The Malay Women and Terrace Housing in Malaysia

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ABSTRACT

Being of one of the major aboriginal groups in Malaysia, the Muslim Malay women differ socio culturally from women of other religious and cultural background.

Malay women have particular spatial requirements especially within the domestic environment. However, these requirements are rarely considered when it comes to the design of modern urban living environments.

Terrace housing is the dominant form of urban housing in Malaysia. Since the 1970s, it has catered to the mass housing needs of 'rural-to-urban' migrants. Associated with the lack of considerations for traditional, cultural and religious aspects, the design of terrace housing fails in terms of intimacy, privacy and safety for Malay women as well as environmental performance and adaptability.

The traditional rural Malay houses evolved in response to the unique cultural needs of the Malay women and her family and offers solutions for contemporary urban housing for Malay families. As contextually appropriate housing solution, their spatial organization and construction system can inform how best to design for the occupants and the environment.

The research studies the Malay women, traditional housing environments and the shortcomings of terrace housing. The thesis aim is to identify an architectural solution to the current issues in Malaysian terrace housing. The study proposes a flexible prefabricated construction method, modular screen-wall panelling and a timber flooring system as a design solution to the socio cultural and religious needs of the Malay women and her family.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	3
ABSTRACT	5
LIST OF FIGURES	10
CHAPTER 1 INTRODUCTION.....	16
1.1 BACKGROUND PROBLEM	16
1.2 AIM OF RESEARCH.....	17
1.3 RESEARCH METHODOLOGY.....	18
1.4 LIMITATION OF RESEARCH.....	18
PART ONE: LITERATURE REVIEW.....	21
CHAPTER 2 THE MALAY WOMEN	22
PART I TRADITIONAL AND MODERN MALAY WOMEN	22
2.1.1 TRADITIONAL MALAY WOMEN	22
2.1.2 MODERNIZATION OF MALAY WOMEN	24
PART II SOCIO CULTURAL REQUIREMENTS DIFFERENTIATE THE MALAY WOMEN.....	27
2.2.1 RELIGION AND THE MALAY WOMEN.....	27
PART III IMPLICATION OF URBAN LIVING ON MALAY WOMEN	32
2.3 VULNERABILITY AND SAFETY OF MALAY WOMEN	32
PART IV DISCUSSION	33
2.4 DISCUSSION	33
CHAPTER 3 THE TRADITIONAL MALAY HOUSE AND THE MALAY WOMEN.....	34
PART I SPATIAL LAYOUT.....	36
3.1.1 BACKGROUND: DESIGN OF TRADITIONAL MALAY HOUSE	36
3.1.2 BUILDING CONSTRUCTION.....	38
3.1.3 CLIMATIC CONTROL	44
PART II FACILITATING THE CUSTOMS OF TRADITIONAL MALAY WOMEN	48
3.2.1 SPATIAL ORGANIZATION: RESPONSES TO CULTURE AND REGION	48
3.2.2 WOMEN IN THE TRADITIONAL MALAY HOUSE	52
PART III DISCUSSION.....	61
3.3 DISCUSSION.....	61
CHAPTER 4 CRITIQUES OF TERRACE HOUSING	62
PART I MALAYSIA'S TERRACE HOUSING	64
4.1.1 INTRODUCTION TO TERRACE HOUSING IN MALAYSIA.....	64

4.1.2 OVERVIEW OF THE DESIGN LAYOUT AND SPATIAL ORGANIZATION	71
4.1.3 CONTEXTUAL SUITABILITY	76
PART II APPROPRIATENESS OF TERRACE HOUSING TO MALAY	
CULTURE	77
4.2.1 IMPLICATIONS ON URBAN MALAYS' SOCIO CULTURE AND WAY OF LIFE	77
4.2.2 TERRACE HOUSING AND THE PROBLEM OF PRIVACY VIOLATIONS	79
4.2.3 TERRACE HOUSING AND THE PROBLEM OF SOCIAL SECURITY AND SAFETY	82
PART III ADAPTATION	83
4.3 USER MODIFICATION OF TERRACE HOUSING	83
PART IV DISCUSSION	87
4.4 DISCUSSION	87
 PART TWO: DESIGN APPLICATION	 89
 CHAPTER 5 DESIGN PROPOSAL: REDEFINING TERRACE HOUSING	 90
5.1 SITE STUDY AND DESIGN BRIEF	91
5.1.1 SITE DESCRIPTION	91
5.1.2 DESIGN BRIEF	92
5.2 PROPOSED DESIGN	93
5.2.1 RAISED FLOOR CONSTRUCTION AND FLEXIBLE PREFABRICATION	93
5.2.2 FLEXIBLE FLOOR CULTURE AND EXPENDABILITY	98
5.2.3 SCREEN-WALL PANEL	102
5.3 DESIGN DISCUSSION	111
5.3.1 DESIGN RESPONSE TO PRIVACY AND SOCIO CULTURAL NEEDS	111
5.3.2 RESPONSE TO ENVIRONMENT	116
 CHAPTER 6 DISCUSSIONS AND CONCLUSION	 118
 BIBLIOGRAPHY	 122

LIST OF FIGURES

Figure 2-1: Women in Kampung Rusila had two roles: mother and paid worker. Seasonal work such as stringing tobacco can be combined with child care, in 1979	24
Figure 2-2: Eight year old Aminah weaving small basket in Kampung Rusila, 1965	26
Figure 2-3: Socializing. Hajah Fatimah in Kampung Rusila chatting with her grandson and a neighbour while trimming pandan, used for weaving mats, in 1966.....	26
Figure 3-1: Traditional Malay house	35
Figure 3-2: The Malay floor culture	37
Figure 3-3: The Traditional Malay House as a human body	37
Figure 3-4: Family cooperation in building the house in Kampung Rusila. Awang replacing palm trunk sections with cement house support blocks while his wife and three children providing the leverage, in 1966	37
Figure 3-5: Construction elements of TMH	38
Figure 3-6: Construction joints of TMH.....	39
Figure 3-7: Ventilated windows and walls of TMH	39
Figure 3-8: Roof types of TMH	40
Figure 3-9: Stairs and <i>beranda</i>	40
Figure 3-10: Common Addition Sequences.....	41
Figure 3-11: Possible expansion possibilities	42
Figure 3-12: Method of attachment in TMH's construction	43
Figure 3-13: Lightweight construction and prefabrication system made shifting house components possible	44
Figure 3-14: Climatic Design of the Traditional Malay House	45
Figure 3-15: <i>Atap</i> (thatched palm roof)	45
Figure 3-16: <i>Tebar layar</i> (gables)	45
Figure 3-17: Penetrated walls	46
Figure 3-18: Gaps in timber floor.....	46
Figure 3-19: Thatched palm roof is replaced by the corrugated iron	47
Figure 3-20: Enclosed and open <i>serambi</i>	48
Figure 3-21: Inside the <i>selang</i> , dictating different floor levels	49
Figure 3-22: Entertaining guests	49
Figure 3-23: Mother sewing on the floor	49
Figure 3-24: Mother weaving atap roof under the house. At the back is hanging laundry and stocked rice	51
Figure 3-25: Adults preparing food while children playing on the <i>pangkin</i> (timber stage) beneath the house	51

Figure 3-26: a) Steps as an ideal meeting place for the young; b)the adults use the courtyard for washing and drying clothes, preparing food or relaxing in the evening; e) <i>Rumah dapur</i> is opened to internal courtyard.....	52
Figure 3-27: Women gathered at the selang's entrance	53
Figure 3-28: Traditional Malay house in Kelantan and Terengganu	54
Figure 3-29: Middle area of Melaka TMH	55
Figure 3-30: Middle area of Negeri Sembilan's TMH	55
Figure 3-31: TMH in Kedah, Perlis and Pahang	56
Figure 3-32: TMH in Pulau Pinang and Selangor	57
Figure 3-33: <i>Para</i> and on-ground kitchen	58
Figure 3-34: Yo yo. The floor will be covered by timber plank and serves as normal floor when it is not used.	60
Figure 3-35: Floor plan of a village house showing phases of extension	60
Figure 3-36: Bathroom in the house	60
Figure 4-1: Double storey terrace housing in Klang Valley	63
Figure 4-2: Terrace housing in Bethel Place Area, London, 1800	64
Figure 4-3: Four-bedroom house in Cardiff, UK, 1904	64
Figure 4-4: War terrace housing in Coryton estate, United States by Geoffrey Jellicoe	64
Figure 4-5: Pembroke Terrace in Sydney, a typical example of a stark early terrace house streetscape close to the city centre, in 1871	65
Figure 4-6: Two storey row houses (one unit per floor) by Pierre Jeanneret in Chandigarh, India. Personal domestic activities are allocated at the front and rear yards for the ground floor unit and at the roof terrace for the upper unit	65
Figure 4-7: Boom-style Rochester Terrace in Melbourne demonstrates how commodious terraces with grand, colonnaded facades can produce high quality urban environments with part-private, part-public garden. Australia's terrace housing features include shaded verandah	65
Figure 4-8: A row of Chinese shop houses	66
Figure 4-9: Early timber shop houses in Penang	66
Figure 4-10: Malaysian shop house styles	67
Figure 4-11: Five-foot way on the ground floor of the shop houses	67
Figure 4-12: Melakan townhouse.....	68
Figure 4-13: Terrace housing configuration in the Klang Valley housing estates	69
Figure 4-14: Housing development in Klang Valley	70
Figure 4-15: Malaysia's terrace housing adapted its configuration layout from the United Kingdom's terrace housing configuration. Picture showing neighbourhood of Upland Roads, London in 1980s	70
Figure 4-16: Clay brick double storey house in Kajang, Selangor. Terrace housing in Malaysia is characterised by deeper front yard and built-in car porch.....	71
Figure 4-17: Example of plan of 2 storey terrace houses (low cost) in Penang	71
Figure 4-18: Two-storey terrace housing in Taman Royal Lily Plan, Perak.	72

Figure 4-19: Houses in Noel Park, North London, 1833. Among the first terrace houses featuring porches and non-hall entrance.....	72
Figure 4-20: Typical three bedroom one-storey terrace housing in Taman Metro Pengkalan	74
Figure 4-21: Double-Storey terrace house with internal courtyard, wet and dry kitchen in Taman Suriza.....	74
Figure 4-22:: Absence of ventilation voids and the use of multiple air-conditioning units per house	76
Figure 4-23: Flood in the terrace housing area, Jitra.	76
Figure 4-24: Celebrating Maulidur Rasul (Birth of the Prophet Muhammad P.B.U.H) by parading and reciting <i>salawat</i> around the terrace housing area	77
Figure 4-25: At night, religious talk is held in one of the terrace houses' porch, stretched towards the streets.	77
Figure 4-26: Eating <i>kenduri</i> in small circles after the religious talk.....	78
Figure 4-27: Men and children eat outside while the women eat inside the house	78
Figure 4-28: Kitchen and stairs visible from living room	79
Figure 4-29: Privacy violations due to close proximity of neighbours.....	80
Figure 4-30: Adaptations to achieve visual privacy include the use of curtains and opening windows in the kitchen.	81
Figure 4-31: Excessive fences and gates are typical in the terrace housing environment.....	82
Figure 4-32: Before and after modification of two-storey low cost housing.....	83
Figure 4-33: Car porches renovated into outdoor "serambi"	84
Figure 4-34: Relocation of kitchen and family area to achieve privacy	84
Figure 4-35: Privacy in the house.....	85
Figure 4-36: Before modification (bought in 1988) and after modification (in 1996)	86
Figure 4-37: Shaded terrace area	87
Figure 5-1: Malaysia, hot-humid tropical country.....	91
Figure 5-2: Map of Malaysia which comprises of Malay Peninsula and East Malaysia	91
Figure 5-3: Land clearings for building construction especially for terrace houses	91
Figure 5-4: Storehouse in Kinaeraba Island.....	93
Figure 5-5: Earthen Floored Room in Yoshijima House.....	93
Figure 5-6: Evolution of the Japanese houses	93
Figure 5-7: Modular column design	94
Figure 5-8: Lot configurations.....	95
Figure 5-9: Different adaptable ground floor plans.....	96
Figure 5-10: Ground floor area	97
Figure 5-11: Middle Shoin seen from the First Room of the Old Shoin	98
Figure 5-12: Interior of the Old Shoin seen from the east side of Second Room	98

Figure 5-13: Katsura Imperial Villa in Kyoto, ca. 1616-1660	98
Figure 5-14: Stubohouse based on the modular tatami sizes	99
Figure 5-15: Installation of single stressed skin panel floor system	99
Figure 5-16: Customized panels for storage and bathroom	100
Figure 5-17: Different arrangements of the SSP in the first floor plan.....	101
Figure 5-18: Projected window bays and screen lattice panels which respond to cultural and environmental references in Middle Eastern countries	102
Figure 5-19: The Perforated House	103
Figure 5-20: Singular wall panels. From top: Panel A, Panel B, Panel C and Panel D	104
Figure 5-21: Possibilities of two or three-panel configurations. From top left: Panel A+B, Panel C+D, Panel A+C, Panel A+D and Panel A+C+D	105
Figure 5-22: Shelving unit	106
Figure 5-23: Screen-wall panel construction system	107
Figure 5-24 : Possible layout adaptations	109
Figure 5-25: View from the front-street.....	110
Figure 5-26: Study of glare and visual privacy in TMH and terrace house	111
Figure 5-27: Accommodating socio-cultural needs and functions	112
Figure 5-28: Proposed screen wall from interior in Type 2	113
Figure 5-29: Proposed screen-wall panel at the living area	114
Figure 5-30: Gradient of privacy by the screen-wall panels	114
Figure 5-31: Screening in the living room.....	115
Figure 5-32: Views from the second living room which offers choices for gender segregation	115
Figure 5-33: Proposed raised floor construction in terrace housing by Mohd Tahir (2006)	116
Figure 5-34: Courtyard effects.....	117

CHAPTER 1 INTRODUCTION

1.1 BACKGROUND PROBLEM

A house is a complex architectural entity. It is a functional object that responds to the needs of a family as well as a personal object which expresses a strong symbolic meaning (Rodriguez & Siret, 2009). As a domestic domain, a house is also the site for many cultural practices and traditions (Ozaki, 2002, as cited in Hashim, Ahmad Hariza, Mohamad Ali, & Abu Samah, 2009)

The Traditional Malay House (TMH) is the rural vernacular architecture; it identifies the predominant presence of Malay-Islamic culture in Malaysia. Designed and built by the villagers themselves, these houses not only reflect the needs and lifestyle of their inhabitants but also manifest the creativity, aesthetic skills and particular regional differences of Malay culture (Gibbs, 1987). The form of the TMH is influenced by the owner's way of life, economic status, natural surroundings and climate (Gibbs, 1987; Mohamad Rasdi, M.T, Mohd Ali, Syed Ariffin, Mohamad, & Mursib, 2005; Nasir & Wan Teh, 1996; Yuan, 1991).

The introduction of national economic policies in the 1970s greatly increased urbanization in Malaysia and led to greater 'rural-to-urban' migration particularly among the Malays (Hashim, Ahmad Hariza, Abdul Rahim, Syed Abdul Rashid, & Yahaya, 2006; Nagata, 1974). Housing designs in Malaysia have changed significantly with the introduction of mass housing in the form of terrace housing to cater for this rapid migration into urban areas (Fee, 1998). The demand for this housing in the 1970s sped up its development pace; this meant insufficient time to draft a set of socio-culturally suited and more flexible by-laws. As such, terrace housing in Malaysia is a prototype of the modern Western terrace houses. Built utilising industrialized construction material and on western codes and regulations, this type of housing not only performs poorly in thermal performance but has also forced socio-cultural changes and violations of privacy amongst the Malays (Hashim, Ahmad Hariza, et al., 2006; Mohamad Rasdi, Mohamad Tajudin, 2007; Mohd Tahir, et al., 2006).

Urbanization and 'rural-to-urban' migration too have contributed to significantly changing culture and social life of Malay women (Ong, 1990; Sendut, 1966). Traditionally, Malay women's attitudes, behaviour and responsibilities are distinguished by Islamic laws and traditional Malay practices. They also have particular spatial requirements within domestic environments. However, modern Malay women living in urban environments and having greater access to education and professional careers are seen to have changed responsibilities, domestic roles and lifestyle.

Consideration for cultural needs is not an essential requirement in the design of terrace housing for the market. Many urban Malays, particularly women find it difficult to maintain traditional and religious practices in terrace housing (Hashim, Ahmad Hariza, et al., 2009; Hassan, 1999). This has forced adaptations to modern ways of living that compromise religious practices and socio-cultural behaviour (Ahmad, Ahmad, & Abdullah, 2009; Nasir & Wan Teh, 1996; Sendut, 1966). In addition, the deficit of space in terrace housing has led to physical modification of houses by Malay families; these changes reflect the needs for privacy, security and family intimacy (Hashim, Ahmad Hariza, et al., 2006).

1.2 AIM OF RESEARCH

The aim of this research is to study **how the architectural qualities of the traditional Malay house (TMH) can inform the design of the contemporary terrace house in Malaysia thereby making it suitable for the needs of the Malay women and the Malaysian context.**

Some keywords used in the thesis can be defined further. TMH refers to the vernacular house of the Malays. Architectural qualities refer to lifestyle, socio-cultural, environmental or contextual implications as well as design, spatial arrangement, construction, material and detailing. Contemporary terrace house refers to row houses introduced after Malaysia's Independence in 1957 and in response to mass 'rural-to-urban' migration since the 1960s.

This thesis discusses the current conditions of terrace housing in Malaysia, compares them to the architectural qualities that the TMH possess and discusses how the TMH facilitates and supports the religious and socio cultural responsibilities of the Malay women. The design component of this thesis focuses on how the design of terrace housing in Malaysia can be made suitable for the Malay women and the Malay culture as well as contextually appropriate.

1.3 RESEARCH METHODOLOGY

The research was conducted through qualitative methods by studying the architectural qualities of both TMH and terrace housing. More specifically this research was conducted utilising:

- Literature review: Books, journals articles, research papers and multi-disciplinary studies on Malay women, TMH and terrace housing (particularly in terms of their architectural qualities, the use of the form and the transformation of lifestyles that terrace housing bring about), and
- Maps and plans: Documented records of people's perception, observation of changing trends and modifications being made to terrace housing, and
- Empirical study by author of Malay women, TMH and terrace housing

1.4 LIMITATION OF RESEARCH

Terrace housing in urban areas are inhabited by a number of ethnic groups namely Malays, Chinese and Indians. However, this research focuses on the Malay and in particular the women. Malays are Muslim and such have specific domestic living requirements to practice and maintain religious traditions. The research will not analyze the roles, needs or lifestyle changes of the Malay men. As a result of limited access to information on the topics being researched, some findings are based on the author's own experience as a Muslim Malay woman who lived in the rural regions of Malaysia.

PART ONE: LITERATURE REVIEW

CHAPTER 2 THE MALAY WOMEN

Malay women's personalities and needs are nurtured and developed from religion, culture and tradition inherited from ancestors. Being one of the major aboriginal groups in Malaysia, these cultures are passed on from parents to daughters through informal learning. Modern Malay women are however challenged with many physical and psychological changes simultaneous to modernization of the country. Before Malaysia's Independence, Malay women had a more traditionally defined and specific role within society. Most of the Malays prior to Independence used to live in rural areas; this made it possible for them to adhere traditions strictly. However, the Malaysian government's policy encouraging the development of manufacturing sector in the early 1970s led to a significant increase in rural-to-urban migration, particularly among Malay women. The preference of light assembly-type industries for female labourers was a significant reason for the large numbers of female migration (Arifin as cited in Khoo, 1984, p. 1256). Finding it difficult to maintain traditional practices in urban areas and out of one's traditional environments, many Malay women are forced to discard certain traditions and adapt others to suit the lifestyle of the urban environment they currently live in. Although this may be viewed as progressive and necessary for the development of Malaysia and strict maintenance of tradition as being a limitation to this progressiveness, this chapter will highlight the negative impacts of the changes on the Malay women.

PART I TRADITIONAL AND MODERN MALAY WOMEN

2.1.1 TRADITIONAL MALAY WOMEN

In traditional Malay culture, women have specific roles in maintenance of the physical home. As the TMH is made from local timber, it required high maintenance and care. The Malay women maintain the floors of the house by constant sweeping and scrubbing, at least two times a day. While the daughters are kept inside to maintain the interior of the house, the *ibu rumah* (mother of the house) sweep the sand or dried leaves around the house. The extent of the compound around the TMH is defined by coconut tree planted at each corner, while the extent

of the sweeps indicates the territory she feels responsible for maintaining, usually less than the compound itself (Gibbs, 1987, p. 15). In certain parts of Malaysia such as Negeri Sembilan, women owned the house and the land. The houses and lands are passed from mother to daughter, and the women take great pride in this tradition. Young daughters will care for the house enthusiastically knowing that the house will someday belong to them (Gibbs, 1987, p. 38)

Traditional women were also known for their roles in maintaining the welfare of their family and society. According to Laderman (as cited in Ong, 1990, p. 261), Malay women were especially knowledgeable and skilled in cooking, child-birth and health care. They maintained the kin and neighbourly relations through sharing resources, information, childcare and work for preparing feast (Ong, 1990, p. 261). Malay women also gained status in the communities through the ceremonial events such as weddings where they networked, shared mutual labour relations and became the managers or hostesses (Kipp, 1995, p. 1053).

The level of traditional women's dependency varies according to areas or regions. Customarily, women depend on their husband to provide food, shelter and clothing. In return, women provide their husbands' everyday needs. However, traditional women were neither totally confined to the household nor totally dependent on men for economic survival (Ong, 1990, p. 260). Some women have more influence in the financial matters of their households, as shown in the study of Kampung Rusila (Strange, 1981). Despite Islamic emphasis on men keeping and handling the money, the traditional Malay husbands will give his earning to his wife to be extracted according to the needs of the family (Ong, 1990, p. 261). In several circumstances, the women will engage in a paid work that will usually still keep them at home. For instance, a fisherman's wife may sew other fishermen's broken fishing nets for extra earnings for the family.

Besides, the traditional women whose husbands take up more than one wife became independent and own up to the role of income providers. A study of women in Kelantan (east coast of Malaysia) shows that women are renowned for their "visibility" particularly in the trade environment (Kipp, 1995), as opposed to the traditional role of staying at home. Other than the advantage of the bilateral inheritance customs that allow these women to own and

manage land on their own, they also earn income from trade that gives them increased autonomy within their families and husbands (Kipp, 1995, p. 1053). Although traditional Malay women's dependencies vary, in general they still rely on their male relatives to provide them with the safest environment as it is a basic custom that the men's role is to guard their sister's, wife's and daughter's virtue (Ong, 1990, p. 261).

2.1.2 MODERNIZATION OF MALAY WOMEN

In the last few decades, Malay women were seen to have changed in domestic roles, education and social life.

2.1.2.1 CHANGING DOMESTIC ROLES

After the New Economic Policy (NEP) was introduced in 1972, large scale entry of young women into mass education and industry has changed society's views towards traditional domestic roles of women. Rural traditional women were blamed for not being hard-working and responsive towards "modern practices" and "new opportunities" in order to improve the well-being of their families (Ong, 1990, p. 266). Modern Malay women, according to the Fifth Malaysia Plan (1986-1990), were seen as key to the "poverty eradication" programme for improving low-income households. The programme promoted new concepts of women's duty based on the Western notion of family as a privatized unit of obligations and exclusion. The roles of modern women have been since defined as "working daughters who could pull their families out of 'backwardness' and as housewives who could inculcate 'progressive' values in their children" (Ong, 1990, p. 266). In other words, the mother-child relationship reflects the Western family model and compromises the central role of the Muslim male as father and the provider.

As a result of the government's poverty eradication program, modern mothers ignore "customary" practices but prepare their children for a "progressive society" and raise them with values such as "efficiency" and "self reliance" (Ong, 1990, p. 266). Domestic chores for instance, are no longer strictly enforced in relation to young daughters.

Figure 2-1: Women in Kampung Rusila had two roles: mother and paid worker. Seasonal work such as stringing tobacco can be combined with child care, in 1979

(Source: Strange, 1981, p. 203)

Meanwhile, education is taught to be the most important thing for children in order to gain a secure career and a stable life. In many rural areas, the emergence of working daughters has changed the tradition of the Malay household. Ackerman (as cited in Ong, 1990) claims that daughters, who were additional providers to the family also contributed their earnings to household expenses and house renovations. On this occasion, the mothers' influence in the household were strengthened as they were responsible for extracting the money from their daughters (Ong, 1990, p. 265).

At the same time, many Malay mothers sought employment in the government and private industries because of the high cost of living. Since it is hard to balance work and domestic responsibilities, primary domestic roles of maintaining the house and family is delegated to housemaids (mostly foreign) thus creating conflict in the concept of the mothers' duty in the family. Realizing this issue, new state policies have been introduced to emphasize the definition of women's domestic domain, moral obligation and responsibilities according to the Islamic values. The then Prime Minister, Dr Mahathir Mohamad was quoted to say that women should stay at home and raise at least five children when their husband can afford it (Chee 1988 as cited in Ong, 1990, p. 272).

The early traditional Malay women who migrated to urban areas or worked in the industry found the income, social freedom and self awakening experience as an opportunity to define themselves. Today, these work and market choices have become a platform for the modern Malay women to not be materially or even morally dependant on their parents or families (Ong, 1990; Strange, 1981). Compared to the traditional Malay women who receive money from their parents, working Malay women with income could now save for their own future.

2.1.2.2 EDUCATION

Traditional women customarily will be married at an early age, between 16 and 19 year-old. Not many pursued higher education after primary school due to financial constraint

and the *adat* of keeping young daughters at home. As pointed out by Bamadhaj, only 5,000 girls were in schools throughout West Malaysia in 1935. In 1946, there were 60,000 in school (Strange, 1981, p. 27). However, children are taught informally by the parents and elders in an effort to pass on the culture and customs to the next generation.

The large scale entry of young women into mass education, Islamic revivalism and economic developments have affected women's perception towards household and communities (Kipp, 1995, p. 1053). Better educational opportunities have led to a higher possibility of employment among women. Other than increasing their families' economic status, education has also exposed women to various new ideologies thus constituting their new identities as modern Malay women. With Islamic revivalism, which is more apparent among the educated Malay women, modern Malay women have been reminded of their moral responsibility to construct and preserve the traditional Malay community (Ong, 1990). University survey by Ong shows that most women saw Islam as a "more comprehensive value system" than Malay custom (Ong, 1990, p. 271). Since Islamic revivalism took hold in the early 1990s, many women have become concerned with the Islamic requirements such as the *aurah*, *dakwa*, and their roles as Muslims.

2.1.2.3 SOCIAL LIFE

The social life of the traditional Malay women revolves around their domestic responsibilities, for instance, while washing clothes, collecting water or buying household groceries. Traditional women also socialize while doing crafts or creating building elements for their houses such as thatched roof (*atap*). On the other hand, modern Malay women engage in an urban style of social entertainment such as dining out and watching movies. They also attend social functions related to either their own work or their husbands'.

Figure 2-2: Eight year old Aminah weaving small basket in Kampung Rusila, 1965

(Source: Strange, 1981, p. 67)

Figure 2-3: Socializing. Hajah Fatimah in Kampung Rusila chatting with her grandson and a neighbour while trimming pandan, used for weaving mats, in 1966

(Source: Strange, 1981, p. 208)

The common village tradition of visiting neighbours and relatives regularly are no longer widely practised. Establishing neighbourhood friendships become difficult due to employment outside the house and as family demands engage the working women's spare time (Strange, 1981, p. 101). Besides, many modern women work, run their business or run for elective office, participate in charitable or organizational work while their domestic chores and children are attended by maids (Strange, 1981, p. 186). This has shown that the social life of the Malay women have changed because of employment and career aspirations.

PART II SOCIO CULTURAL REQUIREMENTS DIFFERENTIATE THE MALAY WOMEN

2.2.1 RELIGION AND THE MALAY WOMEN

Even though the roles of the modern Muslim Malay women have been adapted to the urban way of life, some of the roles are still defined by traditions and Islamic beliefs.

2.2.1.1 RESPONSIBILITY

The Malay tradition, called *adat*, according to Islamic beliefs, emphasizes female virtue and chastity through the roles and responsibilities of women towards themselves, their families and society (Ong, 1990, p. 261). These roles and responsibilities vary based on their marital status. This is because *adat* defines marriage as the significant mark of women adulthood (Kipp, 1995, p. 1053).

It is common for unmarried, adolescent daughters (called *anak dara* or virgin) to be bounded by rigorous restrictions such as keeping a vigilant distant from kinsmen. At all time, the young women are expected to be "bashful and modest". Everyday wear would be loose-fitting long tunics over a sarong called *baju kurong*. Before the Islamic emphasis on *aurah* was extended to covering girls' hair, *anak dara* wore their hair loose or plaited. They also have to stay close to home. During the adolescent period, the young men play

an important role in preventing their sisters from interacting with other men (Ong, 1990, p. 261).

Meanwhile, responsibility to the husbands becomes the priority for the married, both traditional and modern Malay women. This responsibility is cited in the Quran:

*Men are the protectors and maintainers of women, because Allah has made one of them to excel the other, and because they spend (to support them) from their means. Therefore the righteous women are **devoutly obedient (to Allah and to their husbands)**, and **guard in the husband's absence what Allah orders them to guard (e.g. their chastity, their husband's property, etc.)**. As to those women on whose part you see ill-conduct, admonish them (first), (next), refuse to share their beds, (and last) beat them (lightly, if it is useful), but if they return to obedience, seek not against them means (of annoyance). Surely, Allah is Ever Most High, Most Great.*

(Surah An-Nisa, 4:34, emphasis added)

Islam requires the wives to be obedient to their husbands during their presence, and most importantly during their absence. The husband's absence in the traditional Malay culture refers to the period when the husbands are out working. The wives who were then mostly housewives, stayed at home to look after the husband's property; land, house, belongings and the growing children's needs. In the *adat*, wives' interactions with other people were defined within the Islamic construction of their relation to men. Married women could move freely to tend their cash-crop gardens or engage in minor trade. But they were not supposed to sit or seek male company (Ong, 1990, p. 261). A man wishing to visit their husbands would not be welcomed into the house if the husbands were not at home. These acts have been culturally accepted as how married Malay women should guard their chastity and their husbands' honour.

Staying obedient to these laws during husband's absence is more challenging for the modern Malay women who have careers. Unless they work in the same working place, Islam views wives going to work as a situation whereby the wives are in the husbands'

absence. Compared to traditional Malay women who mostly stay at home, modern Malay women will have to guard their chastity against a broader group of people such as people they encounter during the journey to work, male colleagues, clients and others. The way the working wives dress, interact or communicate with the males around them also should be substantially decent so that it will not inflict *fitnah* (temptation). It is considered inappropriate if a working wife has a close friendship with any of her male colleagues.

Apart from the time spent for career during the day, modern Malay women are still responsible for managing the house and family's needs. In Islam, while the responsibility of the wives is to sustain the house and meet the children's needs, the responsibility of the husband is to provide the means to meet those needs. Thus, many households have a domestic maid employed by the husbands to help the working wives in managing the house.

2.2.1.2 PRIVACY FOR WOMEN

The veiling concept in Islam is to recognize the dignity of women and to protect them from the *fitnah* (temptation) of the men.

*And tell the believing women to **lower their gaze** (from looking at forbidden things), and **protect their private parts** (from illegal sexual acts, etc.) and **not to show off their adornment** except only that which is apparent (like palms of hands or one eye or both eyes for necessity to see the way, or outer dress like veil, gloves, head-cover, apron, etc.), and to **draw their veils all over Juyubihinna** (i.e. their bodies, faces, necks and bosoms, etc.) and not to reveal their adornment except to their husbands, their fathers, their husband's fathers, their sons, their husband's sons, their brothers or their brother's sons, or their sister's sons, or their (Muslim) women (i.e. their sisters in Islam), or the (female) slaves whom their right hands possess, or old male servants who lack vigour, or small children who have no sense of the shame of sex. And let them **not stamp their feet** so as to reveal what they hide of their adornment. And all of you beg Allah to forgive you all, O believers, that you may be successful.*

(Surah Annur, 24:31, emphasis added)

From the above verse, the veiling concept works in two ways. The first one is for the women to avoid their eyes from looking at forbidden things such as *aurah* of other Muslim men and women. The latter is for women to veil their bodies and *aurah* from being seen by other people, particularly men. *Aurah* is parts of the bodies that cannot be seen by people who are not families. *Aurah* for men are between the abdomen and knees. *Aurah* for women include all parts of bodies except the palm and face. Covering the *aurah* for women also means covering the shape of the bodies.

One of the veiling mechanisms mentioned in the verse is the physical behaviour such as lowering the gaze and not stamping the feet. This has been developed into behavioural norms in the Malay culture, known as *budi* (etiquette). However, another veiling mechanism in the verse can be understood subjectively in terms of the instruction whereby women are “*to draw their veils all over Juyubihinna and not to reveal their adornment except to their husbands, etc*”. The veils literally refer to proper clothing. Nonetheless, the veils can also be translated into physical screenings such as blinds, walls or spaces which help cover the *aurah* particularly in the house. For the Muslim women, the house is the place where they can have the freedom from covering themselves from other non family members.

2.2.1.3 PRIVACY FOR FAMILY

In Islam, privacy is very important while the right to privacy is one of the most precious freedoms, the most comprehensive right and the most valued by Islam (Berween as cited in Hashim, Ahmad Harizan & Abdul Rahim, 2008, p. 96). Islam emphasizes the importance of seeking permission to disrupt the privacy of the family in several verses.

O you who believe! Enter not houses other than your own, until you have asked permission and greeted those in them, that is better for you, in order that you may remember.

(Surah An-Nur 24:27, emphasis added)

O you who believe! Let your legal slaves and slave-girls, and those among you who have not come to the age of puberty ask your permission (before they come to your presence) on three occasions;

before Fajr (morning) prayer, and while you put off your clothes for the noonday (rest), and after the 'Isha' (late-night) prayer. (These) three times are of privacy for you, other than these times there is no sin on you or on them to move about, attending (helping) you each other. Thus Allah makes clear the Ayat (the Verses of this Quran, showing proofs for the legal aspects of permission for visits, etc.) to you. And Allah is All-Knowing, All-Wise.

(Surah An-Nur 24:58, emphasis added)

According to Islamic requirements, there are three times of privacy that a person should ask permission before disrupting the house or the room in order to respect the privacy of the family. Prophet Muhammad has further explained this principle:

It is not lawful for a Muslim person to peep into the house of another person until he has asked permission. If he peeps into the house before asking permission, verily (it is as if) he had entered.

(Al Bukari, 1955, p. 281)

From the above verses, privacy mechanism is comprised of behavioural acts such as understanding of religious requirements and physical elements such as the design of the house. In many Islamic countries, dwellings are built in relation to visual privacy from the outsiders. Building elements such as entrance, doors, windows and rooms are arranged to provide total protection and freedom for the family members. Other consideration for privacy is the separation of sleeping places for family members to respect the privacy of parents, daughters and sons.

However, the lack of privacy as a result of inappropriate physical elements such as in terrace housing design can result in behavioural adaptations. Many Malay women living in terrace housing have adapted their lifestyle to suit the urban environment and compromised the religious requirements.

PART III IMPLICATION OF URBAN LIVING ON MALAY WOMEN

2.3 VULNERABILITY AND SAFETY OF MALAY WOMEN

Although state policies on education and economic development have led to significant positive Malay women's empowerment, their vulnerability and safety remains a matter of concern. Between the years 2002 and 2004, the Royal Malaysian Police reported that 67 to 69 percent of rape cases are predominantly Malays, much higher than the proportion of Malays in the population (WHO, 2006). Their vulnerability to crime and violence could have been inflicted by the fact that more and more Malay women are present in the external environment. However, many crimes against women such as domestic violence, rape and incest show that their safety is also not substantiated in their own home. In 2003, Royal Malaysian Police received 2555 reports of domestic violence. The number increased by about 21.3% in 2004, with 3102 reports (Jonit, 2006). Almost 70% of the rape acts also occur at home or in a building. However, no research has been done in Malaysia to explain whether it is because homes and buildings may be regarded as secure places by the perpetrators or that most of the opportunities for rape come while victims are in these places (WHO, 2006).

Under Section 376A of the Penal Code, incest is defined as having sexual intercourse with another person whose relationship to him or her is such that he or she is not permitted, under the law, religion, custom or usage applicable to him or her, to marry that other person. According to the Malaysian Ministry of Women, Family and Community Development, reported sex crimes involving incest victims are about 17 percents, which totals 1,541 cases between the years 2000 to 2005 with most cases occurring in Selangor and Johor. Selangor and Johor are regarded as the fastest developing states in Malaysia (Raja Mohan & Ninggal, 2008). Young women are found to be more at risk of sexual crime than older women. Approximately two third of the incest victims each year are girls of 16 year old and below. Similar to domestic violence, the relationships of incest perpetrators to victims are mostly those who are close to them such as fathers (29.53%), uncles (18.17%), stepfathers (16.68%), brothers-in-laws (8.24%) and older brothers (7.33%) (Jonit, 2006).

It is believed that a major contributing factor to sex crimes in Malaysia is urbanization which has led to dramatic lifestyle changes (Raja Mohan & Ninggal, 2008). Other than reluctance to seek assistance due to shame, fear of retaliation from perpetrators, lack of awareness towards the occurrence of domestic violence and incest are other factors that contribute to continuous abuse (Jonit, 2006). A local study on incest also shows that more than 80% of victims clearly stated that the act was repeated (WHO, 2006).

As one of the solutions, the Domestic Violent Act was developed in 1994 by the Malaysian government to help and protect women from violence and abuse. The domestic violence and sexual crime victims are protected and given the option of choosing to stay in a safe house. 28 safe houses (called '*Rumah Nur*' or Houses of Light) have been built by the Welfare Department all over Malaysia to give temporary shelter to these women (Jonit, 2006).

PART IV DISCUSSION

2.4 DISCUSSION

Malay customs and the Malay women defined by religion. Malay women are subjected to maintain Islamic requirements such as veiling and privacy in external and domestic environments. Traditionally, Malay women stayed at home to maintain the welfare of the house, family and society. Urbanization and 'rural-to-urban' migration have increased the number of women in the education and working sectors. The Malay women who live in urban environments continue traditional customs and religious practices, however much of these practices have changed or are adaptations of traditional roles and responsibility to suit the urban environment they live in. As role-model for their children and families, this implies the passing on of compromised traditional practices. This has resulted in the exposure and vulnerability of Malay women to violence and abuse. Since urbanization, reports on crime towards Malay women particularly regarding domestic violence have increased significantly. The next chapter will be looking at how the TMH has facilitated in the continuity of traditional and religious practices and helped maintain the safety and security of the women.

CHAPTER 3 THE TRADITIONAL MALAY HOUSE AND THE MALAY WOMEN

This chapter will study the suitability of TMH to the Malay women and the Malaysian context. The first part of the chapter introduces the design concept, spatial layout, building construction methods, expansion system and the climatic control of the TMH. The second part of the chapter discusses how the spatial organization and spaces of the TMH has facilitated the customs of the traditional Malay women in terms of privacy, domestic ritual and safety of the women.

Figure 3-1: Traditional Malay house
(Source: Yuan, 1991, pp. 6-7)

PART I SPATIAL LAYOUT

3.1.1 BACKGROUND: DESIGN OF TRADITIONAL MALAY HOUSE

The Traditional Malay House (TMH) is the vernacular architecture of the Malays before the colonial period. Its most distinctive vernacular attributes are the raised floor construction, the flexibility of spaces and the use of readily available rain forest materials to counter the hot-humid climate. There are three parts of the house – pillars, walls and roofs. These parts have been interpreted as three stages in man's life – birth, life and death. The Bugis Malay in Johor believed the house represents the human body such as head, ribs and legs (Nasir & Wan Teh, 1996, p. 14) (Figure 3-3).

The house is based on the concept of multi-structures, achieved by the basic construction method and flexible expansion system. *Rumah ibu* (main house) is the largest and most elaborated structure; attached to it are *serambi samanaik*, *serambi gantung*, *lepau* and *jemurung* (or *anjung*). They are considered as dry and clean spaces, used for entertaining guests, sleeping, praying and doing domestic chores. The second structure is the *rumah dapur* (kitchen). It is referred to a relaxed and wet space, separated from the *rumah ibu* and connected by *selang* (passageway). This space is used for food preparation, eating and entertaining female guests. The construction is similar to the *rumah ibu* but at a lower level, and uses more simple materials such as *atap* (thatched palm roof) or crude matting as wall claddings. Both structures may be built at the same time, but most are built as an extension when there is a growing need for it or when the families have better financial ability.

TMH is built, modified, expanded and improved by the occupants themselves (Figure 3-4). As mentioned by Yuan, the house evolves over generations through their changes in way of living which were adapted to their needs, culture and environment (Ismail & Ahmad, 2006). Furthermore, TMH reflects the tradition, social and economic status of the Malays (Nasir & Wan Teh, 1996). The characteristics of the house are influenced by the traditional concept of privacy based on the Islamic law. The house also becomes the platform for the individual and society's day-to-day activities and most importantly cultural and religious festive.

Figure 3-2: The Malay floor culture
(Source: Gibbs, 1987, p. 24)

Figure 3-3: The Traditional Malay House as a human body
(Source from Ismail & Ahmad, 2006)

Figure 3-4: Family cooperation in building the house in Kampung Rusila. Awang replacing palm trunk sections with cement house support blocks while his wife and three children providing the leverage, in 1966

(Source: Strange, 1981, p. 138)

3.1.2 BUILDING CONSTRUCTION

The construction of TMH aims for non-permanency and expendability (Gibbs, 1987, p. 9). It uses basic and flexible construction methods to support the multi-structure system and allow a particular structure to be prefabricated, expanded or dismantled without affecting the other. These methods are achieved by the use of timber as the main material.

3.1.2.1 BASIC CONSTRUCTION METHOD

TMH is a post and beam structure. It is also a prefabricated housing system. Modular elements such as plinth, timber frame, roof, floor, wall, staircases and decorative elements are usually made earlier and assembled on the building site. The timber frame members are connected using mortise and tenon as well as lap and dovetail joints. The flexibility of prefabrication and dismantlement of TMH is accomplished by the use of timber wedges (*baji*) which allows mortise and tenon joints to be tighten or taken apart (Yuan, 1991, p. 105).

The posts are the most important part of the traditional Malay house (Nasir & Wan Teh, 1996, p. 18). As the continuous structural members, they carry the weight of the house to the foundation, pinned by timber beams and timber wedges. Number of posts used in the *rumah ibu* is one of the characteristics that differentiate TMH in different states (Gibbs, 1987, p. 34). For instance, TMH in Negeri Sembilan and Kelantan are known as *rumah tiang dua belas* (twelve-post house) while TMH in Pahang are known as *rumah tiang enam belas* (sixteen-post house).

Figure 3-5: Construction elements of TMH

(Source from Ismail & Ahmad, 2006)

Figure 3-6: Construction joints of TMH

(Source: Yuan, 1991, p. 104)

The walls and windows of TMH extend from floor to the roof, and broken into one or three sections. The top section of walls and windows is made up of fixed ventilation panels decorated with carvings or wooden grills while bottom section is always closed by railings or wooden carved panels. These modular infill panels are placed between the posts. Traditionally, the walls are made from woven leaves such as *bertam*, *rumbia*, *sago* and *nipah* as well as wattle-work made of bamboo strips or tree barks. Walls in modern TMH are made of plain wooden panels arranged vertically, horizontally or diagonally.

The floors sit on the timber beams at sufficient height above the ground. They usually are nailed to the floor joists using tongue-and-groove joints with gaps in between. This gap facilitates the women in maintaining the house where dirt and water from sweeping and washing can fall through to the bottom of the house.

Figure 3-7: Ventilated windows and walls of TMH

(Source: Yuan, 1991, p. 62 & 109)

The dominant features of TMH is the gable roof (Yuan, 1991, p. 110). Typically, the roof is sloped at 45 degrees and covered at both end by wooden panels called *tebar layar*. The roof shapes and designs such as *bumbung perak*, *bumbung limas*, *bumbung panjang* and *bumbung lima* will influence the house form and differentiate the houses in different regions. Regardless of its type, the roof will be supported by kingpost. The simplicity of the roof's construction and design has allowed for additional house expansions.

Stairs and built-in furniture are the minor elements of TMH. Typical TMH has at least three stairs, each at the front, *selang* and back door. In certain houses, the stairway occupies substantial area and is terraced with a platform for sitting. This stairway is called *beranda* (Nasir & Wan Teh, 1996, p. 21).

Figure 3-8: Roof types of TMH
(Source: Yuan, 1991, pp. 22-25)

Figure 3-9: Stairs and *beranda*
(Source: Yuan, 1991, p. 48 & 49)

3.1.2.2 EXPANSION SYSTEM

After the *rumah ibu* is built, the Malays will add a range of additional spaces according to the needs, means, constraints and socio-economic contexts of the families (Yuan, 1991, p. 116). The expansion is usually done during off-seasons where the Malays will have spare time from the farming and fishing activities. In certain cases, the expansion is done according to the families' financial resources. These factors contribute to a slow but sophisticated expansion system which takes the account of the core house. It develops from *rumah ibu* to *serambi gantung*, *dapur*, *lepau* and *anjung*.

The system can be examined from the attachment detail in TMH's method of construction. *Serambi samanaik* is built on the same level of the *rumah ibu* while *serambi gantung*, *lepau*, *jemurung*, *pisang sikat* and *rumah dapur* are often at the lower level, depicting the extension process (Figure 3-12). The existing structure will neither be destroyed by the additions nor will be damaged by its disassembling.

Figure 3-10: Common Addition Sequences

(Source: Yuan, 1991, p. 129)

Figure 3-II: Possible expansion possibilities

(Source: Yuan, 1991, p. 119)

Figure 10. Illustrating the method of attachment of the *serambi gantung* to the *rumah ibu*.

Figure 11. Illustrating the method of attachment of the *lepau* to the *rumah ibu*, the *serambi samanaik* and the *serambi gantung*.

Figure 13. The *serambi gantung* has been added to the *rumah ibu* at a lower level. The *pisang sikat* is placed at the end of the *serambi gantung*.

Figure 14. Illustrating the method of attachment of the *jemurung* to the *serambi gantung*.

Figure 3-12: Method of attachment in TMH's construction

(Source: Gibbs, 1987)

Typically, extended structure such as *lepau* and *serambi gantung* will be covered by rows of timber shuttered windows or openings on each three sides of its walls while carved or latticed panels are placed above and bottom of each openings. In certain cases, the structure will be covered by inferior cladding materials and replaced by more extensive material at later dates (Gibbs, 1987, p. 23). The location of the covered entrance, *pisang sikat* will correspond to the expansion phases of the house. It is first placed on the side of the wall, relocated to the end of the *serambi gantung* when the *serambi* is added and later to the *lepau* when the *lepau* is added (Gibbs, 1987, p. 31). Similar to the columns and

roof type, variation of extension arrangement results to different type of Malay house in each region.

However, the entire TMH can also be built at the same time. In this case, *rumah ibu*, *serambi samanaik*, and *rumah dapur* are built first. A bigger and better *rumah dapur* would be built if the occupants' needs increase, replacing the original one. In certain parts of Peninsula, components of the house would be divided between the children when the parents are dead. The components will then be attached into their own houses.

3.1.3 CLIMATIC CONTROL

The principal idea of thermal comfort in warm-humid Malaysian climate is to minimize solar heat gain and maximize heat dissipation through ventilation and evaporative cooling (Yuan, 1991, p. 71). TMH is considered as the optimal shelter system due to its deep understanding and adaptation of the local climatic conditions.

TMH is known as the house that breathes. Every aspect in the roofs, walls and floors of TMH is designed as a unique ventilation system that allows air into and out the house. Overlapping panels of woven palm leaves roof (*atap*) is an effective means of thermal insulation as it does not transmit heat. Hot air from the interior of the house exits through the gaps in the thatched roof and voids in the gables. The *tebar layar* in the gable is also designed to direct wind into the roof space and facilitate the air-ventilation (Yuan, 1991, p. 110). At the same time, the trussed roof structures are designed with different pitches, wide eaves and gable-side overhang. These large overhangs do not only provide good shading but also direct the rainwater fall further away from the wall (Mohamad Rasdi, M.T, et al., 2005, p. 32).

Figure 3-13: Lightweight construction and prefabrication system made shifting house components possible

(Source: Yuan, 1991, p. 105)

Figure 3-14: Climatic Design of the Traditional Malay House

(Source: Yuan, 1991, p. 71)

Figure 3-15: *Atap* (thatched palm roof)

(Source: Gibbs, 1987)

Figure 3-16: *Tebar layar* (gables)

(Source: Gibbs, 1987, p. 11)

Other ventilation voids can be seen in ventilation grilles, located above all windows, doors and interior walls panels. There are minimal partitions in the interior of the house hence better cross-air ventilation. Windows are kept low and usually opened during the day. In certain houses, windows are made of timber louvers, allowing air ventilation even when they are closed. Glare from the surrounding environment is reduced by the low window design, grilles and carved wall panels which control the bright light into the house.

Figure 3-17: Penetrated walls

(Source: Yuan, 1991, p. 74)

Other integrated ventilation system is the gaps in the flooring construction which allows cool air to enter from the bottom of the house. The width of the gaps is different in certain sections of the house. For instance, gap in the *para* kitchen floor is wider to allow water drops and dry the dishes.

Figure 3-18: Gaps in timber floor

(Source: Mohd Tahir, et al., 2006)

Material

Before the introduction of new building materials, Traditional Malay House was entirely built from the available natural materials found around the site. A simplest house could be made from cut jungle poles, bamboo, rattan ropes and palm trunks and leaves. Walls were made from either split and flattened bamboo or wooden blades of bamboo called wickerwork while the roofs were from thatched palm or sago leaves (Nasir & Wan Teh, 1996).

Later, corrugated iron roof is widely used, replacing the *atap* roof. In modern TMH, the use of glass has result to the loss of its openness qualities. Timber window panels are replaced by movable glass louvers fitted with iron bars. Sometimes, the glass windows are built half-length and do not extend to the floor level (Yuan, 1991, p. 108). The timber flooring has slowly been covered by PVC or rubber mat, preventing the air from entering the gaps between the floor planks. The changes of materials and external appearance of TMH reflect the changing aspiration of the traditional Malays towards relative wealth and status of the family. Unfortunately, these changes also result to the loss of its aesthetic and climatic qualities. The house becomes hotter and uncomfortable to live in.

Figure 3-19: Thatched palm roof is replaced by the corrugated iron
(Source: Gibbs, 1987)

PART II FACILITATING THE CUSTOMS OF TRADITIONAL MALAY WOMEN

3.2.1 SPATIAL ORGANIZATION: RESPONSES TO CULTURE AND REGION

There are several rules of spatial organization employed in TMH in order to accomplish cultural harmony. Rule for achieving spatial hierarchy and sizes of spaces are responses to the cultural needs of the Malays and realized through the concepts of multi-structures, expansion system and privacy (Gibbs, 1987). Located at the front of the house, *serambi gantung* is the first space encountered by guests after the main staircase. It is attached to *rumah ibu* at a lower level and is usually used for entertaining the male guests. As a formal space, it is the most celebrated and highly decorated space of the traditional Malay house.

Hierarchy of spaces and spatial boundary in TMH house are created by placing the most important sections on a higher level from the others (Gibbs, 1987, p. 23). This height hierarchy illustrates the fundamental of respect for one another particularly to the leaders and elders in the Malay society. This doctrine, called the *budi* (etiquette) and *bahasa* (language) is taught at home particularly to the children. If a child is to walk in front of a sitting elderly, he or she must bow along the way. To avoid the impropriety of children walking in front of the elders, the guests' *serambi* area is separated from the private living spaces and other activities of the house through the difference in levels and placement of internal walls. Thus, guests sitting on a lower level of the *serambi* would feel comfortable to converse without disturbing the occupants of the house (Gibbs, 1987, p. 27). Besides, the higher floor levels are the more private spaces. The *selang* or internal courtyards are erected lower than the *rumah ibu* and *rumah dapur* to impose this transition boundary. The women usually used this space for informal social interactions, particularly during neighbourly visits. Some people used it for domestic activities such as doing laundry or cooking preparation. In the *rumah dapur*, the cooking area is built lower than the eating area because the cooking task is usually wet and messy.

Figure 3-20: Enclosed and open *serambi*

(Source: Yuan, 1991, p. 51 & 53)

Figure 3-21: Inside the *selang*, dictating different floor levels
(Source: Yuan, 1991, p. 53 & 55)

Figure 3-22: Entertaining guests
(Source: Mustafa, 2010)

Figure 3-23: Mother sewing on the floor
(Source: Yuan, 1991, p. 85)

Influenced by the Malays embracing the culture strongly in their lifestyle, sizes of spaces in the traditional Malay house are based on a practical calculation of serving the purpose of cultural gathering. *Serambi* and *lepau*, referred as extra spaces, are built when the family increases or when extra space is needed. They are used during *kenduri* (a feast, usually a gratitude for the newborn or good fortune), a wedding or when there has been a death in the family. According to Ariffin, sizes of extended *serambi* and *lepau* spaces could be determined by *dulang* theory, floor mats (*Mengkuang*), praying mats or number of people expected in a ceremonial activities (as cited in Ismail & Ahmad, 2006). Usually, *lepau* is required to accommodate forty people sitting around the closely arranged ten platters (*dulang*) of dishes. The traditional Malays also use floor mats or praying mats to cover the timber floor during *kenduri*. The modular size of these mats made it practical to estimate the size of the space needed for the function.

The Malay culture is popularly known as a floor culture. Traditional Malays sit, sleep, pray and work on the floor (Gibbs, 1987, p. 24). Islamic law specifically requires the person and the place to be cleaned before any prayers can be performed. Therefore, the Malays would take off their shoes and walk with their bare foot inside the house to ensure its cleanliness. Windows are designed lower and often, down to the floor-sill level to suit the posture of the Malays sitting on the floor with their legs crossed or stretched in front of them. This window design also enables visual interaction with the exterior and provides effective ventilation at floor level throughout the house (Mohamad Rasdi, M.T, et al., 2005, p. 29). In the rural area, many traditional Malay families still practice the floor culture, minimizing the needs for furniture and use of appliances hence more spacious spaces.

Raised floor construction resembling a stage is common with TMH. It is perhaps the best solution for protection from wild animals, heavy tropical rain accompanied by flash flood and occasionally heavy seasonal flooding (Mohamad Rasdi, M.T, et al., 2005, p. 29). With the raised floor, occupants have the advantages of extra space for storage and outdoor activities (Gibbs, 1987, p. 12). Many traditional women perform domestic chores under the house while the children play in the house compound.

Figure 3-24: Mother weaving atap roof under the house. At the back is hanging laundry and stocked rice

(Source: Yuan, 1991, p. 91)

Figure 3-25: Adults preparing food while children playing on the *pangkin* (timber stage) beneath the house

(Source: Mohd Tahir, et al., 2006)

In certain part of the peninsular such as Melaka, internal courtyard in TMH serves as an important place for the families' activities and social interactions. It separates the components of the house into different ownership, particularly if there are multiple families living in the same plot of land.

3.2.2 WOMEN IN THE TRADITIONAL MALAY HOUSE

3.2.2.1 PRIVACY FOR WOMEN

Privacy for women in TMH is based on traditional concept of community intimacy and religious requirements towards separation of gender.

In traditional Malay culture, importance of community rather than personal intimacy can be seen from the lack of physical separation in the TMH (Yuan, 1991, p. 84). This concept is developed from the traditional practice of cooperation and sharing of knowledge, skills and labour. Community intimacy influences social preference towards shared spaces hence the open and flexible interior space with minimal internal walls. Moreover, exclusive use of a particular space by individuals is not common in traditional Malay culture except the room for parents or married couples. Instead of physical separation, privacy is defined by shared societal values (Hashim, Ahmad Harizan & Abdul Rahim, 2008). For instance, children are taught not to enter parents' bedroom although rooms in certain TMH do not have doors.

Figure 3-26: a) Steps as an ideal meeting place for the young; b) the adults use the courtyard for washing and drying clothes, preparing food or relaxing in the evening; e) *Rumah dapur* is opened to internal courtyard

(Source: Gibbs, 1987)

However, adhering to the Islamic teaching, TMH is built to control gender separation by accommodating them into specific sections (Nasir & Wan Teh, 1996, p. 15). Male guests are entertained at the front portion of the house (*stairs, anjung, serambi*) but they cannot enter the middle portion (*rumah ibu*) and *rumah dapur* because it is reserved for the family members and female guests. Physical manifestations such as plans, multiple entrances and spatial arrangements in the house also support the women's ability to be unveiled at home. As the men use the front entrance, entrances in the *selang* or in the *rumah dapur* are used by women and female visitors to enter the house, visually protected from the visitors in the front area. During a *kenduri*, these side entrances are only used by the female relatives and friends to go to the kitchen and help with the cooking and food preparations.

Figure 3-27: Women gathered at the *selang*'s entrance

(Source: Yuan, 1991, p. 83)

TMH in different regions have different space organizations and approaches in regard of privacy for women. The absence of internal walls between the main and middle house in

Kelantan and Terengganu's TMH has result to a more exposed interior space. However, privacy for women is maintained towards the end of the house. The passage at the back of the house acts like the *serambi*, except it is used for entertaining close female friends.

Figure 3-28: Traditional Malay house in Kelantan and Terengganu

(Source: Nasir & Wan Teh, 1996)

The passageway in Melaka and Negeri Sembilan TMH are bigger compared to other TMH. The middle area of Melakan TMH is opened to the private internal courtyard enclosed by walls at both ends. Women use this area for social interaction and domestic activities without the need to cover their *aurah*.

Figure 3-29: Middle area of Melaka TMH

(Source: Yuan, 1991)

Figure 3-30: Middle area of Negeri Sembilan's TMH

(Source: Yuan, 1991)

Compared to other TMH, TMH in Kedah, Perlis, Pahang, Pulau Pinang and Selangor do not have *selang* as the second entrance or as the passageway between different structures of the house. TMH in Kedah, Perlis and Pahang consist basic structures of *serambi*, middle house and kitchen. Female guests are entertained in kitchen or the enclosed middle area. Privacy of the family in Kedah and Perlis's TMH is maintained in the inner house by the internal door. The middle area also separates the main house into two wings; women use one part of the house to sleep while men use the other.

Figure 3-31: TMH in Kedah, Perlis and Pahang

(Source: Nasir & Wan Teh, 1996)

In Pulau Pinang's TMH, women are entertained in the kitchen area at the back or in the *lean to*; a structure attached to the house, most probably erected as an expansion over time. The separation of kitchen and *lean to* has given more visual privacy to the family in the middle area during social interaction. In Selangor, occupants maintain the privacy of middle area to the family and build the kitchen area bigger to provide an extra space for female social interaction. An extra room is also provided as a separate sleeping place for the daughters.

Figure 3-32: TMH in Pulau Pinang and Selangor

(Source: Nasir & Wan Teh, 1996)

Privacy in traditional Malay culture is also believed to be “more of a state of mind rather than access to unshared spaces” (Strange, 1981, p. 137). Male family members may work alone on some chores outside or taking naps in certain edge of the house when the women are doing her activities. However, traditional Malays also concern for each other’s wellbeing particularly regarding safety. Mothers keep an eye on their children silently and know every details of their movement. There is no necessity for separation from other people as inaccessible private spaces may suggest possibility of unacceptable behaviour. However, temporary or flexible separations are sometimes used to define privacy during certain times of the day. A cloth partition emphasizes separation for the children’s sleeping places at night, but will be folded during the day. The means of separation in TMH changes at later time according to the economic status of the family. Wealthy villagers built their houses divided by permanent walls rather than cloth or woven partitions results to rooms with closed doors.

3.2.2.2 THE WOMEN’S DOMAIN

In Malay culture, the house is the domain of the woman. As the men work outside, the women carry out the duties of the households and spend most of their time in the house. *Ibu* means mother and *rumah* means house; thus it is appropriate to consider *rumah ibu* as the most important part of the house (Gibbs, 1987, p. 8).

Other important domain for the women is the kitchen. The women cook, wash, eat and socialize in this area. The walls are often clad with *atap* or crude matting while the roof gables are built with voids to allow better ventilation for the women during the heat of the day (Gibbs, 1987, p. 30). Certain walls are cantilevered to provide *para*, storage or drying racks. To some families, kitchen becomes their favourite place to hang out. Most kitchens are big because it serves as an important place for the women to prepare food during cultural functions.

Figure 3-33: *Para* and on-ground kitchen

(Source: Yuan, 1991, p. 55 & 51)

In some houses, a space called *yo yo* is prepared for traditional women about to give birth. It can be found in the floor of the *serambi samanaik*. It measures the length of the body and is slightly broader. The floor boards are narrower and more widely spaced than in the rest of the house (Gibbs, 1987, p. 26). In other houses, the expectant mother will lie on a clean mat on the floor, screened off from the rest of the house by a portable screen or cloths hung from wires overhead (Strange, 1981, p. 71). After the birth, the young mother will lie on the special “roasting bed” previously constructed by the husband or father. It is made of wood and bamboo platform with many holes. Pandan mat is put above the bamboo while metal containers filled with hot coals are placed below it. The women will use the special bed on and off, day and night for a period of 20 to 30 days of the post-partum period (Strange, 1981, p. 72).

Women’s domain outside the house includes communal well and washing spots along the river. Traditional women will meet and socialize with others while bathing or doing their daily washing chores. For instance, everyone in Kampung Rusila during the 1960s bathed publicly. However, the changes in concept of privacy and use of space in the later version of TMH have result to inclusion of this domain nearer or into the house. Residents started to build outhouse toilets. More improvements are later adopted; kitchen, bathing room, toilet and a well inside the kitchen are preferred to be built on ground, extended from the elevated house. As a result, women did not have to go outside to collect water or perform the domestic chores (Strange, 1981, p. 137).

Figure 3-34: Yo yo. The floor will be covered by timber plank and serves as normal floor when it is not used.
(Source: Mohd Tahir, et al., 2006)

Figure 3-35: Floor plan of a village house showing phases of extension
(Source: Strange, 1981, p. 35)

Figure 3-36: Bathroom in the house
(Source: Yuan, 1991, p. 62)

PART III DISCUSSION

3.3 DISCUSSION

The spatial layout and construction of TMH are informed by the religion, tradition and cultural practices of the Malays. It is based on the principals of multi-structures and prefabricated construction system which aims for non-permanency and expendability. Maintenance of customs and religious requirements such as privacy are facilitated by spatial organizations. The hierarchy of spaces and separated house sections support gender separation especially during social functions. Privacy for the women is also achieved by shared societal and religious values. Privacy for the women is respected by all; although the house has minimal solid internal separations, traditional practices ensure a woman's privacy is not violated. The women's domain such as kitchen, courtyard and bathroom are often thoroughly built and designed to meet the needs of the women, both in terms of privacy and for socialization.

The concept of flexible expansion system enables the house to be built with a small investment and expanded when the needs of the families grow or when the family has the financial means to upgrade the house. TMH is also designed as a unique ventilation system. The raised floor, open plan, perforated building elements and the use of natural materials for construction is a response to the warm-humid climate and ensures the thermal comfort of its occupants. The next chapter will look at the terrace housing in terms of its development in Malaysia and its inadequacy in terms of facilitating the continuity of Malay traditions.

CHAPTER 4 CRITIQUES OF TERRACE HOUSING

This chapter will study the suitability of terrace housing as the urban living environment of the modern Malays. The first part of the chapter looks at the introduction of terrace housing in Malaysia, its development after the 1970s urbanization due to mass 'rural-to-urban' migration. This chapter will also provide an overview of the design layout and spatial organization of typical terrace housing. The second part of the chapter explores the appropriateness of terrace housing design to Malay culture. It focuses on needs of the Malay women in terms of religious requirements and her safety. This chapter also looks at examples of users' adaptation of terrace housing to satisfy the needs and lifestyle of Malay families.

Figure 4-1: Double storey terrace housing in Klang Valley

(Source: Mohd Salleh, 2010)

PART I MALAYSIA'S TERRACE HOUSING

4.1.1 INTRODUCTION TO TERRACE HOUSING IN MALAYSIA

The history of terrace housing dates back to the Industrial Revolution in Europe in the 1700s where it was found that mass-production technology could solve architecture and planning development in long term. This new technology changed the methods of construction through the offering of standard size components such as bricks, floor and staircase units as well as pre-cast concrete structural units.

Figure 4-2: Terrace housing in Bethel Place Area, London, 1800

(Source: Muthesius, S., 1982, p.108)

Together with standardized plans and building processes, the technology has speeded up the housing construction at an economical cost. Houses were built in rows; each separated by party walls became the style for middle class worker housing in industrial districts during the great industrial boom. Due to the variations of terrace houses achieving very high densities, this type of house later became so fashionable that by the end of the 19th century, a huge majority of the middle and lower class Englishmen lived in neatly ordered and moderately ornamented terrace housing (Muthesius, 1982).

Figure 4-3: Four-bedroom house in Cardiff, UK, 1904

(Source: Muthesius, 1982, p. 108)

Figure 4-4: War terrace housing in Coryton estate, United States by Geoffrey Jellicoe

(Source: Jensen, 2008, p. 317)

Likewise, various terrace housing cum social housing projects commissioned in other countries aimed to cater to the needs of different populations. Jellicoe's nearly all flat-roofed terrace housing in moderately Modernist design were commissioned early in the Second World War to house the war-workers in the United States; the houses include air-raid shelter as protection from bombing (Jensen, 2008).

Before the development of the transport system, terrace housing was popular during the second half of 19th century in large cities and towns such as Sydney and Melbourne because it provided residential areas close to the place of work (Howells & Morris, 1999).

Figure 4-6: Two storey row houses (one unit per floor) by Pierre Jeanneret in Chandigarh, India. Personal domestic activities are allocated at the front and rear yards for the ground floor unit and at the roof terrace for the upper unit

(Source: Khan, Beinart, & Correa, 2009, p. 131)

Figure 4-5: Pembroke Terrace in Sydney, a typical example of a stark early terrace house streetscape close to the city centre, in 1871

(Source: Howells & Morris, 1999, p. 6)

Figure 4-7: Boom-style Rochester Terrace in Melbourne demonstrates how commodious terraces with grand, colonnaded facades can produce high quality urban environments with part-private, part-public garden. Australia's terrace housing features include shaded verandah

(Source: Howells & Morris, 1999, p. 11)

4.1.1.1 THE CHINESE SHOP HOUSE

The first appearance of terrace housing in Malaysia was the Chinese shop house, usually two storeys high, with the lower floor used for trading and upper floor for residential purposes. The design was brought in by the Chinese immigrants who came to Penang during the boom in trade in the 19th century. Early masonry shop houses were 6 to 7 metres wide and 30m deep, sometimes extending to 60 metres. The shop houses were later adapted to suit the Malaysian culture and environment.

The typical feature of the shop house was the central courtyard, situated in the centre of the house layout and surrounded by high walls. The courtyard provides ventilation and natural lighting into the rear section which has windows opening into the air well. When the value of space increased, the courtyard was reduced to an air well. Dining area, kitchen, bathroom, toilet and drying area are located at the end of the building. Other typical features included jack roof (smaller roof raised above the main roof to allow trapped hot air in the house to escape) and low shuttered windows on the first floor's front.

Figure 4-8: A row of Chinese shop houses

(Source: Fee, 1998, p. 91)

Figure 4-9: Early timber shop houses in Penang

(Source: Fee, 1998, p. 90)

A minimum five-foot-wide veranda on the ground floor was imposed by the British administration at the time to address the extreme of the tropical sun, rain and to create pedestrian linkages. Shopkeepers used this shaded area for displaying products (Fee, 1998, p. 91).

Although the decorative style on the facade of the shop houses later varied from Neogothic, Baroque and Classical to Palladian, the concept of Chinese shop houses remains the same; it catered space for the trading profession and residential all in the same structure. The construction reached its peak in 1920s during the rubber boom and slowed down during the 1930s depression until World War II. From the 1960s onwards, the forms of these shop houses were continued without excessive ornamentation due to the arrival of International Modernism. The land value rose, thus shop houses were built taller, sometimes up to four storeys. In the 1980s, shop houses were built in modern guise in the housing estates and new towns.

Figure 4-10: Malaysian shop house styles

(Source: Muthesius, 1982, p. 90)

Figure 4-11: Five-foot way on the ground floor of the shop houses

(Source: Fee, 1998, p. 91)

4.1.1.2 THE MELAKAN TOWNHOUSE

Another type of Malaysia' early terrace housing is the elongated Melakan townhouse in Melaka, occupied by the Chinese traders marrying the local Malays. It is another example of urban Chinese house from the 17th century, assimilated with the cross-cultural tradition in building methods, construction materials and ornamentation. Instead of shops, the ground floor of the Melakan townhouse becomes the personal residential space (Fee, 1998).

The design of the Melakan town houses reflects the lifestyle and culture of its occupants. Privacy for instance is expressed by the decorative carved half-doors on the main entrance and screens located in the reception hall and the guest sitting room, separating public and private domains. The private areas which consist of the rest of the ground floor and first floor are connected by covered passages and internal courtyards. Religious rituals are performed in the reception hall and ancestral room furnished with altars. In some houses, a trap door is located at the back of the house to allow the residents to board boats at high tide. This townhouse became a major building type by the end of the nineteenth century. However, the designs were simplified and modern materials were used by the developers, creating contemporary, medium and low-cost housing for the majority.

Figure 4-12: Melakan townhouse

(Source: Fee, 1998, pp. 92-93)

4.1.1.3 TERRACE HOUSES OR LINK HOUSES

Between 1947 and 1957, opportunities for participation in commercial and trading activities in the urban areas have resulted in significant rural-to-urban migration. The number of indigenous (i.e. Malay) people to live in the cities and towns in particular, have increased by more than 100 percent of the urban population at the time (Sendut, 1966, p. 485). Out of the total population, the urban population increased from 10.7% in 1921 to 49% in 1990 and 60% in the year 2000 (Hassan, 1999, p. 3). Between 1950s and 1960s, with 34% of the population lived in places with a population over ten thousand people, Malaysia was then regarded as the most highly urbanized nation in Southeast Asia, with the exception of Singapore (Sendut, 1966, p. 484). As a result, mass residential housing ranging from low-cost houses and flats to medium-cost terrace houses and apartments to high-end bungalows and luxury condominiums were introduced in Malaysia in 1980.

Most population do not like to live in high-rise apartment and prefer living at ground level hence the terrace house are the most common and favoured housing type in urban areas (Hassan, 1999, p. 12). Housing census of Malaysia recorded 456,700 terraced houses were built in 1980. The number increased to 1,074,000 in 1991 (27% of the dwellings in Malaysia) and 1,806,929 in 2000 (32.6%) (Department of Statistics Malaysia, 2005). Meeting the demand of housing on the ground, the introduction of terrace housing was also encouraged from the technology it offered. These mass produced buildings are generated from the need of technical efficiency (fast construction process), rather than support for any cultural consideration (Gibbs, 1987, p. 1).

The rapid development pace has resulted in insufficient time to draft a set of more flexible by-laws. Thus, planning law, building codes, regulation and construction systems for terrace housing in Malaysia have been adopted from Western practices and forbidding housing development based on traditional concepts (Hassan, 1999). The new regulations also promote building setbacks, minimum house plot size, new type of gridded street, heavy weight construction and the use of bricks and reinforced concrete as building materials, (Hassan, 1999).

Figure 4-13: Terrace housing configuration in the Klang Valley housing estates

(Source: Fee, 1998, p. 120)

About 40 to 50 terrace house units can be built in one hectare land. Each unit occupies a rectangular lot, between 130 and 170 square metres. The corner lot is usually twice as large as the intermediate unit. The rows are built up to 110m long with small lanes acting as fire-breaks. The self-contained Subang Jaya Township is one of the largest housing estates in the country. It was first developed in 1970s and now contains various adaptations of terrace housing types. A typical housing estate is designed in a grid-like network infrastructure consists of main ring road and several feeder roads. Rows of houses are arranged in a linear back to back layout with a service lane in between. Reserved areas (for schools, civic buildings and mosques) and open areas (for playgrounds and playing field) are often allocated as stated in the planning law (Fee, 1998, p. 120).

Figure 4-14: Housing development in Klang Valley

(Source: Fee, 1998, p. 120)

Figure 4-15: Malaysia's terrace housing adapted its configuration layout from the United Kingdom's terrace housing configuration. Picture showing neighbourhood of Upland Roads, London in 1980s

(Source: Muthesius, 1982, p. i)

4.1.2 OVERVIEW OF THE DESIGN LAYOUT AND SPATIAL ORGANIZATION

According to the Department of Statistic Malaysia, terrace houses are defined by houses built in rows of three or more, with each house having a common wall or walls adjoining the next house. It also includes cluster houses, which are attached to one another in various ways either at the front or at the back, but not in the form of terrace houses (Department of Statistics Malaysia, 2005). The design typologies and affordability vary; however combination of the spatial constraints and adaptations from the Western terrace houses and 18th century Chinese shop houses has result in what is described by Fee (1998) as “predictable and mundane deep living spaces, small rear kitchen and bedrooms with toilet on the second floor”. They are also not often moulded by the social and economic needs of a typical Malaysian family. As stated by Wong, “in spite of their myriad appearance, these housing estates have essentially the same layout –mirror image to each other”(Hassan, 1999, p. 5).

The early low cost terrace houses in Malaysia have a small built area. There were 44 units per acre, and the floor area is 672 sq ft per unit. Before the government stated that there should be a minimum of three bedrooms per house, the terrace houses were built with two bedrooms on the first floor. Spaces on the ground floor include living, dining and kitchen.

Figure 4-16: Clay brick double storey house in Kajang, Selangor. Terrace housing in Malaysia is characterised by deeper front yard and built-in car porch

(Source: Star Property, 2009)

Figure 4-17: Example of plan of 2 storey terrace houses (low cost) in Penang

(Source: Wahab, 1991, p. 26)

Figure 4-18: Two-storey terrace housing in Taman Royal Lily Plan, Perak.

Retrieved from www.lbs.com.my

Figure 4-19: Houses in Noel Park, North London, 1833. Among the first terrace houses featuring porches and non-hall entrance

(Source: Muthesius, 1982)

4.1.2.1 DOUBLE STOREY TERRACE HOUSING

Typical lot for two-storey terrace housing ranged from 20' x 70' (6.096m x 21.336m), 22' x 60' (6.706m x 18.288m), 22' x 70' (6.706m x 21.336), 22' x 80' (6.706m x 24.384m) and 24' x 90' (7.3152m x 27.432m) with gross built up area around 1300 to 1600 sq ft (120m² to 149m²). It could be seen that the typical floor plan of the terrace houses was derived from English terrace housing layout, however with adaptations to meet local and tropical environment. In English terrace housing, spaces are separated by walls to maintain thermal comfort and prescribed with particular functions such as passage entrance, living and dining. On the other hand, living, dining and sometimes the kitchen in Malaysia's terrace houses are designed as one open plan to allow for better ventilation. This approach although socio-culturally not ideal is to allow for flexibility of functions; a solution for limited floor area.

Double bedroom or utility room is usually built next to the kitchen, and often converted into a maid's room. It is sometimes converted to a guest room; this reflects the cultural norm of receiving guests. A bathroom for use of guests and the maid can be accessed from the kitchen. A setback of 6m at the front of the house is allocated according to the district plan for a car porch and small green garden while a 3m setback at the back is for sewerage services. Many occupants place their laundry in this rear yard, covered with an extended roof.

The staircase which often designed at the simplest becomes the main feature of the living space. It is visible from the entrance, living and dining spaces. The master bedroom with bathroom is situated on the upper floor, exclusively facing the front yard while two double bedrooms face the rear yard. The second bathroom is either connected to the rear bedrooms or accessible from outside the rooms. For larger built up area, there is a family area on the first floor as a private gathering space.

Figure 4-20: Typical three bedroom one-storey terrace housing in Taman Metro Pengkalan
(Source: Hua Yang Berhad, n.a.)

Figure 4-21: Double-Storey terrace house with internal courtyard, wet and dry kitchen in Taman Suriza.
(Source: Petrajaya Properties, 2009)

4.1.2.2 SINGLE STOREY TERRACE HOUSING

The design for the single storey terrace housing differs but shares the same deep spatial configuration as the double terrace housing. The gross built up area is typically around 900 to 1000 square feet (83.6m² to 92.9m²). Space in the house includes living and dining room combined as one long space and a kitchen at the back, frequently hidden from the living room. There are 3 bedrooms (master bedroom with bathroom and 2 other bedrooms), utility room (can be converted into small bedroom) and one shared bathroom. A corner lot will usually have an addition terrace next to the dining area.

4.1.2.3 DEFICIENCIES

Several deficiencies of terrace housing design are found in the car porch design, front yard, kitchen and its poor workmanship (Fee, 1998, p. 120). Due to setback rules, the car porch is not always large enough to fulfil its function. There is also limited space for soft landscaping in the front yard. Compared to the emphasis of spacious kitchen in the Melakan townhouse, kitchens in the terrace housing are often so small that they require further extension. Today, the contemporary terrace housing offers more kitchen space in its layout at the expense of higher cost of the property. Wet and dry kitchens are designed as a manifestation of the local cooking culture which is often messy and a meticulous task. As the privacy of the task of cooking is maintained in the wet kitchen, less maintenance will be required for the dry kitchen. Moreover, with the empowerment of women led by rural-urban migration, these kitchens also represent women's changing roles. Today, the tradition of a women becoming the mother of the house is depicted by the dry kitchen becoming her domain. The wet kitchen is the domain of the maid.

Attempts to include internal courtyard is seen as attempt to improve the house design for better air circulation and daylight remittance into the interior. However, this solution is limited to more luxury terrace housing.

4.1.3 CONTEXTUAL SUITABILITY

The environmental suitability of the terrace housing can be summarised into several problems namely poor ventilation, poor thermal comfort, poor natural lighting and insensitive response to seasonal flood (Mohd Tahir, et al., 2006)

Poor ventilation

The absence of sufficient natural ventilation features such as air well, shuttered doors, windows, ventilation panels or penetrated walls which are essential for house-cooling in the hot-humid environment has result in poor air ventilation.

Poor thermal comfort

The Ministry of Energy, Telecom and Posts Malaysia suggests the temperature range for thermal comfort in Malaysia should be between 22 to 26°C while eight studies of thermal comfort in Malaysia agreed that the Malaysian comfort zone should be around 25°C air temperature. However, studies done by Zain show that the temperature range is between 24.5°C and 28°C whereas studies done by Abdulmalik shows that the temperature ranging between 25.5 and 29.5°C, higher than Zain. These results show that the terrace houses in Malaysia usually do not achieve the accepted levels of human thermal comfort. The house is within the hot zone with the Predicted Mean Vote (PMV)¹ ranging between +2 and +3 (Abdul Hussain, Rao, & Woods, 2003).

The reported lack of thermal comfort in terrace housing is mainly due to the poor thermal properties of the building materials and design factors such as building orientation, shading, roof ventilation and activity patterns (Abdul Hussain, et al., 2003). Many design issues such as low ceilings that prevent heat rising, the absent of ventilation louvers in the roof design and the use of glass windows, timber and sliding doors has prevented the dispersion of trapped heat, creating thermal discomfort.

Figure 4-22: Absence of ventilation voids and the use of multiple air-conditioning units per house

(Source: Kong, 2010)

Figure 4-23: Flood in the terrace housing area, Jitra.

(Source: Zainal Abidin, 2005)

¹ The PMV equation indicated the personally experienced deviation to the heat balance -3 (cold) to +3 (hot), seven point scale where 0=neutral.

Today, poor ventilation and thermal comfort are solved by installing an air-conditioning unit in houses.

Poor natural lighting

The deep length of terrace housing plan, partition wall on both sides of the house together with trends of having extensions at the front porch and rear kitchen has caused a minimal source of natural lighting into the house. As roof skylight is not favoured due to the low and straight afternoon sun and the heat it will create, most houses depend on the rear and front windows or sliding glass door for natural light. Some houses are designed with clerestory window or interior courtyard to give extra lighting.

Insensitive response to seasonal flood

Occasionally, flood in terrace housing area is unavoidable.

PART II APPROPRIATENESS OF TERRACE HOUSING TO MALAY CULTURE

4.2. 1 IMPLICATIONS ON URBAN MALAYS' SOCIO CULTURE AND WAY OF LIFE

In the traditional Malay community, cultural, religious gatherings and informal visits are accepted as cultural norms. Many of the spaces of TMH such as '*anjung*', stairs and the highly-celebrated '*serambi*' are designed to suggest a place for these social interactions. Most of the Malays who have migrated from rural to urban areas still practice some of these traditional culture and means of social control, thus creating community bonding within the urban residential neighbourhood (Sen as cited in Hashim, Ahmad Hariza, et al., 2006). Nonetheless, the urban environment and the adoption of Western terrace housing designs have result in unavoidable adaptations to an urban way of life. For instance, understanding towards noise, space and time must be achieved or compromised by the neighbours before any cultural events can take place. This is due to limited yard and living area in the terrace housing design. During social functions such as *kenduri*, the porch and the street will be transformed to cater to guests. Frequently,

Figure 4-24: Celebrating Maulidur Rasul (Birth of the Prophet Muhammad P.B.U.H) by parading and reciting *salawat* around the terrace housing area

(Source: Kasim, 2010)

Figure 4-25: At night, religious talk is held in one of the terrace houses' porch, stretched towards the streets.

(Source: Kasim, 2010)

cooking, washing dishes and preparation tasks are done in the immediate neighbours' compounds. Relatives and neighbours will assist in cooking and catering for the big events.

Nowadays, modern society comprises of office and industrial workers who often spend most of their daytime in their work place outside the home. After working hours, most of the activities are confined to the house such as preparing dinner or spending time with children. In some of the middle class families with working wife, the tradition of preparing dinner at home has slowly been replaced by the culture of eating out. During weekends, the concept for 'personalized family activities' have changed to activities at the shopping complexes or holiday resorts (Mohamad Rasdi, Mohamad Tajudin, 2007, p. 3). High fence and gated houses has led to lack of social interaction hence certain neighbours hardly knowing the other neighbours. Most social interactions in the neighbourhood only occur through informed visits or by formal invitation. Traditional culture such as sharing meals or quick afternoon chat is seldom practiced in the urban area anymore.

Furthermore, living area and kitchen in the terrace housing are often small. This is an advantage for working wives with busy lifestyle as small spaces are easy to maintain. It is also easy for them to visually monitor their children. However, area inadequacy, adapted lifestyles and respecting neighbours' privacy have caused some occupants to be reluctant to host big social functions such as wedding receptions in terrace housing areas. These functions are now often hosted in the parks, community halls or hotels. Those still wanting to hold functions in the house may have to limit the number of guests; a culture that had never been practiced in the traditional community before. Sharing of labour work such as preparing food for the *kenduri*, called '*gotong-royong*' has also slowly been replaced by paid catering services because of the small kitchen area.

In addition, technological innovations have transforming the use of space and time at a faster rate than at any other period since Antiquity (Lawrence, 2000, p. 67). Tendency of having furniture and appliances in the modern society has result in separation and differentiation of spaces. Consequently, the number of types of spaces increases whereas the flexibility of space use decreases. Personalized spaces such as bedrooms are marked as individual territories hence increase of control of space by individuals rather than by family as a whole. Moreover, the size of

Figure 4-26: Eating *kenduri* in small circles after the religious talk

(Source: Kasim, 2010)

Figure 4-27: Men and children eat outside while the women eat inside the house

(Source: Kasim, 2010)

furniture often makes the space feel crowded. The open-plan living in terrace housing design intends to offer diverse possibilities of space arrangements in its limited built area. However, this approach does not respond to the cultural needs for basic privacy and segregation.

4.2.2 TERRACE HOUSING AND THE PROBLEM OF PRIVACY VIOLATIONS

A house should provide its occupants the basic needs for privacy. For instance, most families need certain level of visual privacy and intimacy with family to achieve the utmost personal relationships between its members. However, many problems of privacy violation occur in the terrace housing because the designs do not respond to cultural values and the units are arranged to face other units in a very close proximity, hence the unavoidable violation of visual, noise, smell and familial privacy particularly between opposite neighbours (Hashim, Ahmad Hariza, et al., 2009, p. 202).

Visual privacy is influenced by space orientation and building elements such as stairs, doors and windows (Hashim, Ahmad Hariza, et al., 2006, p. 302). In most terrace housing, entrances are limited to front and rear yards while the stairs are located in the living room, visible from the entrance door (Figure 24 and 27). This design does not give the occupants the visual protection particularly during unexpected visits. Women going upstairs to dress appropriately to receive the guests can be seen from the entrance while other family members on the first floor are restricted to go to the kitchen without interfering the guest in the living room. In certain houses, visual, smell and sound privacy needed by the women towards their kitchen are absent because their domain is open to the living areas (Figure 35). Bathroom on the ground floor is frequently designed near or in the kitchen. Guests have to go through the kitchen to get to the bathroom, again violating the privacy of the women's domain.

Figure 4-28: Kitchen and stairs visible from living room

(Source: Mohd Salleh, 2010)

In several houses, entrance and kitchen doors are designed facing direct to each other. During the day, doors and windows normally will be opened for air ventilation and thermal comfort. A study towards Malay living in terrace housing indicates that many occupants feel they have to sacrifice their privacy if they open the doors and windows because the passers-by can look into their living and dining areas (Hashim, Ahmad Hariza, et al., 2006). Similarly, opening doors and windows for ventilation in kitchen area when the women are cooking also contributes to visual privacy violation from back neighbours. There is also a lack of privacy for the Malay women to enjoy their pastime and do their domestic activities such as drying laundry and heavy cooking outdoor without wearing their *hijab*. This is because outdoor spaces in most terrace houses are limited to front and rear yard therefore visible to opposite neighbours.

Family intimacy, usually related to the separation of family members and separation during social interaction is influenced by availability and organization of space (Hashim, Ahmad Hariza, et al., 2006). In Islam, sleeping places for children of different genders need to be separated when they reach puberty. However, the study towards low cost terrace housing indicates that the separation only occurs between parents and children because there are only two bedrooms in the housing units (Hashim, Ahmad Hariza, et al., 2006). The result of Hashim's study shows that when the bedrooms are allocated to parents and daughters, the sons have to sleep in the living area and have no privacy or place for their personal belongings. When the bedrooms are allocated to both sons and daughters, parents will have no privacy and have to sleep in the living room. In certain cases, bedrooms are divided according to gender where the father and sons sleep in one room while mother and daughters sleep in the other. Thus, separation is maintained but privacy is not provided for parents. There are also cases where bedrooms are allocated to both parents and daughters but the sons keep their belonging in the room. In this case, total privacy and separation are not provided for all members. Nowadays terrace houses are designed with at least three bedrooms, providing separation for parents, daughters and sons. However, the needs for individual privacy have increased that each daughter or son is now accommodated in different rooms.

Figure 4-29: Privacy violations due to close proximity of neighbours
(Source: Mahd Salleh, 2010)

Space organization which is not presented in most terrace housing due to space constraints has led to minimal separation of gender during social interaction (Hashim, Ahmad Hariza, et al., 2006). The living area is designed with open living and dining room with no specific definition or separation for males and females. This sequence of spaces does not provide privacy to the family members especially during the presence of guests. Although males are sometimes entertained in the living area while females in the dining area, most of the time both are entertained in same living room. Even after extension, guests are entertained in the same area because dining and living areas are not separated.

Initially, the perception and the behaviour mechanism towards privacy among terrace housing inhabitants are influenced by understandings of religious requirement (Hashim, Ahmad Hariza, et al., 2006). However, a long-term privacy violations have led to social and behavioural adaptations, particularly towards the traditional Malay idea of privacy (Hashim, Ahmad Hariza, et al., 2006). According to Hashim's study, attitudes towards privacy can be listed as privacy is not negotiable, privacy is compromised and privacy is negotiable. Occupants who feel that privacy cannot be negotiable will make adjustments to their lifestyle and behaviour to maintain privacy.

Most occupants use curtains since they can control views and at the same time air flow into the house. Curtains become very important during the night because they can prevent visual intrusion caused by the use of glass sliding doors and windows. Even so, privacy is still affected if the curtains are opened during the day. Consequently, female family members tend to dress appropriately according to religious requirements. Likewise, behavioural adaptation to achieve privacy in the kitchen is also unavoidable. Back door is only opened when it is necessary. Although it is inconvenient, maintenance of religious requirements is very important to them.

Inhabitants will also modify the house to meet the privacy requirements. In many cases, privacy is compromised for a long time until inhabitants can afford to make physical changes to the house. Some resort to temporary privacy solution such as rearranging the furniture. For instance, cupboard is used to separate living and dining areas (Figure 3-28). Dining table is placed in the kitchen area instead of dining room to give more space for living area or create additional family area. In other cases, privacy is negotiable because inability to have privacy has been

Figure 4-30: Adaptations to achieve visual privacy include the use of curtains and opening windows in the kitchen.

(Source: Mohd Salleh, 2010)

accepted as a way of life. Privacy no longer becomes an important aspect of daily life and the occupants feel that they have no control over the issue even after the house is modified. For instance, some families open the doors and windows because they feel that visual privacy can be compromised for the sake of comfort and convenience. Consequently, appropriate dress according to religious requirements is not strictly followed.

Besides, the Malays living in terrace housing often use cultural norms and Islamic beliefs practiced in the traditional Malay culture to maintain and respect each others' privacy (Hashim, Ahmad Harizan & Abdul Rahim, 2008, p. 98). These include controlling noise, avoiding intentional gaze into the opposite neighbour's house, limiting interaction during certain time of the day and compromising occasional intrusion such as cultural gathering. However, the study also shows several variations towards privacy behaviours practiced in the terrace housing as compared to the traditional culture and religious norms of the Malays particularly regarding accommodating guests (Hashim, Ahmad Harizan & Abdul Rahim, 2008). In several cases, male guests are entertained in the open car porch area because the host wants to maintain the privacy of the house or it is inappropriate to invite non-family male into the house while male family members is absent. Nowadays, families seldom accommodate their relatives for a night stay because they feel their privacy will be affected.

4.2.3 TERRACE HOUSING AND THE PROBLEM OF SOCIAL SECURITY AND SAFETY

Lifestyle changes and problem of privacy violation influence the external and internal social security in terrace housing. Compared to integrated neighbourhood in rural area, terrace housing community has less social intimacy because occupants have limited time to socialize with their neighbours. Less social intimacy leads to low security. Many occupants in terrace housing use territoriality as the environmental privacy mechanism to express their insecurity towards crime, theft and unwanted social intrusion by unknown outsiders and strangers (Hashim, Ahmad Harizan & Abdul Rahim, 2008, p. 100). Fences are often built high while the tinted windows and doors are attached with iron grill. In order to achieve privacy and safety, the gate will be closed and locked most of the time, discouraging interaction with the neighbours.

Figure 4-31: Excessive fences and gates are typical in the terrace housing environment

(Source: Mohd Salleh, 2010)

Although no study has been done towards safety of women in terrace housing, excessive privacy is believed to contribute to crime towards women. Nowadays, modifications to the house such as dividing brick walls have further created visual and sound privacy from the neighbours and sometimes from the members of the family. Crime such as theft, domestic violence or assault in terrace housing areas often occurs without the immediate neighbours realizing about it. It also becomes harder for parents or family members to watch over activities in their children's bedroom once the door is closed. In certain cases, occurrence of improper behaviour such as incest or physical assault happened as a result of the bedrooms linked by shared bathroom.

PART III ADAPTATION

4.3 USER MODIFICATION OF TERRACE HOUSING

In principal, the concept of house modifications suggests that the occupants can change the physical elements of the house to meet the needs of their families. Although terrace housing offer a same layout to all of its inhabitants, many people choose to live in terrace housing because it offers greatest opportunity for modification (Nurizan and Halimah as cited in Hashim, Ahmad Hariza, et al., 2006, p. 302).

Frequently, physical modifications to terrace housing aim to achieve basic needs of the families toward visual privacy and family intimacy (Hashim, Ahmad Hariza, et al., 2006). Most modifications in terrace housing occur to the living area, kitchen and building elements such as location of doors, windows, entrance and stairs as they often contribute to the problem of privacy violations. Study of modification in low cost terrace housing indicates that the stairs are relocated towards the kitchen and hidden from the living area in order to provide visual privacy to the inhabitants particularly during the presence of guests (Hashim, Ahmad Hariza, et al., 2006). Modifications also include an additional living area on the first floor for the use of the family and a proper bedroom for separation of male and female family members (Figure 3-32).

In other cases, some occupants modify the car porch into an outdoor “*serambi*” and entertain the guests in that area because they want to maintain the privacy of the house (Figure 37). It is

Figure 4-32: Before and after modification of two-storey low cost housing
(Source: Hashim, Ahmad Hariza, et al., 2006)

also common to extend the back of the house to relocate the kitchen so it is hidden from the living. As a result, living and dining area becomes bigger. Some families living in one-storey terrace housing convert the dining area into a second living for the family (Figure 38). In other cases, some families purposely change the windows and doors to sliding tinted glass to maintain visual privacy while allowing a view outside (Hashim, Ahmad Hariza, et al., 2006, p. 309).

Figure 4-33: Car porches renovated into outdoor "serambi"

(Source: Mohd Salleh, 2010)

Figure 4-34: Relocation of kitchen and family area to achieve privacy

(Source: Mohd Salleh, 2010)

Another example of modification to achieve privacy is the No Brand House by Y-Shin Architect (Figure 39). Two perforated walls made of cheap concrete blocks are introduced into the front and back of the house, result to transitional space for privacy and optimization of natural ventilation and light penetration.

Other reason for physical modification in terrace housing is to meet the needs of the growing family. Typical terrace housing has three bedrooms while the average Malay household size is 4.8 people (Department of Statistics Malaysia, 2005, p. xlv). Most occupants bought the houses during early marriage or when the children were small hence the sufficient living environment. Nonetheless, family members became older and sometimes bigger in number. To some, the perception of safety and privacy has result to the preference of individual over shared spaces. Some other families will bring the aged grandparents into the house to live as a big family because Islam requires children to be responsible for their parents when they are older. Furthermore, working families nowadays have to consider a proper sleeping place to

Figure 4-35: Privacy in the house

(Source: "Malaysia PAM Award Winner: No Brand House by Y'Shin Architect," 2008)

accommodate a lived-in maid. These basic to extended family structures demonstrate the necessity for bigger or more spaces to achieve the maximum satisfaction for all family members. Nevertheless, physical modifications depend on the financial ability of the occupants.

A study on a terrace house occupied by a family consists of two parents, six children and a maid shows a major modification to the house is made after eight years after the house has been bought. The modification includes extra bedrooms, living area and maid's domain (Figure 41). More bedrooms are provided to separate the family members into similar ages and personalities. They are also useful when it comes to hosting overnight guests and relatives. Living spaces are separated into two areas, one formal than the other and they can provide separation during social interaction. Meanwhile, maid's room is built in the wet kitchen area, separated from the domain of the family in the first floor.

Figure 4-36: Before modification (bought in 1988) and after modification (in 1996)

There are also physical modifications purposely made to cater for socio-cultural needs. For instance, the house is extended at the side, front or back yard to provide an extra space for social and religious gatherings such as wedding and *kenduri*. This type of modification usually does not involve many enclosed spaces but providing shaded area for the guests.

PART IV DISCUSSION

4.4 DISCUSSION

Terrace housing is a time, space and cost-efficient solution designed to cater to the mass housing needs of urban environments. Earlier versions of terrace housing such as the Chinese shop houses and Melakan townhouses in Malaysia reflected local lifestyles and the culture of the occupants. However, current terrace housing is not environmentally, socially and economically moulded to the needs of a typical Malay family and the Malaysian context. The designs are often associated with lack of social intimacy and poor environmental performance. As a result of deficit in built area, the Malay families in particular have to adapt and sometimes discard their traditions, privacy and ways of living. Violation of visual and family privacy in terrace housing is an issue. This is due to inappropriate space orientation, use of building elements such as glazed openings and lack of space between properties facing each other. Hence, social and behavioural adaptations to achieve privacy by Malay women are unavoidable.

The preference of individual privacy over the traditional social intimacy, an outcome of urban living and living in mixed communities has led to excessive privacy amongst Malays. This is believed to compromise the safety of women in domestic environments and contribute to domestic violence and abuse of women. Reasons for user modifications to terrace housing range from basic spatial requirements in terms of traditional practices and thermal comfort, to visual privacy and meeting the needs of growing families. The next chapter will look at how terrace housing design can be improved to make it more suitable for the needs of the Malay women and to suit the Malaysian context.

Figure 4-37: Shaded terrace area

(Source: Mohamed Mokhtar, 2010)

PART TWO: DESIGN APPLICATION

CHAPTER 5 DESIGN PROPOSAL: REDEFINING TERRACE HOUSING

Important finding about the study of Malay women is how the religious and cultural practices as well as the roles of the women must be protected or adapted into the living environment in order to meet the socio cultural needs of the modern Malay women who live in the urban areas. The study then looks at the TMH and how the design, construction and spatial organization of TMH has facilitated the social, cultural and religious needs of the Malay families particularly the women. Having studied the terrace housing, the shortcomings of terrace housing designs are found in the limited built areas as well as inappropriate space organization and building elements which results to the problem of intimacy, privacy and safety for the Malay women as well as environmental performance and adaptability. The design aims to develop a solution for future terrace housing so that it will be more appropriate and suitable to the context of Malaysia particularly the needs of the Malay women.

Tradition can invite interpretation. In principal, tradition requires attention to form and detail to ensure its continuation while negotiation of tradition can allow possible innovation, alteration and extension for social needs (Bronner, 2006). Moreover, intertwining tradition and creativity can give more values and meaning to human expression (Bronner, 2006). In the context of redefining terrace housing, tradition and culture are not seen as a constraint but a framework that allows for choice and adaptation. This chapter explores the design potential of integrating traditional methods and values into modern terrace housing's construction.

Therefore, this chapter will be looking at the design solutions for flexibility of floors and walls that will allow these people to change and adapt the houses to their specific needs using certain construction systems. Based on research findings, this study proposes a raised flooring system, modular screen-wall panels, and flexible flooring construction methods as solution to overcoming the shortcomings encountered in terrace housing by Malay families. It is believed that this would allow for privacy for the women and flexible physical modification and expansion of the families.

5.1 SITE STUDY AND DESIGN BRIEF

5.1.1 SITE DESCRIPTION

Figure 5-1: Malaysia, hot-humid tropical country

Malaysia is located in South East of Asia between Latitude 1 degree and 7 degree of the Equator. Malaysia's climate is hot and humid round the year with high temperature ranging between 22 to 32 degree Celsius and high humidity averaging 75% or more (Wan Ismail, 2005). Although Malaysia is not prone to earthquake, it receives heavy annual rainfall of 2500mm and two seasonal variations (wet and dry) throughout the year therefore the common natural hazards would be flash flood and occasionally heavy seasonal flooding (Mohamad Rasdi, M.T, et al., 2005).

Malaysia is comprised of the Malay Peninsula (West Malaysia) and East Malaysia (Sabah and Sarawak). In 2000, Malaysia has a total population of 23,274,690 people consists of 50.19% Malays, 11% other Bumiputera (aboriginals such as Senoi, Jakus, Ibans, Kadazans etc), 24.46% Chinese, 7.22% Indians and 1.16% others (Department of Statistics Malaysia, 2005).

In the urban context, housing in Malaysia has been built on the ground. Terrace houses in particular are usually built on cleared land or reclamation site. The uncontrolled development of this urban growth has result to flood-prone areas and river pollution (Hassan, 1999).

Figure 5-2: Map of Malaysia which comprises of Malay Peninsula and East Malaysia

(Source: Wan Ismail, 2005, p. 9)

Figure 5-3: Land clearings for building construction especially for terrace houses

(Source: Hassan, 1999, p. 4)

5.1.2 DESIGN BRIEF

Restoring the balance between tradition and modernity requires the development of new architectural prototypes. Based on research findings, terrace housing in Malaysia should be designed with a consideration towards privacy, adaptability and contextual suitability. This will enable not just the Malay community but also other ethnic communities to live in terrace housing in a manner suited to their own cultural traditions.

Privacy

Privacy for the Malay women and her family includes visual privacy. This must be provided from both external and internal environments. Visual privacy from streets, neighbours or the general public is vital. The women and her family should also be provided with visual privacy on the inside, particularly from adult male visitors and guests who are not immediate family. The segregation of space within the family particularly amongst the parents and offspring as required by the religious teachings should be considered in the design of terrace housing.

Adaptability

The design should consider expendability of the house and spaces within to suit the needs of the growing Malay family. An important aspect for consideration in the design of terrace housing should also be different possibilities of adaptability based on the needs of families of different ethnicities and cultural requirements.

Environmental

In order to achieve optimal climatic control, houses in Malaysia should be designed with sufficient ventilation to allow cooling and reduction of the effects of humidity. The house should also use appropriate building materials to prevent heat transmission. It must be protected from rain, periodic flooding and direct solar radiation. Consideration should be given to landscaping for the purpose of natural ventilation and to provide a cooler micro climate around the house and within courtyards.

5.2 PROPOSED DESIGN

This thesis proposes a raised floor construction system that is flexible and prefabricated along with a screen walling system that can be adjusted based on privacy needs. The following section will discuss the proposed systems, the potential they offer and limitations both in terms of design possibilities and suitability to Malay culture and the context.

5.2.1 RAISED FLOOR CONSTRUCTION AND FLEXIBLE PREFABRICATION

Discussion of Precedence

Raised floor construction and flexible prefabrication are construction concept and method ignored in the construction of terrace housing. Raised floor construction methods are used in the TMH and in many traditional cultures across Asia and other regions of the world as a response to contextual conditions, lifestyle and economic status of the inhabitants. In addition to protection from flooding and providing ventilation during the hot summer season, the raised floor protected the inhabitants from dampness rising from the ground. In Malaysia, traditional raised floors were split into levels; these elevated floors due to dryness and cross ventilation made comfortable seating, eliminating the need for furniture. In Japan during the Yayoi Period (3rd century BCE to the 5th century CE), houses were raised for the purpose of storing rice and protecting it from the animals (Itoh, 2004). In the Edo Period (1603-1867), houses with raised floors dictated the status of the inhabitants; the nobility classes always lived in houses with raised floor while the lower classes occupied mat covered dirt floors (Yoshino Antiques, 1999). In the TMH, elevated flooring was used to define male and female spaces; it also provides privacy and family intimacy during social gatherings.

Figure 5-4: Storehouse in Kinoeraba Island
(Source: Futagawa & Ito, 1983, pp. 342-343)

Figure 5-5: Earthen Floored Room in Yoshijima House
(Source: Futagawa & Ito, 1983, p. 143)

Figure 5-6: Evolution of the Japanese houses
(Source: Carver, 1955, p. 26)

Design Potential

By raising the floor of terrace housing, several possibilities in providing better ventilation, natural lighting quality, thermal comfort, family privacy, social functions and environmental solution can be presented (Mohd Tahir, et al., 2006). Improvisation of flexible prefabrication methods as used in TMH into terrace housing design provides an affordable physical adaptation. This also enables some controls to be maintained on the changes being made by the occupants to Terrace housing in their attempts at meeting basic and growing needs.

Proposed Design

The proposed terrace housing consists of two different layouts (Type A and B) organized in a cluster form. Each layout is divided into front and rear structures, connected by a passage. Provisions for kitchen, dining and parking are located on the ground floor while living room, bedrooms and bathroom are located on the first floor.

The important element of the design is the customized pre-cast concrete column systems with 200x100mm end-to-end slots on all four facades for the purpose of pin-jointing the timber beams (Figure 5-7). Improvised from the concept of mortise and tenon joints, the slots are instead built at 200mm gap from bottom to top of column. This allows more choices of height of space for the occupants to adapt or expand. There are two types of columns; 300x300mm for the internal spaces and 300x700mm for the adjoining neighbours. The latter allows changes of height to be made without affecting the neighbours. In addition to 500mm deep for the purpose of cantilevered foundation, the height of the columns varies from 6500mm for two-storey to 9500mm for three-storey height. As a modular design for the terrace housing, the cost of this column can be reduced with the advance of mass-production technology.

Based on the modular column, the project proposes two concepts of flexible prefabrication that can offer a variety of choices for living arrangements at a minimum cost. First, the house can work as a large, basic skeletal that combines a preassembled rigid core (gridded concrete columns) with supporting floor sections and roof structures. However, none of the spaces are

designated with specific functions. In this case, flexible self-adaptations are limited to the arrangements of the internal layout. The second option is to build the house as a completed building but with different plan layouts resulting different built areas. Occupants can choose the layout according to their affordability and later make several expansions to meet their needs. However, these are not a conclusive design. They are merely a proposal to test the possibilities of the raised floor and flexible prefabrication system. For the purpose of this thesis, only Type A is explored.

Figure 5-7: Modular column design

Dimension
300mm x 300mm x 6500mm
300mm x 300mm x 9500mm
300mm x 700mm x 6500mm
300mm x 700mm x 9500mm

Figure 5-8: Lot configurations

Figure 5-9: Different adaptable ground floor plans

Figure 5-10: Ground floor area

5.2.2 FLEXIBLE FLOOR CULTURE AND EXPENDABILITY

Discussions of Precedence

As previously studied in Chapter 3, designing a space based on modular sizes such as the floor mats, praying mats or *dulang* theories is not foreign in the traditional Malay architecture. Similarly, the size of a room in traditional Japanese architecture is determined by the number of *tatami* floor mats usually ranges from four and a half to twelve mats. Although sizes of the traditional *tatami* mats are slightly different in certain regions, the standard size is typically fixed at 90cm by 180cm by 5.5cm thus rooms in traditional Japanese construction will measure in multiples of 90cm. One traditional example of plan and spatial organization governed by the *tatami* modules is the Katsura Imperial Villa built in stages from 1616 to 1660 by the three generations of Hachijonomiya family in Kyoto (Moffett, Fazio, & Wodehouse, 2003). The villa consists of three inter-linking Old, Middle and New *shoins*. Each room in the *shoin* plans is generated from a number of *tatami* mat arrangements. The rooms' dimension can be changed in various ways as the sliding partitions and doors are opened.

Figure 5-11: Middle Shoin seen from the First Room of the Old Shoin
(Source: Ishimoto & Tange, 1972, p. 113)

Figure 5-12: Interior of the Old Shoin seen from the east side of the Second Room
(Source: Ishimoto & Tange, 1972, pp. 114-115)

Figure 5-13: Katsura Imperial Villa in Kyoto, ca. 1616-1660
(Source: Moffett, et al., 2003, p. 108)

The more recent precedent of houses based on the *tatami* modules is the minimum and affordable 9tubohouse designed by Makoto Masuzawa in 1952 and recently restored by Makoto Koizumi. Tubo is the traditional Japanese unit of measurement in building; one tubo is equal to a square based on two *tatami* mats arranged side by side. Despite of its small size, the space in the house is designed efficiently thus creating a more spacious environment. However, the absence of sliding partitions as compared to the Katsura Imperial Villa has made the space and the programs of 9tubohouse remain static.

Figure 5-14: 9tubohouse based on the modular tatami sizes

(Source: Future House Now, 2007)

Design Potential

The traditional construction method which can be integrated into the design of terrace housing is the aim for temporary construction. Instead of the contemporary concrete floors, this design proposes the use of plywood stressed-skin panel system (SSP) to allow for non-permanency and flexibility of internal spaces. SSP construction is lightweight, simple and rapid; it is one of the most cost-effective, energy and structurally efficient building methods (Kurt, 2005). As the SSP construction does not require specific experience, occupants are able to do the assembly or expansion process on their own.

Figure 5-15: Installation of single stressed skin panel floor system

Proposed Design

The SSP panels can be designed into several modular sizes to offer more choices of panels arrangements for room dimensions. The panels sit on the timber beam previously slotted into the openings on the concrete columns.

This project uses single skin panels (top skin only) in most parts of the house to provide space for light fittings or other services to the floor below. Other electrical services such as switches and plugs can be accommodated into the floor panels, reducing the hassle and inappropriate conventional method of integrating the electrical services into the carved brick walls. In addition, certain panels can be customized for specific function such as extra storage inside the floor panels for the bedrooms or sewerage and plumbing services for the bathroom.

Asquith (2006) believes that vernacular is not seen as a static building form but continuously changing and responding to the changes made by its surrounding. Although terrace housing is not the vernacular architecture of the Malays, the initiative to incorporate the idea for choices and changes resembles the flexible physical adaptation in vernacular architecture of TMH. The employment of SSP and screen-wall panel allows internal alterations and multiple uses of spaces without involving major architectural or structural modifications. Changes towards internal arrangements can be made from changing the position of a door, sliding or removing wall to revising the entire internal floor layout. In other words, the scheme gives the occupants a control towards the arrangements of spaces.

Wide x Length x Height (mm)		
1200	3000	150
1200	2400	150
1200	1500	150
900	3000	150
900	2400	150
900	1500	150

Figure 5-16: Customized panels for storage and bathroom

Figure 5-17: Different arrangements of the SSP in the first floor plan

5.2.3 SCREEN-WALL PANEL

Discussions of Precedence

The aim for screen-wall panels in redefining terrace housing design is to provide privacy and ventilation. Achieving both privacy and ventilation performance can be a complex process because privacy is achieved when the opening is closed while ventilation is achieved when the opening is opened. Privacy problems in several regions are solved through architectural solutions. In the Middle Eastern Islamic countries, privacy in the residential buildings is maintained by misaligning the doorways of neighbouring houses, placing limited windows into the streets and treating the windows architecturally (Rowe as cited in Vahaji & Hadjiyanni, 2009, p. 38). Other architectural forms towards family privacy include sequential filtering of the entrances and enclosed courtyards (Bahammam, 2006; Islam & Al Sanafi, 2006).

Mohd Rasdi (2006) suggests window designs in Malaysia's terrace housing should be separated into ones that provides lighting and ventilation and ones that allows views. For instance, ribbon windows located 1.5m above the floor level to the top of the ceiling can be used for lighting and ventilation while 30cm-wide slits located in the corners instead of centre of the walls can be used for the view. The slits should also have 30cm-deep timber or concrete frames to restrict views into the house.

The design possibilities of perforated wall panels have been explored in the Perforated House in Melbourne by Kavellaris Urban Design in their attempt to critique and respond to the repetitive and limited linear terrace housing typology, the boundaries between public and private realm as well as the environmental sustainability in terrace housing design (Kavellaris Urban Design, 2009). The house uses perforated operable walls, doors, curtains and glass walls to eradicate the idea of house as a static form (Figure 5-19).

Figure 5-18: Projected window bays and screen lattice panels which respond to cultural and environmental references in Middle Eastern countries

(Source: Edwards, Sibley, Hakmi, & Land, 2006)

The perforated wall becomes the flexible facade device that transforms the experience of the built environments from opaque and bulky during the day to translucent and permeable during the night. It also blurs the solid threshold between private and public, allowing the occupants to experience the external facade from inside the house as well as invert the internal habitable spaces from communal to individual living programs. The bi-folded, perforated walls and louvers which orientated to the north become the primary cooling system and aid the passive sustainable cross air ventilation of the house when they are opened.

Figure 5-19: The Perforated House
(Source: Kavallaris Urban Design, 2009)

Design Potential

Screen wall panels can be designed to provide flexibility for privacy and ventilation. These panels are based on the modularity of the prefabricated wall components in TMH. Findings on several TMH facade studies shows that a series of sizes varied from 375mm, 500mm, 610mm, 700mm, 850mm, 1100mm and 1900mm are used repeatedly on wall-panelling and window design (Ismail & Ahmad, 2006).

Proposed Design

In this project, the concept of the screen-wall is based on two perforated panels sharing a same pattern but one takes the negative space of the other (Figure 5-20). The advantage of this concept to the mass-production industry is several panels can be produced using limited patterns. The panels can be matched according to the users' preference to create different spatial and privacy experience (Figure 5-21).

The complementing panels in this design project are placed opposite each other between the 300mm-deep concrete columns, with sliding roller at the bottom and top parts. As the panels slide perpendicularly away from each other, cavity space will be created for the purpose of simultaneous ventilation and privacy (Figure 5-23).

Figure 5-20: Singular wall panels. From top: Panel A, Panel B, Panel C and Panel D

Figure 5-21: Possibilities of two or three-panel configurations. From top left: Panel A+B, Panel C+D, Panel A+C, Panel A+D and Panel A+C+D

The variation of sizes allows for different opening dimensions; it also results to distinguished facade treatments. In this design, the screen-wall panel system consists of two height measurements that fit the 3m floor-to-floor height level. The panels are used in all facades as well as the internal partitions except where privacy is most important such as bathrooms or toilets.

The panels which are made of moulded PVC plastic will require less cost and maintenance compared to the traditional wood panels. The plastic material also offers variety of hues and translucency to control the degree of glare and privacy into the house. A further element explored in relation to this light-weight material is the built-in furniture system in order to make the most of the cavity space between the two panels. Similar to the TMH, this terrace housing project explores the notion of house becoming its own furniture where options for storage, wardrobe and shelving are integrated in the wall system hence the call for fewer furniture.

Wide x Height x Deep (mm)	Possible use
900 x 900 x 45 1200 x 900 x 45	Walls, Balustrade
900 x 2100 x 45 1200 x 2100 x 45	Doors opening, Balustrade

Figure 5-22: Shelving unit

Figure 5-23: Screen-wall panel construction system

Figure 5-24 : Possible layout adaptations

Figure 5-25: View from the front-street

5.3 DESIGN DISCUSSION

5.3.1 DESIGN RESPONSE TO PRIVACY AND SOCIO CULTURAL NEEDS

In this project, a balance of privacy and interaction between the family members, guests and immediate neighbours are achieved from the raised floor construction, internal courtyards and screen-wall panels. By elevating the floor level, the visual intrusion from the street can be reduced to a minimal thus the living area can be designed as a semi private outdoor *serambi* with minimal screen-wall panels. As found by Hashim (2008), inclusion of *serambi* or external shared spaces in terrace housing design can provide a transition zone for privacy, guests and community bonding. In order to provide more privacy for the family, internal courtyard is placed between the main and secondary structures thus female family members can socialize in the outdoor without wearing their *hijab*. Other privacy for the women is included in the second entrance, located in the passageway between the two structures.

Raised floor construction provides an extra space on the ground floor for socio-cultural and religious gatherings. Activities such as preparation work and religious event can be done in separate spaces for different genders. More communal spaces are also integrated into the design to increase social intimacy in the community. The main stairs to the living area on the first floor is shared between two immediate neighbours while clustered organization of the houses has created another internal courtyard for the women to socialize or extend their domestic work outdoor.

In the TMH, the open plan and wall materials have created an intimate visual link and environment between the occupants. Any inappropriate acts or behaviours can easily be seen or heard by others in the same or adjacent room, hence the safety for the women. Safety for women in the internal space of this project is mostly provided by the screen-wall panels where privacy can be controlled by sliding the panels closer to the perpendicular panels, reducing the view from the patterns' voids. This flexibility and the use of translucent plastic material allow visual and sound connections between two adjacent spaces when it is needed by the occupants namely the mother supervising her children during the day.

Figure 5-26: Study of glare and visual privacy in TMH and terrace house

(Source: Yuan, 1991, p. 77)

Figure 5-27: Accommodating socio-cultural needs and functions

Figure 5-28: Proposed screen wall from interior in Type 2

Figure 5-29: Proposed screen-wall panel at the living area

Figure 5-30: Gradient of privacy by the screen-wall panels

Figure 5-31: Screening in the living room

Figure 5-32: Views from the second living room which offers choices for gender segregation

5.3.2 RESPONSE TO ENVIRONMENT

Raised floor construction, screen-wall panels and internal courtyards can increase environmental performance of terrace housing while satisfying socio-cultural spatial requirements of the Malay women and their family.

Ventilation

Many studies have been done to improve the ventilation system in the terrace housing. For instance, a study on reintroduction of traditional ventilation components into terrace housing design suggests that the ventilation components should cover 50% of the front and rear facades to achieve the desirable thermal comfort (Said, Raja Shahminan, & Salleh, 1999). The occupants should open the doors and windows at night instead of the conventional practice of opening the doors and windows during the day to avoid bringing in the hottest air of the day from outside (Davis, Ghazali, & Nordin, 2006). Mohd Tahir (2006) suggested that the inclusion of adjustable floor louvers can increase air-ventilation in the terrace housing more naturally.

Figure 5-33: Proposed raised floor construction in terrace housing by Mohd Tahir (2006)

In the proposed design, raised floor construction increases air movement throughout the ground floor while the upper floor captures the higher velocity wind. The proposed screen-wall panels cover most of the facades thus allowing maximum ventilation. Opening the gaps of the screens for ventilation during night as suggested by research can be done without compromising safety. The courtyard, by its enclosure, provides privacy and creates a microclimate. Additional planted trees and use of water in the landscape help cooling the air and encourage the hot air circulation.

Figure 5-34: Courtyard effects

Lighting

The long and narrow terrace housing design usually relies on windows and doors in the front and rear of the house as sources of natural lighting. This is inadequate. The screen panels and internal courtyards in the proposed design supply additional lighting into the house therefore reducing energy consumption.

Flooding

Raised floor construction elevates the living areas onto the first floor, preventing major damages during occurrence of floods.

CHAPTER 6 DISCUSSIONS AND CONCLUSION

The research looks into the significant meaning of house as a dwelling that shelters the occupants from the external environments as well as a representation of the occupants' cultural identities. The findings propose that the house is the most important place for people to construct and maintain social, cultural and religious identities. Wright (2005) also believes that the house is a "personalized statement about the family as a group of individuals, as members of a class, and is an emphatic declaration about the woman's personal taste and her abilities as a wife and mother" (Wright, 2005, p. 144). For the Muslim Malay families and women, the house is the prime opportunity for expressing their understandings towards cultural and religious beliefs. As a setting, the house can also influence their behaviour towards cultural or religious requirements.

The findings of this research suggest that urbanization, 'rural-to-urban' migration and education have shifted the roles and priority of the modern Malay women away from their prescribed traditional and religious responsibilities. Modern Malay women are seen to be more independent, educated and career-wise. Their perceptions towards domestic roles have changed, however their needs from the living environments and in terms of safety remain mostly unchanged. Many of these needs are still informed by cultural and religious requirements and practices. It appears that the modern Malay women's needs for privacy and safety are hardly met in their urban living environments. This is due to the lack of considerations for cultural and religious aspects.

Designing mass terrace housing in urban areas is a challenge. It is not only restricted by unsuitable building laws and planning codes but also influenced by the developers yearning for maximum profitability. Terrace housing is associated with social status and aesthetic values; most developers sell the facades rather than the suitability of the designed house to the context and socio culture of Malaysians. The findings of the research suggest that the limitation of space and built area not only contribute to environmental problems but also add to socio cultural problems, particularly to Malay families and Malay women. Although these inadequacies are discussed in the many studies done on the environmental performance of the terrace housing, their intention is not to highlight the implications of terrace housing design on the social behaviour of the occupants. Inadequate studies

have been carried out on the religious and socio-cultural needs of occupants of terrace housing. It appears that the lack of social intimacy in terrace housing have forced the Malay families to adapt to modern way of living. This has meant compromising traditional practices and socio cultural behaviours.

The main concern towards Malay families and Malay women living in terrace housing is their safety and inability to maintain the cultural and religious requirements. Contributing to this is lack of visual privacy and family intimacy in the house. This is due to physical living environment that are not sensitive to cultural needs of the inhabitants. The Malay families also have preferred individual privacy over the traditional social intimacy. This excessive privacy may have contributed to domestic crime towards women. It appears that many inhabitants modify their houses because the designs and the physical living environments do not meet their basic, socio-cultural and growing needs of the family.

The planning and design process of a dwelling can be improved by taking the accounts of the behavioural needs, social custom as well as cultural and religious backgrounds of the inhabitants. Instead of employing design planning and construction method from foreign countries, prefabrication of terrace housing based on the architectural elements and planning of TMH would be more suitable to the Malaysian context because it adapts the warm-humid climate and supports the religious responsibilities and socio culture of the Malays particularly the women. Several concepts of TMH which can be developed and adapted into the construction system in the urban context are the multi-structures, basic construction methods, flexible expansion systems and the use of prefabricated modular elements.

The findings of this research suggest the introduction of raised floor construction, flexible prefabrication method and the modularity of concrete column, screen-wall panels and timber stressed-skin panel flooring system into terrace housing design in order to improve the consideration of cultural needs of the Malay women and her families. The principle of the construction is simple and easy to be understood and constructed. It challenges the notion of industrialization and mass-production technology which has contributed to 'industrial-like' housing designs. This research's big design move is the introduction of timber as the beam and flooring system compared to the

standardized concrete and bricks construction to imply the temporary construction and as the platform for flexible modifications, adaptations and expansions to be made effectively by the occupants according to their specific needs. At the same time, the idea to introduce TMH's elements into terrace housing design can be seen as an effort to appreciate the TMH as the vernacular architecture of the Malays and look at the possibility of reviving its unique architectural elements as well as socio cultural and environmental advantages into the contemporary and urban contexts.

This research recommends that the advantages of light prefabricated elements which require minimal skilled labour and machinery should be explored and developed into the current housing design in order to encourage active involvement of the occupants. Besides, a bigger terrace housing layout should be built compared to the current ones so that the design of the modular column, SSP and screen-wall panel systems can offer more choices of adaptations for the occupants. The cost of the bigger layout can be compensated by the advantages of the industrialization and mass-production industry which the proposed design elements can be produced at an affordable cost.

Although this research focuses on the needs for better cultural consideration towards the Malay families and Malay women living in terrace housing, the research findings in this area can build on and extend to the needs of other terrace housing occupants such as the Malay men or other ethnic groups.

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