



UNIVERSITI PUTRA MALAYSIA

***HINDU RESIDENTS' SATISFACTION WITH SPATIAL LAYOUTS
IN LOW-COST FLATS, SELANGOR, MALAYSIA***

OOI SIEW CHOONG (RICHARD)

FRSB 2015 4



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IN LOW-COST FLATS, SELANGOR, MALAYSIA**

By

OOI SIEW CHOONG (RICHARD)

**Thesis Submitted to the School of Graduates Studies, Universiti Putra Malaysia,
in fulfillment of the Requirements for the
Degree of Master of Science**

January 2015

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of
the requirement for the degree of Master of Science

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**Chairman: Mohammad Yazah bin Mat Raschid, PhD
Faculty: Design and Architecture**

Religious and cultural considerations of specific communities are usually overlooked in the design of low-cost flats in Malaysia. This is probably due to limitations on the construction budget as well as poor understanding of religio-cultural needs. The result is a spatial layout that is generic and purely functional, in which Hindu households will be experiencing some degree of dissatisfaction. Furthermore, they were built primarily to relocate squatters from private or government land. The consequences of residential dissatisfaction include emotional and psychological stress. The aim of this study is to observe the degree of Hindu residents' satisfaction with the spatial layout of LCFs in Selangor. The methodology employed to determine the level of satisfaction is a combination of 150 surveys and 5 physical observations, supported by 30 interviews, of low-cost flat case studies conducted around Puchong in Selangor. The data is examined via a combination of discourse, statistic and spatial studies. The results indicate that Hindu residents are generally satisfied with the spatial layouts of their low-cost flats with some reservations. A common complaint is that some rooms are spatially and functionally inadequate for their intended religio-cultural purposes. It appears that many Indian households rely more on cosmological and metaphysical sources, rather than the physical and material, for comfort and well-being. Nevertheless, design strategies, such as the addition of spaces for altars, may enhance the living standard of Hindu families.

Pertimbangan agama dan budaya bagi se-sebuah masyarakat tertentu biasanya diabaikan dalam reka bentuk rumah pangsa kos rendah di Malaysia. Ini mungkin kerana batasan bajet pembinaan dan juga kekurangan pemahaman keperluan agama-budaya. Hasilnya ialah susun atur ruang yang generik dan bergantung semata-mata kepada fungsi, di mana isi rumah Hindu akan mengalami sedikit rasa tidak puas hati. Tambahan pula, rumah pangsa tersebut telah dibina terutamanya untuk menempatkan semula penduduk setingan daripada tanah swasta atau kerajaan. Keasn daripada rasa tidak puas hati kediaman ini termasuklah tekanan emosi dan psikologi. Tujuan kajian ini adalah untuk memantau tahap kepuasan penduduk Hindu terhadap susunatur ruang rumah pangsa kos rendah di Selangor. Kaedah yang digunakan untuk menentukan tahap kepuasan adalah gabungan 150 tinjauan dan 5 pemerhatian fizikal, disokong oleh 30 temubual, kajian kes rumah pangsa kos rendah yang dijalankan di sekitar Puchong, Selangor. Data ini dikaji melalui gabungan wacana, statistik dan kajian morfologi. Keputusannya menunjukkan bahawa penduduk Hindu secara umumnya berpuas hati dengan susun atur ruang rumah pangsa kos rendah mereka dengan mengenalpasti beberapa masalah. Aduan yang biasa diterima adalah mengenai saiz bilik yang kurang sesuai untuk keperluan agama dan budaya. Hasil kajian mendapati ramai penghuni India lebih bergantung pada sumber kosmologi dan metafizik, daripada fizikal dan material, untuk kesejahteraan dan kesejahteraan. Walau bagaimanapun, strategi reka bentuk seperti penambahan ruang untuk mezbah-mezbah, boleh meningkatkan taraf hidup keluarga Hindu.

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APPROVAL

I certify that a Thesis Examination Committee has met on 15 January 2015 to conduct the final examination of Ooi Siew Choong on his thesis entitled "Hindu Residents' Satisfaction with Spatial Layouts in Low-Cost Flats, Selangor, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CAD	Computer-Aided Design
CIDB	Construction Industry Development Board
CIS	Construction Industry Standard
JPN	Jabatan Perumahan Negara
LCF	Low-cost Flat
LRT	Light Rail Transit
MHLG	Ministry of Housing and Local Government
NEP	New Economic Policy
POE	Post-Occupancy Evaluation
PPR	Program Perumahan Rakyat
REHDA	Real Estate and Housing Developers Association
UBBL	Uniform Building By-Laws
VS	Vaastu Shastra

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter establishes the aim of the research by presenting the study background and discussing the problem statement, based on the notion that culturally-sensitive housing has an effect on the identity and well-being of dwellers where the relationship between Hindu residents and low-cost flats (LCFs) in Puchong is the primary focus. It also describes the research aims and proposition and concludes with the structure of the thesis.

1.2 Study Background

Social problems are often related to poor housing development. Between 1991 and 1992, for example, a total of 13 riots broke out in Britain in “low-income areas with long-standing social problems and poor reputations.” Research by the Joseph Rowntree Foundation (1997) found that “the areas contained a dangerous combination of large numbers of out-of-work young males with no status or stake in society, living in low-income work-poor households, in areas suffering from a high social stigma.” Similarly, a study of the 3 largest local authority housing estates in the London Borough of Brent revealed that the projects built in the 1960s were already in general decline by the 1980s. The high-rise housing blocks were part of an effort to clear slums and resolve a national housing crisis. They were initially deemed “ultra-modern, ideal environments to live in, incorporating deck access, which would replace drab brick houses in narrow street layouts” (Stewart and Rhoden, 2003).

Complaints against estates include them being “inhumane, harsh and forbidding in appearance”, “neglected, poorly funded and managed”, “reinforcing insecurity, low self-esteem and underachievement”, “marginalizing an increasingly welfare-dependent population – a new ‘under class’” and “stigmatized, as new residents protested against architecture and design faults, nuisance from children, vandalism and urination in common parts, noise, dampness and flooding of landings and walkways” (Stewart and Rhoden, 2003).

The above problems can probably be leveled against some of the LCFs in Malaysia. Can similar riots break out from our low-income housing areas? Are Malaysian from the Indian community doing well in such environments? A literature search has revealed little information on how residents in LCFs are really coping. Visher (2001), describing the post-occupancy evaluation (POE), stated:

“Loosely defined, it has come to mean any and all activities that originate out of an interest in learning how a building performs once it is built, including if and how well it has met expectations and how satisfied building users are with the environment that has been created.”

The author is not aware of any POEs done on LCFs in the country. There is simply an information gap on the topic. This is the problem that this study will attempt to address. The general trend in LCF designs appears to be a western-style open-plan, where walls between living, dining and kitchen spaces are minimized or removed entirely. A Muslim woman in such an environment, would be forced to wear her hijab while cooking in the kitchen if there are male guests in the living room (Hadjiyanni, 2007). This is both uncomfortable and unsafe. A culturally-sensitive housing design that understands end-user lifestyles would go far in providing a satisfying living environment for its inhabitants.

When cultural needs are not met, the result can be social exclusion and isolation (Findlay, 2011). It can also be a source of stress (Hadjiyanni, 2007). In addition, housing provides dwellers with a sense of identity that is important for community building. (Hadjiyanni, 2007; Findlay, 2011). People who have lost cultural connections tend to suffer mental, emotional and physical health problems (Hadjiyanni, 2008). Such problems can effect generations (Hadjiyanni, 2009). Culturally responsive housing enhances physical and psychological well-being (Lee and Park, 2011).

A literature search reveals that some research has already been conducted on the housing needs of the Malays. The general recommendation is that similar research be done for the other racial groups in the country. Rahim (2000), for instance, suggested examining, “the culture core of the different

community groups such as the Chinese and the Indians in relation to low-cost housing design in general and the building elements in particular. The findings could be used to formulate a set of design guidelines that could be beneficial and supportive of all Malaysians". Ali (2007) stated, "For research on built environment and human behaviour studies, further study on the importance of privacy concept and cultural needs from the user-behavioral perspectives of other races in Malaysian such as Chinese and Indian is recommended to be conducted. This will give a more thorough picture on the views of the needs of end-users of mass-housing". Meanwhile, Rahim (2007) proposed, "a comparative study on the privacy of other major ethnic groups in Malaysia in relation to the needs of Malaysians.

Sufficiently similar needs among the different ethnic groups may help to generate conclusive housing design ideas and solutions which can be accepted by all. Measurement of the specific ethnic groups and the specifics of housing design attributes affecting the privacy of the family". Bowes, et al. (2000) pointed out that "debates on minority housing ... have tended to be particularist". This research's intention, on the contrary, is to understand a minority community in order to better formulate universalist policies applicable to all.

As cultures change over time, Rent and Rent (1978) recommended that research be done on a continuing basis:

"To identify the meaning of housing and thus values toward housing, what influences the development of these and the conditions which their development is a most needed base of knowledge by which to perceive the housing problem and from which to formulate policy and programs. ... The phenomena of housing and its impact on people and their lives can never be fully understood until there is an ongoing research endeavor into both the social and physical aspects for all distinguishable groups in a population."

The effect of good or bad housing can also last a long time because buildings are durable. Nearly 40% of houses in the UK today were built before the Second World War (Silva and Wright, 2009), which began for Britain in 1939! They are also more likely to be rehabilitated than replaced due to financial and logistical constraints (Zarecor, 2012). The greatest impact is on women and children because they spend the most time at home (Shrestha, 2000). Dwelling size and overcrowding can hinder the cognitive development of children (McNamara, et al., 2010). Conditions such as overcrowding, poor ventilation, cold, heat, dampness, mould and pest infestation can also affect the health of dwellers directly or indirectly (Firdaus and Ahmad, 2013).

1.3 Problem Statement

According to research done by Hadjiyanni (2007 and 2009) and Findlay (2011), culturally insensitive housing can lead to stress and alienation, among other things. There is therefore a need to find out if LCFs in Malaysia meet the cultural and religious needs of the Indian inhabitants. The problem arises because such housing is likely to be designed to meet very basic living requirements and not intended for any specific race or community. Cultural and religious considerations are probably not taken into account. Therefore this study will investigate the current LCF layouts and their physical design characteristics. Meanwhile, the views of Hindu households in LCFs will be solicited to determine their level of satisfaction and discover ways to improve future LCFs.

1.4 Research Aims

The main aim is to ascertain the residential satisfaction level of Hindu residents in LCFs in connection with the appropriateness of the spatial layout for religious and cultural purposes. The aim is then broken down into three research objectives (Table 1.1) (Ibrahim, 2009).

Table 1.1 Research Objectives

Main RQ: What is the level of residential satisfaction for Hindu households living in LCFs?	
RQ construct	Description of Research Objectives
LCF design documentation	RO1: To investigate and document existing LCF plan and design characteristics.
Residential satisfaction for Hindu Tamils	RO2: To determine the satisfaction level of Hindu families in the spatial layouts of their LCFs.
LCF design improvements	RO3: To ascertain design improvements that can increase the levels of residential satisfaction based on the investigation of existing LCF plans and the views of the residents.

1.5 Research Proposition

The proposition of the research is that Hindu residents may or not be dissatisfied with the overall planning and layout of LCFs as they were not specifically designed with Hindu requirements in mind. However, by understanding religio-cultural needs and identifying areas of inadequacy in the planning and design of existing units, future LCFs can be improved to better accommodate Hindus and raise their level of residential satisfaction.

1.6 Organisation of Thesis

The thesis is divided into 6 chapters. Chapter 1 introduces the background and rationale behind this research study. It establishes the problem statement and defines the research questions and aims. Chapter 2 then examines the information available in recent literature on the topic and compiles the work that has been done by previous researchers as the starting point for the present study. The following two chapters explain the rationale behind the selection of the methodologies chosen to tackle this research study and describe the specific actions required in the process of data collection and analysis. Chapter 3 discusses case studies, surveys and interviews, while chapter 4 focuses on physical observations and spatial studies. Chapter 5 then compiles the data collected from the interview and survey fieldwork and uses techniques such as discourse and statistical analysis to establish research findings. Finally, chapter 6 concludes the thesis with a critique of the strengths and weaknesses of the research and a summary of the findings and recommendations.

BIBLIOGRAPHY

- Adler, E.S. & Clark, R. (2008). In *How's It's Done: An Invitation to Social Research (3rd Ed.)*. Thomson Wadsworth.
- Agus, M.R. (2003). The Impact of Government Intervention on the Housing Market in Malaysia. *Journal of Comparative Asian Development*. 2(1): 133-149.
- Ali, H.M. (2007). *The Interdependency of House Layout, Privacy and Culture from the User-behavioural Perspective of Urban Malays*. Master thesis, University Putra Malaysia.
- Andersen, H.S. (2008). Why Do Residents Want to Leave Deprived Neighbourhoods? The Importance of residents' Subjective Evaluations of Their Neighbourhood and Its Reputation. *Journal of Housing & the Built Environment*. 23:79-101.
- Ariffin, R.N.R., Nadarajah, S. and Zahari, R.K. Residential Satisfaction in Private Low-cost Housing in the Urban Area: A Case Study of the Klang Valley, Malaysia. In *Urban Dynamics & Housing Change – Crossing into the 2nd Decade of the 3rd Millennium*, Proceedings of the 22nd International Housing Research Conference, ENHR 4-7 July: Istanbul, 2010.
- Arlkatti, S. and Andrew, S.A. (2012). Housing Design & Long-term Recovery Processes in the Aftermath of the 2004 Indian Ocean Tsunami. *Natural Hazards Review*. 13(1): 34-44.
- Atkinson, D., Okada, H. and Talmy, S. (2011). Ethnography and Discourse Analysis. In Hyland, K. & Paltridge, B. *Continuum Companion to Discourse Analysis*. Continuum International Publishing Group.
- Bailey, C.A. (2007). In *A Guide to Qualitative Field Research (2nd Ed.)*. Pine Forge Press.
- Barcus, H. (2004). Urban-Rural Migration in the USA: An Analysis of Residential Satisfaction. *Regional Studies*. 38(6): 643-657.
- Berkoz, L., Turk, S.S. & Kellekci, O.L. (2009). Environmental Quality and User Satisfaction in Mass Housing Areas: The Case of Istanbul. *European Planning Studies*. 17(1): 161-174.
- Bowes, A., Dar, N. and Sim, D. (2000). Citizenship, Housing & Minority Ethnic Groups: An Approach to Multiculturalism. *Housing, Theory & Society*. 17(2): 83-95.
- Chang, A.I. (1993). Taoism in Architecture. In B. Farmer & H. Louw. *Companion to Contemporary Architectural Thought*. Routledge.
- Chown, I. (2012). Houses and Flats. In D. Littlefield. In *Metric Handbook – Planning & Design Data (4th ed.)*. Routledge.
- Colquhoun, I. (1991). In *Housing Design in Practice*. Longman Scientific & Technical.
- Construction Industry Development Board (1998). In *Construction Industry Standard 2*.
- Crosbie, M.J. (2006). In *Multi-Family Housing: The Art of Sharing*. Images Publishing.
- Creswell, J.W. (2007). In *Qualitative Inquiry & Research Design: Choosing Among Five Approaches (2nd ed.)*. Sage Publications.
- Creswell, J.W. (2008). In *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research (3rd ed.)*. Pearson.
- Creswell, J.W. (2013). In *Qualitative Inquiry & Research Design: Choosing Among Five Approaches (3rd ed.)*. Sage Publications.
- Creswell, J.W. (2014). In *Research Design: Qualitative, Quantitative and Mixed Method Approaches (4th ed.)*. Sage Publications.

- Dekker, K., de Vos, S., Musterd, S. & van Kempen, R. (2011). Residential Satisfaction in Housing Estates in European Cities: A Multi-level Research Approach. *Housing Studies*. 26(04): 479-499.
- Edmunds, D.S., Shelby, R., James, A., Steele, L., Baker, M., Perez, Y.V. & TallBear, K. (2013). Tribal Housing, Codesign and Cultural Sovereignty. *Science, Technology, & Human Values*. 38(6): 801-828.
- Erdogan, N., Akyol, A., Ataman, B. & Dokmeci, V. (2007). Comparison of Urban Housing Satisfaction in Modern and Traditional Neighbourhoods in Edirne, Turkey. *Social Indicators Research*. 81(1): 127-148.
- Farmer, B. (1993). Client, Community and Climate: Byker – A Case Study. In B. Farmer & H. Louw. *Companion to Contemporary Architectural Thought*. Routledge.
- Farmer, B. (1993). 'Commoditie'. In B. Farmer & H. Louw. *Companion to Contemporary Architectural Thought*. Routledge.
- Findlay, M. (2011). Social housing for cultural diversity. *Australian Planner*. 48(1): 2-11.
- Firdaus, G. & Ahmad, A. (2013). Relationship between Housing and Health: A Cross-Sectional Study of an Urban Centre of India. *Indoor and Built Environment*. 22(3): 498-507.
- Flick, U. (2014). In *An Introduction to Qualitative Research (5th Ed.)*. Sage.
- Gelil, N.A. (2011). Less Space, More Spatiality for Low Income Housing Units in Egypt: Ideas from Japan. *International Journal of Architectural Research*. 5(2): 24-48.
- Gillham, B. (2000). In *Case Study Research Methods*. Continuum International Publishing Group.
- Gillham, B. (2005). In *Research Interviewing: The Range of Techniques*. Open University Press.
- Gillham, B. (2008). In *Observation Techniques: Structured to Unstructured*. Continuum International Publishing Group.
- Gokhale, V.A. (2005). Analytical Study of Living Environment in the Tsunami-Affected Areas of Tamil Nadu, India. *ISET Journal of Earthquake Technology, Technical Note*. 42(4): 219-225.
- Gopal, P.S., Gapor, S.A. & Pandian S. (2011). Indian Urban Poverty in Malaysia ... A New Phenomenon? The Pre and Post Malaysian Independence Perspective. *Asia Pacific Journal of Social Sciences*. 3(1): 32-48.
- Govindasamy, A.R. (2010). Indians and Rural Displacement: Exclusion from Region Building in Malaysia. *Asian Journal of Political Science*. 18(1): 90-104.
- Gray, J. (2011). Architecture and Architechne: Building and Revealing in High-Caste Nepalese Houses. *South Asia: Journal of South Asian Studies*. 34(1): 89-112.
- Hadjiyanni, T. (2007). Bounded Choices: Somali Women Constructing Differences in Minnesota Housing. *Journal of Interior Design*. 32(2): 13-27.
- Hadjiyanni, T. (2008). Kitchens as Cultural Mediums: The Food Experiences of Mexican Immigrants in Minnesota. *Housing & Society*. 35(2): 97-116.
- Hadjiyanni, T. (2009). Re/claiming the Past: Constructing Ojibwe Identity in Minnesota Housing. *Design Studies*. 30: 462-481.
- Hadjiyanni, T. (2009). Aesthetics in Displacement: Hmong, Somali & Mexican Home-making Practices in Minnesota. *International Journal of Consumer Studies*. 33: 541-549.
- Hashim, A.H. & Rahim, Z.A. (2008). The Influence of Privacy Regulation on Urban Malay Families Living in Terrace Housing. *International Journal of Architectural Research*. 2(2): 94-102.

- Hashim, A.H., Ali, H.M. & Samah, A.A. (2009). Urban Malays' User-behaviour and Perspective on Privacy and Spatial Organisation of Housing. *International Journal of Architectural Research*. 3(1): 197-208.
- Herfert, G., Neugebauer, C.S. & Smigiel, C. (2012). Living in Residential Satisfaction? Insights from Large-Scale Housing Estates in Central And Eastern Europe. *Tijdschrift voor Economische en Sociale Geografie* © 2012 Royal Dutch Geographical Society KNAG.
- Hur, M. and Morrow-Jones, H. (2008). Factors that Influence Residents' Satisfaction with Neighborhoods. *Environment and Behaviour*. 40(5): 619-635.
- Hyland, K. & Paltridge, B., 2011. Introduction. In *Continuum Companion to Discourse Analysis*. Continuum International Publishing Group.
- Ibrahim, R. (2009). Setting Up a Research Question for Determining the Research Methodology. *Alam Cipta Fakulti Rekabentuk & Senibina, Universiti Putra Malaysia*. 3(1): 69-72.
- Ibrahim, R. (2010). *An Eagle View for Designing a Doctoral Research Framework from Research Question*. Presented at the 2nd International Doctoral Education research Network (IDERN2010) organized by 21-23 April in UPM.
- Jabatan Perumahan Negara (2012). <http://ehome.kpkt.gov.my>.
- Johnstone, B. (2008). In *Discourse Analysis, (2nd Ed.)*. Blackwell Publishing.
- Joseph Rowntree Foundation. Riots and Violent Disturbances in 13 Areas of Britain. *Social Policy Research 116*. June 1997: 1-4.
- Jiboye, A.D. (2009). Evaluating Tenants' Satisfaction with Public Housing in Lagos, Nigeria. *Urbanistika/Architektura*. 33(4): 239-247.
- Kaur, A. (2006). Malaysia. In B.V. Lal. In *The Encyclopedia of the Indian Diaspora*. Editions Didier Millet in association with the National University of Singapore.
- Khambatta, I. (1989). The Meaning of Residence in Traditional Hindu Society. In J-P. Bourdier and N. Alsayyad. *Dwellings, Settlements and Tradition: Cross-cultural Perspectives*. University Press of America.
- Larson, R. & Farber, E. (2012). In *Elementary Statistics – Picturing the World (5th Ed.)*. Prentice Hall.
- Lee, E. & Park, N. (2011). Adapting to Cultural Differences in Residential Design: The Case of Korean Families Visiting the United States. *Journal of Interior Design*. 36(2): 1-19.
- Library of Congress Country Studies: India (1995). <http://www.loc.gov>.
- Littlefield, D. (2012). In *Metric Handbook: Planning & Design Data (4th ed.)*. Routledge.
- Li, Z. & Wu, F. (2013). Residential Satisfaction in China's Informal Settlements: A Case Study of Beijing, Shanghai and Guangzhou. *Urban Geography*. 34(7): 923-949.
- Lofland, J., Snow, D., Anderson, L. & Lofland, L.H. (2006). In *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis (4th Ed.)*. Wadsworth / Thomson Learning.
- Marshall, C. & Rossman, G.B. (2011). *Designing Qualitative Research (5th Ed.)*. Sage.
- McNamara, J., Cassells, R., Wicks, P. & Vidyattama, Y. (2010). Children in Housing Disadvantage in Australia: Development of a Summary Small Area Index. *Housing Studies*. 25(5): 625-646.
- Minichiello, V., Aroni, R. and Hays, T. (2008). In *In-Depth Interviews (3rd Ed.)*. Pearson Education Australia.
- Ministry of Housing and Local Government (2011). In *National Housing Policy*.

- Ministry of Housing and Local Government (1984). In *Uniform Building By-Laws, 1984*.
- Mohit, M.A., Ibrahim, M. & Rashid, Y.R. (2010). Assessment of Residential Satisfaction in Newly Designed Public Low-cost Housing in Kuala Lumpur, Malaysia. *Habitat International*. 34: 18-27.
- Mohit, M.A. and Nazyddad, N. (2011). Social Housing Programme of Selangor Zakat Board of Malaysia and Housing Satisfaction. *Journal of Housing and the Built Environment*. 26: 143-164.
- Neuckermans, H. (1993). A 'Thick' Description of Windows. In B. Farmer & H. Louw. *Companion to Contemporary Architectural Thought*. Routledge.
- Oh, D. & Lee, J.S. (2003). Comparison on Housing Satisfaction of General Purchase Households and Resettled Cooperative Households Living in Redevelopment Apartments Located in the Northern Seoul Area. *International Journal of Urban Sciences*. 7(2): 119-130.
- Paltridge, B. (2012). In *Discourse Analysis: An Introduction (2nd Ed.)*. Bloomsbury Academic.
- Patra, R. (2006). A Comparative Study on Vaastu Shastra and Heidegger's 'Building, Dwelling and Thinking'. *Asian Philosophy: An International Journal of the Philosophical Traditions of the East*. 16(3): 199-218.
- Patra, R. (2009). Vaastu Shastra: Towards Sustainable Development. *Sustainable Development*. 17: 244-256.
- Parkes, A. & Kearns, A. (2003). Residential Perceptions & Housing Mobility in Scotland: An Analysis of the Longitudinal Scottish House Condition Survey 1991-96. *Housing Studies*. 18(5): 673-701.
- Rahim, Z.A. (2000). *The Characteristics, Changes, and Effects of Building Elements in the Two-storey Public Low-cost Housing on the Malay Culture Core*. Master thesis, University Putra Malaysia.
- Rahim, Z.A. (2007). *Privacy and Modification of Terrace Housing Among Malay Occupants in the Klang Valley, Malaysia*. Doctoral thesis, University Putra Malaysia.
- Rai, R. (2006). Singapore. In B.V. Lal. *The Encyclopedia of the Indian Diaspora*. Editions Didier Millet in association with the National University of Singapore.
- Rapoport, A. (2005). In *Culture, Architecture and Design*. Locke Science Publishing.
- Rengarajan, V. (1976). In *Rural Housing in Tamil Nadu*. Madras Institute of Development Studies.
- Rent, C.S. and Rent G.S., 1978. Low-Income Housing: Factors Related to Residential Satisfaction. *Environment and Behavior*. 10(4): 459-488.
- Rubin, H.J. and Rubin, I.S. (2012). In *Qualitative Interviewing: The Art of Hearing Data (3rd Ed.)*. Sage Publications.
- Saavala, M. (2003). Auspicious Hindu Houses: The New Middle Classes in Hyderabad, India. *Social Anthropology*. 11(2): 231-247.
- Salfarina, A.G., Malina, M.A. and Azrina, H. (2010). Trends, Problems & Needs of Urban Housing in Malaysia. *International Journal of Human & Social Sciences*. 5(14): 977-981.
- Salleh, A.N.A., Yusof, B.N.A., Salleh, C.A.G. & Johari, D.N. (2011). Tenant Satisfaction in Public Housing and Its Relationship with Rent Arrears: Majlis Bandaraya Ipoh, Perak, Malaysia. *International Journal of Trade, Economics & Finance*. 2(1): 10-18.
- Sapsford, R. (2007). In *Survey Research (2nd ed.)*. Sage Publications.

- Selangor Town & Country Planning Department (2010). *Manual Garis Panduan & Piawaian Perancangan Negeri Selangor, Edisi Kedua*.
- Scollon, R. & Scollon, S.W. (2003). Discourse and Intercultural Communication. In Schiffrin, D., Tannen, D. & Hamilton, H.E. *The Handbook of Discourse Analysis*. Blackwell Publishing.
- Shrestha, G. (2000). Gender Relations and Housing: A Cross-community Analysis. *Gender Technology and Development*. 4(1): 61-86.
- Sinha, A. (1998). Design of Settlements in the Vaastu Shastras. *Journal of Cultural Geography*. 17(2): 27-41.
- Silva, E.B. & Wright, D. (2009). Displaying Desire and Distinction in Housing. *Cultural Sociology*. 3(1): 31-50.
- Sirat, M., Hamat, A.F.C., Aziz, A.R.A., Rahim, A., Salleh, H. & Yaakob, U.H. (1999). In *Low-cost Housing in Urban-Industrial Centres of Malaysia: Issues & Challenges*. Universiti Sains Malaysia.
- Stewart, J. & Rhoden, M. (2003). A Review of Social Housing Regeneration in the London Borough of Brent. *The Journal of the Royal Society for the Promotion of Health*. 123(1): 23-32.
- Sufian, A. and Rahman, R.A. (2008). Quality Housing: Regulatory & Administrative Framework in Malaysia. *International Journal of Economics & Management*. 2(1): 141-156.
- Sufian, A. and Mohamad, N.A. (2009). Squatters & Affordable Houses in Urban Areas: Law & Policy in Malaysia. *Theoretical & Empirical Researches in Urban Management*. 4(13): 108-124.
- Sufian, A. and Ibrahim, A. (2011). Equitable Distribution of Low-cost Houses in Malaysia: Constraints and Challenges. *International Journal of Economics & Management*. 5(1): 251-265.
- Tan, T.H. (2011). Sustainability & Housing Provision in Malaysia. *Journal of Strategic Innovation & Sustainability*. 7(1): 62-71.
- Tan, T.H. (2012). Housing Satisfaction in Medium- and High-cost Housing: The Case of Greater Kuala Lumpur, Malaysia. *Habitat International*. 36(1): 108-116.
- Thomas, G. (2011). In *How to do your Case Study: A Guide for Students and Researchers*. Sage.
- Tiesdell, S. & Oc, T. (1993). Architecture and People. In B. Farmer & H. Louw. *Companion to Contemporary Architectural Thought*. Routledge.
- Tracy, K. (2003). Discourse Analysis in Communication. In Schiffrin, D., Tannen, D. & Hamilton, H.E. *The Handbook of Discourse Analysis*. Blackwell Publishing.
- United Nations (1948). *Universal Declaration of Human Rights*. www.un.org/en/documents/udhr.
- Van der Ven, C. (1993). The Theory of Space in Architecture. In B. Farmer & H. Louw. *Companion to Contemporary Architectural Thought*. Routledge.
- Vera-Toscano, E. & Ateca-Amestoy, V. (2008). The Relevance of Social Interactions on Housing Satisfaction. *Social Indicators Research*. 86(2): 257-274.
- Vischer, J. (2001). Post-Occupancy Evaluation: A Multifaceted Tool for Building Improvement. In *Learning from our Buildings: A State-of-the-Practice Summary of Post-Occupancy Evaluation*. National Academy Press.
- Widdowson, H.G. (2007). In *Discourse Analysis*. Oxford University Press.
- Willford, A. (2002). "Weapons of the Meek": Ecstatic Ritualism and the Strategic Ecumenism among Tamil Hindus in Malaysia. *Identities: Global Studies in Culture and Power*. 9(2): 247-280.

- Willford, A. (2006). Tamil Identity and the Ethnic Fetish in Malaysia. In *Cage of Freedom*. University of Michigan Press.
- Yeoh, S.G. (2001). Producing Locality: Space, Houses and Public Culture in a Hindu Festival in Malaysia. *Contributions to Indian Sociology*. 35(1): 33-64.
- Yin, R.K. (2003). In *Case Study Research: Design & Methods* (3rded.). Sage Publications.
- Yin, R.K. (2009). In *Case Study Research: Design and Methods* (4thed.). Sage Publications.
- Yin, R.K. (2011). In *Qualitative Research from Start to Finish*. The Guildford Press.
- Yin, R.K. (2012). In *Applications of Case Study Research*. Sage.
- Yip, Y.T. Former Squatters in Dire Straits. *The Star Online*. 11 May 2009. www.thestar.com.my.
- Zarecor, K.E. (2012). Socialist Neighborhoods after Socialism: The Past, Present, and Future of Postwar Housing in the Czech Republic. *East European Politics and Societies*. 26(3): 486-509.

