليل التفاضل السيمانطقي والتحليل الإحصائي يُستخدم في فحص أسباب التي تؤثر إلى وظيفة الساحة. وتقليديا، كان بيوت الشرفة مع الساحة في ماليزيا تحتوي على أكثر من الساحة الواحدة في بيت واحد. وفي تحليل الساحة الموجودة في بيوت الشرفة الحالية، لوجد أن هناك ثلاثة أنواع الساحة، وهي الساحة في الأمام والساحة في الوسط والساحة في الورا. وهذا البحث أيضا يشير إلى العلاقة بين نوع الساحة ووظيفتها. وفي ماليزيا، الساحة في الأمام تُستخدم للاستعمال العام، والساحة في الوسط هي مكان لاجتماع الأسرة والأهل، أما الساحة في الورا تُستخدم للخدمات المنزلية.

APPROVAL PAGE

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DECLARATION

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This dissertation is dedicated to my beloved parents

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

The courtyard can be defined as an enclosed area that is completely or partially enclosed by walls or buildings, typically one forming part of the castle or large house (Oxford, 2011). In most countries, the courtyard is regarded as one of the indigenous form of dwelling which was sustained over 5000 years throughout many regions on earth (Edwards, Sibley, Hakimi, & Land, 2006). It works quite differently in different climatic condition, as stated by Schoenauer and Seeman (1962). Courtyard is most suitable for hot climate as a climatic modifier in achieving comfort for human being besides providing privacy. Therefore, courtyard is always regarded as a generic typology in hot and arid climate or pertinent to the notion of Islamic architecture (Ozkan, 2006). However it has been verified that ancient civilization had used courtyard as a building morphology. It can also be found extensively from China to Morocco. In hot and humid climate of Malaysia, the existing of courtyard in the middle of terrace houses and in the Melaka traditional house seems to be a sideline with less emphasize on its function (Wan Hasyimah, 2005; Wah, 2000). Over the past 30 years, few attempts have been made in improving the quality of housing including the re-introduction of courtyard as to promote better living environment with proper ventilation and day lighting (Wah, 2000). Thus, this research aims to identify and to analyze the factors influencing courtyard function in Malaysian terrace houses. The scope of the research is to investigate the dominant factors which determine the relevance or existing of courtyard function as it says to improve the livability of Malaysian terrace house.

1.2 RESEARCH BACKGROUND

Researches have been done extensively in order to understand the notion behind the existing of courtyards which are located in various places all over the world (Salama, 2006; Al-Nafea' & Llewellyn-Jones, 1997; Assi, 2001). In summarizing the collection of researches pertaining to the courtyard house, four (4) major topics had always been highlighted which are:

- i. Historical and theoretical framework of courtyard house.
- ii. Climatic and environmental dimensions of courtyard house.
- iii. Social and cultural dimensions of courtyard house.
- iv. Evolution, contemporary approach and development of courtyard house.

The researches conducted mainly analyzing three (3) major subjects or variables which are courtyard users, courtyard type or design and the courtyard function or performance. According to the specific region, each subject will be analyzed in order to understand the notion of the courtyard typology and function. The purpose of classifying the research according to the region is aimed to understand the elements and the components of courtyard house in which, the similarities and the differences can be compared. The regional research classification can control the constant parameter and the variables. Therefore, the research outcome may lead to a finding which applicable for a specific region on a specific period of time (Edward, Sibley, Hakimi and Land, 2006). It is important to establish a typology for courtyard house as a grounded case study for future analysis (Pfeifer and Brauneck, 2008).

1.2.1 Issue of Courtyard in Malaysia Terrace Houses.

After independence, Malaysia has adopted the idea of terrace or link housing scheme from Great Britain due to the rapid urbanization at the urban area especially in Klang

Valley (Rajeh, 1989). According to the historical record, the existing of shop houses in the old town of strait settlement such as Malacca, Penang and Singapore were recorded as early as 1884 (Syed Zainol, 1992). The typology of terrace or link houses in Malaysia has already evolved over the past 56 years old or even more than that. Through the evolution of the house design, several issues were highlighted such as poor ventilation, day lighting issue and thousands of Ringgit were thrown into waste in a process of renovation. Besides, the need of larger spaces becomes a major consideration in utilizing the limited land plot for housing development (Salama, 2001).

Above all the problems which have been stated, there is a clear statement by Wah (2000) who has highlighted that the design intervention by re-introducing the courtyard into the terrace or link house scheme seems to be partly unsuccessful. It happened due to several factors mainly caused by the end user and also the designer. This statement is supported by Schoenauer and Seeman (1962), which stated that the stage of courtyard evolution is parallel with the evolution of human ecology. The need for privacy, climatic condition and the requirements for adjustment to the available land area limitations, become relevant factors which determine the function of courtyard house today. The research problem of the present study arises where an investigation on the notion and the relevance behind the existing of courtyard in Malaysia terrace house is needed.

In principal, courtyard is not a common or a popular housing typology for current Malaysian culture. According to Sharif, Zain and Surat (2010), it is related to the change of need in the current condition, associating the human involvement and human behavior. He has suggested that house was designed in the way that fits the need physically, psychologically and environmentally. In the massive development,

the design of terrace or link courtyard house were generalized. Repeated type of courtyard design were imposed into the housing design regardless of the context such as orientation and location. Hence, it leads to the inappropriate outcome that affects the social culture and human behavior. It also neglected the notion of courtyard function and at the same time it defeats the core function of the house which is supposed to reflect the culture of the inhabitants and to satisfy the human needs (Low and Chambers, 1989).

1.3 PROBLEM STATEMENT

In Malaysia, since 1981, several studies have determined that terrace houses were poorly designed in order to achieve various climatic comfort and social requirement (Nasibeh, Salleh, Haw & Jaafar, 2008). Further investigation by Suhaida, Tawil, Hamzah, Che-Ani and Tahir (2010), has found that the livability index for terrace house in Malaysia has never been analyzed. Hence, there is no clear indicator describing the actual condition of livability problem in terrace house. Few attempts have been done in improving the living quality index including the re-introduction of courtyard in terrace or linked houses as to promote better cross ventilation in the compact development (Rajeh, 1989; Wah, 2000). The attempt of re-introducing the courtyard without proper understanding of its function was a waste. As the result, courtyard are often seen by owners as a waste of space and eventually closed (Wah, 2000). Here, the core problem lies on generalization of courtyard in the design of Malaysian housing without having a proper understanding of the relationship between the courtyard design or type and the users. This deduction was supported by Shabani, Tahir, Shabankareh, Arjmandi and Mazaheri (2011). When the main aim is to make

changes in housing design and construction, the close inspection of the spatial arrangement and lifestyle is mandatory.

Even though, courtyard is expected to improve the living quality climatically, it does not totally work in the case of Malaysian terrace house. Yeang (nd) has suggested that it is not a good idea to build courtyard inside the building in hot humid climate. Courtyard should be placed between the inside and the outside. In explaining this exclusive phenomenon, Rapoport (2007) has suggested that in certain regions, climatic condition might be a modifying factor influencing the courtyard design as well as the courtyard function. This theory is well known as anti-climatic theory. The finding on the environmental research conducted by Tablada, Blocken, Carmeliet, De Troyer and Verschure (2005), Sadafi, Salleh, Haw and Jaafar (2008) and Rajapaksha (2004) indicated that the courtyard performance in Malaysia shows low significance level in providing thermal comfort for the occupant and it has rejected the hypothesis on the role of courtyard as climatic modifier in the context of Malaysian terrace or link house.

Thus, this research was conducted in order to investigate other factors which might influence the function of courtyard house through the relationship of three (3) major subjects which are the courtyard design or type, the courtyard function and the courtyard users. The research has identified the gaps where a relationship in between these three (3) subjects related to courtyard has never been established. Little research has been done in identifying the specific function of courtyard as stated in Table 1.1.

1.3.1 Research Gap

The review from the collected studies on courtyard function had found a research as shown in Table 1.1. Table 1.1 has tabulated the related studies done in relation to

courtyard house. The studies were divided according to the objectives of the research. The first finding shows that there is no research has been done specifically on the courtyard function in Malaysian terrace house. The research gap become apparent either courtyard is really important in Malaysian terrace house or it is just another component adopted for the sake of trend and style. Further review on the studies shows that courtyard spatial function is also has little review in relation to this research. Thus, the combination of both components (spatial layout and function) would be best to begin the research inquiries in the realm of Malaysian terrace courtyard house.

Table 1.1 Research Review and Research Gap

YEAR /AUTHOR	LOCATION	COURTYARD USERS	COURTYARD TYPOLOGY	COURTYARD PERFORMANCE	COURTYARD FUNCTION
(1993)Abu Baker Shawesh	Ghadames, Libya			environmental factors	
(1998) Ping Xu	Beijing,china	*culture			
(2001)Nibediata Das	Kalkota,India	*social culture		solar shading/natural ventilation	
(2002) Patricia T.F	Penang,Malaysia		*heritage		
(2004)A. J. F. Rutten	Netherland			Daylighting	
(2004)Indrika Rajapaksha	Sri Lanka			Nocturnal ventilation/ passive cooling	
(2005)R. Ahuja	India			Natural cooling	
(2005)Abel Tablada	Cuba		*courtyard geometry	air flow/ thermal comfort	
(2005) Wan Hashimah	Old towns of Malaysia		*heritage		
(2006) Asyraf Salama	Cairo		*typology/ evolution		
(2007)Amos Rapoport		*culture			
(2007) Mansoor Mohammed	Yemen			Thermal behaviour	
(2007)Aqeil Ahmed	Yemen	*perception of architect and student			
(2008) Nasibeh Sadafi	Malaysia			Thermal Impact	
(2009)Maria Carme Belarte Franco	Southern Gaul		*history		
(2009)A. Bahauddin	Penang, Malaysia		*heritage		
(2010)Mohammad Reza Leylian	Kashan,Iran			climatic control	
(2010)Faris Ali Mustafa	Erbil city, Iraq				spatial function
(2010)Faisal Aljawabra	North Africa/ USA	relationship Behaviour		relationship climatic control	
(2010)L.S. Rikko	Nigeria		*evolution		
(2010)Nada Al- Nafea	Riyadh, Saudi		*typology		
(2010)Anita Gidlöf-Gunnarsson				Noise	
(2010)M.A. Kamal	Lucknow, india			Thermal performance	
(2011) Tay Wee Jen	Melaka, Malaysia			thermal comfort	
(n.d)A. Ghaffar	Penang, Malaysia		* heritage		
(n.d)Jaime J			*history		
(n.d)Eman Assi	Palestine		*typology/evolution		
(n.d)Ismail Said	Malaysia			ventilation component in terrace house	
(n.d)Awni K. Shaaban	Oman			sustainable housing	