# TOWARDS SUSTAINABLE LOW COST HIGH RISE URBAN HOUSING IN KUALA LUMPUR, MALAYSIA

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## Summary

Sustainability is a multi-dimensional concept when applied to our built environment. Not only does sustainability require that housing developments are designed, developed, constructed and managed in a way which minimises negative impacts on the environment and society as a whole but also the community of which the development is part can only be sustainable if it is a place where people want to live now and in the future.

Malaysia's population growth and urban migration combined with its ambitious economic development objectives conflated to create an urgent need to house growing numbers of people in its major conurbations, particularly in the capital Kuala Lumpur. Many of these people were in low income groups and some part of a disturbingly large squatter population. In the search for a solution, policymakers turned to low cost high-rise projects, attracted by the high density housing such projects could deliver.

This mixed methods research triangulates different types of data to produce a deep insight into the sustainability of low cost high-rise public housing in Kuala Lumpur. The research was partitioned into two separate studies, one qualitative and the other quantitative each differentiated by the corresponding data sources and methodological approach. In the case of the qualitative study these data were collected through user focus groups, one-to-one expert interviews, written observation notes, and location photography. For the quantitative study a residential satisfaction survey provided the data.

A wide range of findings emerged from the quantitative study many of which highlighted a range of negative aspects of the high solution to urban housing policy challenges. However, many of these issues were within the remit and capacity of policymakers, designers and developers to address suggesting that despite the major challenges ahead it may be premature to abandon the high-rise option in the quest to house low income groups among rising urban populations. In some respects, the survey study contrasted by revealing a generally positive level of satisfaction among users.

The thesis completes with a set of best practice recommendations which will be of interest to policymakers, developers and designers of low cost high-rise housing and all those interested in the sustainability of the built environment.

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- A.Aminuddin, Are Low Cost High Rise Housing In Kuala Lumpur Sustainable Development for Communities? A Resident-centric Study. Journal of Design and the Built Environment is an internationally-refereed journal.

## Dedication

This thesis is dedicated to my family, my wife Nik Haniza Suriani and my loving son Adrian Taufiq Ressang. I also extend this dedication to my late farther Aminuddin Ressang, my late step brother Agus Ressang, my late nephew Nur Iman, my late cousins Ery and Erfan and also my sister in-law who passes away during my thesis writing.

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## List of Abbreviations

ACEM – the Association of Consulting Engineers Malaysia

BREEAM - Building Research Establishment Environmental Assessment Method

CF- Certificate of Fitness

DBKL - Dewan Bandaraya Kuala Lumpur (Kuala Lumpur City Hall)

EPU – Economic Planning Unit

EIS - Environmental Impact Assessments

FSC - The Forest Stewardship Council

GBI – Green Building Index

GDP – Gross Domestic Product

GSB - Greenbuildingindex Sdn. Bhd.

HDI - Human Development Index

IIED - International Institute for Environment and Development

IUCN - International Union for the Conservation of Nature

IMF – International Monetary Fund

JPI - Johannesburg Plan of Implementation

LEED - Leadership in Energy and Environmental Design

LCH – Low Cost Housing

LCHRF - Low Cost Housing Revolving Fund

LCHR – Low cost high-rise

MBSB – Malaysia Building Society Ltd

MGBC - Malaysia Green Building Confederation

MHLG – Ministry for Housing and Local Government

MMD - Malaysian Meteorological Department

NEP – New Economic Plan

NGA - New Growth Areas

NGTP - National Green Technology Policy

NYPD- New York Police Department

ODPM – Office of the Deputy Prime Minister (UK)

PAM – Pertubuhan Akitek Malaysia (the Malaysian Institute of Architects)

PLCHP – People's Low Cost Housing Programme

PPR - People's Housing Programme

SBTool - Sustainable Building Challenge Framework

SMART - Stormwater Management and Road Tunnel

SLCHP - Special Low Cost Housing Programme

SEDA Malaysia - Sustainable Energy Development Authority of Malaysia

TBL – Triple Bottom Line

UNCED - United Nations Conference on Environment and Development

UN-DESA United Nations Department of Economic and Social Affairs

UNDP - United Nations Development Programme

UNFCCC - United Nations Framework Convention on Climate Change

UNHSP - United Nations Human Settlements Programme

UN-REDD - United Nations collaborative initiative on Reducing Emissions from Deforestation and forest Degradation

US-EPA - U.S. Environmental Protection Agency

WCED - World Commission on Environment and Development

WCS - World Conservation Strategy

WSSD - World Summit on Sustainable Development

## Glossary of Terms

**Anti-social behaviour** - A legal definition of such behaviour can be found in English law which defines it as 'Acting in a manner that caused or was likely to cause harassment, alarm or distress to one or more persons not of the same household as (the defendant).' (Crime and Disorder Act 1998).

**Affordable Housing** – the affordability of housing tends to be measured in terms of the proportion of household income spent on housing costs. IN the US, for example, this figure is set at 30% for housing to be classed as affordable (O'Dell et al. 2004).

**Low Cost Housing** – in the Malaysian context low cost housing is defined by a specific set of criteria including the selling price, the groups at which the housing provision is targeted, and minimum design standards including the built up area. These criteria can and have changed since the introduction of low cost housing policy.

**Green Buildings** – According to the Malaysian organisation Green Building Index (2016), "A Green building focuses on increasing the efficiency of resource use – energy, water, and materials – while reducing building impact on human health and the environment during the building's lifecycle, through better siting, design, construction, operation, maintenance, and removal."

**High-rise Housing** – For the purposes of this thesis, multi-story buildings that are >18.3m above ground level at the highest point.

**Sustainable Development** – By the early 1970s the link between economic development of the environment had been established. The concept of sustainable development was adopted to describe a compromise under which economic growth could continue but with greater regard to its effect on the environment (Dresner, 2002).

**Sustainability** – Sustainability is the effectively the successor term to sustainable development. It is common to view sustainability as having three dimensions, the economic, the social and the environmental. Under this concept sustainability is achieved when each of these criteria are met (Barton, 2000). In this study the three criteria are applied to low cost high-rise housing in Malaysia.

**Sustainable communities –** In this thesis a UK government definition is used to determine whether a community is sustainable: "Sustainable communities are places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all." (Department of Communities and Local Government (UK), 2005).

**Urbanisation –** In the last three decades of the 20th century Malaysia experienced rapid urbanisation. This is a process which has three components a) rural to urban migration b) natural population growth within urban areas c) the reclassification of previously rural areas to urban and their agglomeration into built up areas (Duflot, 2012).

# Chapter 1 : INTRODUCTION TO THE RESEARCH

## 1.1 Background and Statement of the Problem

While housing is of course an essential need, the built environment in which we live is also a key determinant of quality of life and this environment comprises far more that the basic shelter of four walls and a roof. As UN Habitat (2012. p.1) reminds us, “No longer regarded as simply a roof over one’s head, housing today plays a crucial role in achieving sustainable development – as envisaged by the idea of sustainable housing.” For construction to be sustainable the construction stakeholders are required to design, develop, construct and manage a project in a way that minimises negative impacts on the environment and society as a whole (Abidin et al., 2013, p.10).

This study investigates the provision of low cost high-rise (LCHR) housing in Kuala Lumpur through the lens of sustainability and in so doing is able to evaluate the appropriateness of high-rise solutions at a time when the government is working towards ambitious environmental goals at the same time as it is striving to provide housing to low income groups.

At the time Malaysia gained independence from the British in 1957, its former colonial rulers, in common with many other Western nations, were turning to high-rise solutions to the demand for new housing, in the mid-1950s the British government was paying subsidies to encourage UK local authorities to build high-rise blocks of flats. Newly independent Malaysia took up this approach and has maintained it to this day, long after such developments fell out of favour in the UK.

In any country and for any government, housing provision for lower income groups presents major policy challenges and this is certainly the case in Malaysia where the provision of affordable housing to low income groups has been on the New Economic Policy agenda since its inception in 1971 and remained in the successor plans up to this day. Indeed, the Vision Development Plan (2001 to 2010) included an increased emphasis on sustainable urban development. In particular, efforts have been made to house low earners and squatters residing in urban areas such as Kuala Lumpur and Penang in LCHR housing. Overall, however, Metibogum and Raschid (2013) conclude that Malaysian government housing policy is geared towards the needs of middle income groups and the policy definition of affordable is a broad one extending to middle income groups.

Since independence in 1957 Malaysian governments have set out their policy objectives in 5-year plans and to varying degrees housing the people of the country, and specifically low-income groups, has been a feature of these plans. Targets for housebuilding are set and the proportion of these within the low-cost category are also specified. The first high rise residential building was completed one year after independence in 1958 (see Figure 1-1: Suleiman Court the first high-rise apartment building in Kuala Lumpur, completed 1958.

Alongside the development of housing policy has been the emergence of environmental issues now gathered under the umbrella of sustainable development which has seen Malaysia sign up to and act upon a range of international agreements, perhaps most notably the Kyoto Protocol which was ratified by Malaysia (classified as a non-Annex 1 (Developing) country) on the 4$^{th}$ of September 2002 (UNFCC, 2014). The Malaysian government has also imposed its own target of a 40% reduction in carbon emission intensity of GDP by 2020 when compared to 2005 levels (Hamzah, 2013, p.136).



Figure 1-1: Suleiman Court the first high-rise apartment building in Kuala Lumpur, completed 1958
(source:www.skyscrapercity.com/)

Returning to housing policy, the design parameters and guidelines issued by government for this new housing were basic in form and content. They were formulated to ensure speedy and practical construction to meet the objectives of housing low income people and squatters as expeditiously as possible. Construction of this LCHR urban housing began in Kuala Lumpur in earnest more than 50 years ago and new projects are begun on a regular basis. Quality factors such as access to treated water, electricity, and waste disposal as well as levels of overcrowding are monitored in the government's 'Housing Component Index' (Economic Planning Unit, 2013). However, this is by no means a comprehensive measure of sustainability, for this a combination of research such as this study and the application of Malaysia's Green Building Index, which was launched in 2009 to promote sustainable housing, are more appropriate.

One of the Malaysian Government Economic Planning Unit's key performance indicators is the degree to which it has fulfilled its objective of providing affordable housing to the two bottom quintiles in terms of income. The EPU reported that between 2000 and 2012 the progress toward this goal moved from one third up to more than 40% and that this had been achieved through a combination of public and private sector provision (Economic Planning Unit, 2013, p.32).

Despite this apparent progress on affordable housing in general, according to Abidin et al. (2013) the lack of government incentive programmes and meagre progress in revising construction regulations are two factors holding back the advance toward green buildings. There is also a lack of demand for green housing, probably arising through lack of awareness, which has inhibited the potentially positive role that market influence could have (Abidin et al., 2013).

On the other hand, sustainable housing has become a well-supported goal across the built environment professions with professional association such as *Pertubuhan Akitek Malaysia* (PAM) – the Malaysian Institute of Architects and ACEM – the Association of Consulting Engineers Malaysia both playing a leading role in the development and use of the GBI and in promoting housing sustainability in general. This support has also been seen in educational institutions.

### 1.2 Research aim and objectives

This research was undertaken to add to our understanding of the potential for sustainable LCHR housing in urban areas of Malaysia and to assess its overall appropriateness as a solution to the challenges of sustainable housing. It was

undertaken in the belief that there is a gap in both our knowledge and practice of the development of sustainable housing for the lowest income groups. The research also aims to assess to what extent high-rise housing is necessarily the answer to housing low income groups in a sustainable way. The study is also purposed to output recommendations for how urban high-rise housing can be improved in quality and designed and built in more sustainable way while at the same time maintaining affordability.

The objectives that act as the study's markers in its pursuit of these aims are as follows:

- To provide a summary of the current knowledge base on the subject in the form of a review of literature first on the concept of sustainability and second on how sustainability is being applied in current design approaches and parametres in the Malaysian context.
- To develop a methodological framework for the research which is designed to collect reliable and valid data relevant to the research questions and facilitate the systematic analysis of this data.
- To give voice to the perceptions of the residents and providers in the setting.
- To evaluate this study's findings using both existing literature and the findings of other studies.
- To reach conclusions and make recommendations for both practice (in the form of design parametres) and for further research.
- To assess the overall suitability of high-rise solutions to the joint objectives of providing affordable housing to low income groups while achieving ambitious environmental targets.

### 1.3 Research Questions

The setting of research questions is a crucial initial step in any research study. Such questions focus and guide subsequent stages of the research process including the scope of the literature review and the design of the research methods. The following five research questions have been set for this study.

- RQ1 How sustainable is the low-cost high-rise model of public housing in Kuala Lumpur?
- RQ2 How satisfied are the residents of LCHR housing in Kuala Lumpur with their unit, their neighbourhood and its social climate?
- RQ3 How do experts perceive the sustainability performance of LCHR housing?
- RQ4 How would PPR LCHR housing perform if assessed using the Green Building Index?
- RQ5 What best practices can be used to enhance the sustainability performance of LCHR housing?

### 1.4 Research Scope and limitations

So that focus can be maintained on the research questions, the scope of the study has to be decided upon. While issues of sustainable housing, particularly that aimed at low income groups, is a live one across all developing countries, this thesis limits itself to consideration of Malaysia. The case study used in the research is located in inner city Kuala Lumpur, the capital, however, the findings and recommendations are intended to be generalizable to other urban areas in Malaysia. The study is also delimited by the type of housing being examined, that being low cost and high-rise. A further delimitation is achieved by the setting

of specific research aims, objectives and research questions, as presented above.

This study is also limited by resources, notably time and financial. Larger samples and multiple cases may have added to the generalizability of the study if greater resources had been available.

### 1.5 Significance of the research

Housing is a key policy area and the provision of LCHR urban housing to low income groups is an important objective of these policies. Research which can inform this policy in some way is therefore significant and valuable. Moreover, research which focuses on the sustainability issues of such housing is particularly useful. As UN Habitat (2012) states, sustainable solutions are necessary if the various demands from climate change, urban growth, affordable housing provision, access to services, and the need for clean energy and environmental conditions are to be meet. Furthermore, housing is fundamental to social development and improved economic prosperity.

In the author's opinion both the Malaysian government's housing policies and the professional support for sustainable housing has not given adequate priority to marrying the need for affordable housing for the lowest income groups with the imperative to provide this housing in a way which is sustainable. This thesis seeks to address this lack of priority and to correct it to some degree. Additionally, while the government, education institutions and non-governmental organisations have been more proactive in recent years there is still a question mark over have far this has penetrated the construction sector and the number of sustainable housing projects has grown only slowly and then

mainly aimed at middle and higher income groups. The current research will recommend design parametres that can be taken up by the builders of affordable high-rise housing.

There is also the need to evaluate whether the long-standing tendency to see mainly high-rise solutions to the issue of housing for low income groups is an appropriate one when the sustainability dimension is added to the equation. This study aims to cast greater light on this question.

This study also enhances its significance by making practical recommendations for design parameters for LCHR housing which can be of value during the planning and design of future urban developments. Research can play an important role in assisting the government as well as the local authority in ensuring that the low-cost housing developments have basic habitable needs and sustainable short and long term.

### 1.6 Structure of the thesis

**Chapter 1 – Introduction:** This chapter has explained the background to the area of research and the context in which the study is set as well as the particular research problem that will be examined. It also presented the aims and objectives of the thesis together with setting the research questions to be addressed. The scope and limitations of the research were explained and finally, the planned contribution that the study is aimed to make was also presented.

**Chapter 2 – Sustainability: How the concept evolved.** This chapter is presented in two parts. The first part presents the evolution of the concepts of sustainability and sustainable development describing its development from the

early 1960s to the present day. In addition to this, the three dimensions or sustainability (the social, the economic and the environmental) are explained as this approach to sustainability would be important later in discussing the findings of the current study. The second part narrows the focus from the general context of sustainable development to the position of the built environment, particularly housing, within the wider sustainability discourse. A second aim is to introduce and discuss environment assessment tools as they are applied to the built environment. The Green Building Index, developed in Malaysia, is given particular attention.

**Chapter 3 – The Emergence and Growth of High-rise Housing** The purpose of this chapter is to describe the emergence and development of high-rise housing around the world emphasising public housing aimed at low income groups in urban areas. The experience of western countries in regard to high-rise housing is discussed to draw out the key issues so that the attempted solutions can be understood. In addition to this, the chapter examines high-rise housing from a sustainability perspective. The geographic focus moves to Asia later in the chapter to explore how cities like Singapore and Hong Kong have met the challenge for compact urban living.

**Chapter 4 – The Malaysian Context** This chapter is presented in two parts. The first provides the country context of the research. It comprises a description of aspects of Malaysia which are pertinent to housing, including climate, natural disasters, urbanisation and the local challenges and opportunities in terms of sustainability in housing development. The steps taken by the government to encourage sustainable development are discussed and the first part finishes with a review of recent official statistics on the housing provision in the country. The second part reviews the development of low cost housing policy in Malaysia and so further contextualises the current study. After defining low cost housing

(LCH) it sets out how LCH policy has evolved from the 1950s to the present day going through each of the five-year plans that have been in place since independence and include the targeted and actual outturn for LCH building. Additionally, there are sections on allocation practices, squatters and residential satisfaction as these three issues are particularly relevant to the current study.

**Chapter 5 – Methodology:** In this chapter the research paradigm, research design and specific research methods are described and discussed to show how the study was performed. It explains how the different sets of data were collected from semi-structured interviews, focus groups, by observations and through a questionnaire survey. There is further explanation of how the data were analysed. Finally, the ethical issues that the researcher had to consider were discussed.

**Chapter 6 – Findings of the qualitative study** This chapter presents the findings of the qualitative study in which residents of LCHR housing in Kuala Lumpur voiced their perceptions of their housing and community and expert participants (3 architects and a politician) gave their views through in-depth interviews. To support these first two data sources observation data collected by both the researcher and a sustainable buildings expert (a GBI assessor) were also introduced. The main themes arising were the reports of crime and anti-social behaviour, maintenance issues and certain points of conflict with the city authority responsible for the management of the project. The high density LCHR housing as represented by the five cases in this study was not viewed as sustainable by the experts. Overall, however, there was insufficient evidence to conclude that LCHR housing was unsustainable, though this may be because the expectations of the former squatters who participated in the study were relatively low.

**Chapter 7 – Results of the quantitative study:** As the qualitative study could not conclusively answer the research questions a further quantitative component was added to the research design**.** This chapter presents the results from the data collected from a residential satisfaction survey undertaken at the same five sites that the focus groups had been held at. A large sample (n=280) responded to the survey and the results and analysis revealed some interesting contrasts with the focus group data.

**Chapter 8 - Evaluation and Discussion:** In chapter 8 the findings presented in the two previous chapters are evaluated and discussed and in doing so the research questions formulated at the outset of this research are addressed. As well as using the findings of the current study, where appropriate other studies and literature sources were drawn on in the discussion in order to facilitate the most reliable possible answers to the research questions set. The chapter is organised into the three dimensions of sustainability - social, economic and environmental. The main questions arising related to the social sustainability dimension.

**Chapter 9 - Conclusion and Recommendations:** The conclusions of this study are summarised in this chapter and a set of best practice recommendations for policymakers and designers are presented. Following a chapter by chapter summary the research objectives and research questions first listed in this introductory chapter are appraised. The framework for best practices based on the research is then presented. The thesis finishes with some suggestions for a future research agenda in the field of low cost housing sustainability.

# Chapter 2 : SUSTAINABLE DEVELOPMENT AND SUSTAINABLE HOUSING

## 2.1 Introduction

The purpose of this chapter is to discuss the concept of sustainability and how it became applied to housing. This is achieved in two parts with part one covering the generality of the concept and part two looking specifically at housing. The chapter reviews the literature in order to present an historical commentary on the evolution of the concept of sustainability from its emergence in the early 1960s and then its application to housing and the more recent emergence of the 'green building' concept.

## PART ONE: THE EVOLUTION OF THE SUSTAINABILITY CONCEPT

## 2.2 Evolution of the Concept

While industrial production, the nature of work, value systems and the growth of science and technology were all changing rapidly and spurring on explosive population growth the 18$^{th}$ and 19$^{th}$ centuries gave little time for thoughts of sustainability. Even though the use of natural resources to fuel economic activity was unfettered there were no detectable signs of concern. The Earth it seemed would just keep on giving.

In fact, it was not until 1962 to that the first voices were being heard imploring people to awareness of the environment and the effects of untamed pollution. This point in time was marked by the publication of *Silent Spring* (Carson, 1962), an environmental science book documenting the harm being caused by

chemical pollutants. I was the first time such concerns were voiced to a wide public in America. Six years later and man was on the moon taking photographs of “Spaceship Earth” it visualised the vulnerability of the planet and the natural limits on human activity, it depicted the planet as something to take care of and not continually exploit (Dresner, 2002). It took just a couple more years before the environment movement as we know it today was born (Gore, 2006). The oil crises of the 1970s demonstrated to people across the world the extent of mankind’s dependence on the planet’s natural resources and how these resources were not infinite (Williamson et al., 2003).

The link between the very future of mankind and the sustainability of the environment was firmly made in a 1972, the year before the first oil crisis, in a publication titled *The Limits to Growth* (Meadows, et al., 1972), written by a group which later became known as the Club of Rome. It described how the depletion of natural resources, environmental pollution and degradation was the result of economic growth and that if that growth in population, pollution, food production and natural resource depletion, continued along its trajectory the planet’s ability to cope would be exceeded in a hundred years’ time. The “Limits” thesis gained support from Daly (1977) in Steady State Economics where the conflicting nature of the relationship between economic growth and protecting the environment was proposed. It was argued that governments should give up the pursuit of continual economic growth and instead adopt a zero-growth strategy (Daly, 1977).

Also in 1972 the United Nations Conference on the Human Environment, which took place in Stockholm, made its first exploration into the link between global economic development and the environment (Dresner, 2002; Mebratu, 1998). The urgent need to react to the issue of environmental deterioration was acknowledged and formed part of the Stockholm Declaration on Human

Environment (UN, 1972). While analysis of the precise effects of growth on the environment were still lacking at this stage the consensus that ‘we cannot go on like this’ was clearly emerging at this point.

With such powerful interests benefiting from the ‘growth is good’ hegemony and now, from the 1970s, being threatened by the ‘limits’ perspective it is unsurprising the reaction was fierce. With such diametrically opposed positions the only option was some form of accommodation or compromise. This came in the shape of ‘sustainable development' a middle way which offered both ideologies some room to go forward (Stockdale, 1989).

The 1970s was dominated by a philosophy of preservation which in practical terms meant conserving nature within clearly defined boundaries and away from the directly conflicting effects of economic development which was viewed as an ideal in opposition to environmental preservation. By the time the International Union for the Conservation of Nature (IUCN) formulated the World Conservation Strategy (WCS) (IUCN, et al., 1980) in 1980 the idea that conservation and development were not necessarily mutually exclusive was gaining wider global support.

The Strategy signalled a substantial realignment in conservation, from its earlier focus on the physical fencing off of nature reserves to seeing conservation and development as integrated concepts. It argued that development was required to take people out of poverty and facilitate conservation but also that where development does not facilitate or is not accompanied by the conservation of nature then great harm will result to the fragile world and its human population. The Strategy’s definition of development was "modification to the biosphere to satisfy human needs", while conservation was "the management of human use of the biosphere to yield the greatest sustainable benefit to present and future

generations" (IUCN, et al., 1980). The term 'sustainable development' made no appearance in the main text, but the Strategy's subtitle was "Living Resource Conservation for Sustainable Development," undoubtedly giving prominence to the concept (Khosla, 1995). By bringing the time dimension into the development-environment debate the Strategy had uncovered a factor around which the concept of sustainability can fuse (Khosla, 1995). However, the Strategy had its limitations, principally as a result of not addressing wider economic and social issues and restricting itself to concern for how environmental sustainability can satisfy human needs (Khosla, 1995).

### 2.2.1 The Brundtland Report

Seven years later, in 1987, the World Commission on Environment and Development (WCED) produced a publication entitled Our Common Future (WCED, 1987). Better known as the 'Brundtland Report', the deficiencies identified in the Strategy were addressed by linking the social, economic and environmental dimensions of development in an explicit way. By seeking to form a joint goal which put the separate aims of development and sustainability together a new model could be created with both economic and ecological dimensions – sustainable development (Lele, 1991). Thus the link between the environment and conservation from the IUCN approach in 1980 had been replaced with one which recognised that development and environment issues need to be addressed together and that concern for either the environment or development on its own was fruitless.

The Commission reported that the basic needs of a large proportion of the world’s population were left unmet, and gave a warning that a range of crises, including ecological ones, would arise from such widespread inequity and

poverty. It is in the Brundtland Report that the defining statement on sustainable development can be found describing it as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p.8). Whereas the limit-to-growth model of the 1970s sought to constrain economic activity, sustainable development emphasised the social and economic aims of society, especially in developing countries, and at the same time pointed out that achieving these aims were bound up with achieving of environmental objectives.

Furthermore, the Brundtland Report gives prominence to the firm link between improvements in the environment and the alleviation of poverty and social equality through sustainable economic growth and underscored our total dependency as a race on the environment we live in, in a way which went far beyond the exploitation of its natural resources for economic goals: "ecology and economy are becoming ever more interwoven —locally, regionally, nationally and globally" (WCED, 1987, p.5). There are constraints including "the ability of the biosphere to absorb the effects of human activities" (WCED, 1987, p.8) and the imperative to "adopt life-styles within the planet's ecological means" (WCED, 1987, p.9). In this way, sustainable development does not represent an assumption that economic growth is either achievable or a desirable pursuit in every circumstance.

The way Brundtland defined sustainable development prompts another question about how we should define 'needs'. Undoubtedly different societies will define these needs differently with sharp contrasts between developed and developing countries. These different interpretations are reflected in the lack of consistency among institutional definitions of sustainable development (Mebratu, 1998). Unsurprisingly each interpretation varies according to which particular group that institution represents be it a nation state, a business

interest or a community. Each interpretation is also supportive of a different set of policies and practices. Needs are not universal but vary according to values and context as a number of authors have suggested (e.g. Max-Neef, 1991; Douglas, et al., 1998; Maslow, 1987). This relativist view of needs would mean that sustainable development based on needs invites groups and individuals to project their particular values and interests onto the concept. This malleability in the concept and the theory underpinning it has seen the nomenclature of sustainable development being adopted by corporate management and politicians alike (Wackernagel & Rees, 1996).

### 2.2.2 Caring for the Earth

The IUCN followed up its 1980 WCS report with another, entitled Caring for the Earth (IUCN, et al., 1991). In comparison to the original report, which focused solely on changes to the environment, the 1991 report, while maintaining this focus on environmental issues, also demonstrates an enhanced awareness of social issues with proposals for change in the global economy, in quality of life issues, the socio-economic structures, and more participative democracy (Hopwood, et al., 2005). Caring for the Earth defined 'sustainable development' as that which "improves the quality of human life while living within the carrying capacity of supporting ecosystem" while 'sustainability' is "a characteristic of a process or state that can be maintained indefinitely" (IUCN, et al., 1991, p.211).

By defining in this way the imperative condition for sustainability is the improvement of the quality of human life but with the constraint of the supporting ecosystem's carrying capacity. The definition, however, does not remove all contention because it requires a universally agreed definition of the 'quality of human life' and then unanimity as to what the 'carrying capacity of supporting

ecosystems' and a generally accepted understanding of which human actions are undermining these supporting ecosystems.

Opposing arguments between countries of the North and those of the South on who is responsible for putting the carrying capacity under stress have become a permanent feature of the sustainability debate and at the 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro (known variously as the 'Rio Conference' or the ‘Earth Summit’) it was the pivotal point of contention. Despite the North-South spilt 154 countries put their signature to the Rio Declaration on Environment and Development and also reaffirmed the earlier Stockholm Declaration.

### 2.2.3 The Rio Declaration

By 1992 a framework of global agreements was in place covering five aspects of sustainability, specifically: The Rio Declaration (UNESCO, 1992), Agenda 21 (UN, 1992a), the Statement of Principles on Forests (UN, 1992b), the Convention on Biological Diversity (UN, 1992c), and the Framework Convention on Climate Change (UNFCCC, 1992). A clear contrast had been established between the approach to the environment and economic development of the 1970s and that now in place by the early 1990s. This manifests itself in three newly established assumptions: 1) The planet was experiencing atmospheric warming and stratospheric ozone layer depletion; 2) the finite nature of the Earth’s natural resources; and 3) the need to promote economic growth where such growth aims to minimize impact of the ecosystems (IUCN, et al., 1991; World Bank, 1992; Hardoy et al., 1992).

Agenda 21 makes mention of the economic inequalities both among, and within nations, it also points to increasing poverty, illiteracy, hunger, and the ongoing ecological degradation (UN, 1992a). The two salient issues in the UNCED were, firstly, the relation between development and the environment between environment and development and secondly an understanding of how the theory of sustainable development actually applied in practice in a way which balanced protecting the environment with the real economic and social concerns with the world faced. In Agenda 21 protecting the environment, economic development and social equity stand side by side as pillars of sustainable development (UN, 1992a).

### 2.3 The Three Dimensions of Sustainability

As concluded above, sustainable development can be seen as three dimensional — the social, the economic and the environmental. To achieve the status of “sustainable” each of the three dimensions or criteria must be satisfied.

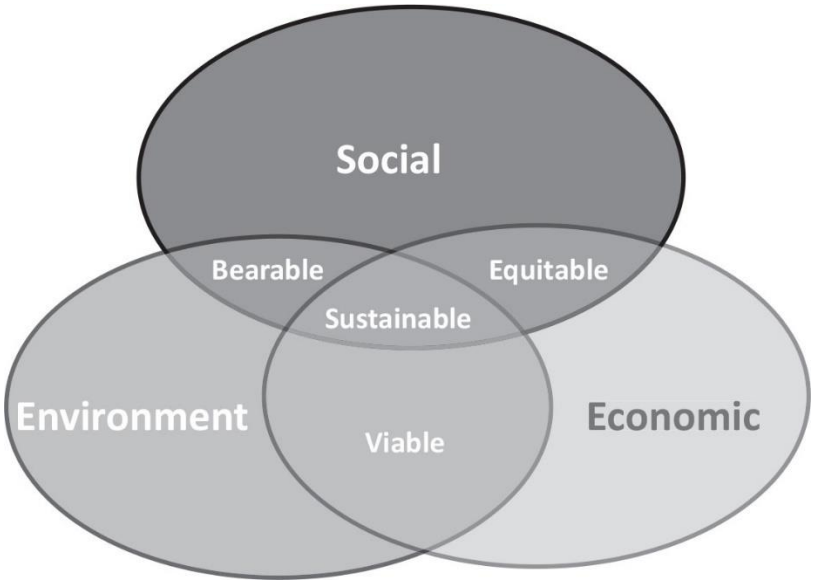



Figure 2-1: The three dimensions of sustainability

As buildings have both environmental and human aspects, this part of the thesis is concentrates on building an understanding of the interrelated nature of these dimensions so that the different approaches to implementation can be revealed.

With all the complexity associated with the concept of sustainable development, its varying aims and wide scope, implementation is problematic. There is diverged opinion on which aims and approaches should be prioritised. Is it a priority to achieve an ever-increasing standard of living? What is the moral position of shareholder value? Do human needs take priority over the environment? This dichotomy is expressed in the discourses around weak v. strong sustainability (Pearce, et al., 1989; Pearce & Barbier, 2000; Turner & Pearce, 1993), Shallow versus Deep Ecology (Naess, 1989), and the Brown and Green Agenda (McGranahan & Satterthwaite, 2000; International Institute for Environment and Development [IIED], 2001).

Notwithstanding this tension, the so-called 'Triple Bottom Line' (TBL) approach to sustainable development has emerged (Eikington, 1994) in a way designed operationalise the sustainable development concept within the business sphere. TBL seeks to rationalise development that promotes economic growth, but maintains social inclusion and keeps the impact on the environment to a minimum. However, there remain discrepancies as to how sustainable development should be interpreted. Should the three dimensions already mentioned be treated as equal or is the environment a dominating dimension dictating to the other two (Rydin, 2003). These two approaches are now considered.

Under the first ‘all dimensions are equal’ approach, the three dimensions are seen as three interconnected rings (Lutzkendorf & Lorenz, 2007; Barton, 2000; International Council for Local Environmental Initiatives [ICLEI], 1996; ISOIFDIS

15392, 2008). This simplistic model has each of the three dimensions standing alongside each other with equal prominence.

Sustainable development is frequently shown as aiming to bring the three together in a balanced way, in order to solve reconciling conflict. For example, the International Organization for Standardization (1SO/FDIS 15392, 2008, p.8) explained that:

> The three components are inextricably linked to each other, are interdependent and to be balanced. They must be considered equally. These aspects should be listed in no particular order...The overlapping areas represent aspects of mutual influence. The overlapping may lead to positive impact in one sphere resulting in adverse impact in the other(s). [Sustainable development] is a term that is increasingly accepted worldwide within the corporate community, and a framework for corporate reporting practices.

As such, each activity or project needs to take account of these interrelationships. As Robinson (2004, p.378) states: "solutions that address only environmental, only social or only economic concerns are radically insufficient."

However, the separation implied by the model, lends itself to the picking and choosing of priorities depending on one's perspective. A number of authors have remarked on the weaknesses and limits of this model which mainly arise from its assumption of independence of the environment, economy and society from each other (Neumayer, 1999; Giddings, et al., 2002; McGregor, 2003; Wackernagel & Rees, 1996). What is more, this approach comes with the risk that sustainable development will become lop-sided rather than balance across each dimension. According to IUCN (2006) and Neumayer (1999), gives the impression that it is possible to make trade-offs -offs between dimensions, something in alignment with `weak' sustainability which argues that that built

capital can be a replacement or substitute for natural systems and resources. Similarly, McGregor (2003) suggests that this model fails to sufficiently acknowledge the environmental limitations on growth because fundamentally it is a balancing mechanism, which essentially trades off economic growth against the two other dimensions. IUCN (2006) further stated that it was inappropriate for them to be treated as equivalents. This has led to a contrast appearing Consequently, a distinction is often drawn between a 'strong' form of sustainability (where trade-offs are not permitted or are constrained) and `weak' sustainability (where they are indeed allowed) (IUCN, 2006).

Wackernagel and Rees (1996), Daly (1992), Rees (1995), and Giddings et al. (2002), each offered an alternative under which the economy is dependent on society and the environment, and that without society, there could be no economy. They also noted that human activity takes place within the environment. This view positions the economy as a subset of society, which in turn is a subset of the environment. In other words, economic capital is positioned in the centre being the basis of wealth creation, which then drives the development engine forward, while being constrained by social and environmental considerations. Giddings et al. (2002) suggest that putting economics in the centre is not the same as saying it has to be the focus. In fact, it is a subset of the other two and is dependent on them. Mankind requires the environment, but the environment is not dependent on mankind. The economy is dependent on both society and the environment while for many, society still exists without the economy (Lovelock, 1991).

Whichever particular point in time we identify as the birth of the concept of sustainable development it is clear that it is now the leading global approach to addressing the environmental challenges facing Mankind.

## PART TWO– SUSTAINABLE HOUSING AND THE ROLE OF ENVIRONMENTAL ASSESSMENT TOOLS

### 2.4 Part Two Introduction

The first part of this chapter described the development of the concept of sustainable development since the early 1960s and how it was effectively a marriage of two projects that some had considered irreconcilable environmental sustainability and economic development. Malaysia's Vision 2020 launched in 1990 targeted achieving developed country status by 2020 something which by 2010 would require ten years' GDP growth of an average 6.5% (Oxford Business Group, 2010). So, if the marriage of the two concepts is to be an equal one then sustainability efforts would need to be substantial.

Whichever particular point in time we identify as the birth of the concept of sustainable development it is clear that it is now the leading global approach to addressing the environmental challenges facing Mankind.

After discussing conceptual development in part one, the second part narrows its focus first onto the part played by the built environment in sustainable development and the way this is reflected in policy and the emergence of environmental assessment tools then further narrows to describe one particular assessment tool and how it is being applied in Malaysia.

Sustainability in the built environment unsurprisingly focuses on cities and their expanding urban areas. While this chapter is more concerned with solutions in the form of steps towards a sustainable built environment, it is worth remembering that while urban areas may hold great promise for progress towards environment objectives they have already been marked out as one of

the major causes of our environmental woes, particularly climate change. The United Nations Human Settlements Programme (UNHSP) identifies urbanisation's role in climate change as arising through the prevalent pattern of this seen across the world today. This they refer to as density-based suburbanisation and is just as likely to be seen in developing countries as it is in developed ones. This phenomenon is driven by land speculation which leads to the peripheries of cities being converted from rural land to urban uses. As the residents of these suburban areas have energy intensive middle-class lifestyles including private vehicle use (often with multiple cars per household) the effect in environmental terms is a serious one.

An alliance of economic agents is behind this trend which UNHSP reports as comprising of "real estate developers, home- and road-builders, national and international chain stores, among others, more often than not with support from banks and finance houses." They decisively assert that "Wasteful expansion of cities in endless peripheries is a major factor behind climate change." (UNHabitat, 2012, p.11).

We can conclude that cities are both a source of environmental problems and a potential remedy. While this thesis is mainly concerned with inner city areas and specifically low-cost high-rise residential buildings it is also recognised that the challenges faced stretch beyond this to the formal borders of cities and beyond as the UNHSP forcefully reminds us

.

### 2.4.1 Sustainable development – a flexible term

The multiplicity of the dimensions of sustainability was further added to by the Habitat II Agenda (United Nations Development Programme [UNDP], 1996),

that resulted from the United Nations International Conference on Human Settlement in Istanbul in 1996, when it formulated the concept of 'sustainable politic'.

Subsequently in 2002, the conceptual evolution of sustainable development took another step forward at the World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa. The Johannesburg conference was the UN's largest so far (Hens & Nath, 2006). The documentary result of the WSSD was the Johannesburg Plan of Implementation (JPI) (UN, 2002). Continuing the trend for additional components to be bolted on to the original conception of sustainable development the Johannesburg Plan added the dimension of 'participation', meaning that all sections of society should be involved in ensuring sustainability and share in the aims of moving away from unsustainable production and consumption practices, careful natural resource management, poverty eradication and long termism in decision making. It was effectively the arrival of the stakeholder approach to sustainability (UN, 2002). Whether any project or initiative is sustainable is determined by its participative basis. Furthermore, the JPI points out that each of the pillars or components are mutually supportive elements of development in the long term (UN, 2002).

Clearly, the early uses of the term 'sustainable development' were markedly different in the 1960s and 1970s, when compared to 1980s and after, mainly in that assertions of the need to constrain both population and economic growth had lost favour. In the 1960s and 1970s focus was on the conservation natural resources based on the fact that these resources were understood to be finite and that their depletion may occur at a rate which could actually harm the growth of the world's economy. Contrastingly, those advocating sustainable development in the 1980s were looking for means to make economic growth sustainable, with technological change seen as the most viable route (Pearce,

et al., 1989; Commonwealth Government, 1990). It was in 1982 when the British government started to use the word `sustainability' to define to sustainable economic growth to supplant the focus on resource exploitation (Beder, 1994). The main clarifying element of the WCED in 1987 was the emphasis on the requirement for continual economic growth, including economic growth "[because] development is seen as ...desirable for the entire world,...most particular for those nations which are currently 'underdeveloped" (Eichler, 1999, p.185). The Brundtland Report refuted the idea that there were environmental constraints on growth (Kirkby, et al., 1995) and foresaw a way to achieve economic growth without damaging the environment as a vital necessity (Rees, 1990). Dresner (2002) sought to explain the controversy issue with the argument that the concept of sustainable development facilitated a desirable balance between environmental concern and a positive view of economic growth. Growth was not bad *per se*, instead it was the growth strategies which needed modification (Dresner, 2002).

As previously mentioned, the absence of unanimity on the definition of sustainable development has laid the concept open to definition by a wide range of interests in their pursuit of their own interests (Beder, 1996). This self-interest can be seen at every level in individual projects, localities, regions, nations and globally (van Pelt, 1993). Sustainable development has become a concept that can be taken up by a wide range of interests from environmental activists to big business and each has their own interpretation. Unsurprisingly, Pezzoli (1997) explains that there is no shortage of literature to be read on the topic, yet no consensus on definition, even in the same disciplines, which is something which could account for the meagre progress on many environment issues. In an essay entitled ‘Politics of Sustainability’ Tim O'Riordan (1988) argues what lies behind the universal support for the words 'sustainable development' is the fact

that they can be used, on the one hand by those environmentalists who emphasise the sustainability and on the other by developers who emphasise the second word. There are many who would say that this contains an inherent contradiction because it is that very development that is ecologically unsustainable and which has brought us to the precarious position we are now in. Indeed, a large number of those identifying themselves as environmentalist view the word ‘development’ as an untenable one which actually refers to the wanton and careless degradation of the natural world, paving paradise to put up a parking lot, to borrow from the song lyrics.

Second, because the term is so vague it allows almost anyone to advocate its cause (O'Riordan, 1988). Nevertheless, Daly (1996) puts the case that getting a consensus around a vague term is more useful than sharp differences on a precise one and represented good politics. By the mid-1990s even this early vagueness was not enough to produce a consensual approach, in fact it was fomenting disagreement: consider that Fowke and Prasad (1996) calculated that there were a minimum of 80 variations on the ‘sustainable development’ definition circulating at that time.

In a similar vein, Mawhinney (2002) showed that 'sustainable development' had become a somewhat worn out phrase and that while some common themes emerge from the definitions there were equally common differences in priorities, ambiguous meanings and issues of the extent of the how the term should be applied. A number of other authors also expressed hesitancy about the usefulness of the term (Doughty & Hammond, 2004; Tryzna,1995; Dresner, 2002; Goldin & Winters, 1995). Doughty and Hammond (2004) went as far as to brand it an "oxymoron". There are also issues concerning the terms 'sustainable development' and `sustainability' and whether or not they can be used interchangeably as indeed they were in Agenda 21. However, Dovers and

Handmer (1992) did draw a distinction between the two arguing that 'sustainability' is the ultimate yet extremely difficult objective to bring the world into a sustainable condition while ‘sustainable development’ is a process by which it may be possible to move a little further along that road (Dovers & Handmer, 1992). This division between the two terms was also suggested by the International Organization for Standardization (ISO CD 15392, 2004) which asserts that `sustainability' actually results from applying the concept of `sustainable development' and ensures that the ecosystem stays intact for future generations. Hence we can see that under this approach `sustainability' is the objective while 'sustainable development' is a process. In a surprising contrast to this McNeill (2000, p.18), states that 'sustainable development' should also be a goal because must be a goal it is "unambiguously concerned with the normative, what ought to be done not with describing the actual experience of one or more countries".

It is undoubtedly highly problematic to achieve a common philosophy around the concept of sustainable development with consensus seemingly out a reach. It may be that the term is simply too broad and has too many nuances to be adequately definable. It is beyond doubt contentious. Whatever view is taken it is clearly an area of contention. This does not mean that disagreement on what is to be done is inevitable. Indeed, a broad consensus that the natural resource exploitation of the past would be harmful to mankind if it continued. Furthermore, the term has proven effective in bringing many groups under the same umbrella. It has secured its place because it provides the basis for a relationship between the environment and socio-economic aspects of human life and as such this paper has adopted the term when referring to attempts to understand the relationship economy, society and the environment.

## 2.5 Sustainable housing as part of sustainable development

According to UNDP leading expert Dr Arab Hoballah "…almost no country in the world can hope to achieve carbon dioxide-reduction targets without including the building sector into their plan of action." (Hoballah cited in Suhaida et al. 2013, p.3).

The reason for this is that the built environment is a source of a range of significant negative impacts on the environment. A study conducted in the US sought to identify and quantify each of these impacts (Levin, 1997). As seen in figure 2 the main impacts are energy use and carbon emissions with raw material use, solid waste generation, use of water, water effluents, other releases and land use following in that order.

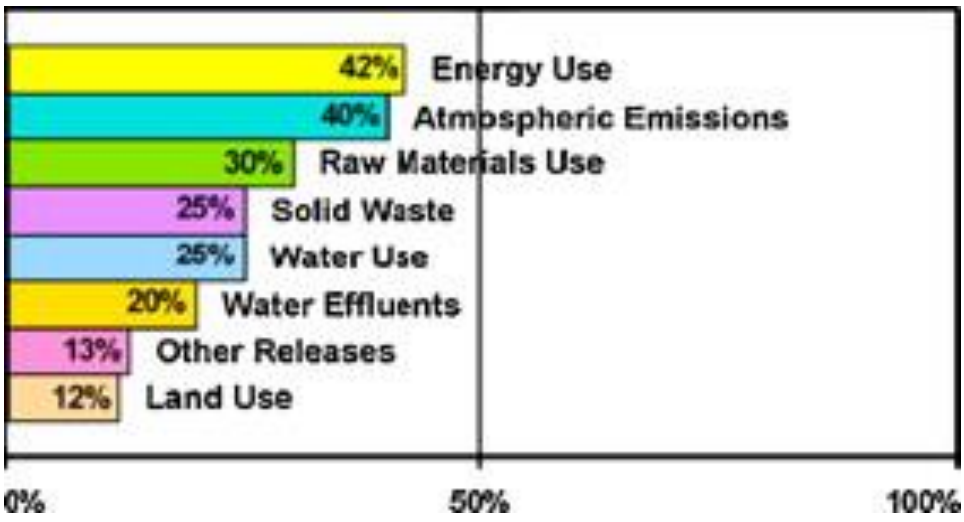



Figure 2-2: Environmental Impacts of the built environment (Source: Levin, 1997)

Unsurprisingly, as will be seen later, these impacts are strongly reflected in the design of environmental assessment tools including Malaysia's Green Building Index.

Another important dimension to the impact of buildings on the environment is made by Bauer et al. (2010) who reminded us that the impact is longitudinal in the sense that buildings are with us for many decades, even centuries in some cases. Negative impacts designed into buildings now are likely to be with us in 50 to 80 years' time and conversely the benefits of sustainable buildings built today will yield environmental dividends for an equally long time (Bauer et al., 2010).

Sustainable building practices are able to significantly reduce or even eliminate the aforementioned negative environmental impacts and in the case of refurbishments can ameliorate previously used unsustainable designs. In parallel to this already vital benefit, the use of sustainable design measures delivers long term reductions in building operating costs, lower the potential for liability issues arising from poor air quality, enhances staff productivity (in office buildings), and adds to the building marketability (Bauer et al., 2010). The U.S. Environmental Protection Agency defines a green or sustainable building as "a structure and using process that is environmentally responsible and resource-efficient throughout a building's life-cycle: from design, construction, operation, maintenance, renovation, and demolition" (US-EPA cited in Suhaida et al. 2013, p.3).

While all countries clearly need to address the environmental impacts of the building sector the priorities and policies in developing countries will be different to those in developed ones. Malaysia is classed as a developing country (in Kyoto terms) but has aspirations to become a developed country in the near future. Indeed, it has "newly industrialized country" status and is an "emerging market/economy" according to Dow Jones Indexes (2011) and the Independent Evaluation Office of the IMF (2009) respectively.

While developed countries may be able to emphasise the environmental dimensions of sustainability taking it to a higher level, developing countries are likely to need to prioritise the fundamental needs of citizens, including the provision of housing to low income groups, an important policy in Malaysia.

In the UK the built environment accounts for 50% of energy consumption and uses 40% of all raw materials consumed in the economy (Green Construction Board, 2013) while in the United States (US), the building sector is believed to account for around 48 percent of annual greenhouse gas emissions (American Institute of Architects, 2006).

In terms of energy efficiency, there is evidence that Malaysian buildings perform less well than the regional average. Using the Building Energy Index (BEI), which measures energy consumption per square meter per year, the South East Asian average was reported at 233 kWh/$m^2$/yr while Malaysian buildings used more than 15% more at 269 kWh/$m^2$/yr (Zainordin et al., 2012). Zainordin et al. (2012) suggest that buildings' energy consumption can be reduced by 30% if a 'whole building' approach is taken, and multiple technologies applied and that this can be achieved without automatically increasing costs.

There has been a partial shift within the construction sector globally. This has seen it move from a position where environment issues where a relatively small part of the overall building process to one where the development process itself has been integrated into the overall environmental agenda (Abidin, 2009). Now, "Sustainable construction is seen as a way for the construction industry to contribute to the effort to achieve sustainable development" (Abidin, 2009, p. 422).

## 2.6 The emergence of environmental assessment tools

Determination as to whether a building satisfies this definition in all its aspects requires the use of an assessment tool and an associated rating system. Many professionals, policy makers and academics have been involved in the development of these systems around the globe and a plethora of such assessment tools are now operating worldwide. Among the essential characteristics of these assessments identified by Bauer et al., (2010) are usability, convenience, relevance to the different stages of the design process and when completed the results of the assessment should be easy to communicate, reliable and transparent.

Bragança et al. (2010. p 2011) states, “The purpose of sustainability assessments is to gather and report information for decision-making during different phases of the construction, design, and use of a building.” They see two contradictory extremes concerning the development and use of environmental assessment tools. At one end of the scale they are proliferating in number and becoming ever more complex while at the other there are effort to make them more user-friendly with an emphasis on simplicity (Bragança et al., 2010). With countries working towards global environmental objectives, a degree of consistency among such tools would surely be a good thing. However, there are climatic, economic, social and cultural variations between countries and these also need to be reflected in the precise nature of the system used in a particular country. Cooper (1999) makes this point arguing that attempts at universalism with regard to assessment tools ignores “the socio-economic and political dimensions of sustainability.”

There are three types of building assessments tools according to Bragança et al. (2010) these are 1. Systems to manage building performance (Performance

Based Designed) 2. Life cycle assessment systems and 3. Sustainable building rating and certification systems. Our interest in this chapter is principally with the third type.

Under sustainable building ratings and certification systems the highest rated certification effectively creates of pool of best practice experience which developers can refer to should they opt to seek sustainability in their projects (Bauer et al., 2010). Bragança et al. (2010) identify the three leading rating and certification systems as being the Leadership in Energy and Environmental design (LEED), developed in the U.S.A; the Building Research Establishment Environmental Assessment Method (BREEAM) that originated in the UK; and the Sustainable Building Challenge Framework (SBTool), a multinational collaboration of some 20 countries. Other systems tend to have their methodological roots in one of these three.

Among the 'pioneer' systems the first was BREEAM being introduced in 1990 by the UK's Building Research Establishment (BRE). Originally designed for office buildings, BREEAM had the important feature of being able to be applied at an early project design stage so that results can be fed into the design development process allowing modifications to be made along the way (Ding, 2008). The BREEAM system has been continually updated and now covers new homes among a far broader range of buildings. It has also gone on to heavily influence other national rating systems such as those in Holland, Canada, Hong Kong and Australia (Ding, 2008). BREEAM certificates award fair, good, very good or excellent certification based on the scores achieved and since its inception 250,000 buildings had been certified with over one million having been registered for assessment, numbers supporting the claim that BREEAM is the world's leading environmental assessment method for the built environment (BRE, 2014).

Table 2-1: Summary of three leading building assessment tools

| Name | BREEAM | LEED | SBTool |
|---|---|---|---|
| Introduced | 1990 | 1998 | Various |
| Elements | Management<br>Health and Wellbeing<br>Energy<br>Transport<br>Water<br>Materials<br>Waste<br>Land Use and Ecology<br>Pollution | Sustainable Sites<br>Water Efficiency<br>Energy & Atmosphere<br>Materials & Resources<br>Indoor Environmental Quality<br>Innovation in Design | Site regeneration & development, urban design & infrastructure<br>Energy and resource consumption<br>Environmental loading<br>Indoor environmental quality<br>Service quality<br>Social, cultural and perceptual aspects<br>Costs and economic aspects. |

Sources: BRE Group 2017; USGBC, 2017; SBA 2017.

Bragança et al. (2010) argue that sustainability when attached to a building is only achieved when all four dimensions of sustainability are satisfied: economic, social, and cultural and environmental. Furthermore, the assessment of components of buildings or even entire individual buildings is no longer sufficient and building sustainability assessment (BSA) tools have been developed to reflect this. The built environment needs to be assessed as a whole and this includes the neighbourhood, services, and public transport not simply the buildings (Castanheira & Bragança, 2014).

A prosperous city is an objective that can only be achieved “when environmental and social objectives are fully integrated in a city’s overall economic goals to help bring about environmental sustainability” (UNHabitat, 2012, p.78). In Malaysia three cities have urban populations in excess of 1million people – the capital Kuala Lumpur, Klang and Johore Bharu. In the case of the capital, the population is forecast to rise to 1.938 million having been 1.12 million in 1990 (UN Habitat, 2012). For Kuala Lumpur and Malaysia’s other urban centres a key social objective is the housing of low income groups while environmental goals include reduction in carbon emissions and energy efficiency (UNHabitat, 2012).

### 2.7 The Green Building Index in Malaysia – how does it work

Of the three types of systems or tools for building assessments identified by Bragança et al. (2010) Malaysia’s Green Building Index falls into the third category being a rating and certification system. The aims of assessment tools in general are “to foster more sustainable building design, construction, operation, maintenance, and disassembly or deconstruction by promoting and making possible a better integration of environmental, societal, functional, and cost concerns with other traditional decision criteria” Bragança et al. (2010. p.2015). Similarly, Abidin (2009) described the overall aim of the GBI as being the provision of opportunities to developers for designing and constructing sustainable, green buildings which deliver energy and water savings, a healthy indoor environment, improved connectivity to public transport and services as well as the use of recycling and greenery. The developers themselves declare that their tool is aimed “to assist the building industry in its march towards sustainable development” (Green Building Index, 2013).

The Green Building Index is now established as Malaysia's first and foremost building assessment tool having been first introduced in 2009 by Greenbuildingindex Sdn Bhd (GSB) and officially launched by the government on the 21st May of that year following a soft launch on 3rd of January that year (Green Building Index, 2010). As described, the index was developed by Malaysian Institute of Architects (PAM) and the Association of Consulting Engineers Malaysia (ACEM) with the support of the Malaysia Green Building Confederation (MGBC). Hence the GBI is essentially a private sector initiative but one which for both content and timing fitted well with government priorities.

The GBI comprises of the six principle criteria of Energy Efficiency, Indoor Environment Quality, Sustainable Site Planning and Management, Materials & Resources, Water Efficiency, and Innovation. In this regard it most closely resembles the LEED which has 6 very similarly labelled categories. The index developers themselves refer to the GBI as an extensive modification of systems including the Singapore Green Mark and the Australian Green Star system. As mentioned before, the need for modification mainly arise from the tropical weather experienced in Malaysia, the specific environmental needs of the country as well as its social and cultural needs (Green Building Index, 2013).

The GBI is targeted primarily for use by building owners, project teams, developers, government, building designers and other contractors. Its aim is to provide validation for environmental initiatives during the design phase and/or during the construction and procurement phases for both assessing and improving the environmental performance of the building. Table 2-2 show the GBI scores and various categories of certification awards. The level of certification based on several quantitative band as indicated in Table 2.3.

Table 2-2-: GBI: the maximum points score for each of the six categories

| **Part** | **Item** | **Maximum Score** |
|---|---|---|
| 1 | Energy Efficiency (EE) | 23 |
| 2 | Indoor Environmental Quality (EQ) | 12 |
| 3 | Sustainable Site Planning & Management (SM) | 33 |
| 4 | Material & Resources (MR) | 12 |
| 5 | Water Efficiency (WE) | 12 |
| 6 | Innovation (IN) | 8 |
| Total | | 100 |

Table 2-2: GBI: Rating bands

| GBI Rating | Points |
|---|---|
| Platinum | 86+ points |
| Gold | 76 to 85 points |
| Silver | 66 to 75 points |
| Certified | 50 to 65 points |

Under the 6 main parts of the assessment are a further 39 sub-criteria each with their own maximum points allocation. The number of points scored is calculated using a combination of quantitative metrics or yes/no questions mainly relating to inclusions or omissions in the design plan.

The process of receiving GBI certification starts with the application and registration, once this is completed a project co-ordinator/ GBI facilitator is appointed. The second stage comprises the Design Assessment which is undertaken by a GBI certifier which is followed by the issue of a provisional certificate when appropriate. There is an appeal available in the event of a fail or for a higher rating. The third stage (Completion and Verification Assessment) takes place once the project has been completed and again involves

assessment by a GBI certifier. Based on their assessment Platinum, Gold, Silver or Certified ratings are awarded. At three yearly intervals the project will need to be reassessed.

Registration fees are dependent on the size of the project, whether it is a building or a township and whether it is new construction or an existing one. For example, the registration for a 'large' (30,001 to 50,000$m^2$) new construction is currently 32,000 RM (approx. US$9,150). This fee includes the Design Assessment and the Completion and Verification Assessment but does not cover any possible appeal.

The Malaysian government offers a range of fiscal incentives to encourage energy efficiency. There is a specific incentive for buildings which secure GBI certification which comprises 100% tax exemption of qualifying expenditure, stamp duty exemption to the level of the cost of securing certification when the building is first sold. In other words, project developers will have their investment in GBI certification returned at the point ownership is transferred to the building's first buyer (KeTTHA, 2009).

In addition to these fiscal incentives, companies involved in the supply or use of green technologies including those used in the construction sector became eligible to apply for 'soft' loans which included both 2% of the interest being borne by the government and loan guarantees covered 60% by the government and 40% by banks (greenbuildingindex.org, 2010).

In additional to the original two versions of the GBI (new residential and office buildings) a GBI tool for existing buildings (April 2010) Townships (March 2011) industrial buildings (June 2011), hotels (March 2014) and interiors (September 2014) have followed in rapid succession (Green Building Index, 2013).

This thesis is mainly concerned with high-rise residential buildings which are defined under the GBI as “Strata Building in which the topmost floor is >18.3m above ground level” (Green Building Index, 2010, p.6).

### 2.8 The Green Building Index and barriers to sustainable building

The Malaysian government launched its National Green Technology Policy (NGTP) in 2009 as a statement of intent of its desire to make use of technology to achieve sustainable development goals. As well as financial incentives it was also made easier to secure planning permission for a green home than for a conventional one (Alias et al., 2012).

Alongside the policy a series of initiatives were also introduced, most notably Green Neighbourhood, Low Carbon Cities Framework, Green Pass, and our focus here, the Green Building Index. The GBI was effectively endorsed and given a semi-official status when fiscal incentives were linked to GBI certification and there were also reports that the Prime Minister had instructed that his office be refurbished to achieve GBI certification (Abdul-Aziz & Ofori, 2012).

Two issues raised by Suhaida et al. (2013) are first harmonisation and second regulation and the government’s role in both. Regarding harmonisation, they recommend that the various tools and rating systems in use in Malaysia should be brought into greater alignment with the encouragement of policymakers. Based on their belief that sustainable development has yet to reach its full potential in the Malaysian construction sector they call for step-by-step formal regulation of the construction sector to replace the voluntary framework that is currently in place. This combined with an intensification of awareness efforts

would, they argue, speed up progress and make it more comprehensive (Suhaida et al., 2013).

Despite strong government policy support and fiscal incentives enabling the cost of certification to be recouped there is still resistance among developers and building owners to the use of green technology and to green buildings in general (Bagdad & Mohammad, 2013). At the root of this resistance is believed to be that these end users are unconvinced that they will see a return on their investment in the 'green way'. Green technology is perceived as expensive and environmental objectives are seen as disconnected from economic realities. Furthermore, it is viewed as highly problematic to assign economic value to the outcomes of sustainable building, particularly on a project by project basis (Bertrand, 2010). Having said this such calculations are increasingly being attempted and in Malaysia experts are putting numbers to the idea of selling price premiums (Dass, 2014), the likely additional costs of green technology and materials are being quantified (Santos, 2013), the GBI release statistics on emission reductions achieved through certification (Green Building Index, 2014) and one can hypothesise that financial savings data will soon follow.

Abidin and Jaapar (2008), writing before the introduction off the GBI, highlight the tentative take up of sustainable building in Malaysia's construction sector. They refer to media reports of poor construction outcomes and irresponsible builders as evidence that the sustainability message had yet to get through to builders and building owners.

Abidin (2009) conducted a study to investigate the level of awareness of the concept of sustainable building and whether this had fed through into practice. Using a survey questionnaire with 271 potential respondents from a sample of construction developers approached though only 35 returned questionnaires

and then 12 interviews with larger scale developers they found that there was a prevalence of low to moderate levels of knowledge of the concept of sustainability. From the data they established seven headings under which the reasons for the relatively slow implementation of green building practices could be placed. To briefly summarise these were: inadequate legal enforcement; insufficiently high profile role played by the government; the need for surveyors, architects and engineers to be more vocal in their advice on green issues; a general lack of urgency in Malaysia arising from the belief that its natural resources are plentiful; low levels of knowledge among developers of sustainable construction and sustainability in general; the widely held perception among developers that sustainable construction is uneconomic; and finally a passive culture leading developers to believe that these matters are more an academic pursuit than a practical one for them (Abidin, 2009). Awareness was also found to be greater than a desire to implement with cost being reported as a leading deterrent. Having said this, better resourced developers and those who place a high value on reputation were more willing to apply green construction as they associated it with design quality (Abidin, 2009). The overall conclusion was that while there was a growing body of evidence of success for green building initiatives, inhibiting factors were “lack of knowledge, poor enforcement of legislation, education vs. experience and passive culture” (Abidin, 2010, p. 425).

Another questionnaire survey was carried out by Samari et al. (2013) which received 167 responses from 673 questionnaires sent out to randomly chosen Malaysian construction professionals. This survey too investigated the barriers to a greater level of implementation of green construction practices the main methodological difference being that Abidin (2009) had used a sample comprising of developers only. This second survey was conducted in 2012 a

number of years after the introduction of the Green Building Index. Despite this and in line with Abidin (2009) awareness among construction professionals of sustainable construction was found to be low as was the availability of professional expertise. Respondents were asked to report who they felt was responsible for the future development of green construction. The party respondents felt should have the major role in such development was most often selected as the government, second consultants, third contractors and finally the developers (Samari et al., 2013).

Herein lies an interesting dilemma because when respondents were asked to highlight the barriers to future green construction implementation financial barriers scored highest. “Lack of credit resources to cover up front cost”, “Risk of investment”, and “Higher final price” received the three highest mean scores (Samari et al., 2013, p.7). The dilemma is that these financial barriers are experienced first and foremost by developers who were also reported in the same survey as being the group least appropriate to having the major role in the future development of green construction (Samari et al., 2013). Hence, the group experiencing the barriers (developers) are not seen as needing to be particularly proactive in seeking to lower the barriers with the industry seeming to look to government to provide the answers. In their conclusion the researchers state that their study suggests the answers lie with “incentive instruments such as structural incentives, subsidy and rebate program, tax incentive scheme, low interest mortgage loan, voluntary rating system and market and technology assistance” (Samari et al., 2013, p.8).

The theme of investigating awareness of and barriers to green buildings was also taken up by Alias et al., (2012) who investigated the views of homeowners from Klang Valley and Penang. Of 150 questionnaires distributed 50 were returned (34%) and this quantitative data was supported by a series of

interviews with one developer who was using the Zero Home Energy Concept in its development of new homes.

Once again financial issues came to the fore and tellingly more than two-thirds of homeowners reported that they would not be interested in purchasing a green home if it was more expensive than a conventional one. In common with the other studies cited above both awareness and acceptability levels were low and barriers were overwhelmingly economic ones (Alias et al., 2012).

From the interviews with the developer we learn that lack of green technology and materials as well as some water recycling systems are an issue. These had to be imported at increased cost. Expertise also had to be secured by sending employees to other countries for training in green construction (Alias et al., 2012). However, in the most recent couple of years many of these materials and equipment have reduced in price as they have become available locally (Zhin, 2014).

While Alias et al., (2012) involved end users the relevance to the current research in that the type of home involved (detached properties aimed at home ownership and in a non-urban area with above average selling prices) contrast greatly with the LCHR flats aimed at low income groups that I am concerned with.

Two issues raised by Suhaida et al. (2013) are first harmonisation and second regulation and the government's role in both. Regarding harmonisation, they recommend that the various tools and rating systems in use in Malaysia should be brought into greater alignment with the encouragement of policymakers. Based on their belief that sustainable development has yet to reach its full potential in the Malaysian construction sector they call for step-by-step formal regulation of the construction sector to replace the voluntary framework that is

currently in place. This combined with an intensification of awareness efforts would, they argue, speed up progress and make it more comprehensive (Suhaida et al., 2013).

The role of the GBI in the overall movement for sustainability in the built environment is evolving rapidly. Notwithstanding the challenges highlighted in the above-described literature, its progress is reflected in the GBI's own statistics. As of December 15th 2014, a total of 644 projects had applied for certification and 595 of these had been duly registered (172 registrations were for projects in Kuala Lumpur). Of the 265 had been certified with 234 certifications being provisional and 31 final. Certified buildings accounted for 10,832,300.26 $m^2$ of floor space. Unsurprisingly the vast majority of certifications were under the two original categories of Non Residential New Construction and Residential New Construction. GBI calculate that 517,627 tCO2e/annum of CO2 emission reductions were attributable to GBI certified buildings. In terms of registration trends, in its fifth year of operation (2013 Q2 to 2014 Q1) there were an average of 10.3 registrations per month, the highest annual average. However, in the most recent (incomplete) year the monthly average had somewhat fallen (Greenbuildingindex.org, 2014).

### 2.9 Summary

Sustainable development is the marriage of two projects, sustainability and development. Malaysia aims to reach developed country status by 2020 and in declaring this aim is has committed itself to rapid development. It has also raised the priority of the sustainability part of the dual project and has recognised the importance of the construction sector and the built environment in achieving these goals.

In 2009, the Green Building Index was introduced by the private sector with government support. It joined an increasing number of similar systems being applied around the world. As mentioned, since its introduction it has awarded certification to some 235 buildings and some 330 more are registered and awaiting assessment. Scholars, practitioners and policymakers have evaluated the first five years of the GBI and have mainly considered it a qualified success. Challenges remain, however, in areas such as awareness building and selling the message that investments in green technology and construction practices are not accompanied by an economic penalty. The economics of sustainable construction may be moving in its favour with evidence growing of both falls in the cost of sustainable materials and 'green' technology and the achievability of selling price premiums. The resistance widely reported in the literature may well start to erode. In the following chapter there is a discussion of the changing role that high-rise housing has played around the world.

# Chapter 3 : THE EMERGENCE AND GROWTH OF HIGH-RISE HOUSING

## 3.1 Introduction

The challenge of housing vast numbers of citizens rose to the top of the policy agenda for a number of different reasons. In Europe, it was the geopolitical upheaval and, in some cases, the physical destruction caused by the Second World War, which triggered a housing crisis. In the United States the laissez-faire approach to government had led to mass homelessness. In some Asian cities there was hyper-urbanisation caused by rapidly growing populations. Wherever it was, residential architecture needed to be recalibrated and high-rise construction and pre-fabrication both came to the fore of the debate (Miller Lane, 2007).

The purpose of this chapter is to discuss the emergence and development of high-rise housing around the world. In keeping with the delimitations of this thesis it emphasises public housing aimed at low income groups in urban areas. Furthermore, the countries and cities drawn on are developed and high income in economic terms. As Malaysia aspires to achieve this status in the not too distant future and as one of the key objectives of this thesis is to offer practical recommendations for the future of mass public housing in Malaysia's cities focussing on already developed examples was more appropriate. The chapter starts with a discussion of the rise and fall of high-rise housing in western countries, particularly the UK, Germany France and the US before moving on to the new version of high-rise living that has assumed compatibility with the objectives of sustainable development as exemplified by two Asian cities, Hong Kong and Singapore.

### 3.2 The rise and fall of high-rise in western countries

By all accounts the history of high-rise housing did not start well. Perhaps surprisingly, only few Roman city dwellers could afford their own detached home and the vast majority lived in multi-story apartments some as high as ten or more storeys (Aldrete, 2004). The bad news for these high-rise residents was that the buildings they lived in frequently collapsed. Rome, better known to us for its monumental architecture, was actually full of unstable apartment buildings built by unscrupulous developer landlords such as Cicero (Aldrete, 2004) the politician, orator and lawyer (among other things) who would have certainly have needed a lawyer if he had been around today. Successive emperors moved to limit the number of floors in such buildings but the profits from building upwards meant that these regulations were often ignored (Aldrete, 2004).

Despite this inauspicious beginning, European cities featured high-rise residential buildings through mediaeval times, famous among them Bologna in Italy which must have had a skyline resembling modern day Hong Kong with up to 180 towers rising into the Bolognaise sky in the 12$^{th}$ and 13$^{th}$ centuries (Roversi, 1989).

Architectural impetus for high vertical structures other than 'towers' of the traditional form originated with the American skyscraper movement of the 1880s and 90s led by the pioneers of the Chicago School. Its debut was as a ten-storey building in Chicago in 1885. At this time the invention of the electric elevator was crucial to making the skyscraper a practical possibility (Korom, 2008).

It was the Second World War, or perhaps more accurately, post War reconstruction that saw high-rise residential buildings assume centre stage in the urban built environment of the whole of the continent of Europe. According to Turkington et al. (2004, p.1) the high-rise tower block was “the most visible

and uniform product of post-war urban planning." It was a truly pan-European phenomenon with high-rise housing developments that had little to distinguish them from one country to another.

Architects working under the modernist banner understood and promoted the role of mass housing constructing in providing better quality housing to the working class and in so doing creating a more egalitarian society (Turkington et al., 2004). While modernism in architecture can be traced to the 1920s and 1930s it was in the 1960s that western and northern Europe saw mass construction of residential tower blocks. Such tower blocks were viewed as the best means to achieve modernist egalitarian goals: "The free-standing high-rise block was promoted as the only means of achieving modernist building principles" (Turkington et al., 2004, p.6).

The high-rise building boom of the 1960s was driven by the political desire to solve the major problem of urban housing shortages. These shortages grew out of rapidly rising urban populations whereby general population growth, widespread internal migration from rural to urban areas, and international migration, particularly to colonial countries such as France and the United Kingdom, combined to create a vast shortfall between supply and demand (Turkington et al., 2004). With urban populations set to continue to grow for the foreseeable future and other innovative forms of housing development such as the garden cities perceived as too little and too slow the urban tower block became the leading solution because it was seen as quick, cheap and efficient (Turkington et al., 2004).

Turkington et al., (2004) identify seven drivers behind the move to high-rise residential construction as the preferred solution for 1960s architects, planners and policymakers in Europe. Firstly, was the already mentioned housing

shortage; second was technological developments; third the modernist architecture project's desire for an egalitarian society; fourth, the aim of protecting rural areas from development; fifth, the people's demand for better living conditions; six, inter-authority competition to produce the most 'modern' housing; finally, national governments' acceptance of and support for radical solutions to meet their policy objectives.

One thing that seems is not a driver is consumer choice (or perhaps user preference is a better term). According to evidence gathered by a polling organisation and reported by Evans and Unsworth (2012), when asked what type of housing they would prefer to live in just 1% selected the high-rise flat option. The lower the density of housing the more preferred the type of housing was reported to be when cost was not a factor. From a different angle another survey asked residents to state which type of new housing development they would prefer to have built in their neighbourhood, again multi-storey flats were the least preferred. They also reported the results of surveys of (private sector) high-rise city centre residents themselves (in this case in the city of Leeds in the North of England). Despite being expensive, residents reported dissatisfaction with the amount of living space, the lack of green spaces, expensive parking and its lack of suitability for children (Evans and Unsworth, 2012).

Technological innovations, including the use of concrete instead of bricks, made the construction process far faster and logistically simpler. Prefabrication was the principle innovation under which large components of the building were made offsite and brought to the site at the point they were required. Turkington et al., (2004) cite examples where the time to build a home was shrunk by as much as 70% between 1950 and 1960. This was happening at a time when there was a widespread belief the technology held they key to solving all society challenges. Jacobs et al. (2007, p.610) sum up the optimistic vision, "The high-

rise … was intended to be a pragmatic, technically driven housing solution that would radically restructure the patterns and quality of domestic life."

### 3.3 High-rise falls from grace in the West

The light crisp concrete of newly built tower block turned dirty dark grey through pollution and weathering and the faults caused by hasty construction were exposed for all to see sometimes with catastrophic consequences such as the partial collapse of Ronan Point in east London in 1968 (Delatte, 2009). As in Ancient Rome, the high-rise solution to housing the population fell out of favour among, professionals, politicians and the general public. The issues were both technical and social and they surfaced within a decade of the first wave of mass high-rise building in Western Europe (Jacobs et al., 2007). Dunleavy (1981) even referred to high-rise housing as, "One of the most widely proclaimed (if unstudied) 'failures' of public policy."

As the 1970s arrived the era of high-rise building drew to a close in many western countries though it continued in Eastern Europe and much of Asia (Lawrence, 1996). The optimism of modernist architecture and its promise of a more equal society being created through the built environment now became the 'small is beautiful' era as typified by Schumpeter's famous book (Schumpeter, 1973). In countries such as the UK, Denmark and Poland those with the means to do so were starting to leave their high-rise homes to be replaced by those who could not exercise such choice (Turkington et al., 2004).

### 3.3.1 The United Kingdom

Nowhere are the changing perceptions towards high-rise tower blocks as a mass housing solution starker than in the United Kingdom. Turkington, (2004, p.147) described it as a “dramatic change, from a symbol of social progress in the 1950s and 1960s to a symbol of housing failure not ten years later”. For the purposes of this study it is useful to ask: Why did this happen? Another vexing question is how can public sector high-rise housing been seen as such a mistake and be so badly stigmatised while at the same time the private sector apartment buildings of our prime city centre locations and aimed at middle class professionals are counted among the most sought after accommodation in the country.

First it is worth remembering that whatever the optimism of the modernist architects and planners, the merits of the single-family house were deeply ingrained into the British psyche and high-rise blocks were in such sharp contrast to the low density gardened houses which for decades since the First World War had been the established ideal. As Turkington (2004, p.148) explains “The continued cultural dominance of the family house in British housing design cannot be underestimated, and helps to explain the problematic status of public sector flats.”

With 4 million homes damaged or destroyed in the Second World War coming on top of the pre-war housing shortage and then made all the more urgent by two million newly wed couples it is difficult to imagine a more acute set of circumstances. No wonder housing had risen to the top of the political agenda. With progressive architects and planners enthusing over their modernist solutions to urban housing and its politically attractive link to technological advancement it is perhaps not so surprising that policymakers were alert to the

possibilities. Some travelled abroad to learn from the experiences of other countries and returned satisfied (Turkington, 2004). An important lesson that will be returned to later in this thesis is that there was no consultation with the potential users/ tenants as to their attitudes to high-rise living. It was assumed, in very British style, that they would simply passively accept what they received and do so with gratitude (Turkington, 2004).

In the immediate post war years building regulations restricted multi-storey residential buildings to a maximum of 5 storeys but as changing attitudes were matched by rising state subsidies for high-rise building the dam burst and high-rise public housing really took off. Between 1956 and 1966 the number of high-rise residential buildings (6 storeys or more) increased from 6,000 to 44,000 (Turkington, 2004).

If the rise of high-rise was fairly spectacular then its fall was sudden, virtually overnight in housing policy terms. Turkington (2004) points to two specific reasons/ events behind the end of the UK's affair with high-rise housing. First was the aforementioned Ronan Point disaster involving a gas explosion and partially collapse of a tower block in 1968. Second, the Labour government, which had come to office in 1964 promising to building 500,000 new homes a year, passed the Housing Act 1967 which signalled a break from the policy it had inherited which had been favourable to high-rise construction. Specifically, the act ended the subsidies that were paid by central government to local government for each storey built above the sixth. These subsidies had often been the decisive factor in persuading often sceptical local authorities of the merits of high-rise (Murray, n.d.). Public spending cuts continued into the 1970s and councils sought to save on maintenance costs meaning their high-rise stock degraded as a result.

In the 1980s the public sector high-rise tower block did make something of a comeback in terms of its share of public housing stock, though it was not necessarily based on the merits of high-rise. In fact, when the new Conservative government, elected in 1979, legislated for the 'right to buy' your public sector home it was the high-rise flat that was left on the shelf while low rise houses were purchased in their hundreds of thousands. Suddenly high-rise made up a far greater proportion of the remaining public sector stock and municipalities realised they had to start accepting their role (Turkington et al., 2004). It was a half-hearted acceptance and certainly not a repeat of the optimism of the 50s and 60s.

Today in the United Kingdom a contradictory set of attitudes to high-rise residential buildings prevails. On the one hand, public sector high-rise building has been moved to the sidelines, while the existing stock ensures that refurbishment, or possible demolition will continue for the time being. On the other hand, city centre high-rise developments are viewed as a largely positive thing (Kearns et al., 2012).

On 14th June 2017 a significant event for LCHR housing in the UK took the form of a tragic fire involving the loss of 71 lives and around 70 injured at a 24 storey tower block that had rapidly spread to engulf the whole building. The tower had been built in the 1970s but had recently been refurbished including the addition of new exterior cladding which may have caused the rapid spreading of the fire (BBC News, 2017). Media reports indicated the choice of cladding and lack of sprinklers may have been cost rather than safety driven and at the time of writing the police were considering charges including manslaughter and a public enquiry was underway the outcome of which is likely to heavily influential on future LCHR housing in that country (Agerholm, 2017).

### 3.3.2 Germany

The German case is particularly interesting because it involves two separate states which became unified in 1990. Knorr-Siedow (2004) discusses the German context seeking to understand what the differences are between those high-rise estates and tower blocks that have been successfully and relatively smoothly integrated into the housing market and those which seem to be a continual source of problems.

While not so dramatic as in the UK, Knorr-Siedow (2004) still points to a “spiral of decline” in high-rise housing in Germany. In the 1960s and 70s approximately 800,000 flats were built in in housing estates, but the vast majority were of 4 or 5 storeys. Only in the larger estates did the high-rise blocks reach 20 storeys or more.

Looking to the positive examples in Germany, Knorr-Siedow (2004) highlights that the careful selection of their residents, only possible when there is strong demand, contributed to community development (something Bloom (2012) also mentions as a predictor of success in the US). Where high-rise estates in Germany were kept to a moderate size and where they were integrated into the city the establishment of ‘neighbourhoods’ seemed possible (Knorr-Siedow, 2004).

### 3.3.3 France

Like the UK and Germany, France faced the post-War years with a major housing crisis. However, it was not until the late 1950s that a major programme of state subsidised high-rise building was implemented. These buildings

attracted controversy from the beginning although for those moving out of their slum dwellings they must have seemed a great improvement.

In a further parallel with the UK, with barely more than a decade passed in the early 1970s the high-rise towers had begun to deteriorate and rather than a housing solution they were now seen as a significant social problem. However, in contrast to the UK, when public disorder, including riots, spread through France in the 1980s and early 1990s they were concentrated in the high-rise estates of the suburbs not the city centres as they were in the UK. After 25 years of high-rise residential building, overwhelmingly in the social sector, construction of such blocks ended in 1974. While statistical data is hard to find Blanc and Stébé (2004) estimate that there are up to 2.6 million high-rise socially rented units many of which were refurbished in the 1990s. The question again arises, 'What caused the high-rise tower block to fall so dramatically out of favour?' and secondly if examples of good high-rise estates exist what characteristics do they have that the poor examples do not?

Unlike those successful examples in Germany, the typical French high-rise housing estate was not integrated into the city but separate with residents usually living some distance from their workplace. The estates were self-contained usually having their own amenities such as schools, shops and playgrounds. As in the UK, in France modernist architects, led by Le Corbusier, were successful in convincing policy makers and urban planners of their vision of a high-rise future. Again prefabrication and use of concrete and steel made construction an efficient and speedy process (Blanc and Stébé, 2004).

Starting in 1954 the race to construct 'emergency estates' to solve the homelessness crisis saw the government investing in the design of new dwellings and the development of rapid construction techniques which resulted

in the building of high-rise housing estates on the peripheries of France's cities. "High-rise housing became a symbol of the urban 'avant-garde'" (Blanc and Stébé, 2004, p.104). They were seen as triumphs of technology and offered family accommodation which was judged to be comfortable and actually offered, on average, more rooms per dwelling than non high-rise housing. By 1964 200 high-rise housing estates had been built comprising some 365,000 units. After 1973 no more were built and it was apparent already that the modernist's vision was not turning into reality (Blanc and Stébé, 2004).

Among the reasons identified by Blanc and Stébé (2004) are firstly, the locations chosen for the high-rise estates were disconnected from the urban centres leading to the marginalisation of the residents. Secondly, hasty low-cost construction was achieved at the expense of quality whether it is in terms of architectural quality, environmental quality or in technical quality. For example, they were badly insulated and the fabric of the buildings suffered rapid deterioration. Thirdly, these high-rise estates were based on the sociological premise that if you house different social classes together they will meld together and class differences would disappear over time. Affluent young professionals were housed alongside the urban poor who needed rehousing after slum clearance. The first group simply tended to move away while the poorer residents with little or no choice in the matter became indignant at being moved away from the city centres. Instead of social integration and cohesiveness the result was segregation as the better resourced and those able to repay low cost home loans moved out into single family houses often back in the now slum cleared city centres while the poorest were left on the high-rise estates. This in turn added to negative perceptions of high-rise housing.

There were improvement and refurbishment schemes during the 1980s and 1990s but these were mainly undertaken because social landlords were still

paying of the loans taken out to build them in the first place, at that stage demolition was not an option. Today, as with the UK some demolition has been undertaken but in other cases it has been decided to take the improvement path, often in the face of tenant opposition to demolition which seems to be based on a fear of what might replace them. Negative perceptions and prejudices are highly durable and in France this negativity towards high-rise estates remains in place, “High-rise tenants are often viewed as second-class citizens, stigmatised by the simple name of their estate” (Blanc and Stébé, 2004, p.112).

Social landlords have been wary of attracting only the lowest income groups as tenants and to try to secure more middle-class tenants schemes have been attempted which offer co-ownership, though Blanc and Stébé (2004) report that these have failed. While Bloom (2012), writing on the US context, highlighted an element of tenant selection as a part of the formula for high-rise success and Knorr-Siedow (2004), referring to Germany, argued that such selection would contribute to community development, Blanc and Stébé (2004, p.112) cast doubt on this when writing, “Mixing the population of high-rise housing estates through some form of social engineering does not appear to be a realistic prospect.” Other efforts to create a mix of tenants have involved attracting students.

In terms of the future of high-rise housing in France, Blanc and Stébé (2004, p.113) argue that if one is to be sustained it will be through involving tenants to a greater extent in the development of such housing, concluding that “grassroots democracy currently offers the only route to building a future into French high-rise housing estates.”

### 3.4 High-rise issues and solutions from the West

Poor quality high-rise social housing had become associated with effects of physical and mental health although Sowden and White (2014) demonstrated that these problems can be addressed through improvement programmes including insulation, double glazing and internal refurbishment. Drug use has also been linked to high-rise social housing in both the UK and the US. Parkin and Coomber (2011) writing about London, found that communal spaces, such as garbage disposal rooms, in high-rise social housing had been taken over by intravenous drug users.

High-rise housing has often been discussed in the context of 'a sense of community', or more precisely the lack of it. Zaffs (1998) conducted a US study to investigate residents' perceptions of this sense of community using one sample from high-rise housing and another from low rise garden apartments. Overall high-rise residents reported less satisfaction compared with their low-rise counterparts and among the issues raised were security and the fact that high-rise blocks were not suitable for the young. Lawrence, (1996) also found that high-rise living also proved particularly problematic for families with young children due to the limited opportunities for outdoor play and the safety concerns associated with living far above the ground.

It had become apparent that the nature of high-rise buildings threw up management issues not normally seen in low-rise alternatives. Communal areas such as lifts and corridors became subject to vandalism and anti-social behaviour raising issues of public safety (Turkington et al., 2004). This issue was not limited to Europe, in the United States a growing divide had emerged between middle class apartment buildings managed and supervised by resident superintendents, doormen and lift operators while high-rise public housing had

no such security and decayed as a result (Newman, 1995). Cities such as Chicago had excellent private high-rise housing and poor public high-rise housing (Fuerst & Petty, 1991). Therefore some highrise residential in the west were demolished to make way for new development, see figure 3-1.



Figure 3-1: Birmingham (UK) Clyde Tower demolition in 2006

(Source: www.municipaldreams.wordpress.com)

As a solution to the problems of social housing to low income groups the high-rise tower block had effectively disappeared from consideration in some countries. By the time any sort of revival of high-rise residential construction occurred in the late 1980s and early 90s the market for such accommodation had totally changed from low income groups to young affluent professionals seeking luxury accommodation near city centres and often in sought after waterfront developments (Turkington et al., 2004). High-rise developments in both Western Europe, particularly the United Kingdom, and also in the United States had become very much a private sector activity and tended to be located

in the most desirable urban locations (Yuen & Yeh, 2011). Ironically, this was a return to the situation of the 1930s where those few multi-storey blocks that were built had been aimed very much at the top end of the market (Glendinning & Muthesius, 1993).

The dominant anti high-rise view was not, however, the only view. Fuerst and Petty, (1991, p.123) challenge the notion that successful high-rise public housing is beyond reach, pointing out, “Contrary to conventional wisdom and public perceptions, high-rise public housing is often successful in a great many different locations. For instance, most public housing for the elderly in the United States is in high-rise buildings; generally, it is excellent. There is also much good high-rise, low-income family housing.” The authors argue that while a small number of controversial high-rise public housing projects have dominated perceptions and contributed to a poor reputation the reality is that “there are literally hundreds of excellent high-rise buildings … across the country” (Fuerst & Petty, 1991, p.124).

Writing twenty years later, Bloom (2012, p.418) echoes much of what Fuerst and Petty wrote when pointing to the successful experience of New York in terms of the provision of high-rise public housing to low income groups: “High-rise public housing has been entirely discredited in the United States as a legitimate affordable housing planning strategy because of notorious failures in large cities such as St. Louis and Chicago.”

The lessons of New York are, according to Bloom (2012, p.418) high-rise public housing is viable “provided that sufficient attention is paid to design, tenancy, financing, and social control. Design should include the use of durable material able to withstand hard use and the installation of an extensive security system including CCTV. There also needs to be a regular presence for maintenance

such as superintendents or contractors. Tenancy selection such as reserving a certain proportion of units for working families is also considered important. Management control is exerted through door to door late rent collections and annual apartment inspections. Finally, it is work noting that New York City Housing Authority has its own public housing police force which at one time exceeded 1500 officers in size (Bloom, 2012).

We can conclude that while mass public housing projects, including high-rise ones, were perhaps never going to fit with the United States' liberal free market ethos it would be wrong to say that such housing has not been built and, despite its poor reputation, also wrong to suggest that there are no successful examples to be learned from. Furthermore, it was in the United States that concept of "Placemaking" was developed in the mid-1990s. Placemaking concerned not high-rise buildings but public spaces and how they can be used to encourage the kind of social interaction which enhances quality of life.

At the heart of the approach is its person-centredness, listening to people to discover their aspirations and needs (Shibley & Schneekloth, 1995). Weisman (2001) addressed the question of what constitutes a place, or rather what makes a building a place. He theorised that a building becomes a place when people are connected to the building through 'the program', referring to the design program which combines three other programs, the functional, architectural and experiential. Now, around the globe architects and planners taking concepts such as these are putting how a resident or user experiences a building at the heart of their work whereas in the 1950s and 1960s these experiences were either assumed or overlooked altogether.

### 3.5 High-rise buildings and the challenge of sustainability

Jacobs et al. (2007, p.609) state that "Demolition is a fate that has befallen many high-rises in the UK as social housing authorities deem them to be 'unsustainable'." Where they have not been demolished it is the economic realities of squeezed public spending that may have kept them standing. It is fair to say that during the high-rise building boom of the 1960s concern over the natural environment and the impact the built environment may have on it was not high up the agenda. The post war construction of multi-storey buildings had included the use of toxic building materials such as asbestos, formaldehyde adhesive and paints that were lead-based to mention a few. These were perhaps a leading cause of the virtual epidemic of allergies and respiratory illnesses that have affected some European countries. (Lawrence, 1996). Ventilation systems became spreaders of bacterial disease such as Legionnaire's Disease. On top of this interior walls offered inadequate acoustic insulation and external ones often had poor thermal insulation.

However, since the Brundtland Commission's report Our Common Future was published in 1987, sustainability and then sustainable development have become key terms for governments at the tables of international meetings and congresses. Brundtland and subsequent congresses such as those of Rio de Janeiro in 1992 and Johannesburg in 2002 sought to plot a path to a sustainable future and build this into binding global agreements the most important currently operational one of which is the Kyoto Protocol of 2005.

The built environment, including residential housing, became subject to a whole new range of scrutiny from a sustainability point of view. Emphasis was now being placed on the community rather than the qualities of individual buildings or developments. While defining environmental and economic sustainability has

received much scholarly attention, somewhat less has been given to establishing an understanding of precisely what social sustainability is, generally and specifically for housing. Elborombaly (2015, p.3) states the aim of socially sustainable building as “improving the lives of those with whom the building interacts. The well-being of a building’s workers, occupants, community members, neighbors, and other stakeholder interests should be interdependent.” The second was formulated to describe a sustainable community. In the UK, sustainable communities were defined as follows:

> … places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all (DCLG, 2005).

From around the world evidence that high-rise housing was falling short of this definition had already been mounting for decades and as a social housing solution it had fallen out of favour long before the sustainability agenda had been established. However, high-rise housing had one quality that ensured it would always have some supporters and tempt others – high density.

After the first wave of high-rise building and in line with the new sustainability agenda, architects and designers started looking at the high-rise from the sustainability perspective and discovered that the two could be married in both environmental and social terms. There was great interest in insulation, the use of eco-friendly building materials, efficient use of resources (recycling and refurbishment) and of course carbon emissions. However, there was also raised awareness of ‘quality of life’ issues such as noise and traffic pollution, crime and safety and the availability of services and amenities.

### 3.6 Asia's new movement for compact urban living

We have read in this chapter how high-rise residential buildings came into and went out of favour in Western countries, particularly as solutions to the need for mass housing of low income groups in the public sector. By the arrival of the new millennium an increasing number of voices were once again looking high-rise buildings and suggesting that they were not a bad idea *per se* and that if they were better planned, designed and managed, particularly with reduced building density, they could provide satisfactory housing and quality of life to their residents. "It is ... wrong to identify tower blocks as 'vertical slums' and insist that they should all be flattened. Many are clearly acceptable places to live for their residents" (Church and Gale 2000, p.19 cited in Yuen & Yeh, 2011, p.3).

While the public sector in western countries turned away from high-rise buildings from the 1970s onwards, this was never the case in some Asian cities, notably Hong Kong and Singapore where it has always remained central to efforts to make the high-density environment as liveable as possible (Yuen & Yeh, 2011). In fact, these two cities have far exceeded the normal definitions of high-rise and high numbers of 'super tall' residential blocks with 50 or more floors are commonplace, prompting Yuen & Yeh (2011, p.3) to argue that "Hong Kong and Singapore represent the extreme cases of tall residential building environment and high urban density". Their use of high-rise housing solutions is borne of necessity, or rather the confluence of a number of irresistible factors (perhaps better referred to as limitations).

Considering Hong Kong first, population increase and hence density, rose dramatically after the Second World War and the communist takeover in 1949. In fact, in just 6 years from 1945 the population rose from 0.6m to 2.0m and

further growth was spurred by a burgeoning economy. Today the population is over 7.2m (Census and Statistics Department, 2014). Furthermore, in Hong Kong topography is a factor with three quarters of land being on hill slopes and a lot of the remaining flatter areas being in private hands (though leased not owned as the government owns Hong Kong's land) (Yuen & Yeh, 2011). Additional flat land is obtained by hill flattening and sea reclamation and it is on this land that most of the development has taken place. The government's tight control on the release of land for leasing has created extremely high land prices which in turn has driven building skywards. Hence, we can conclude that Hong Kong's high-rise living has resulted mainly from a combination of rapid population growth, topography and very high land prices (Yuen & Yeh, 2011). When we consider that some street blocks in Hong Kong have a staggering density of 400,000 to 600,000 people per square metre it is fair to say that Hong Kong represents an exceptional case.

Turning to Singapore, taken across the whole land area population density is even greater than Hong Kong and total population is currently 5.61 million have also grown rapidly in recent decades from 2.07 million in 1970 (Department of Statistics, 2017). While Singapore and Hong Kong share the joint drivers of population growth and limited land the nature of the response has been very different as most clearly seen in the height of the high-rise buildings. Hong Kong's supertall buildings have not been found in Singapore, in fact by the year 2000 nine out of ten public sector residential buildings were 12 storeys or less and the private sector was broadly similar (Yuen & Yeh, 2011). Only in the last 10 years has 40-storey plus construction started with public housing not venturing past 40 storeys as of 2009 (Yuen & Yeh, 2011). Subsequently, however, the 7 block Pinnacle@Duxton public sector development has taken this up to 50 storeys (Meiyu, 2011).

In chapter two we read how the early standpoint of the environmental movement that development and environmental protection were incompatible evolved into what we know today as sustainable development. A parallel transformation in the attitudes towards high-rise residential buildings can also be detected. From the pioneering modernist hope of the 1960s to the villainy of the 1970s and 80s the high-rise tower block has been resurrected in the 21st century in some quarters as a viable route to a sustainable built environment, sustainable from both the environmental and social perspectives.

In common with much of Europe, Singapore's first wave of high-rise building paid little attention to sustainability while concentrating on development. The latest wave is very different (Yeun, 2011). Yeun (2011) explains the approach taken in Singapore to make compact urban living sustainable. Central to this is the use of landscaping, tree-planting, and open space provision as well as the 'greening' of the verticality. Under this latter aspect the roofs of high-rise buildings frequently become gardens, ground level recreation areas are included in the design and other communal areas are routinely planted. The importance of air flow, light flow and view is also fully understood having been forgotten all too often in the 1960s. Natural light and good air flow ventilation are both effective ways in reducing energy consumption in high-rise blocks.

The overall effect is a high-rise version of garden city living. In fact, the government is attempting to turn the whole of Singapore into a garden city by linking all open spaces together with an ambitions 360km path network (Yeun, 2011). Singapore aims to show that nature and city living are not incompatible. There are also examples in Singapore which demonstrate that green buildings can be cost effective in the long run not least because energy consumption can be reduced by up to 35% (Yuen, 2011). Furthermore, it has been shown that efficient resource use such as water conservation and recycling as well as using

prefabrication to optimise resource use in construction are achievable. Compact urban living also reduces the number of car journeys and their polluting emissions.

Yuen (2011) concludes that failure to design for a sustainable environment is no longer an option and also argues that the criticisms of high-rise living which followed the first wave of the 1960s are not inevitable and that one important step is the greening of the compact urban living concept.

Hong Na & Park (2011) argue that the traditional characteristics of Asian dwellings, particularly those that that are eco-friendly can also be integrated into 21st century high-rise construction. Many off these are related to the south-east Asian climate. For example, a sieve-like façade can be used to provide natural ventilation, shade and to regulate wind swept rain. Traditional architecture, they argue, featured high levels of ingenuity and this can be combined with modern technology rather than be replaced by it.

South Korea experienced rapid economic growth and accompanying urbanisation between the early 1960s and mid 1990s in what is widely known as the 'Miracle on the Han' a reference to the river running through the capital city Seoul. Alongside the growth came a skyscraper boom and from 1990 onwards these high-rise blocks increasingly took the form of supertall apartment buildings between 30 and 50 storeys (Je et al., 2006).

However, echoing the experience felt in other parts of the world, the proliferation of high-rise residential living brought with it a range of social problems which, according to Cho and Lee (2011) can be put down the disappearing sense of community. In other words, they have failed to become sustainable communities as previously defined. To understand these issues Cho and Lee (2011) attempted to conceptualise what a high-rise sustainable community would look

like in the Korean context. Figure 3-2 demonstrates how residents are connected to the physical buildings through a living program.

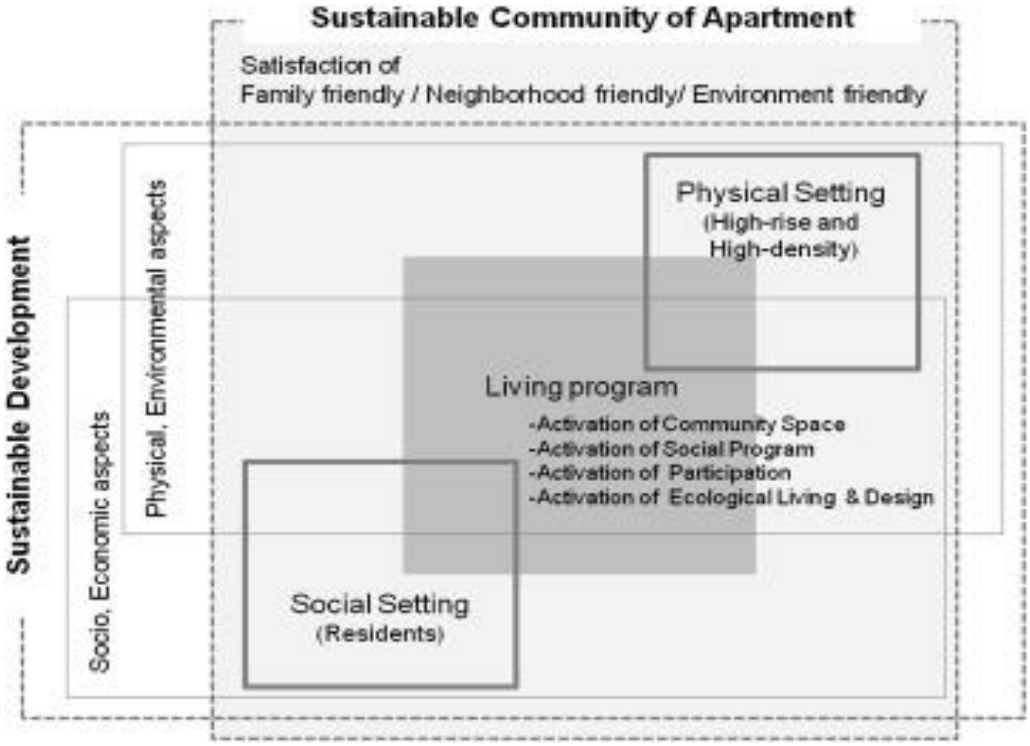



Figure 3-2: Cho and Lee's (2011) conceptual model for a sustainable high-rise community

Firstly, they recognised that residents' satisfaction was a key indicator of sustainability, something overlooked in the past, arguing that "housing satisfaction is closely linked to the establishment of a stable community for apartments" (Cho and Lee, 2011, p.1429).

Cho and Lee (2011) studied cases with a wide array of community building facilities including swimming pool, gym, golf practice areas, sauna, book clubs, computer rooms, centres for the elderly, billiards, table tennis etc. Something far beyond the 1960s conception of European high-rise living. Furthermore, community spaces, community programmes, participation, ecological living and

design are all aspects which require activation in high-rise developments in order to ensure they are sustainable communities. If this is achieved then Cho and Lee (2011, p.1435) are optimistic about the future of high-rise living in Korea, “community spaces and programs and active resident participation will pave the way for a healthy, sound, and sustainable community in which residents can meet their lifestyle needs and enrich their lives together with their neighbors.”

However, somebody has to take responsibility for activating this ‘community’ and the participation of residents, merely constructing a play area or a communal club activity rooms, does not ensure its role in building a sense of community or neighbourhood and Cho and Lee (2011) do not address this.

The experience of the Asian cities discussed here suggests a recognition that high-rise housing in urban areas is inevitably going to be part of the housing mix where a high-density built environment is unavoidable. It is also recognised that the experience of the tenant is vital if a sustainable high-rise community is to be created and maintained and that rather than focussing on concrete and steel, social aspects and human interaction need far more consideration. The task of planners and architects working on high-rise developments in the 21st century is and will remain far more complex than that of their counterparts in the 1950s and 60s.

### 3.7 Summary

The first wave of mass high-rise building took place in the late 1950s and 1960s with Western Europe leading the way. Within ten years technical and social problems had surfaced and the optimism of architects, planners, and

policymakers dissipated. A corpus of studies appeared from the 1960s onwards which variously linked high-rise housing to poor mental and physical health, crime and vandalism, low resident satisfaction, high resident turnover and the absence of community. In some countries, when apartment blocks returned they were upmarket, well-located and aimed at urban professionals they never returned to the public housing agenda in any significant numbers.

In our UK and France examples we learned that the rapid rise of high-rise public sector housing was not founded on tenant demand but more likely the aspirations of modernist architects and politicians desperately seeking a policy solution. It was sustained for around a decade by financial subsidies and one these subsidies were removed enthusiasm rapidly waned. France's experiences had many parallels with the UK, but there high-rise estates were mainly outside city centres, while Germany presented rather unique circumstances as a result of the reunification of the country in 1990.

Some Asian cities such as Hong Kong and Singapore and Seoul also had an initial wave of high-rise building in the 1960s and while they were also inadequate and unsustainable in many ways the high-rise format remained a feature of public housing in a way they failed to in many western countries. The movement for compact urban living underpinned by new found sustainability credentials has seen accelerated innovation in high-rise design and construction in these countries. Density of urban population is particularly acute in two Asian cities Hong Kong and Singapore and their experiences may provide valuable indications for Kuala Lumpur when it comes to high-rise housing.

Furthermore, the lessons from 1960s Europe and elsewhere seem to have been learned, particularly with regard to the need to hear the voices of residents in

order to understand how they experience high-rise living and what is required to create and maintain a sense of community in such developments.

In the following chapter I introduce the Malaysian context and how it affects housing policy development. I will also describe the experience of Malaysia and specifically Kuala Lumpur in its attempts to provide mass housing solutions to its own rapidly growing population and the past present and possible future role of high-rise housing in this pursuit.

# Chapter 4 : THE MALAYSIAN CONTEXT AND THE DEVELOPMENT OF LOW COST HOUSING POLICY

## 4.1 Introduction

This chapter presents the Malaysian context of the current research in two parts. In the first part, the country's climate, challenges from natural disasters and urbanisation trend are explained as major factors in housing the population. Next the particular environmental stresses and objectives of the country is discussed to understand the impetus behind sustainable development. After this incentives in operation to develop sustainable buildings is presented before the first part end with some key housing data from the 2010 National Census.

The second part narrows the focus to low cost public housing and how policy in this area has developed since the country's independence. The key points of each of the first 11 national five-year plans are presented and discussed. There are also sections on the squatters issue and the concept of residential satisfaction both of which are highly relevant to the present study.

## PART ONE: THE MALAYSIAN CONTEXT

## 4.2 Part One Introduction

The first part of the chapter describes first the natural and then the socio-demographic characteristics of Malaysia that have a relevance to the research questions addressed in the present study.

### 4.2.1 The research context

Located in central South East Asia, just north of the equator, Malaysia has a tropical climate and comprises two large regions, separated by the South China Sea: East Malaysia and the Malay Peninsula (see Figure 4-1). East Malaysia covers a significant portion of Borneo. However, it is the Malay Peninsula that is home to the majority of Malaysia's estimated 30 million plus inhabitants

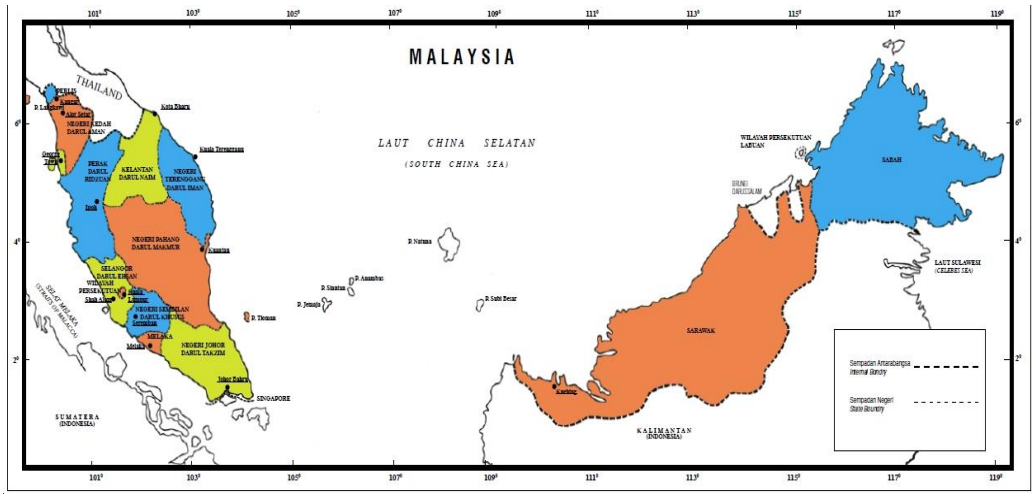



Figure 4-1: Map of Malaysia (Source: Department of Statistics, Malaysia, 2012)

In 2017, the population was reported to be 31.1 million (Department of Statistics, Malaysia, 2017, p.1).

### 4.2.2 The climate

Malaysia's weather is dominated by two monsoon regimes based on their wind direction. From late May to September the Southwest monsoon brings relatively drier weather while the Northeast brings heavy rain from November to March especially to the east coast states of Peninsular Malaysia and western Sarawak. The short periods between the two monsoon seasons are characterised by

changeable wind directions and speeds and are relatively mild (Malaysian Meteorological Department, 2012).

The eastern regions of Malaysia experience heavy annual rainfall, with 3242.6 mm recorded in Kuantan, Pahang and 5403.4 mm recorded in Sandakan, Sabah in 2011 (Department of Statistics Malaysia, 2012). The west coast is comparatively sheltered and experiences dry conditions between November and March. However, during the May – September period the western regions receive heavy rains while the east coast is dry. While the rainfall for the city of Kuala Lumpur was not separately reported neighbouring Subang had 2,668.4 mm in 2011 (Department of Statistics Malaysia, 2012).

Temperatures are relatively constant throughout the year with Subang recording a mean annual maximum of 33.3º C and a minimum of 25.1º C in 2011 (Department of Statistics Malaysia, 2012).

Generally, the wind flow over the Malaysian Peninsula is light and variable while cloud cover is common from its location in the equatorial doldrum area (Malaysian Meteorological Department, 2013). Notwithstanding the cloudy conditions Malaysia's proximity to the Equator means that it receives a great deal of sunlight and solar radiation, usually about 6 hours per day as a national average (Malaysian Meteorological Department, 2012).

### 4.2.3 Natural disasters

There are three types of natural disasters relevant to the Malaysian housing context. In descending order of importance, they are flooding, earthquakes and subsidence. Each is now briefly described.

#### 4.2.3.1 Flooding

Floods are the most significant climactic threat facing Malaysia, taking place almost constantly and in all areas of the country, even in more elevated regions. This situation has been exacerbated by human activities including encroachment on floodplains, destruction of highlands, and deforestation (Liu, 2003). Deforestation is a particular problem for Malaysia with the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) reporting that "Malaysia's deforestation rate is accelerating faster than that of any other tropical country in the world. Between 1990 and 2010, Malaysia lost an average of 96,000 ha or 0.43% per year or 8.6% of its forest cover" (UN-REDD, 2015).

In response to flood danger the government have introduce certain anti-flooding measures, including the Stormwater Management and Road Tunnel (SMART) in Kuala Lumpur, embankment reinforcement and flood gates and keys. However, these have so far failed to remedy the situation. In December 2014, over one hundred thousand people were forced to evacuate their homes as exceptional water levels were experienced in eight southern provinces on the Malaysian Peninsular (Al Jazeera, 2014).

Kuala Lumpur does not escape flood problems with flooding and flash floods regularly inundating thousands of hectares of populated area along the Klang River and its tributaries. The flash floods can occur suddenly, without warning, following heavy rain and rapidly reach their peak level. There is an upward trend for the incidence of flash flooding in urban areas and this is attributed to the process of urbanisation itself (Sosi, and Sulaiman, n.d). Urbanisation changes land use, decreases permeability of the land surface, and increases demand on

infrastructure. When the flash floods do occur, losses are intensified by the poorly maintained drainage system (Sosi and Sulaiman, n.d).

Traditional houses, which are raised above ground level, are better equipped to deal with regular flooding; however, modern-style ground-level urban housing fares less well. National and regional governments are responsible for carrying out flood relief, which usually involves temporary rehousing of evacuated populations in municipal buildings, schools, etc.

#### 4.2.3.2 Earthquakes

Earthquake tremors are regularly felt in Malaysia. For example, 25 Earthquakes were recorded for Malaysia in December 2014 at magnitudes of 5.0 or greater (Richter Scale) though in none of these cases was the epicentre on either the Malaysian Peninsular or Eastern Malaysia (Malaysian Meteorological Department, 2015). The peninsular itself is located on the tectonically stable Sunda plate (Van & Lau, 2013, p.130).

The majority of these earthquakes are experienced in Malaysia as a result of its location on the boundaries between the Indo-Australian, Eurasian and Philippines tectonic plates (Malaysian Meteorological Department, 2013). Tectonic activity from these boundary areas has been known to reach Malaysia. Earthquakes with epicentres in Sumatra have been felt in the western areas of the Malay Peninsula (Malaysian Meteorological Department, 2015). Epicentres have also been recorded in Malaysia, including in Bukit Tinggi in the central peninsular area and in Ranau, Sandakan, Tawau and Semporna in the state of Sabah on Borneo (Malaysian Meteorological Department, 2015).

In terms of damage to housing, seismic activity is less of an issue than flooding in terms of damage. So-called ‘landed’ or multiple housing units built using reinforced concrete (RC) are able to withstand mild earthquakes. Although the walls are not specifically built to endure seismic activity, the roofing and overall structure exhibit sufficient rigidity for this purpose (Adnan, Tuan Chik and Baharudin, 2002).

These findings are confirmed by research by Balendra, Tan and Kong (1999), which again found that reinforced concrete, 3-storey structures are able to withstand earthquakes; these characteristics apply to landed houses. As current building practices are sufficient in terms of rigidity, it has not been felt necessary to modify regulations in the construction industry in order to address the threat of property damage due to seismic activity (Adnan et al., 2002).

#### 4.2.3.3 Coastal erosion and subsidence

The northwest coast of the Malay Peninsula is experiencing ongoing coastal erosion. Such erosion can arise from either human activities or natural processes. Human activities include the installation of coastal structures such as sea walls, coastal mineral extraction and river modifications; among the natural processes are sea level rise, wind induced waves and tsunamis (Mohamad, Lee & Samion, 2014). Applying a coastal vulnerability index found that 40% of Peninsular Malaysia was rated as having a high vulnerability and 11% a very high vulnerability (Mohamad, Lee & Samion, 2014). Among the consequences of this coastal erosion is potential for loss of life and loss of housing.

The limited availability of land combined with a rapid rate of urbanisation in Malaysia, created an acute pressure to find sites for new homes and pushed up land prices. Consequently, some settlements were erected on steep hill slopes, notably in Kuala Lumpur and Georgetown. On the 11th of December 1993 (Figure 4.2), a landslide resulting from ten days of continuous rain destroyed an apartment block in the “Highland Towers” development in Kuala Lumpur, killing 48 (Samah, 2006). While undoubtedly the most catastrophic, Highland Towers has not been an isolated incident. Samah (2006, p. 158) reports 13 such incidents in the Klang Valley between 1990 and 2006 four of which involved loss of life.

In 2010 City Hall published its Hillslope Development Guideline for the Federal Territory of Kuala Lumpur 2010. It restricted development on Class III and IV slopes (with inclines of 25º-35º or >35º, respectively) but these regulations were implemented too late to prevent the construction of a large number of such developments (DBKL, 2010, pp. 8-12).

The regulations require developers building on Class III/IV slopes to be subject to Environmental Impact Assessments (EIA) concerning geology, geotechnics and geotechnology. Developments must also comply with other specific conditions, and slope monitoring and maintenance must be carried out during and following construction (DBKL, 2010, pp. 8-12).

The Highland Towers tragedy has caused general aversion to hillside developments. Landslides continue to be a problem, however. In 2008, at Bukit Antarabangsa, a landslide killed 4 and caused significant damage to residential properties (Longbottom, 2008). More recently, an orphanage was hit by a landslide in Hulu Langat, resulting in 16 casualties (BBC News, 2011).



Figure 4-2: The collapse of Highland Towers on December 11th 1993 (Source: The Star Online)

### 4.3 Urbanisation of Malaysia and Malaysian society

The urbanisation of Malaysia has occurred at a rapid pace (see figure 4.3), rising from 34% in 1980 to 62% in 2000; this then rose to 71% in 2010 (Department of Statistics, Malaysia, 2011). The United Nations Department of Economic and Social Affairs (UN-DESA) puts the figure for 2014 at 74% and estimates that by 2050 this will have reached 86% (UN-DESA, 2014, p. 22).

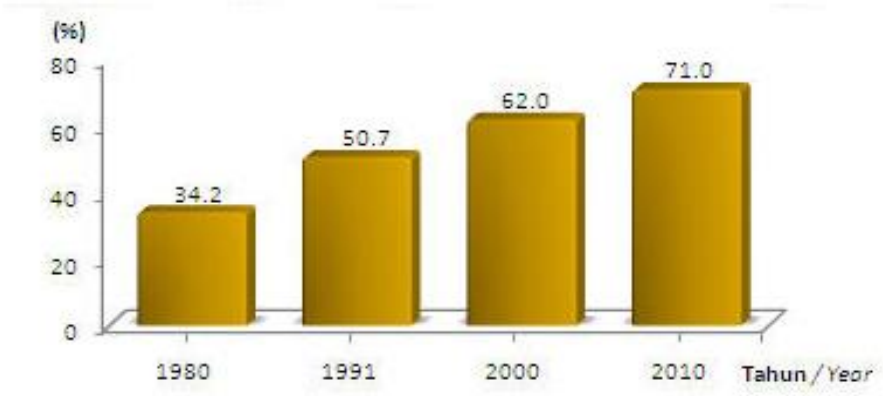



Figure 4-3: Level of Urbanisation in Malaysia, in 1980, 1991, 2000 and 2010 (Source: Department of Statistics, Malaysia, 2011)

Population densities of different parts of Malaysia vary greatly. At one end of the scale Sarawak was home to just 20 people per square kilometre in 2010 compared while at the other the Federal Territory of Kuala Lumpur (the largest urban centre) had a population density of 6,891 persons per square kilometre Department of Statistics, Malaysia, 2010). Figure 4.4 illustrates these varying densities.

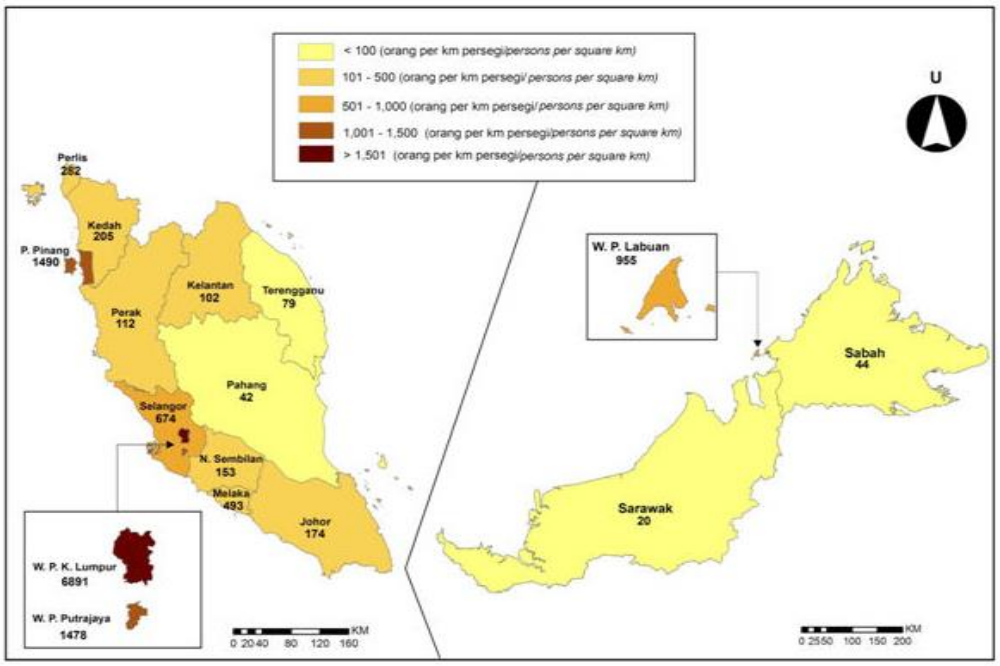



Figure 4-4: Population density by state, 2010 (Source: Department of Statistics, Malaysia, 2011)

While a rising overall population is one of the factors driving urbanisation it by no means accounts for all of it. In fact, population increases in Malaysia have been relatively modest and decelerating. From an annual increase of 3.0 % in 1988 down to 1.5% in 2016 (World Bank, 2017) with falling birth rates partially offsetting greater life expectancy and decreased mortality resulting from better healthcare (Department of Statistics Malaysia, 2012). The labour force is expanding rapidly, indeed between 2009 and 2013 it rose from 11.3 million to

13.6 million, or 2.3 million more people either in work or of working age (Department of Statistics Malaysia, 2015). With so many of the jobs in urban areas it is no surprise that migration to urban centres has been so rapid with three quarters of the population now living in urban areas. While the original driver of urbanisation was migration from rural Malaysia it is now migration from smaller towns and cities to major urban centres to find work that is pushing urbanisation (Masron et al., 2012). The population of the Federal Territory of Kuala Lumpur was 1.72 million in 2013 and in recent years, rates of population growth have been low and recorded at less than 1% in 2012 and 2013 (Department of Statistics, Malaysia, 2015).

Having said this, it is in the suburbs and exurbs of Kuala Lumpur, not included in the above population numbers that the most dramatic and sustained population growth has occurred as a result of urbanisation. This can be clearly seen in Figure 4.5, which shows the trend since 1950 for both the core federal territory and the suburbs and exurbs.

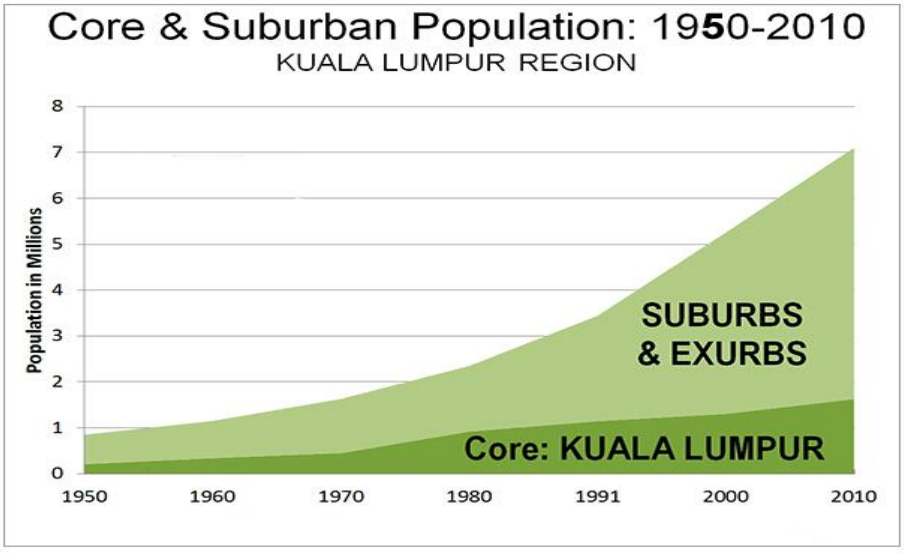



Figure 4-5: Core and Suburban Population of Kuala Lumpur 1950 -2010 (Source: www.newgeography.com/)

Demographic trends regarding age reflect a population which is living longer. Comparing the census of 2000 with the census of 2010 the proportion of the population of Malaysia aged below 15 years fell to 27.6 per cent from 33.3 per cent in 2000 (Department of Statistics, Malaysia, 2014). Conversely, the proportion of the population at working age (15 - 64 years) rose to 67.3 per cent from 62.8 per cent. The proportion of the population aged 65 years and over also rose to 5.1 per cent up from 3.9 per cent in 2000. Malaysia remains a relatively young country despite the median age increasing from 23.6 years in 2000 to 26.2 years in 2010 (Department of Statistics, Malaysia, 2014).

In 2006, the Federal Department of Town and Country Planning Peninsular Malaysia a part of the Ministry of Housing and Local Government published its National Urbanisation Policy (NUP). Section 21 of the Policy referred specifically to housing provision starting with the overarching principle that the needs of the population will dictate housing provision. Specific measures included adopting the National Housing Policy as the starting point for housing provision; ensuring a diversity of stock in housing type and affordability (both owner occupied and rented); targeting a one family one household objective; reducing the number of squatters to zero; identifying sites for public housing programmes; ensuring that these public housing programmes are conveniently located and provided with adequate infrastructure and amenities; including the needs of groups such as the elderly and disabled when planning housing areas; and finally providing suitable transit accommodation for foreign workers at suitable sites (JPBDSM, 2006, p. 60).

The Malaysia Urban Indicators Network (MURNInet) was introduced in 2002 as a means of measuring the sustainability of Malaysia’s urban centres (Shamsuddin & Rashid, 2013).

### 4.4 Environmental stresses and pressures

The Human Development Index (HDI) measures average achievement for several indicators of quality of life. Malaysia's HDI ranking has increased steadily over recent decades. The rapid process of urbanisation has given rise to improved services including healthcare and education as well as significant improvements in infrastructure. According to the UNDP, a country's HDI ranking can indicate whether quality of life in developing countries is approaching that of developed countries. In terms of gross national income (GNI) per capita Malaysia was ranked 88th at $ 10,430 though when purchasing power parity methodology is applied this rises to $22,530 and a ranking of 71st (World Bank, 2014a). It is perhaps in the rate of increase in GNI that Malaysia's performance can most easily be seen (Figure 4-6: GNI (Atlas method) in $US 2005 – 2013 (Source: World Bank, 2014b).).

Indeed, GNI per capita almost doubled between 2005 and 2013 and Malaysia's GNI per capita is significantly higher than both the East Asia and Pacific region as a whole and the combined average for upper middle-income countries (World Bank, 2014b). In 2008 the Commission on Growth and Development reported that Malaysia had completed a quarter of a century of annual growth rates above 7%, one of only 13 countries to do so (Commission on Growth and Development, 2008). This growth has also been inclusive, in the sense that it has had a dramatic effect on reducing poverty levels. The World Bank reports that poverty rates had been reduced to 1 percent in 2014 having been 49.3 percent in 1970 (World Bank, 2015a).

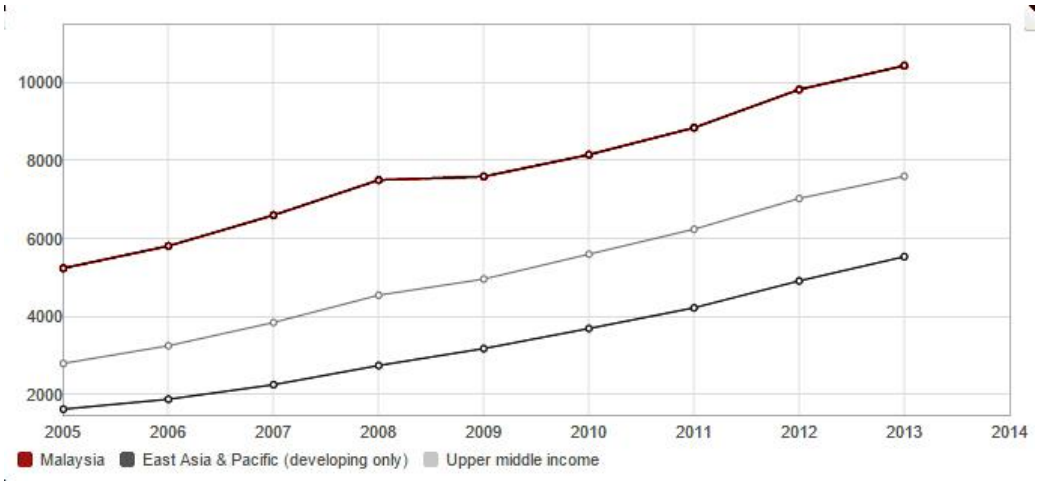



Figure 4-6: GNI (Atlas method) in $US 2005 – 2013 (Source: World Bank, 2014b).

The country's overall HDI ranking reached 0.773 in 2013 from a starting point of 0.619 in 1975, (UNDP, 2014a, p. 3); this placed it 62nd on the list, unchanged on the previous year (UNDP, 2014b, p. 15). If Malaysia's average income continues to increase at a regular rate without any sudden downturns, Malaysia can expect to be listed as a developed country in the foreseeable future (UNDP, 2010, p. 42).

The increased quality of life of Malaysia's people and the rapid industrialisation that has driven it have come at some significant cost to the environment. Malaysia's CO2 emissions have grown from 65,202 million metric tonnes (MMT) in 1990 to 198,785 MMT in 2012 (US-EIA, n.d.) although they have been stable in recent years when measured as metric tonnes per capita at 7.7 metric tonnes in 2010 (World Bank, 2015). Among the mitigation steps being taken to reduce CO2 emissions is the reduction in the use of fossil fuels while promoting hydro energy; adding biomass to the energy mix; fuel switching for passenger cars; and the general promotion of the principle of sustainable development (including in the construction sector) (Ang, Morad, & Ismail, 2013). At the United Nations Climate Change Conference in Copenhagen (COP-15) in 2009, Malaysia

unilaterally announced that it planned to lower CO2 emissions by 40% (of 1990 levels) by 2020 (Zaid et al., 2014).

While urbanisation has been a strong trend in Malaysia, forested areas, comprising permanent reserved forests, state-owned forests, wildlife reserves and other reserved forested areas, continue to account for more than half of Malaysia's territory, at 18.24 million hectares in 2011 (Department of Statistics Malaysia, 2012, p. 123). With 61.7% of total land area being forest in 2012 (World Bank, 2015c) Malaysia is among the most well-resourced countries in terms of carbon stocks in forest biomass, although logging and development continue to pose a danger to reserved forest areas. The amount of forest area licensed for harvesting in Peninsular Malaysia and Sabah declined by a combined 9,200 hectares between 2009 and 2013 but this was more than counteracted by a 38,000 increase in Sarawak over the same period (Department of Statistics, Malaysia, 2014, p.60). Exports of both logs and sawn timber have reduced in recent years (Department of Statistics Malaysia, 2012, p. 102).

Arable land is increasingly dedicated to palm plantations, as both its price and the international demand for palm oil continues to rise. Palm oil exports rose from 13.67 MMT in 2007 to 18.44 MMT in 2011 (Department of Statistics Malaysia, 2012, p. 102). As a consequence of the growth in palm oil plantations forested areas, as well as areas dedicated to the cultivation of rice, cocoa, rubber, tobacco and pepper, have accordingly decreased (Department of Statistics Malaysia, 2007, p. 115). Mature oil palm trees can also provide timber for harvest, while palm foliage and sawdust can be used to produce electricity.

The six main pollutants monitored in Malaysia are Ground Level Ozone (O3), Plumbum (Pb), carbon monoxide (CO), Sulphur Dioxide (SO2), Nitrogen Oxide

(NOx) and particulate matter PM10. Air pollution is the result of the presence of these pollutants in the atmosphere (Department of Statistics, Malaysia, 2014b). Ground Level Ozone (O3) is frequently the dominant component to air pollution especially in urban areas later in the day around rush hour when it is formed by the reaction of NOx with Volatile Organic Compounds (VOCs) emitted from both industrial activity and motor vehicle exhaust (Department of Statistics, Malaysia, 2014b). Pb is a naturally occurring pollutant which exists both in the form of vapour and particles. However, most Pb concentrations that are found in the environment result from human activities. CO is a highly poisonous, colourless and odourless gas which is present in the air but at non-toxic levels. Emissions from motor vehicle exhausts, industrial processes and open burning activity are the major sources of CO in urban areas. Nitrogen Dioxide (NO2) is formed in the atmosphere through the oxidation of Nitrogen Monoxide (NO). This reddish brown coloured toxic gas has a particularly pungent odour.

Overall the major sources of air pollution in Malaysia are emissions from motor vehicles, stationary sources (industries including power plants), and open burning activities. Motor vehicle emissions contributed 68.5 per cent of the total, stationary sources 26.7 per cent and others (including open burning) 4.8 per cent (Department of Statistics, Malaysia, 2014b).

The Malaysian government has published the Malaysian Ambient Air Quality Guidelines which sets a maximum acceptable level for each of the aforementioned pollutants. The Air Pollutant Index (API) is also used by the Department of Environment of Malaysia to monitor air pollution in real time from data gathered at 51 points throughout the country (Department of Environment, 2015).

Industrial pollution in Malaysia's water is also a concern. Malaysia's rivers have been used for transport, as a source of drinking water, and to supply hydroelectric power. Recent monitoring has demonstrated an increasing threat from a range of sources of pollution including include oil spills, waste from agricultural and livestock cultivation, disposal of solid and domestic waste, untreated sewage including improper discharges from sewerage treatment plants and agricultural runoff containing hazardous chemicals Department of Statistics, Malaysia (2014b). In general, water pollution has taken place when the colour and composition of the water has been changed to such a state in which it is unsuitable for consumption and poses risks to human health. The Malaysian government monitors levels of pH value, Ammoniacal Nitrogen (NH3-N), Biochemical Oxygen Demand (BOD5), Chemical Oxygen Demand (COD), Suspended Solids (SS) and Heavy Metals at 812 manual stations located within 140 river basins around the country (Department of Statistics, Malaysia, 2014b). The results are aggregated to produce a Water Quality Index; on some of the measures there has been a marked drop in the percentage of river basins being rated as clean. For example, in 2008 55.2% of river basins were rated clean in terms of Biochemical Oxygen Demand pollutant, but by 2012 this number had fallen to 8.6% (Department of Statistics, Malaysia, 2014b, p.32).

### 4.5 Incentives to develop sustainable buildings/homes

Malaysia's location and climate offers several inherent incentives for the development of sustainable construction. For example, Malaysia's latitudinal position makes it relatively straightforward to place windows and eaves for maximum provision of shade and to best situate solar or photovoltaic equipment for provision of hot water, as solar elevation is relatively consistent throughout

the year. Solar radiation is also relatively high in Malaysia and also consistent through the year creating suitable conditions for the use of solar cells, thermal converters and hybrid systems (Syed, Fadzil, & Byrd, 2014). Between 1990 and 2009 the average temperature for the coldest month in Malaysia (January) was 25.4ºC while for the hottest month (May) it was just 1.1ºC higher at 26.5ºC (World Bank, 2015d).

Existing building standards in Malaysia include a number of eco-friendly practices, particularly with regard to building materials and sharing of innovations. The Forest Stewardship Council (FSC) and the Malaysian Timber Council (MTC) regulate standards for all wood produced, although the majority of Malaysia's timber is exported (Islam and Siwar, 2009; MTC, 2010). The established agricultural industry, producing oil palms, rubber trees, rattan and bamboo, offers potential for the provision of timber for construction. Concrete and cement are made from locally sourced sand, gravel and lime (although extracting these materials is energy-intensive). Autoclaved aerated concrete (AAC) blocks are produced locally and are eco-friendly. These blocks are used in sustainable building designs, in particular the Smart and Cool Home (SCH) and the CoolTek House (CTH), which are designed to reduce thermal load. The Demonstration Cool and Energy Efficient House (DCEEH) offers ways to reduce thermal load in existing terraced homes. The techniques and practices used in all three of these designs have been shared with the public and can be freely duplicated (Ismail & Rashid, 2014).

Solar PV is also becoming more widely used, and the Malaysian national government offers financial incentives to increase its use via both the SURIA 1000 project and the introduction of a feed in tariff. SURIA 1000 is a project running as part of the Malaysia Building Integrated Photovoltaic (MBIPV) Project which is funded by the Malaysian government and the UNDP among others. It

aims to bring developers of commercial and residential buildings in contact with Solar PV providers via a bidding system (MBIPV, 2009). The MBIPV was intended to run for a defined period and indeed it concluded on 31st May 2011 having successfully led policy and education, improved technical skills and supported technology development (Hussin et al., 2012).

The Sustainable Energy Development Authority of Malaysia (SEDA Malaysia) is a statutory body set up under the Sustainable Energy Development Authority Act 2011 and so to some extent represents a successor project to MBIPV. However, SEDA's main role is to administer the Feed in Tariff policy that was introduced by Renewable Energy Act 2011 (SEDA Malaysia, n.d.). Feed in tariffs are commonplace in countries seeking to incentivise the of solar PV and work by on the one hand obliging energy distribution companies to accept feed-in from individuals and companies at a rate set by SEDA Malaysia. Hence these individuals and companies can recoup some of their investment in Solar PV through the income from their excess energy. Feed in tariffs are also available on a similar basis for hydro, biomass and biogas (SEDA Malaysia, n.d.).

During the same period waste management has been improved in Malaysia's construction industry. At the heart of the waste management effort is the "Industrialised Building System" (IBS) programme. IBS involves using prefabricated components in the construction of buildings. These components are manufactured off-site and transported to the site for assembly (Din et al., 2012). The benefits which have attracted the construction industry toward embracing IBS are that it is seen as a route to both higher productivity and quality, lowers health and safety risks for site workers and lowers overall construction costs. In addition to this there are environmental benefits through minimising waste, lower levels of site materials, a neater and cleaner site environment and less construction noise (Din et al., 2012).

The Construction Industry Board of Malaysia (CIDB) oversees the "Industrialised Building System" (IBS) programme, implemented in 1998. This was followed by the IBS Roadmap 2003-2010 and IBS Roadmap 2011-2015; these are blueprints for industrialised construction by 2015 (Din et al., 2012). While there has been significant adoption of IBS there are economic factors acting as a barrier to further progress. These include the relatively inadequate financial incentives on offer which do not compensate for the thin profit margins on offer through the adoption of IBS and the fact that readily available cheap foreign construction site labour is offsetting the cost benefit of switching to IBS (Din et al., 2012).

Another programme run by the CIDB is the "Quality Assessment System for Building Construction Work" (QLASSIC) programme, first introduced in 2006. It is essentially a methodology which enables the workmanship of the construction industry to be measured and compared and at the same time measure and record the overall performance of building contractors (CIBD, 2012). Assessment under the programme is carried out by assessors appointed by the CIBD. For developers there is the opportunity to use quality defined by QLASSIC as a contractual requirement for their contractors.

Energy efficiency is also regulated by the "Code of Practice on Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings" (Department of Standards, Malaysia, 2007). This concerns non-residential buildings, both existing and new-build, providing a standard for efficient energy use, including energy from renewable sources (Department of Standards, Malaysia, 2007, p. 2). This code of practice operates in conjunction with Malaysia's "Uniform Building By-Laws" (UBBL), which focuses on enhancing safety in newly constructed buildings.

### 4.6 Housing in Malaysia

Between 2000 and 2010, the overall number of dwellings in Malaysia rose from 5.57 million to 7.35 million; of these, the proportion in urban areas rose from 51% to 63% (Department of Statistics, Malaysia, 2013 p. 1)

In terms of type of housing units there was a decline in the percentage of detached and semi-detached houses 40.1 per cent and 9.1 per cent in 2000 to 32.9 per cent and 7.2 per cent in 2010 respectively. This was partly offset by a growth in the share that were terrace, townhouse, or cluster houses which grew from 32.6 per cent in 2000 to 36.4 per cent in 2010. The largest growth in share terms was for flats, apartments and condominiums rising to 19.9 per cent (2010) from 12.6 per cent a decade earlier (Department of Statistics, Malaysia, 2013 p. 2). This latter category of housing unit had become particularly dominant in W.P. Putrajaya (74.1%) and W.P. Kuala Lumpur (66.6%). Nationally, 15% of properties were unoccupied, with the single largest reason being that they were new completions awaiting occupation. In Kuala Lumpur, approximately one in eight properties were vacant at the time of the 2010 census (Department of Statistics, Malaysia, 2013 pp. 2-3). The average size of a household in 2010 was 4.3 persons which was a decline from the figure of 4.7 persons in 2000. Between 2000 and 2010 home ownership became less prevalent with a fall from 63.2% (2000) to 55.8% (2010) (Department of Statistics, Malaysia 2014, p.8).

There was a sharp increase in the use of bricks for the construction of housing which followed the shift towards the building of flats; 75.5 per cent of outer walls comprised of brick in 2010 up from 59.5 per cent in 2000 (Department of Statistics, Malaysia, 2013 p. 4).

Progress was made in the provision of treated piped water supply with 93.0 per cent of housing units having such a supply in 2010 compared with 88.9 per cent

in 2000. Over the same period the percentage of housing units with an electricity supply increased from 95.1 per cent in 2000 to 97.9 per cent in 2010. The 2010 Census also revealed that 99.6 per cent of urban dwellings had flushing toilets, although this figure fell to just 41.6 per cent for rural dwellings (Department of Statistics, Malaysia, 2013 p. 6).

## PART TWO: THE DEVELOPMENT OF LOW COST HOUSING POLICY IN MALAYSIA

### 4.7 Part Two Introduction

The second part of this chapter further contextualises the current study by presenting an overview of low cost housing in Malaysia. After defining low cost housing (LCH) it sets out how LCH policy has evolved from the 1950s to the present day going through each of the five-year plans that have been in place since independence and include the targeted and actual outturn for LCH building. In addition to this there are sections on allocation practices, squatters and residential satisfaction as these three issues are particularly relevant to the current study.

### 4.8. Defining Low Cost Housing

The term 'low cost housing' (LCH) has been employed broadly and often in the extant literature and policy concerning global housing provision. Among the earlier definitions of LCH, Ural (1980, p.1) refers to housing that is intended for those individuals with a below-average or low income. Sulong (1984) defines low-cost housing as public housing, government housing and cheap housing.

Rather than sales value many academics argue that the term is more appropriately based on the cost of manufacturing the house (Drakakis-Smith, 1981; Lal, 1995; Kilham, 2008). Ghani and Lee (1997) suggest that a dwelling with a sales value of RM25, 000 or less is low cost, though pinning the definition to fixed monetary value is not because property prices rise and fall as do the costs of raw materials. Indeed, the government ceiling for low cost housing is now RM42 000 but is also now dependent on location (Bakhtyar et al., 2013, p. 130). Furthermore, as much of the low-cost housing being built in Malaysia is for social renting a sales price also seems inappropriate.

There is a distinction to be drawn between LCH and the widely used concept of 'affordable housing'. As purported by Stone (2006, p. 154)

> …affordable houses are not, by definition, low-cost, as … generally this includes social housing as well as LCH in addition to fiscal assistance housing for those middling income groups that find it a challenge to buy houses within a speculative, privatised marker.

Consequently, there remains no exact price ceiling for the costs of construction so long as individuals are able to purchase the house itself.

For example, the UK government, as contained in its National Planning Policy Framework 2012, employs the definition of affordable housing as: "Social rented, affordable rented and intermediate housing, provided to eligible households whose needs are not met by the market. Eligibility is determined with regard to local incomes and local house prices. (UK Dept. for Communities and Local Government, 2012, p. 50) Specifically with regard to rented housing this means "a rent of no more than 80% of the local market rent." (p.50). In the UK the definition plays an important role in planning decisions as private developers must normally undertake to build a certain proportion of affordable

houses alongside those at market prices if planning permission is to be granted. With regard to low cost housing the use of cost of the defining criterion can have the effect of requiring government to subsidise the supply as developers are often unable to meet the often very low-cost ceilings, something that has certainly been the case in Malaysia.

In Malaysia's case, the term 'LCH' has been employed for more than half a century to define the policy goal of housing provision for low income groups since independence (Housing Trust, 1956). Moreover, the phrase was converted into a politically approved definition to show the government's intention to assist people in low-income brackets.

In Malaysia, the low-cost housing development programmes are undertaken both by the public and the private sectors. The public low-cost housing programmes, which started from the First Malaysia Plan (1970–1975), are concentrated in the major urban areas like Kuala Lumpur and Georgetown. The main objective of the Public Low-Cost Housing Programme (PLCH) has been to improve the quality of life, eradicate poverty among the low-income group and to resettle the urban squatters.

The price at sale of a group of houses or a particular building with particular specifications has been employed by governments to define LCH in Malaysia (Malaysia, 2006, p. 55). The price at sale of LCH is evaluated by a review process every so often in which the government aims to guarantee that all citizens who have low-incomes are able to afford LCH. This review also considers the specifications for construction and design regarding LCH, and this is carried out to try and lessen the expense of construction overall (CIDB, 1998). Consequently, LCH in Malaysia can be said to be housing that is allocated to those in low-income demographical groups, and that these houses are either

for purchase or rent in the public and private sectors, and are all built with regard to established construction standards.

Twice every five years the Departments of Statistics, Malaysia, conducts the Household Income Survey the base data from which is used to establish the 'Poverty Line Income' (PLI) (Economic Planning Unit, 2013a). The PLI has been applied to determine the minimum needs for a household based on three essentials; clothing; footwear and food, and also certain non-personal elements including power, energy/heat and fuel in addition to household furniture items and further necessaries such as medicine and basic recreational and transportation expenses, in addition to the educational needs of children (Economic Planning Unit, 2013a). This index, the PLI, is 'refreshed' on an annual basis to adhere to the altering price levels of certain commodities over time, and that the GPR (consumer price index). Under this methodology official statistics show that there has been a dramatic drop in the levels of poverty in Malaysia. In 1970, 49.3% of the population were deemed to have an income below PLI but by 2012 this figure has fallen to just 1.7% (Economic Planning Unit, 2013b). There are limitations to the PLI methodology. It is an absolute line rather than a relative one which is tied to median income (a measure preferred in some countries); and it does not allow for major regional variations in the cost of living (there are three PLAs for Peninsular Malaysia, Sabah & Sarawak). Recognising both the virtual eradication of absolute poverty and the limitations of the PLI method the government announced in 2013 that it would add a further measurement the 'Multidimensional Poverty Index' (MPI) to its reporting (Government of Malaysia, 2013).

The significance of the PLI in terms of low cost housing provision is that no provision is made to those who fall below the PLI as they are deemed too poor to rent or buy low cost housing even with assistance. These people are classed

as the extreme poor at whom other government programmes are targeted such as the "Pembangunan Rakyat Termiskin Program" (PPRT), the extreme poverty development programme.

Low cost housing developments are aimed at Malaysians with a household income of less than RM 2,500 per month. Until recently they had been available to purchase for between RM 30000 and RM 35000 or to rent at RM124 per month. While the rental cost is still valid the government is ending the sales of PPR housing in most cases (The Star Online, 2014).

## 4.9 A brief history of low cost housing in Malaysia

### 4.9.1 The pre-independence period (1950 to 1954)

The concept of low cost housing was introduced by the British prior to the end of colonial rule to deal with emerging housing issues. From 1956 the Housing Trust was given the responsibility to develop LCH. Before this, the Housing Trust had restricted itself to the sale and construction of homes that were available for purchase for the middling income families, (Housing Trust, 1956, p.2). After the 1955 general election, the Trust was situated under the jurisdiction of the Ministry of Natural Resources and the responsible minister was subsequently given the role of the Trusts' Chairman and the minister concerned soon ruled that the trust should primarily be concerned with providing LCH for sale and rental. Housing was then aimed at individuals that had a lower-than RM300 per month income. The Trusts' role as a governmental agency was also the commencement of the national government’s intervention in the provision of LCH across the country (Housing Trust, 1956, p. 5).

The low cost housing developed at this time was mainly for the rural poor with government-led urban housing policy mainly concerned with provision for government and public sector employees (Sulaiman, Baldry & Ruddock, 2005). Colonial efforts at LCH development were poor and did not achieve the required levels of building. According to Sulaiman, Baldry and Ruddock (2005, p.4) while there was an awareness that to successfully address the housing needs in Malaya 30,000 new homes would need to be built every year with the vast majority in the low cost category in fact during this period only 311 actually were, something attributed to the lack of a proper ministry to oversee policy, regulation and implementation.

### 4.9.2 The first and second Malaya Plan (1956- 1965)

Between 1956 and 1965, the period of the First and Second Malaya Plans little priority was given to LCH and over the 10 years less than 9,000 low cost houses out of a total new build of 425,876 units were completed. The policy priority remained government employees and there was also no contribution to LCH from the private sector during this period (Sulaiman, Baldry and Ruddock, 2005, p.4). Throughout this period housing was still being co-ordinated by The Housing Trust and the main objectives were to address squatters' needs and also attempt to slow up rural-urban migration by building low cost homes in rural areas.

In the Second Malaya Plan (1961-1965), the government did give emphasis to the provision of affordable houses as part of social welfare, it was stated that home ownership would be a key element of Malaysia's new democratic society (Agus, 1997, p. 3).



Figure 4-7: Pekeliling flats completed built between 1964-1967

(Source: www.skyscrapercity.com/.)

However, the objective was never met due to the low number of low cost houses constructed, as a result home-ownership among low income groups failed to rise (Johnstone, 1979, p. 220). In 1964, the Ministry of Housing and Local Government (MHLG) was set up with the Housing Trust coming under its responsibilities. After the MHLG was set up LCH policy was based on the federal district government making funds available to underpin low-interest rate mortgages and state governments releasing appropriate land plots and providing infrastructure at no charge to the project (MLGH, 1966, p, 3). Lower paid public sector employees as well as construction workers themselves were among the groups targeted for LCH at this time. One such attempt to address the need for housing in masses are the construction of Pekeliling flat, see figure 4-7.

### 4.9.3 First Malaysia Plan (1966 – 1970)

The First Malaysia Plan saw LCH rise up the policy agenda as part of its efforts to address the needs of Malaysia's lower income groups. The government now attempted to bring the private sector into the overall effort to provide LCH alongside its public sector activity. Although 1MP did recognise that it would be left to the state to provide the overwhelming majority of LCH because "the incomes of this economically weak section of the community are too low to encourage private developers to enter this field of housing development" (EPU, 1965 p. 182). Slum clearance and the rehousing of squatters was also singled out for action in 1MP. Ethnicity also became an important dimension of housing policy with Bumiputera (the indigenous people of Malaysia) needs receiving specific attention as they were more likely to be found amongst the poorest Malaysians. Government's intervention in the housing market in this period also started to focus on low-cost housing to meet the needs of the poor especially the Malays who are considered as Bumiputera (indigenous people of Malaysia) and are overrepresented among the poorest groups in Malaysia. During this plan the target of 30,000 low cost units was undershot by the Housing Trust with only 21,700 achieved (Sulaiman, Baldry & Ruddock, 2005, p.4).

In 1967, the Housing Trust introduced its 'crash' programme that was intended to address under supply of LCH in smaller urban areas which had been hitherto overlooked (MLGH, 1968a). However, the period up to 1970 saw no widespread LCH programme which came anywhere near close to meeting what was assessed as the real need. According to Pacione (2009, p.538) the aim of this approach was truly to "obtain a degree of political favour as opposed to resolving the crisis regarding public housing", going on to state that:

> …schemes were intended to be an obvious display of governmental concern for those in poverty or poor conditions, rather than a genuine effort to resolve the housing situation, often implemented in the manifestation of the high-rise tower blocs, irrelevant of their financial or cultural applicability.

### 4.9.4 Second Malaysia Plan (1971 – 1975)

The sectarian riots of May 1969 were blamed by some on the marginalisation of certain groups within Malaysian society and provided fresh impetus to the provision of LCH to low income groups. A quota system was introduced which required that a minimum of 30% of new housing was for Bumiputeras, who as mentioned were more likely to be in the low-income category (Agus, 1997). However, the government was keen to emphasise that its public housing programme was for "low income groups of all communities irrespective of race" and was "designed for an integrated multi-racial community" (EPU, 1971, p. 257). The plan also seemed to accept that the private sector was not going to play a significant role in housing low income groups.

The New Economic Policy (NEP) was a 20-year plan introduced in 1971. It presented a significant shift from a smaller to a greater element of control with regard to the provision of LCH in the country. The eradication of poverty had become one of the foremost government priorities and the NEP recognised that adequate provision of LCH was an important element of this. In 1972 the Housing Trust was dissolved and the National Housing Department assumed its role regarding LCH. Whatever the aspirations and priorities were, by the end of the plan period end in 1975 only 13,244 LCH units, or 50.5 per cent of the targeted number, had been built (Sulaiman, Baldry & Ruddock, 2005, p.4). Just 1.1% of the houses built by the private sector could be viewed as low cost (EPU, 1976, p.332).



Figure 4-8: Loke Yew Flat in Kuala Lumpur completed 1974 Source: www.skyscrapercity.com

Overall the period of the 2MP gave, in budgetary terms, a relatively low priority to housing generally and low-cost housing specifically. Just 3% of the national budget was allocated to housing and only 19% of this was targeted at low cost housing (Ahmad, 1996, p.128). Loke Yew Flat as in Figure 4.8, was built within the second Malaysia Plan to provide multi-racial accommodation within the city.

### 4.9.5 Third Malaysia Plan (1976 -1980)

Once again in MP3 the government emphasised the priority it gave to housing the people as part of the goal to eradicate poverty. The plan targeted building 56,800 LCH units on Peninsular Malaysia under public housing programmes (EPU, 1976, p.334). However, the public housing programme delivered only 26,250 units of low cost housing continuing the trend of underachievement

(EPU, 1981, p.360). Private developers were expected to cater to the middle and higher income groups, but were encouraged to build LCH houses either on their own or through joint ventures with public housing agencies and the government's frustration at the private sectors contribution showed through in the Plan: "… private sector developers will have to be more to national social objectives not merely to economic gains" (EPU, 1976, p.336). Government launched a financing scheme through Malaysia Building Society Bhd (MBSB) for houses costing below M$20,000 (€4106) as LCH units. Housing Developers Association (HDA) established a housing company, HDA Perumahan Berhad, specifically to build private LCH. Similar to the previous plan 3MP saw 20% of total public housing expenditure allocated to PLCHP (Ahmad, 1996, p.139).

During the third plan the Town and Country Planning Act 1976 was put on the statute books. The act introduced compulsory provision of certain public amenities and covered all housing including the PPR developments that are studied in the current research. These compulsory amenities were 1) 10% of area to be open space and to include children's playground with play equipment, 2) a *surau* (prayer hall), 3) a multi-purpose community hall, and 4) one parking space per unit plus a 10% addition for visitors.

### 4.9.6 Fourth Malaysia Plan (1981-1985)

Overall, the public sector's housing performance during the Fourth Malaysia Plan was better than the private sector (excluding groups and individuals) in terms of number of houses built. This was a result of the very large financial resources invested by the federal government in the construction sector and in housing development (Ahmad, 1996).

Frustrated at the lack of contribution made by the private sector the Malaysian government now required developers to include at least 30-50 per cent of the units in all new projects as a condition of being granted planning permission. The houses would have a sales price of no more than RM 25,000 wold be offered on a long-term tenancy with a right to buy after 10 years. The government targeted the private sector to build 90,000 of these LCH units but at the end of the period the figures showed that it had only managed 22,794 (22.3%). Under the concept of cross-subsidization the contactors in the private sector were expected to make high profits on both high and medium level contractual projects to more than cover their possible losses on the LCH element of their projects.

For its own part the government targeted public housing programmes to build 176,500 LCH units but fell well short at 72,302. It was also during this plan that the target groups for the LCH provision was more clearly defined as having a maximum monthly household income of RM 750 (EPU, 1981, p.366. There were also minimum design standards set with a 550-600 square feet build area, a living room, two bedrooms, a kitchen and a combined bathroom-toilet (Sulaiman, Baldry & Ruddock, 2005, p.4). Groups specifically targeted in the Plan were workers in industrial estates, residents of New Villages and workers in estates (EPU, 1981). The rising priority given to housing low income groups is shown in the level of allocation given to PLCHP; half of all public housing funds were allocated to the low-cost programme (Ahmad, 1996, p.139).

#### 4.9.7 Fifth Malaysia Plan (1986 - 1990)

This period saw a new dimension added to the LCH policy and this concerned the concept of human settlement which emphasised the need for the

construction of housing developments to be accompanied by planning for adequate social facilities such as schools, community halls, clinics, prayer rooms and other amenities such as libraries and playgrounds. The provision of these social facilities was first implemented in Kuala Lumpur's New Growth Areas (NGAs) mainly found on the outskirts of the city. During the plan the government continued to urge private sector developers to meet their obligation to build 30% of their homes as LCH.

There was an economic recession in Asia from 1986 to 1989 and in Malaysia the government sought deeper cooperation with the private sector to generate LCH projects for Malaysians. To this end they introduced the Special Low Cost Housing Programme (SLCHP), which began in 1987 aiming at 240,000 finished LCH units developed entirely through the private sector. The programme was also intended as a spur to economic activity and employment to counter the effects of the ongoing recession. With assistance from the Bank of Malaysia the government managed to generate a RM 2 billion stimulus for LCH. Nevertheless, despite the political will and the available capital a total of only 84,940 houses were completed (EPU, 1991). In an analysis by the World Bank (1989, p.45) it was demonstrated that while there were benefits to the economy which exceeded the RM 25,000 cost of each LCH unit and while the purchaser was undoubtedly also receiving a good deal, for the private sector developers the costs outweighed the benefits and that in fact they were making a loss of nearly RM 2000 on each unit.

Overall the Fifth Malaysia Plan set an ambitious target of 416,200 LCH units with the private sector expected to provide 370,400 of these while the public sector contributed 45,800 (EPU, 1986). The actual completed LCH units delivered by public and private sector developers were 88,877 and 26,172 respectively (EPU, 1991).

While the percentage of the total housing budget allocated to PLCHP was similar to the previous plan (48%) in real cash terms there was a dramatic fall from RM 1,712.22m under 4MP to RM 477.30m for 5MP (Ahmad, 1996, p.139). This was due to the recession.

### 4.9.8 Sixth Malaysian Plan (1991 – 1995)

The Sixth Malaysia Plan continued with the reliance on the private sector for providing the overwhelming majority of newly built LCH units, however, the difference with the previous plan was that the private sector come reasonably close to achieving its target. A total of 255,700 LCH units were targeted with the private sector providing 84% of these. By the end of the period 227,379 LCH units had been with the private sector falling just 3,697 units short of its objective, a far better performance than in the previous two plans.

This plan was characterised by an emphasis on home ownership as a source of social cohesion and progress.

In 1994, mainly driven by the need to tackle the issue of squatters in urban centres, the Federal government introduced the PHP for rental programme. These squatters could not afford to buy their home even at subsidised prices so this programme was the chosen option for rehousing them (Suid, 2013).

The Sixth Malaysia Plan was also the period in with the National Development Policy (NDP) replaced the New Economic Policy (NEP). The NDP would run for 20 years from 1991 and it was less interventionist in tone that its predecessor with a greater emphasis on the private sector (EPU, 1991).

RM 952m was allocated to all public housing programmes of which 77% went to PLCHP (Ahmad, 1996, p.139).

### 4.9.9 Seventh Malaysia Plan (1996 – 2000)

The period covered by the Seventh Malaysia Plan was a crossover point that saw major economic change. It saw the end of the period of economic liberalisation and rapid economic growth that had dominated the last 20 years and which had seen a policy of privatisation pursued including in the housing sector with the government stepping back from a direct role in housing provision. In July 1997, Asia suffered its financial crisis and Malaysia was one of the countries affected. To recover from the subsequent slump, the Malaysian government became more interventionist including in regard to housing policy.

The targets and results were as follows: LCH units targeted, 64,000 public and 137,000 private; LCH units built 62,812 public and 127,514 private. Overall almost 95% of the target was achieved a strong performance in percentage terms but it did not represent an increase in units built compared to the previous plan, in fact it was a drop of 37, 053. The private sector mainly built medium and high cost houses reflected by the completion of a total of 554,458 units of such houses or 291.8 per cent of the Plan's target (EPU, 2001, p.502).

Specific policy moves made under this plan included the extension of the Low Cost Housing Revolving Fund (LCHRF) providing incentives to the private sector to implement new projects, and the establishment of the National Housing Corporation Ltd in 1997 as a public sector housing developer (Sulaiman, Baldry & Ruddock, 2005). In 1998 the government introduced a new

pricing schedule for LCH which ranged from RM25,000 (€5133) to RM42,000 (€8624) dependent on the location and type of dwelling.

| Main characteristics of PPR rental scheme from 1998 | |
|---|---|
| Targeted Group | Squatters with income not exceeding RM 1500 per month (USD390) |
| Housing type | Low cost high-rise blocks up to 18 storeys |
| Unit size | Not less than 60 sq meter (650 sq ft) |
| Features | 3 bedrooms, 1 living room, 1 kitchen area, 1 bathroom, and 1 toilet |
| Monthly Rental | RM 124 (USD41) |

(Source: National Housing Council)

In 1998 the federal government launched its People's Housing Programme (PPR). The PPR is a national government housing program aimed at resettling squatters and providing housing for low-income earners. The program is implemented by the National Housing Department which falls within the Ministry of Housing and Local Government. The program consists of two housing schemes, one PPR for Rental (PPRS) and the other PPR for Ownership (PPRM). PPRM houses in Peninsular Malaysia are sold for between RM30,000 and RM35,000 which is a discounted price (Government of Malaysia, 2015). Every unit constructed for either PPRM or PPRS must follow the planning and design specifications set out in the National Housing Standard for Low Cost Housing Flats (CIS2). Recently the Malaysian government indicated that it is to stop the sale of PPR units making them available for rent only. PPR, the government says, is to provide a temporary place for low income households to live before they look for better accommodation to purchase in the future (The Star Online, 2014).

In Kuala Lumpur all developments over 5 acres in area are required by the DBKL to include 30% low cost housing units although if the developer is unable to provide the low-cost units they can make a financial contribution to the housing fund. This is calculated as ten percent of the total number of units multiplied by RM 35000 (DBKL, n.d.: p.161).

### 4.9.10 Eighth Malaysia Plan (2001 – 2005)

The pendulum of policy between public and private swung decisively back towards public sector development of LCH for the Eighth Malaysia Plan as the government realised it was never going to keep up with demand through the public sector programmes alone.

A total of 230,000 LCH units were targeted with 191,000 (83%) expected to come from the public sector and the rest (39,000) from private developers. When the final results were reported it was revealed that the public sector had only built 103,620 units, however, this was partially offset but overachievement in the private sector who built 94,029 units (EPU, 2006, p. 439)

The significant undershoot in public sector LCH construction was attributed to difficulties in identifying suitable development sites as well as issues related to the rehousing of squatters (EPU, 2004). With regard to these squatters the Plan had stated, “The construction of low-cost houses under PPRB will be expedited to enable all squatters to be relocated by the end of the Plan period.” (EPU, 2001, p. 520). This objective was not met.

In 2002, the Federal government brought in the PHP New Policy for sale and rental to replace the PLCHP implemented by State governments from 1976.

However, despite the introduction of PHP by Federal government, the market still played a significant role in low cost housing provision in Malaysia.

### 4.9.11 Ninth Malaysia Plan (2006 – 2010)

From 2006 to 2010 the public sector was tasked with building 97,000 LCH units and the private sector 77,700 units, meaning a total of 174,700. (EPU, 2006). During this period the government had funded 44% of all LCH development costs and as the first decade of the 21st century came to a close it was reported that the previous 20 years had seen 808,000 low cost houses built meaning an average of just over 40,000 per year (EPU, 2010).

Across the period of the 9MP the government had funded 100% of housing for those below the poverty line, 44% of low cost housing, 28% of low-medium cost housing and 23% of medium cost housing (UNDP, 2014). From these figures it is clear that the private sector had assumed an important role in provision for low income groups apart from the very poorest.

On the 1st of January 2010 with a view to damning the property market and disincentivising property speculation the government re-imposed a property gains tax which meant that any profits made on the sale of a property within the first 5 years of ownership would be subject to a 5% rate of tax (Ong, 2013).

### 4.9.12 Tenth Malaysia Plan (2011- 2015)

The start of the 10MP period came at a time of rapid growth in property asset values. In both 2010 and 2011 year on year increases of 12.2% were recorded in Kuala Lumpur (Liew & Haron, 2013). On consequence of this was that private sector developers, seeing a buoyant market, were keener to focus on medium

and high cost projects where greater profits were to be had. It also raised the issue of LCH applicants seeing their houses as investments to take advantage of the rising property values.

The Tenth Malaysia Plan declared that the priority was no longer seeking sheer volumes of houses in their plans but making sure the right type of housing supply was meeting the demand from different locations and for different socio-economic groups. Sustainable communities were also now a priority.

“Today, the housing issue for Malaysia is no longer about insufficient housing stock, but rather about ensuring that there are enough houses for various segments of society. It is also about having houses in a safe, healthy and comfortable built environment befitting the socio-economic status of the country” (EPU, 2010, p.277).

The Tenth Malaysia Plan also stated that 78,000 units of new affordable public housing would be constructed by the Federal Government and provided to families or individuals who had a total household income no greater that RM2,500 per month (EPU, 2010, p.278). A 700 square foot urban LCH unit was to be sold for RM42,000.

The tenth plan also recognised that there was a widespread problem of housing maintenance in Malaysia as a whole. In 2010, it had already set up a fund named *Tabung Perumahan 1Malaysia* to incentivise private sector maintenance projects on low cost housing. Now in the new plan RM 500 million would be set aside for major repair and maintenance work covering items such as the replacement of water tanks or lifts at public sector developments. However, the funding would be in the form of matching grants where half of the financing would have to come from the residents via their management committees (EPU, 2010, p.279). According to the Ministry of Urban Well Being, Housing and Local

Government (UHLG) (2013) in 2013 funds were allocated for the building of 123,000 affordable homes across the country. Of these 23,454 low cost dwellings were to be constructed by the Ministry under the PPR program and using the industrialised building system. The two main target groups for these homes are low income workers and squatters.

When the results for 10MP were published in 11MP it was reported that 102,201 affordable homes had been completed with a further 79,436 under construction. There are six programmes current running, during the period of the 10MP less than 12% of completion were under the PPR programme.

### 4.9.13 Eleventh Malaysia Plan (2016 -2020)

Green growth is a key phrase in 11MP – the plan announced that new government buildings would incorporate green designs and features and reiterated wider use of assessment tools including the GBI. The intention for the public sector to continue to play the leading role in low cost housing provision was confirmed and with regard to affordable housing 11MP declares that the government intends to "… encourage all new affordable housing developments to adopt sustainable practices, and provide liveable and environment-friendly facilities and infrastructure…" (11MP 4-17).

## 4.10 Recent developments in low cost housing policy in Kuala Lumpur

In Kuala Lumpur the provision of public housing is the responsibility of DBKL, or City Hall, effectively meaning that it is controlled by the federal government (who appoint the DBKL). Elsewhere in Malaysia it is a matter for state governments.

The Ministry of Housing and Local Government's (MHLG's) design guidelines and requirements in combination with the availability of financial resources are the key determinants of public housing design (Shuid, 2013). As can be seen in Table 4-1, there has been a steady increase in the size and number of bedrooms in a public housing unit which at the outset had just one bedroom and an area of just 37.1sq m (Shuid, 2013, p. 227). However, while many will have benefited from a better quality of life as a result of these changes their remains no link between the size of the applicant family and the housing unit offered.

| **Period** | **No. of Bedrooms (Unit Size)** |
|---|---|
| 1956 - 1981 | 1 bedroom (37.1sq m) |
| 1982 - 1996 | 2 bedrooms (49.2sq m) |
| 1997 - 1998 | 2 bedrooms (52sq m) |
| 1999 to present | 3 bedrooms (60sq m) |

Table 4-1: Changes in the size of LCH units since 1956 (Source: Shuid, 2013, p. 227)

Low cost public housing in Kuala Lumpur is now almost entirely high-rise in order to meet the requirement for high density and low cost. Until 2009, public housing under the four programs shown in table 4 was mainly managed by DBKL and rented out to low income tenants. There was, however, a change of approach in October 2009 when a decision was made by the federal government to sell a large proportion of the public housing stock in the city. Sitting tenants were given the right to buy their unit at a discounted price in a policy reminiscent of the 'Right to Buy' policy introduced in the UK in 1980 which while controversial has seen more than 1.5million homes moved from the social rented sector into owner occupation.

In Kuala Lumpur the government put up 62% of its total stock for sale which amounted to 44,146 homes comprising all of the PPR-MTN and the majority of DBKL's non- PPR public housing. An income cap of RM 2,500 per month was set to target the less well off; furthermore, favourable finance packages were made available which effectively meant that instead of an RM 124 rental payment, residents could make a monthly mortgage payment of as little as RM 160. The units were sold at between RM 21,500 and RM 35,000, far below their market value. Despite the incentives not all tenants took up the offer to purchase their home. Some of the receipts from public housing sales were set aside to fund repurchases of units where the owner had failed to meet their mortgage commitments (The Sun Daily, 2012). Another much reported problem with the disposal of public housing has been property speculation. With a buoyant property market in Kuala Lumpur, public housing units' market value has been rising rapidly attracting speculative investors interested in a short term, low risk investment.

### 4.10.1 Allocation of low cost housing

While most of the review above has concentrated on policy development regarding on the supply of LCH another important dimension is allocation. While the private sector has played an important role in supply it has been the government, either state or federal which has always controlled allocation since the 1950s in the case of public LCH and 1981 in the case of private LCH (Shuid, 2011). At the time of independence, a 'First Come First Served System' operated for low cost houses built by the Housing Trust. Then in 1964 the Ministry of Local Government and Housing introduced a points-based waiting list system which was administered by the Housing Trust. In 1971 a quota

element was added to the points-based system which ensured that 30% of LCH units went to Bumiputeras. With the Housing Trust being discontinued in 1972 the opportunity was taken a few years later to devolve responsibility for allocation of public LCH to State governments and in 1981 this responsibility was extended to private sector LCH.

With the jurisdiction for the LCH programme being passed to state governments after 1976, one of the unexpected consequences soon became the influence of politicians on the allocation process. Many politicians saw the opportunity to use the allocation process to influence voters. Consequently, a significant number of those who bought houses in the 1980s were supporters of the incumbent political party (Agus, 1982, p. 60). Indeed, the LCH units concerned became known as 'political houses' as they were used to reward party members who had made a contribution to the party (Agus, 1982, p. 61). Within Johor, for instance, in excess of 10% of the LCH was distributed to the ruling party membership while they sidestepped the ordinary application procedure, as cited in Agus (1986, p. 74) and as was stated by the director General of the NHD National Housing Department of Malaysia in 1981:

> the government has set guidelines of allocation to all of the state government regarding the selection of LCH applications. These need to be adhered to closely by all officials, if it seen to be prudent to accommodate applicants on the basis of political leaning then it must be established that the allocated quota for this amount is set at 10%...

Both the federal and state governments often accepted the requirement to give certain quotas of LCH to political allies. Thus, the government proposed that only an upper limit of 10% was to be given to such individuals. Despite this, in reality the number of these individuals could well have been greater (Agus, 1986, p. 74). Furthermore, a study by Hassan (1984) expounded on the point

that ruling political figures can affect the process of allocation. The system of allocation was subject to warping and alteration by political figures and administration bureaucrats. LCH distribution that was undertaken throughout the 1980s can shed some light on why so many people had difficulty in attaining LCH regardless of the number of houses being built in both public and private sectors at this time.

Until January 1996 the Federal government had left the allocation of low cost housing to State governments including the formulation of the criteria used in assessing applications. It was in January 1996 that the Federal government issued its first guidelines to States regarding allocation criteria. Further editions of the guidelines were issued in 1997,1998 and 2006. In May 1997, alongside the introduction of the Federal PHP, the government approved the introduction of a nationwide Open Registration System (ORS) under which applications to purchase a low-cost housing unit would be held on a central MHLG database. The government had also wanted to use ORS for rental applications, but State governments did not apply it in this area and the ORS did not have legal status as no legislation was enacted to support it.

Shuid (2011) concludes that the Federal government decided to introduce ORS to drive corruption out of LCH allocation as it was believed that some State housing administrators may be accepting payments to expedite applications. Similarly, the ORS would improve perceptions of transparency and fairness among the public. The introduction of ORS did not result in the total elimination of malpractice in the allocation of LCH by State governments and local authorities. For example, in 2010 the media reported on a case in Selangor in which 500 staff of the Petaling Jaya City Council were found to have been allocated LCH units despite being ineligible (The Malaysian Insider, 2010). While it may have been an improvement, by 2004 ORS was receiving criticism

for being inefficient and responsible for growing numbers of unsold units. A project was launched to improve the system and in April 2006 a new improved computerised ORS was launched accompanied by a new set of application assessment guidelines (Shuid, 2011).

The purpose of issuing guidelines was to keep LCH allocation in alignment with Federal housing policy in terms of which groups were targeted. For example, the 1998 guidelines gave the single largest number of application points to those who had lost their home so that it would give priority to the rehousing of squatters who had been given relocation orders. This in turn fitted in with the 'Zero Squatters by 2005' policy objective. These points were removed from the 2006 guidelines which gave most points for monthly household income and number of dependents as the government refocused on low income families from the formal sector (Shuid, 2011).

The key factor currently being used to assess eligibility is income with an upper limit place at RM 2,500 of monthly household income. Recipients of housing aid are identified by district or state agencies through the e-Kasih portal, a nationwide database used to capture data on low-income households.

The most significant development in recent years has been the suspension of applications for purchase of LCH units and currently only applications for rented housing are being allowed.

### 4.10.2 Squatters

Squatters have had a long-standing presence on Peninsular Malaysia. Under British colonial rule Malaysia was heavily exploited for its natural resources, particularly tin and rubber. Additional labour was needed, and the British turned

to India and China to supply it, but they failed to make adequate housing provision for the new labourers (Sufian & Mohamad, 2009).

This move combined with the introduction of new land tenure laws can be seen as the starting point for squatter settlements in the country but a series of other events including the global recession of the 1920s, the Second World War, the rapid urbanisation and industrialisation that followed independence in 1957, and the New Economic Plan of 1970 which followed the 13th May 1969 riots and encouraged migration to urban centres among Malays also contributed in their own way to the problem the Malaysia government found itself faced with at the end of the 20th Century (Sufian & Mohamad, 2009). Data collected by Wegelin (1978) suggested that no less than 31% of the population of Kuala Lumpur in 1968 were squatters a number which had risen to 37% by 1971.

Permitting and even encouraging internal migration to the cities of rural labour in search better education, social services and employment while failing to plan adequately for housing, infrastructure and services (Hamdan, 2012) was a mistake government was keen to reverse and squatters began receiving a high priority in successive policies and five-year plans. Squatters were built haphazadrly around the city of Kuala Lumpur including in Lembah Pantai (see Figure 4.9).



Figure 4-9: Squatters housing near study area of Lembah Pantai.

(Source: ww1.kosmo.com.my)

In 1990 there were believed to be as many as 36,000 squatter units in Kuala Lumpur alone (Sufian & Mohamad, 2009). A squatter survey conducted in 1998 reported that there were 197 squatter settlements in Kuala Lumpur covering approximately 645 hectares. City Hall's 'Kuala Lumpur Structure Plan 2020' gives figures of 243,200 squatters living in 40,930 units in 1980 falling to 129,130 living in 23,970 units in 1998 (DBKL, 2003, chp. 12, point 531). In line with the National Development Plan (1991-2000) Kuala Lumpur declared its intention to be squatter free, in common with many other parts of the country, by 2005, an objective it would not fully achieve.

For a country aspiring to reach developed country status by 2020 this has represented a significant policy challenge for the Malaysian government and local authorities.

Long houses, transit accommodation for squatters, were constructed by developers who were obliged to do so if they were building on land with a squatter settlement (Sufian & Mohamad, 2009). The typical housing path for a squatter in Kuala Lumpur has been squatter settlement to long house to PPR high-rise low-cost housing.

The National Economic Action Council introduced the People's Housing Programme (PPR) in December 1998 as previously stated above it comprised of two components, a home ownership scheme and a rental one. The rental scheme was aimed at low income earners but also specifically at squatters. The monthly rental of RM 124 was set at a level these squatters could afford and eligibility criteria required an income of less that RM 1500 per month. Even where the monthly rental could not be afforded there was financial aid available in certain circumstances. Further evidence of the priority given to squatters was seen in the application assessment guidelines issued by the Federal government to State governments for use in the Open Registration System. Under these guidelines a large number of points were to be awarded to squatters who had been issued notices to be rehoused. This stayed in place until 2006 (Shuid, 2011). However, despite the 'Zero Squatters by 2005' policy objective State censuses undertaken in 2010 revealed that there were still 90,282 squatter families still waiting to be rehoused across the country (National Housing Department, n.d., p.68).

### 4.11 Residential Satisfaction

Research into residential satisfaction is of value both academically and to policymakers and planners. Housing is a vital part of overall well-being and quality of life for an individual and a source of satisfaction, safety and rest.

Beyond this, the roof over one's head is likely to involve the most significant piece of consumption and individual will experience in their lifetime (Adams 1984).

As often repeated in this research, for a housing development to me sustainable people have to want to live there. With this in mind, attempts to measure the satisfaction of residents with a particular type of housing are certainly worthwhile. The Malaysian government has given a high priority to housing in general and housing low income groups particularly. In 1987, Husna and Nurijan conducted the earliest piece of research into satisfaction among residents of LCHR dwellings in Kuala Lumpur. They found significant levels of dissatisfaction (41% of respondents) regarding a range of different aspects of the dwellings with lack of a dining space and lack of a toilet that was separate from the bathroom being the two leading causes of dissatisfaction with more than eight out of ten highlighting these deficiencies (Husna and Nurijan, 1987). Subsequent to this study, the low-cost housing design in Malaysia has undergone changes from the provision of two to three bedrooms with the addition of a dining room, a separate bathroom and a toilet, and a drying area (CIDB, 1998).

Elsewhere, Mastura et al. (undated) studied resident satisfaction at public housing projects in Penang, Malaysia. They found that satisfaction was significantly influence by project type, house price and length of residency. A combination of environmental and socio-demographic variables influenced residents' satisfaction according to Lu (1999) in what is a complex construct. This American study also separated housing satisfaction from neighbourhood satisfaction; for the former it found age a key variable with older residents expressing higher levels of satisfaction; single parent families were less likely to be satisfied. Beyond demographics, size of living space was important, and

satisfaction also rose the greater the proportion of income being spent on it; this latter point suggesting that housing satisfaction can be 'bought' (Lu, 1999). Housing satisfaction is also related to neighbourhood satisfaction as are many of the aforementioned variables including age. Homeowners, and high earners, unsurprisingly, report greater satisfaction with their neighbourhood than renters and low earners (Lu, 1999). Zaffs (1998) carried out a US study to investigate residents' perceptions of this sense of community comparing a sample from high-rise housing with another from low rise garden apartments. Overall high-rise residents reported less satisfaction compared with their low-rise counterparts. Among the issues raised were security and the fact that high-rise blocks were not suitable for the young

Halimah and Lau (1998) found in their study in Selangor, Malaysia that there may be an ethnic dimension to residential satisfaction. Specifically, in their investigation of satisfaction in low cost housing they found significant differences in aspirations toward their housing between Malay and Chinese housewives living in low cost housing. Returning to home ownership Teck-Hong (2102) states that home ownership brings with it a greater sense of control over one's dwelling; it also results in self-esteem, a sense of achievement and personal security. Therefore, home ownership profoundly affects satisfaction.

Mohit, Ibrahim and Rashid (2010) undertook an evaluation of satisfaction among residents of public high-rise low-cost housing in Kuala Lumpur, Malaysia. In fact, the blocks studied were at a project located 20kms from the city centre. They concluded that residents were moderately satisfied with their residential environment but whilst neighbourhood facilities, support services and public facilities were more highly rated, the features of the dwelling unit and the social environment (including crime and safety) were more likely to be sources of a lack of satisfaction.

Goh and Yahaya (2011) used a comparison between the degree of importance and degree of satisfaction to measure residential satisfaction at post-1998 developed PPR housing in Kuala Lumpur. The most important factors highlighted by the respondents were safety and security followed by the availability of amenities such as parking, playgrounds, clinics, convenience shops and grassed areas. These were also the areas of the greatest gap between expectation and delivery. The researchers concluded that residential satisfaction was mostly dependent of the authorities properly enforcing control on the developments. However, design was found to be significant with widespread dissatisfaction with elements of the existing PPR design including the kitchen and the yard. Improving design was capable of raising general levels of satisfaction in PPR LCHR housing (Goh and Yahaya, 2011).

### 4.12 Summary

This second part has reviewed how low-cost housing policy has developed in recent decades in Malaysia. Housing policy has been given a high priority during that period and strides have been taken towards matching the populations' needs with provision. However, not all has progressed smoothly. Neither the interventionist approach of the government through public housing provision nor the operation of the housing market in the private sectors has been entirely successful. For much of the period considered here, insufficient priority was given to low-cost housing provision and successive Five-Year Malaysia Plan targets were missed (Government of Malaysia, 2001; 2006). On the other hand, there was an oversupply of medium- and high-cost housing leaving many houses unsold and empty (Teck-Hong, 2102). Cities such as Kuala Lumpur

have also been blighted by the sight of abandoned housing developments, perhaps the very antithesis of sustainable housing.

In order to achieve sustainability in the housing industry in Malaysia, housing developers should regulate their housing activities to suit households' needs and wants. One possible way to meet households housing needs is to examine factors which account for housing satisfaction or dissatisfaction. The chapter also presented a brief analysis of three issues of particular pertinence to the current study – allocation practices, Malaysia's squatters and the concept of residential satisfaction.

In the next chapter the methodology used in the current research study is presented.

# Chapter 5 : METHODOLOGY

## 5.1 Introduction

The preceding chapters have comprised extensive secondary research of a wide range of literature types including empirical studies, authoritative reports and official government data. This phase of the research yielded substantive chapters representing the current state of knowledge and information on the concept of sustainability, sustainable housing and environmental assessment tools, the emergence of high-rise housing, the context of Malaysia, and finally the development of low cost public sector housing policy in that country. Having established what is already known from historical analysis and what has been claimed empirically, the second half of this thesis is concerned with a primary research study aimed at addressing the research questions presented in chapter one and in so doing will seek to add to our understanding of sustainability as applied to LCHR housing in Malaysia.

Described by Babbie (2007) as the science of finding out, research methodology is a central driver directing the research along the right path. The aim of this chapter is to explain the methods that were used in the course of this study of LCHR housing in urban areas in Kuala Lumpur, Malaysia. When a researcher decides on and designs their research they are involved in a series of choices and selections; therefore, these decisions are also reflected upon so that each one can be justified. The chapter first explains the research paradigm that underpins the whole research project and then described the main characteristics of the research design. This is followed by a description of what the researcher actually did, how the samples were selected, how the data was collected and how it was then analysed. Two further sections follow in which

first the limitations of the methodology are discussed and second the ethical considerations pertaining to the research are explained.

## 5.2 Theoretical considerations

In entering the second phase of research the researcher had to confirm the appropriate response to three areas of theoretical consideration. At the highest level this regarded the very nature of the reasoning that was to be deployed in the study. Secondly, what definitions of sustainability and sustainable housing would be drawn from chapters two and three and applied to the primary research phase. Thirdly, what research paradigm would be applied and would this result in qualitative or quantitative (or mixed) research methods.

### 5.2.1 Inductive or deductive reasoning

The research problem of the current study could potentially be addressed through two contrasting approaches to reasoning – inductive or deductive. In a deductive study of the sustainability of LCHR housing in Malaysia a researcher would most likely start by applying an existing theory to the research and formulate a hypothesis (or set of hypotheses) which the research would confirm or fail to confirm. From here the theory may be developed. This can be viewed as a top down approach (Bryman, 2008).

An inductive approach to the research problem would not adopt a theoretical framework or hypothesis from the outset but instead the researcher will commence their investigation and employ a constant process of evaluation. In this sense, the inductive approach is more open-ended and exploratory. Induction leads to the development of ideas and potentially the proposal of new

theory (Bryman, 2008). The researcher's conduct of the current research is more closely associated with the inductive approach as it started open-endedly then narrowed through a process of constant evaluation of both secondary data (literature review) and the primary data collected for this research until this evaluation was considered sufficiently robust to underpin theoretical and policy propositions.

### 5.2.2 Researching sustainability requires definition

Unsurprisingly, sustainability research emerged in the late 1960s and early 1970s alongside environmentalism and a questioning of human consumption of natural resources and its impact on the physical environment (Fahy & Rau, 2013). The question immediately arises as to which methods are most appropriate for studying sustainability but before this can be addressed sustainability (and for this study, sustainable housing) has to be defined as varying definitions can lead to different methodological choices. The broad concept of sustainability (defined in Brundtland when still referred to as sustainable development) is that it is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p.8). Developing this principle, the current study also works within the framework of the 'triple bottom line' which states that there are three dimensions to sustainable development the social, the economic and the environmental. The primary research phase commenced with the understanding that for LCHR housing in Malaysia to achieve the status of "sustainable" each of the three dimensions or criteria must be satisfied with important consequences for the research design. For sustainable housing, the current study applies the three-dimensional approach to sustainability and

recognises that for the social dimension, social inclusion and the principle that a sustainable community is somewhere where people want to live are significant.

### 5.2.3 The research paradigm

At a very initial stage of the research process the researcher must decide which methodological approach is most appropriate to the research aims and to addressing the research questions they have set. It is of paramount importance that the selected approach facilitates not just the collection of data relevant to the research questions but also the whole research process, which includes the reporting of identified findings and where required (as it is for this study) the formulation of recommendations for practice and policy (Tashakkori & Teddlie, 2010). This set of research 'beliefs' or overarching approach towards the nature of knowledge is referred to as the research paradigm. Bryman's (2008, p.605) describes this paradigm as a "cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done, [and] how results should be interpreted." However, he also questions whether in fact qualitative and quantitative research represent paradigms at all as there are many commonalities and overlaps between them (Bryman, 2008).

The traditional paradigmatic dichotomy has been between those adopting a positivist ontology and those who reject positivism in favour an interpretivist stance. Positivist researchers believe that an objective reality can be studied by a detached researcher and that fact can be separated from value judgement (Carson et al., 2001). The results of positivist research are understood as 'hard' knowledge in a single external reality which can be generalised and support theory. It is dominated by statistical techniques applied to numerical data

(Carson et al., 2001). In contrast, interpretivist researchers reject the existence of a single external reality and instead focus on interpretation and understanding arrived at by experiencing what they are studying rather than being detached from it (Neuman, 2000). Interpretivist research is overwhelmingly non-quantitative and the knowledge it generates is acknowledged as perceived knowledge at least partly constructed by the researcher (Neuman, 2000).

The present study combines elements of positivist and interpretivist approaches and both qualitative and quantitative methodology, therefore it would be generally viewed as mixed methods research. This choice is made for pragmatic reasons and reasons promoted by the need to prioritise the research problem and the search for originality. As now explained.

### 5.2.4 The pragmatic approach of mixed methods

A 'pragmatic' research approach is an alternative to both interpretivism and positivism (Tashakkori and Teddlie, I998) although neither positivism nor interpretivism are rejected. Instead, pragmatism places the highest priority on using methods that have the best chance of comprehending the research problem, this generally means using mixed methods (Creswell et al., 2003). While there are various forms of pragmatism, this approach supports the view that most knowledge comes from actions, situations and consequences (Creswell et al., 2003).

This concentration on the research problem often means applying pluralistic methods aimed at advancing understanding and knowledge of the problem (Tashakkori and Teddlie, 1998). Pragmatic researchers are free to choose the techniques, methods, and procedures of research that best meet their needs

and purposes (Creswell et al., 2003). In social research, there is an expansive debate about the suitability of various methods, but this debate is far from having achieved a consensus view (Cohen et al., 2011). The research problem for the present study is the sustainability of LCHR housing. It was apparent to the researcher at an early stage that no one method or data source would offer genuine understanding due to the complexity of the issues involved.

### 5.2.5 Why both quantitative and qualitative methods were selected

Sustainability did not develop into a global issue, it was born as one and if anything has grown into a more localised one. The most high-profile studies of sustainability have involved the analysis of large scale global data sets such as GDP, GHG emissions, and global temperatures. Al Gore's well-known documentary 'An inconvenient truth' is a prime example of this.

The current study aims to increase understanding of the sustainability of LCHR housing principally along the social dimension based on the premise that for any form of housing to be sustainable it needs to satisfy environmental, economic and social sustainability dimensions. The researcher concluded that the best way to achieve this understanding was to combine qualitative and quantitative methods, aiming to combine the benefits of both.

On a level more specific to the current study, quantitative methods are commonly used in research on housing generally and low-cost housing in Malaysia specifically. In particular, survey instruments have been used to measure residential satisfaction and design quality (Sulaiman & Yahaya, 1987; Mastura et al. undated; Halimah & Lau, 1998; Salleh & Yusof, 2006; Mohit, Ibrahim & Rashid 2010; Ariffin et al., 2010; Ahmad, 2011).

Despite the popularity of quantitative methods in built environment and sustainability research the current study also applies qualitative methods. In the field of built environment research, Amaratunga et al. (2002, p.21) have argued that there are "distinct signs of a growth in the application and acceptance of the use of qualitative approaches." Here, the choice of qualitative methods was decided for a number of reasons. Firstly, it was considered particularly important to capture the behavioural components of sustainable housing, in other words how people behaved within their built environment, how they perceived the behaviour of others and what this means for the sustainability of the housing, a qualitative approach was deemed appropriate for this. Secondly, the study sought the in-depth perceptions of expert informants familiar with the concept of sustainable housing rather than, for example, views expressed in the form of response selections on a survey questionnaire. Thirdly, the first two parts of the study could be to an important degree confirmed by field observations, another qualitative method.

A fourth but nevertheless important consideration when undertaking doctoral research is the quest for originality and the combination of qualitative and quantitative research methods described later in this chapter form a novel approach to evaluating the sustainability of LCHR housing.

### 5.3 Research Design

Research into the built environment may have tended to underestimate the role of research design, when compared, for example, to the social sciences (du Toit & Mouton, 2013). Yet there are many advantages in its careful consideration because, "A research design provides a framework for the collection and analysis of data" (Bryman 2008, p.31). There are three main dimensions to this

study's design which merit fuller explanation; firstly, that it is mixed methods research something already discussed above, second that it is case study research and third the research design employs triangulation to enhance reliability. The second and third characteristics are now considered.

### 5.3.1 Case Study Research

This research comprises a single-case design. The researcher's rationale for adopting a single-case design is that the case selected is sufficiently typical and representative and that the depth of coverage offered by that single case is considered adequate. Case study research is not a method of data collection but rather a research model which can involve a number of different methods of data collection and analysis which can be applied in a range of contexts (Bromley 1986 cited in Sarantakos, 2005). It can be defined as the detailed and intensive study of a single case in order to understand its specific complexities and also often to generalise findings to other cases (Bryman, 2008). The case could be a single individual, organisation, community, family, school or in the case of this study a location of high-rise housing development in Kuala Lumpur. The case study approach will facilitate a detailed examination of the setting through the data collected using the techniques described below.

Furthermore, case study research is well established among researchers in the field of the built environment. In a meta-analysis of 415 built environment research studies du Toit and Mouton (2013) report that 92 (22.2%) used a case study design. In built environment research the case can be, among others, a country (Skea, 2012), a metropolitan area (Waygood, Sun & Susilo, 2014), multiple cities (Wang et al., 2012), transport locations (Park et al. 2014) and as with the current research a residential neighbourhood (Kuntz, 2011).

Selection of the case also included practical considerations that would become extremely important once the field study was operationalised. The research design would necessitate multiple visits to the location for establishing relationships with gatekeepers, then holding focus groups and finally conducting observation visits. Therefore, the location of the case had to be accessible to the researcher.

### 5.3.2 Triangulation

The third salient feature of the research design is triangulation: “a strategy that will aid in the elimination of bias and allow the dismissal of rival alternative explanations of conclusions and propositions” (Mathison, 2005, p.423). A prime concern for the researcher in designing their study is the imperative for reliability and validity. Validity is defined as “how far a measure really measures the concept it purports to measure” (Bryman & Cramer, 2005, p.80) while reliability refers to consistency over time. In this design, a number of steps have been taken to maximise reliability and validity.

Triangulation is the main technique applied in this study to maximise reliability and validity. According to Guion et al. (2011, p.1) “Triangulation is a method used by qualitative researchers to check and establish validity in their studies by analysing a research question from multiple perspectives.” For this study, this involves both a triangulation of methods and a triangulation of data. Data is obtained from multiple sources using focus groups, semi-structured interviews, observations and a survey instrument to collect quantitative residential satisfaction data.

Triangulation comes in four main forms: method triangulation (using multiple methodologies); investigator triangulation (deploying multiple investigators); theoretical triangulation (applying multiple theoretical perspectives); and data triangulation (the use of multiple data sources). Both method and data triangulation have been applied to enhance the validity of the evaluation of the findings of this study and to reduce the possibility of bias and error.

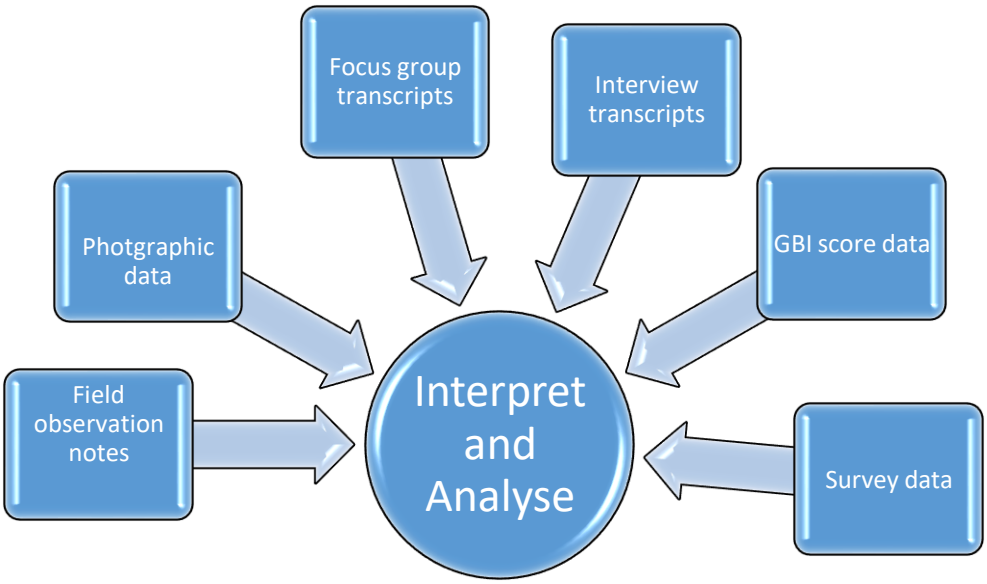



Figure 5-1: The triangulation of data in this study

Four different data collection methods were used: focus groups, semi-structured interviews, field observations and a survey. These four produced a total of six different forms of data: focus group transcripts, interview transcripts, researcher field notes, photographic data, data from expert application of the Green Building Index tool and residential satisfaction survey data (see Figure 5-1).

The research process began with an evaluation by the researcher in the form of secondary research into the sustainability of LCHR housing which was presented in chapter three. The second component was the focus group study in which the perceptions of residents were elicited on a range of questions related to the sustainability of the LCHR housing that they were living in. This generated rich first hand data on the real lived experiences of residents which was of particular value in evaluation of the social sustainability of this form of housing. However, the focus group study lacked data on the economic and environmental dimensions of sustainability.

The interview study with the expert sample was designed to add this element to the research's primary data by eliciting the knowledge, perceptions and interpretations of this well-informed sample. Having gathered and analysed this second body of data the next step was for the researcher to undertake field observations collecting data both in the form of written notes and photographic documentation. The objective of this part of the study in methodological terms was to collect data that could be used to confirm the analysis of the two prior studies (resident focus groups and expert interviews).

Finally, to add a quantitative dimension to the research and to ground the rich deep focus group and interview data in an objective statistical analysis, a residential satisfaction survey was carried out using a modified version of an existing instrument.

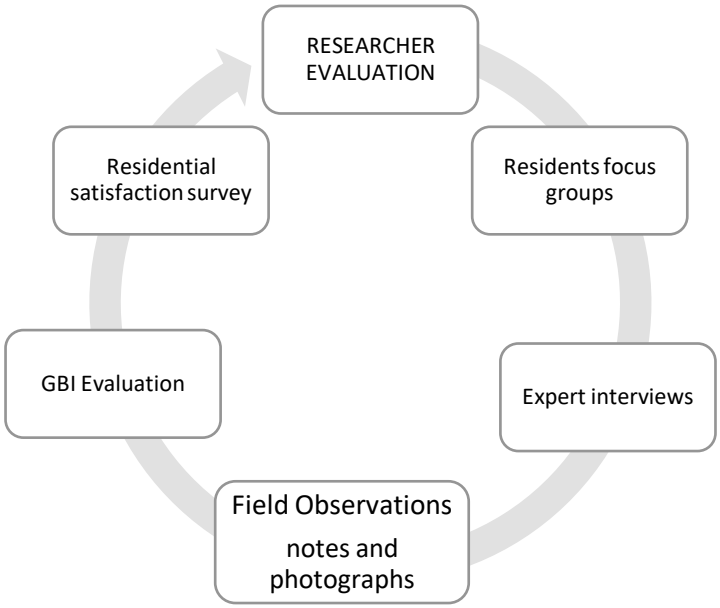


Figure 5-2: The process of evaluation continued throughout

Hence the process is one of continual evaluation and re-evaluation aimed at homing in on an accurate and reliable evaluation of the findings on which to base the addressing of the research questions and the main research output – the framework for sustainable LCHR housing (Figure 5.2)

### 5.4 Sampling for the study

In this section the terms research area, location and setting each refer to Kampung Kerinchi a neighbourhood in the Pantai Dalam region, specifically in the Bangsar South area of Kuala Lumpur (see Figure 5.3). The terms blocks and sites refer to the particular high-rise flats that were used both in the focus group study and subsequently in the observation study.

### 5.4.1 The research setting and its selection

Kampung Kerinchi was first established in 1890 and has since typified the key issues in urbanisation and low-cost housing provision for decades since the influx of large numbers of migrants to the city. Its name is associated with the ethnic conflicts of 1969, then more recently the plan to eliminate squatting in Malaysia and specifically in Kuala Lumpur. The 60-acre site is one of the nearest developments to the city centre and is well served by transport infrastructure (rail, bus, taxi). Nearby amenities include a hospital, clinics, schools, multi-purpose halls, universities and shopping centers. There is also easy access to a state highway and other major and minor roads. It is a major development with over 2000 units built under the PPR and is managed by City Hall.

That the Kerinchi area and the sites within them were not selected using a probability sampling technique does not infer that the sampling was haphazard. Kerinchi was purposely selected for a range of reasons. Social phenomena (urbanisation), politics and specific policy initiatives (ending squatting) that were discussed in detail in earlier chapters are well represented by Kampung Kerinchi. Furthermore, it is currently earmarked as an area for urban redevelopment. The units at Kerinchi were also representative of housing policy specifications and cost parameters. As discussed in chapter 6, an important dimension of housing policy in Malaysia and specifically in Kuala Lumpur was the elimination of squatting. Squatting is perhaps the ultimate expression of socially unsustainable housing and the research area is representative of the transition out of squatting and into public sector LCH?

Overall Kampung Kerinchi can be reasonably identified as being representative of housing where the research questions presented in chapter one can be

productively addressed its location was accessible to the researcher which was operationally important.

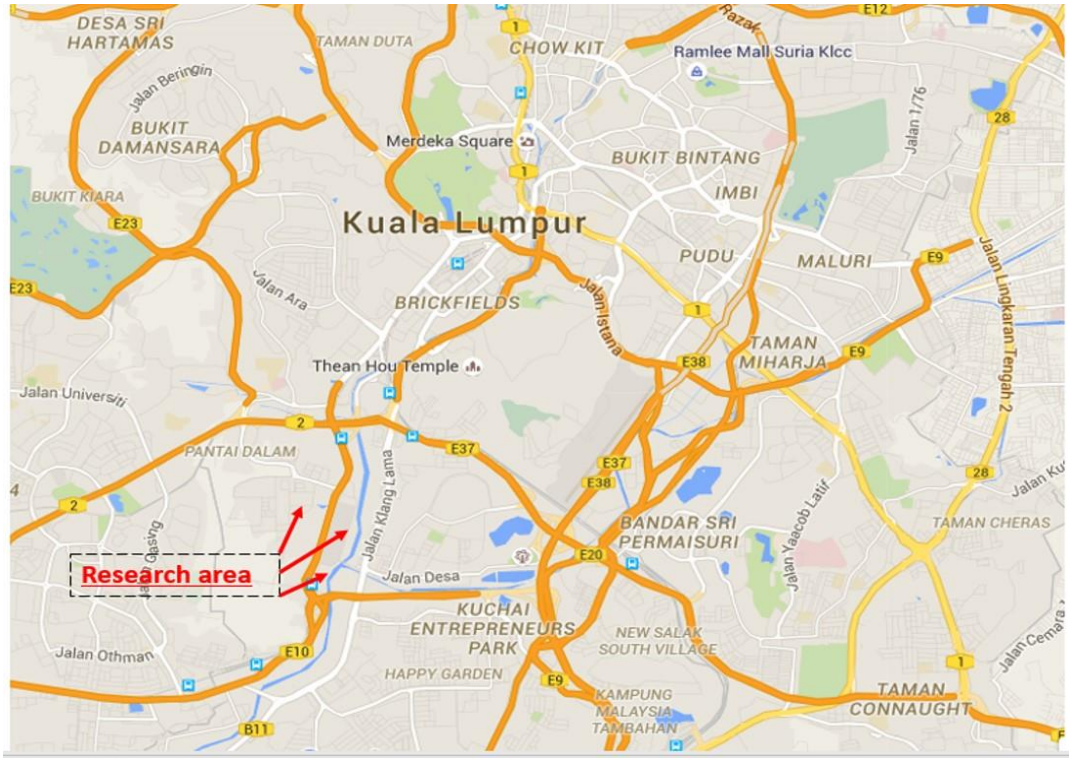



Figure 5-3: Map showing the research area

### 5.4.2 Selecting the research sites

For two of the three studies (focus group study and observational study) it was necessary to form a sample of individual LCHR blocks within Kampung Kerinchi. There were several considerations in this process. The main selection criteria were that the blocks were constructed under the Program Perumahan Rakyat (PPR), were based on the LCHR model and were and managed by City Hall. The sites should all be located within the research area. The five sites selected were completed between 1997 and 2009. The sites comprised either individual blocks or multiple blocks combined into one focus group (See Appendix 1).

The next step in arriving at the final sample was to access gatekeepers to evaluate their willingness to encourage resident participation in the focus group study and to assist the researcher in making field observations. A researcher attending the site, making notes and taking photographs in the environs of residents' homes may arouse suspicion and a negative reaction. It was adjudged that this would be overcome with the cooperation and attendance of a community leader. Community leaders at residential blocks in the research area were contacted in a 'sounding out' process. Initially, the responses were slow coming and lukewarm. In an adjustment to the gatekeeper strategy it was concluded that a 'super-gatekeeper' was needed. The researcher was able to engage the interest of the local MP who contacted the community leaders at the blocks which had a positive effect on their co-operation. The community leaders of the blocks of those most those most willing to cooperate once the study was operationalised were added to the sample of five. Two further blocks were held in reserve in case one or more of the originally selected gatekeepers dropped out.

This form of sampling can best be described as opportunity sampling including the use of gatekeepers to access a reasonably hard to reach population. Photographic and diagrammatic data on the five selected blocks is found in Appendix 5.

### 5.4.3 Sampling for the focus groups

The residents of the five sites at the Kerinchi research area can be seen as a hard to reach population. While not being a 'hidden population' they were hard to reach mainly due to distrust which may have arisen from their not knowing

the researcher or perhaps their belief that I represented their landlord in some way (something explained further under 'ethical considerations').

The use of a super gatekeeper and community leaders as gatekeepers for individual blocks was described above. With community leaders encouraging participation it was not difficult to populate and hold the focus groups. Following the use of a 'gatekeeper' and the lowering of barriers of reluctance the sample could be developed using snowball sampling. As Bryman (2008, p. 184) explains that under this form of sampling "the researcher makes initial contact with a small group of people who are relevant to the research topic and then uses these to establish contact with others." In this way, the total number of residents taking part in the 5 focus groups eventually totalled 45.

### 5.4.4 Sampling for the semi-structured interviews

The sampling technique applied to the population of housing providers involved in the Kerinchi site can best be described as 'purposive'. Under this technique "researchers purposely choose subjects who, in their opinion, are relevant to the project" (Sarantakos, 2005, p.164). It is also sometimes referred to as judgmental sampling. There are no specified procedures for this technique, in this study the researcher was referred to relevant companies and government departments by senior members of the residents' community who acted as gatekeepers.

Expert sampling (another term used) in which a sample of individuals with demonstrable and relevant knowledge was deemed appropriate to meet the objective of adding a technical dimension to the 'layman' perceptions of local residents as expressed at the focus groups, this was particularly important for

the economic and environmental dimensions of sustainability. Probabilistic sampling techniques would not have been appropriate as the researcher sought only experts with a direct knowledge of the research area, hence the use of the gatekeepers.

### 5.4.5 Sampling for the residential satisfaction survey

The survey was conducted at each of the five sites also used for the focus groups. Four of the buildings are 17 floors high and the fifth 21 floors and the researcher aimed to have each level represented in the sample as the focus group data had indicated that how the LCHR housing was experienced may vary according to floor level. It is for the same reason that quotas were used for end and middle units. Three units were targeted for each floor making a total of 56 per site and 280 overall. Response rates were high as the questionnaires were distributed and received back in person by the researcher and three assistants. Only residents agreeing to respond were handed a questionnaire. When a resident did not return the questionnaire a replacement respondent was found until the quota was reached.

## 5.5 Research Methods: collecting the data

A research method is a particular technique used to collect data. This study employed multiple methods, and each is discussed below.

### 5.5.1 Collection of focus group data

Focus groups involve “loosely constructed discussion” among a group of people who the researcher has brought together for the purposes of gathering data (Sarantakos, 2005, p.194). The researcher moderates and guides this discussion and addresses the participants as a group rather than individually. In this study, there were six elements to the data collection through focus groups mainly relating to the actions of the researcher.

Firstly, the participants were selected as per the process described above. Second the group was formed by bringing them together at the same location at the same time. Thirdly, the researcher introduced the topic and acted as arbiter and facilitator. Fourthly, the researcher proceeded to guide the discussion so that it remained relevant to the research topic. There was a tendency for the participants to use the focus group as a forum for raising their own particular gripes and from time to time the researcher needed to subtly refocus the group on the research topic. Fifth, the researcher encouraged discussion among the participants instead of between the participants and the researcher; and sixth the researcher observed, made notes and audio recorded the discussion for subsequent transcription, translation and analysis.

There were five focus groups, one for each of the selected high-rise blocks at the Kerinchi site in Kuala Lumpur. Each group consisted of between 8 and 10 people all of whom were resident in their respective block. Three of the focus groups were held in a communal room within the respective block with the remaining two taking place in a resident’s home as the communal room was unavailable. It was considered important to have multiple focus groups at different blocks because as systematic random sampling is not available, focus groups can be unpredictable in terms of the ultimate composition of the group

(Bloor et al., 2001), the only sampling filter applied was that the members of the group must be current residents.

### 5.5.2 Collecting data by interviewing experts

Interviews undertaken for research purposes are mostly described in terms of a continuum from structured to unstructured with those located between the two poles referred to as semi-structured (Bryman, 2008). The degree of structure attributed to an interview depends on a number of factors and choices that the researcher makes when designing the research; the more exploratory the interview the less structure required and conversely the more the key issues and themes are already established, for example in prior research, the more the researcher is likely to want to introduce structure to the interviews to ensure these themes and issues are covered (Bryman, 2008).

Qualitative research tends to avoid structured interviewing in favour of semi-structured or unstructured forms (Sarantakos, 2005, p. 270). This is because qualitative researchers are seeking reflexivity and naturalism which require substantial openness and flexibility aimed at offering respondents the greatest possible degree of freedom to express themselves and follow their own lines of thought (Sarantakos, 2005, p. 270).

Having said this, a fully unstructured form of interview poses a number of challenges, particularly to the more inexperienced researcher, such as the author of this paper. The main challenge is that without some degree of structure a novice researcher may not be able to maintain the interview on a course which addresses the topic at hand and large quantities of less relevant data may be collected. As unstructured interviews often involve the researcher in asking just one initial question and then having what is essentially a conversation (Bryman,

2008, p. 438) certain skills are required to move the interview forward within acceptable parameters.

For this reason, a semi-structured approach was chosen for the current study. The semi-structured interview presents a balance between structure and control ensuring that the interviews stay on a course relevant to the research questions and flexibility which ensures that respondents have plenty of opportunity to fully express their perceptions and raise potentially interesting points that the interviewer may not have anticipated (Sarantakos, 2005).

To achieve this balance, the interview questions to be asked and the order that they are to be asked in is fully planned beforehand. Having said this, an interview guide is prepared outlining the main areas of investigation on which data should be gathered. This guide is taken to the interview but not read from as this may inhibit the respondents' feeling of being able to make unrestricted responses. Bryman (2008, p. 442) describes this guide as a "brief list of memory prompts of areas to be covered" hence it is very different from a full interview schedule with itemised questions that are asked in a particular order.

There were four interviews in total, each of which lasted more than 60 minutes. Three took place in the aforementioned communal rooms and one at the home of the interviewee. In the present study, the interviews were audio recorded once the informed consent of the participants had been verbally given. The audio tapes were subsequently transcribed and translated for analysis purposes. While transcription was extensive, certain irrelevant, repeated or unclear statements were omitted to reduce the workload involved in both transcription and translation. Having said this, sufficiently detailed transcription was completed to permit examination of the topic being studied (Davidson, 2009).

### 5.5.3 Non Participant observations and photographic documentation

Observation, also known as the collection of indirect data, has the advantage that the relationship is minimised between the researcher and the researched. Although it is a systematic method of data collection that relies on a researcher's ability to gather data through his or her senses (O'Leary, 2010. pp.210- 211)

Observation is a flexible method of data collection that comes in many forms. According to Sarantakos, "Observation can study all observable social phenomena, as long as they are accessible" (2005, p.220). In this study, there was a mixture of human and physical observation as the researcher was collecting data on the physical objects comprising the high-rise housing at the research area and how humans interacted with this built environment. Data was collected in the form of notes taken by the researcher during site visits and in the form of photographs which were subsequently described and evaluated. The notes would ensure that accurate captions could be written for the photographs used in the findings chapters.

Each note comprised both a descriptive and a reflective element (see appendix A). In all 5 visits were made (one to each of the five blocks) and a total of 150 photographs were taken. The principle role of the observation element of the study was to verify and triangulate data obtained through the focus groups and semi-structured interviews. As Sarantakos (2005, p.232) states, "The information provided through observation can help to test the validity of information provided through other channels."

The use of photography in academic research is growing and offers certain significant advantages to the researcher. For decades, documentary photography has been an important tool in both social research and policy change (Szto et al., 2005). Having recorded the image, the researcher then has

the time to reflect on what is being represented and analyse its meaning (Basil, 2011). As well as recording the built environment, the images enabled the researcher to collect data on how people interact with this environment such as the signs of anti-social behaviour, the parking of vehicles and the usage of green and communal spaces. Photographs add a naturalistic and objectivist dimension to other data such as that collected through interviews and focus groups as a photograph can be viewed as "an omniscient recording of reality as it occurred" (Basil, 2011). Although the still image captures a particular moment in time it has a high standard of objectivity because we can see it 'with our own eyes'. A photograph recording evidence of vandalism, for example, is providing objective observational data to support the more subjective field notes that the researcher makes as they interpret what they have observed and recorded.

The observation/ photographic study was conducted once all the focus group and interview data had been collected and analysed. The main themes and sub-themes had been provisionally identified so the researcher had a framework within which to conduct the observation and the study had a confirmatory purpose rather than an exploratory one. For example, the focus groups revealed that a range of anti-social behaviours were perceived as degrading the lives of participants and the observation/ photographic study was able to confirm that there was evidence of such behaviour (vandalism/ improper waste disposal etc.)

### 5.5.4 Collecting GBI evaluation data

The final data was collected in the form of a report by a certified GBI Assessor. The Green Building Index was described in detail in chapter three. It was considered valid to apply this Malaysian-developed measurement tool to the

research case; furthermore, there is no record of this having been applied before to a LCHR housing development constructed under the PPR programme.

### 5.5.5 Collecting the data from the survey

The quantitative survey data was collected using a modified version of the Residential Environmental Satisfaction Scale (Adriaanse, 2007). This 18-item instrument was supplemented with some profiling items that the previous (qualitative) findings had suggested would be significant (floor number, length of residency, tenure type etc.). The survey was prepared using both English and Malay (See Appendix 2).

The survey data was collected physically from the residents who had agreed to participate in the survey. This was carried out by the researcher and two assistants. There were five sites and data were collected on five non-consecutive days.

The researcher attended the research sites with three volunteer assistants. Operating in pairs, each pair visited alternated floors of the block. The data collectors knocked on unit doors and introduced themselves and the purpose of the research. If the occupant was adult and agreed to participate in the survey a questionnaire was passed to them and they were advised that they would return 30 to 60 minutes later to collect the completed survey. Where a resident expressed a preference not to participate no additional pressure was put on to persuade them to take part the data collectors moved to the next unit. Collection on a given floor continued until 3 residents had responded. Of the 295 residents handed a form 285 returned it to the collector. Of the 285 returned forms 5 were

incomplete and discarded. The sample taken forward for analysis was, therefore, 280.

## 5.6 Data Analysis

### 5.6.1 Transcription and translation

Before the collected data could be analysed, two important tasks had to be completed – transcription and translation. Both the focus groups and the interviews were audio recorded and subsequently these digital files were transcribed in Malay using the denaturalised approach. While seeking an accurate representation of the focus groups, this approach does not include the pauses, and incomprehensible speech (people talking over one another). All of the focus groups and interviews were transcribed by the researcher to ensure consistency of treatment across all data. As is common with spoken qualitative data some responses or contributions or parts of them fail to yield anything relevant to the study that do not address the research questions or raise interesting new themes (Bryman, 2008 p.455). In this case these data fragments were neither transcribed nor translated. The field notes were written by hand and subsequently typed up straight into English.

Once the data from the focus groups and interviews was transcribed it was translated into English by the researcher. While the researcher has a high degree of proficiency in English the English transcripts were proofread to eliminate errors.

### 5.6.2 Analysing the focus group and interview data

Qualitative data was collected from the focus groups, the semi-structured interviews and from the observation notes made by the researcher. All this data was transcribed on a personal computer into Word files.

To analyse the data, the researcher used computer-assisted qualitative data analysis (CAQDAS), specifically the programme NVivo was used. CAQDAS has a number of advantages. These include the computerisation of otherwise time-consuming manual tasks: coding, retrieving fragments, copying transcripts, assembling similarly coded fragments etc. (Bryman, 2008, p.565). As well as being faster and more efficient, using CAQDAS makes the process of coding and identifying themes more transparent and reduces the tendency toward anecdotalism – where for example quotes may be taken from transcripts without due regard to how prevalent the attitudes or perceptions they contain are in the overall body of data (Bryman, 2008).

There are, however, disadvantages arising from the use of CAQDAS. At the highest level, it may be said to undermine the very principles of qualitative research with its interpretivist paradigm as it seeks to mimic quantitative research. Furthermore, it may be less suitable for focus group data because it does not reflect the interaction that takes place at such a group and this interaction is considered important data in itself. There may also be a loss of narrative flow as data treated more like numbers (Bryman, 2008, p.567).

Overall it was considered that the advantages outweighed the disadvantages for this particular study and so the transcribed data was imported into NVivo where it was explored, coded and queries were run to establish themes; word trees were created, and memos added for use when writing up the results. All data in the form of words, focus group transcripts, interview transcripts and field

notes were analysed in this way. Examples of Nvivo screenshots are included as Appendix 4.

### 5.6.3 Analysing the photographic data

The photography used in this research was a supportive adjunct, added with the purpose of conveying the human experience of the residents as well as graphically depicting the built environment and verifying, exemplifying and visualising the data collected through the focus groups and one to one interviews. The photographic data was collected after the coding process for the focus groups, interviews and field notes had been completed. The photographs were cross referenced to a field note and attributed to a theme and a code from those already identified. The findings were presented accordingly. Together with the field notes the photographic data offered the researcher the opportunity to verify some (but not all) of the self-reported data collected in the residents focus group study and the expert interview study.

### 5.6.4 Analysing the survey data

Data was input into a Microsoft Excel spreadsheet and then exported to SPPS for statistical analysis. The results are presented in chapter seven and example screenshots from SPSS are included as Appendix 3. First, descriptive statistics were generated to describe the sample, the size of their household, the number of vehicles they have, their length of residency and whether they owned or rented their flat. The level their flat was on was also recorded.

Secondly, factor analysis was conducted for the 18 survey items that constituted the residential satisfaction survey. These items were analysed in three groups. The first group (items 6 to 9) represented the 'dwelling satisfaction' factor; the second group investigated the 'internal neighbourhood reputation' factor (items 10 to 12); the third group (items 13 to 23) represented the 'social climate' factor.

Thirdly, bivariate analysis was undertaken to examine the relationship between the variables describing the respondent (length of residency, tenure, vehicles, household size and flat level) and levels of satisfaction.

### 5.7 Limitations of the research methods

The three main sources of limitations to the research methods arise through sampling and through the subjectivity associated with qualitative research in general and qualitative data analysis in particular. There were also limitations linked to the sampling methods used for the survey questionnaire.

#### 5.7.1 Limitations of single case design and the sampling methods

It is understood that no single case (herein the research area) will be perfectly representative nor can it claim to be fully generalizable. The reasons for selecting Kampung Kerinchi were discussed earlier in this chapter; however, the lived experiences and the sustainability performances of other LCHR housing developments in Malaysia may vary meaning that different cases may produce different findings. Having said this LCHR housing developed under the PPR scheme is subject to a design and financial template that would suggest a high degree of similarity in the sustainability performance of such housing. The use of a case study approach immediately raises questions of external validity

or generalizability. To what extent can a single case ever represent an entire phenomenon in a way that produces findings which may be applied generally? In the current study, this asks how far the Kerinchi site in Kuala Lumpur can be representative of other urban areas in Malaysia so that the findings and recommendations can be applied beyond the case study. The researcher selected the case in their belief that it was an exemplifying, typical one and also a microcosm of many housing policy issues that have featured in Malaysia in recent decades.

At the next level, the sample of blocks within the research area was also not randomly selected. Again, the potential for such a sample to produce atypical findings that would not be replicated if other blocks had been selected exists but is made significantly less likely by the close similarities between all LCHR housing developed and managed under the PPR scheme.

A further limitation was introduced through the self-selecting nature of the focus group samples. Participation in the groups was not a result of random chance but dependent on responding positively to the community leaders' invitation. It may be that those residents more engaged in housing related issues were more likely to assent to attendance or simply that the time and place of the focus group meetings skewed the sample in some way.

The expert sampling for the interview study was also purposive rather than random. A larger sample of experts chosen randomly may have produced data that more accurately reflected 'expert opinion' as a whole on the question of the sustainability of LCHR housing.

### 5.7.2 Limitations of researcher bias, subjectivity and data analysis

Moving from the sampling limitations to researcher bias, the subjectivity of qualitative research and the problems of generalisation, this study is limited by the nature of qualitative research. The study inevitably includes subjectivity throughout, would be hard to replicate and is limited in its generalizability. The researcher evaluated throughout what was significant and important to the subject of the sustainability of LCHR housing both in existing literature and in the data collected for the current study. This was a process of subjective judgement aimed at narrowing down what commences as an open-ended exploration across a broadly defined problem and narrows to the point where specific research questions can be addressed and a framework of specific recommendations can be offered. To strengthen the validity of the study the researcher deployed a triangulation of data sources and a transparent and systematic approach to data analysis.

CAQDAS can be seen as a means to make qualitative data analysis more systematic and in some ways mirror the rigour of quantitative statistical analysis. However, such a mirroring is always going to fall short which for interpretivist researchers is entirely normal and not a limitation at all. Critiques of CAQDAS would point out that while the process may be streamlined and computerised in the end the analyst still interprets the data. With specific regard to focus groups, CAQDAS and the coding and retrieving it involves may not capture the interaction that takes place in the group. According to Kitzinger (1976) this interaction itself represents valuable data. For this particular study, however, this interaction was felt to be of marginal significance.

Overall the researcher was mindful of Amaratunga et al.'s (2002) point that qualitative research in the field of built environment may be attributed a low

credibility in the eyes of policymakers. The response was to introduce triangulation of data sources and transparency in data analysis and evaluation. It was also decided to conduct a quantitative survey to ensure there was also triangulation of methods.

### 5.7.3 Limitations in sampling for the survey

The researcher established that the use of probability sampling for the residential satisfaction survey was highly problematic. A postal survey was ruled out due to the lack of control over response rates and the likelihood of a very low response rate. This meant physical distribution was required. However, the composition of residents varies according to time of day and day of the week. For safety reasons, it was decided to distribute and collect the survey responses during daylight hours. This reduced the participation rates of working age males as many would be at their place of employment. Likewise, non-working females, the unemployed and the retired were likely to be overrepresented. The sample was also self-selecting as only those who agreed to respond were handed a questionnaire.

## 5.8 Ethical considerations

Social research inevitably involves ethical issues and this study is no exception. Many of these issues revolve around the question of how we treat those we are studying and particularly how we avoid any harm coming to them (Bryman, 2008). Addressing these ethical considerations benefits not just the subjects but also the research itself. As Delamont and Atkinson (2011) point out, the expectation of confidentiality held by respondents encourages honesty which in

turn generates more reliable data for the study. For this reason, the expectation of privacy is upheld in this study.

### 5.8.1 Potential for harm

A researcher needs to be sensitive to the potential for harm (or indeed perceived potential for harm) arising through participation in the study. In this study, such potential was detected at an early stage. The residents of the blocks which formed the population for the study perceived a threat to their tenancies from the landlord, something intensified in many cases by their former status as squatters. The researcher felt from the outset of contact with the population that there was a widespread perception that participating in the research may result in negative consequences. In order for the study to proceed according to the research design steps would need to be taken in order allay these fears and remove the potential for harm.

There was also consideration given to the potential for harm to the researcher and assistants arising from the physical distribution and collection of survey questionnaires at the research sites. To mitigate this data collection only occurred during the daytime and collection was always carried out in pairs.

### 5.8.2 Informed consent

Participants must never be coerced into participating in any research and their participation should be “free, voluntary and fully informed” (Sarantakos, 2005, p.20). In many cases it is possible to obtain this consent in writing through means of a signature. However, there are also many occasions where this is

not possible and where consent can only be obtained verbally and to insist on written consent would in fact make the study impossible. The current study obtained verbal consent: as Leeds University (2011, p. 1) point out one legitimate justification for using verbal consent is “Where asking participants to review and sign forms that have an air of officialdom about them might be considered risky by the participant.”

At the outset of each focus group and interview I introduced myself and then the role of the meeting in the research and the aims of the research itself. The participants were advised that their participation was entirely voluntary and that they could withdraw their participation at any time without giving a reason. A final confirmation question was asked to check that they had understood what had just been explained to them.

Similarly, for the survey the questionnaires were physically distributed only after the questionnaire and the research had been explained as was the entirely voluntary nature of participation.

### 5.8.3 Privacy, Anonymity and Confidentiality

Also, during the initial introduction at the start of each focus group or interview the steps that would be taken to maintain the privacy of the participants were explained. Participants were advised that their names and other personal details would not be passed to any third parties and would not appear anywhere in the written report of the study. Where individual participants were referred to a code would replace their name. For the consultants and government agents participating in the semi structured interviews job titles and brief descriptions of their roles would be included in order to establish the authority and perspective of their words but that this information would be insufficient to identify the

individuals concerned and that wherever a name was required for clarity a code would be used instead.

The survey questionnaire collected no data that could identify the individual respondent. Floor numbers were recorded but flat numbers were not. No names were recorded.

All data collected and any information concerning the participants and respondents was kept on a password protected PC that belonged solely to the researcher.

### 5.8.4 Ethics and use of photography in research

As the researcher was to visit residential areas to make observations and record data as photographs it was necessary to give consideration to the ethical aspects of this activity. Inevitably, some of the photographs depict people as they go about their daily lives and yet there was no possibility of gaining informed consent from these people. It was also not practical to show the photograph to these people prior to its use which may have been helpful in other circumstances (Langmann & Pick, 2014). In response to this it was decided to apply the principle of anonymity to any person shown in the photographs by blurring the faces of anyone who was recognisable.

## 5.9 Summary

After the extensive review of existing literature and knowledge presented in the earlier chapter this chapter has explained what the researcher did to add to understanding of the sustainability of LCHR housing in Malaysia and why it was

done in the particular way it was. This comprised a high-level discussion of the theoretical considerations behind the methodology, a description of what choices were made regarding research methods, how the research was operationalised, and finally a reflection on the limitations of the research and on what ethical considerations it had involved.

The following two chapters present and analyse the findings of this research starting with the qualitative study then followed by the results of the quantitative survey study of the residents of Kampung Kerinchi.

# Chapter 6 FINDINGS OF THE QUALITATIVE STUDY

## 6.1 Introduction

While previous chapters have presented and discussed a wide range of literature to establish a basis on which to take forward the present study, the findings in this chapter and the themes and subthemes into which they are organised have emerged through an entirely inductive process. The chapter triangulates focus group, observation and interview data aim at providing richer descriptions of each theme and subtheme. At the end of each main theme there is a discussion of the findings and at the end of the chapter there is a summary identifying what the main findings were.

The research used a sample of five research sites. These were each constructed as part of the Malaysian government's *Program Perumahan Rakyat* (which translates as Integrated People Housing Programme) or PPR and were completed between 2000 and 2009. The PPR was introduced by the Malaysian government in 1998 as part of a policy objective of ending all squatting in Kuala Lumpur by 2005 (Sufian & Mohamad, 2009). Housing developed under the programme was thus overwhelmingly aimed at squatters with low incomes. In major cities including Kuala Lumpur the housing built under the PPR program comprised of high-rise blocks of either 11-12 or 16-18 storeys. They mainly comprised of three-bedroomed units of at least 60 square metres (Sufian & Mohamad, 2009).

The chapter includes examples of data to represent what was both said and observed. Focus group data is denoted by 'FG' followed by the number of the focus group. Data from expert interviews (three architects and one politician) is denoted 'EX' followed by the interview number. The text identifies observational

data which is mostly supported by photographs, also refer to Appendix 5 and Appendix 6.

### 6.1.1 The residents

So as not to discourage participation at the focus groups, demographic data on the participants was not systematically collected. However, participants were offered the opportunity to volunteer information such as family size, previous accommodation, length of residency at the research site and so forth. This section presents the findings on the subthemes which related to the residents themselves, where they came from, their role in the decision to move there, the comparisons they made with their previous accommodation, family sizes, ethno-cultural issues, expressions of satisfaction and lastly how the experts in the interview study perceived the residents.

### 6.1.2 Where they came from

The focus groups revealed two routes to the current accommodation. All participants had once been squatters, and some had been moved directly from their squat to the PPR housing. However, the majority had transferred from a long house where they had been 'temporarily' been housed as an interim step. The most notable experiences reported showed how long the journey from squat to long house to PPR had taken some of them.

> We are originally from a squatter house then transferred to the long house. When we were at the long house, they told us that we are going to move out after 2 or 3 years only. But it ended up being 17 years. So, we are poor, waited for their instruction only. When they finished constructing this house, they asked us to move here. (FG3)

The desire to achieve the political goal of ending squatting in the city seems to have exceeded the authorities' ability to construct the squatters' new accommodation.

### 6.1.3 Hobson's Choice

The residents described how they were selected for PPR housing, normally through a ballot. There was little choice as there was an agreed policy to end all squatting in the city. While residents recalled expressing preferences to City Hall regarding the location of their PPR accommodation it is unclear if this had any influence. The overwhelming interpretation of the ex-squatters was that they were instructed.

> First, we were instructed to move from the squatter housing to the long house. They promised it would be only for 2 years, but it ended up being 17 years. After that they instructed us to move here. If later, they instruct us to move somewhere else, we will just follow the instruction. (FG3)

Ballots were held to select the transferees and while there appeared little choice as to whether to move or not there did appear to be some leeway to 'lobby' for which floor was given. This was invariably a question of seeking a lower floor with priority given to elderly and infirm residents. The higher the floor the less desirable they appeared to residents, not least because of the problems associated with the lifts that are discussed later in this chapter.

### 6.1.4 How it compares to before

As mentioned, the residents come either directly or indirectly from squatters' camps. While these camps and the long houses that some had stayed at before coming to the PPR drew some nostalgia and seemed to have a greater sense of community there was an acknowledgement that their new home was an improvement in other ways."*The cleanliness is ok. Because at the long house the rats were so big. Here there are no rats. That's good. They even used to bite our feet."* (FG1)

However, participants also felt that their children were easier to control in the long house and the layout made it easier for them to find a place to study. Larger families also expressed regret at moving out of the long house as their new accommodation was so cramped. Those coming directly from the squatters' camp, not via a long house, were more unequivocal in their recognition of the improvement in their circumstances. One participant explained that the long house offered a more flexible living space with could be extended to the front to the back or upward to the attic.

### 6.1.5 Predominance of large families

Why do low socio-economic groups have such large families? It is often said in the UK that this is because of welfare payments which increase the more children you have but this is not the case in Malaysia. Raising children is expensive. The standard PPR unit design seems to be aimed at the standard Malaysian family size which at the time of the focus groups was reported to be 4.31 (DOSM, 2011) persons but problems arise when families exceed that size. Which, in the case of the present study, they often did. When introducing

themselves, participants often stated how large their household was: "*I live at PPR Kampung Limau with 10 people… I have 8 children."* Three generation households also seemed to be quite common. The size of the families had a consequence for the use of the living unit. Both children and adults preferred to spend more time outside of the unit with one participant stating he only returned there to sleep.

### 6.1.6 Housing different cultures

Housing people together from different ethnic groups was part of the 1Malaysia ethos but did bring with it some challenges. Among those that were mentioned in the data were religious rituals and cooking habits.

The cultural differences around funeral arrangements was given as an example of the challenges of supplying facilities to enable the varying rituals to be observed. The Muslims have their mosque but there are no facilities for the Indians to privately carry out their rituals.

> The most sensitive issue is the Indian mortuary. If an Indian dies it takes 2 to 3 days until all their family arrives. While waiting, they spray rose water. I know our neighbours cannot accept this. They will show sour faces to us. Muslims are different. We have already requested them to put in one mortuary. The corpse doesn't have to be taken up and down. It can be just left there for 2 or 3 days. (FG1)

### 6.1.7 Expressions of satisfaction

The focus groups were mainly characterised by descriptions of the negative aspects of the participants' lives such as poor maintenance, cramped living

conditions and the anti-social behaviour of some residents. However, it would be wrong to suggest that no positive views were aired. One site was described as ‘clean’ and ‘cared for’ (FG1); another had good facilities and a ‘beautiful’ environment (FG3). One user described her site as ‘peaceful’ and ‘celebrative’ (FG4) while the words ‘clean’ and ‘comfortable’ were commonly used.

Location and accessibility were seen as positives and residents at one site benefited from river views (see Figure 6-1: River views from PPR Seri Pantai Blok 102).



Figure 6-1: River views from PPR Seri Pantai Blok 102

### 6.1.8 How the experts view the residents

There were various depictions of the residents made in the expert interviews. They were seen as wanting something for nothing; having large families without considering the consequence and of not actually being poor. Instead they owned multiple cars, satellite TV and enjoyed the benefit of either purchasing or renting at subsidised cost. It was pointed out that non-payment of rent,

maintenance fees, mortgage instalments was rife calling into question whether LCHR housing was actually economically sustainable.

> **EX3**: They are actually rich people. Some people own luxury cars. 1 unit sometimes has 2 – 3 cars. They are not ordinary people. Not poor people. There are people who are actually poor but we can count how many of them on our hands. They can save a lot if they stay there. If we observe, these squatters can afford to install paid satellite TV, cars, big houses, inside everything complete.

Residents were perceived as having a sense of entitlement and lacking personal responsibility. One example of this was residents who complain that their unit is too small having ever larger families. Experts also felt that by not paying their rent or maintenance fees they were contributing to the degradation of their living environment. The poor environment and lack of cleanliness was viewed as the result of residents being too busy 'getting by'. Anti-social behaviour and non-payment were seen as a contagion with residents, knowing their neighbours do not pay, feeling they should not either.

### 6.1.9 Discussion

The participants were overwhelmingly former squatters moved from their camp usually via a long house and then to their current accommodation. The residents had little influence over this relocation. This is a journey which can apparently take many years. On the face of it their unit and surroundings at the PPR site should be far better than the squatters camp and the long house, however, there were perceptions among the participants that in some ways the long house was preferred. It seemed to offer a more flexible living space, a more communal atmosphere and be a better place to raise children. Clearly, some of the inherent characteristics of high density, LCHR housing were not valued by the residents.

Among the factors associated with family size in Malaysia are ethnicity, education and contraception use, the economic value placed on the adult female's time and the economic value of children to the household (Butz and DaVanzo, 1975). From the present study, the precise factors that have led to an apparent preponderance of large families at the research sites cannot be confidently identified.

The focus groups were attended by parents and grandparents, they depicted the youth as bored and troublesome and give the impression of inter-generational mistrust. Some of the reasons for this are included in the next section.

### 6.2 Anti-social behaviour and criminality

It is not surprising that one of the main themes to emerge from the three studies is that of anti-social behaviour, including criminality. Low income residential areas around the world are linked to increased ASB and crime and Kuala Lumpur is no exception. More specifically, the literature has supported the notion that LCHR public housing is strongly associated with this problem beyond other forms of public housing, essentially arguing that there is something intrinsic in this form of housing that creates the conditions for this behaviour. The findings of the current study may help our understanding of what these conditions are.

Anti-social behaviour (ASB) is a broad term covering behaviour that is defined as a crime in law but also other behaviour that can be viewed as a nuisance which may cause distress, but which may not constitute a criminal offence. The findings on the full range of these behaviours are included in this section starting

with the least serious ASB then moving to more serious crime. I start with what the combined studies informed us about waste and cleanliness LCHR housing.

### 6.2.1 Waste and cleanliness

The LCHR housing in the present study had an endemic waste problem. Overall the sites were dirty, and some residents showed a distinct lack of consideration for others. Waste collection rooms or outside collection skips were observed to be chaotic and in a poor state. It was clear that some residents did not place a high priority on cleanliness as shown in Figure 6.2.



Figure 6-2: Fly tipping degraded the environment and promoted social disharmony

We heard that residents on upper floors may be reluctant to go so far to dispose of waste, when residents were willing to gown down to the ground level waste leaked onto the floors of passenger lifts creating unpleasant smells and infestations. One participant pointed out that disposal chutes would have

helped. Two chutes would be useful, one for recyclables and the other for non-recyclables. If you are living in a unit near the stairs/ lifts at the end of corridors, then you are likely to have other people's waste placed near to your door. Keeping verandas clean was reported to be left to the goodwill of the residents with some displaying more of it than others. Elsewhere, areas such as stairwells appeared to be cleaned regularly by City Hall cleaners but despite this the inconsiderate behaviour of some residents overwhelmed efforts to keep the sites clean. There was considerable irritation shown by this study's participants at this form of ASB:

> The one thing I dislike is the human behaviour. They are given the new development but are still littering, throwing rubbish everywhere even though there is a proper waste place. This human behaviour just throwing away rubbish from their house everywhere. (FG5)

Another consequence of the waste disposal habits of some residents was blocked drains which added to the sites' myriad of water related issues. Inconsiderate laziness is a short step from behaviour that can lead to serious problems even crimes, as the next sub-theme reveals.

### 6.2.2 No love from above

Residents of the upper floors throw down rubbish onto the ground or with the help of the wind onto the lower floors. It degrades the environment, undermines any sense of community by causing resentment and can cause real danger to physical safety of residents. The act of throwing things (water, rubbish and worse) down onto other residents below seems metaphorical of LCHR living and the anti-social behaviour associated with it. It is most likely that an individual will go unsanctioned for throwing things off the veranda, so it relies on self-

imposed or parent or peer-imposed sense of social responsibility to contain this. The current study found that this sense of responsibility is profoundly lacking among many residents of LCHR housing in Kuala Lumpur, echoing the absence of a sense of community.

At ground level, the fear of being hit my something thrown from above seemed well-founded, with one resident referring to a hammer being thrown: *"I want to complain. I'm scared. Sometimes they just throw things [from above]. That day, it was a hammer." (FG1)*

Cigarette butts are thrown from upper floor verandas and one focus group participant recalled how a fatal fire resulted when a still burning cigarette butt was blown into a unit on a lower floor. Water was thrown only for it to land on clothes drying on a veranda below. Cans, bottles, kitchen waste, sanitary pads, broken windows, the aforementioned hammer and cigarette butts were all identified as being thrown from above. During the field observations evidence was seen of this behaviour and the efforts made to clean up (Figure 6.3).



Figure 6-3: DBKL cleaners remove items thrown from above from a ground floor canopy.

One of the architects (EX3) cited this phenomenon as a reason for having inside corridors and no verandas. However, field observations confirmed these internal corridors to be dark and poorly ventilated, the proximity of one front door and cooking area to the one across the corridor reduced privacy. A resident from FG2 confirmed this lack of privacy and reported how they could hear their neighbours when they quarrelled.

### 6.2.3 Personal safety

Fears for personal safety were widely held among residents. Older residents appeared to fear the youth and perceived an additional threat from 'outsiders'. Residents indicated that the unpredictability of behaviour may result from alcohol and drug use. Muggings appeared commonplace with residents able to refer to recent incidents within their own personal knowledge.

> If I want to buy things after nightfall, if there are people I know using the lift at that time, I'll go with them. But I will not go alone, I'm afraid that I'll get robbed in the lift. There was someone who got robbed just near their own flat. (FG2)

Children faced their own threats to personal safety with residents reporting bullying as a day to day problem and even cases of kidnapping. An architect (EX2) also discussed a case of kidnapping at a PPR site.

It was not just other residents and criminal 'outsiders' who were perceived as a threat to personal safety. Lack of maintenance, particularly to external lighting added to the sense of foreboding among residents should they need to go out of their units after dark. Field observations confirmed that dimly lit areas were common at the sites particularly on lower floors, even during the daylight hours (Figure 6-4).



Figure 6-4: Lower floors were observed to be dimly lit with no lighting switched on.

Lifts and corridors were seen as potentially dangerous and ground level areas were subject to the threat from falling objects, described above. At one focus group (FG3) residents expressed their concern over the fitness of the site in terms of fire safety as their long-standing requests for confirmation that a fire safety certificate had been issued had not been responded to by City Hall. The same focus group recalled how they had had to put out two fires themselves as the fire engine had arrived too late. The controversy of the Certificate of Fitness (CF) was also confirmed by an architect (EX3) and the local MP (EX4). Additionally, the possibility of verandas that had decayed into bad condition collapsing to the ground was put forward at FG3.

One resident (FG5) perceptively suggested that it was in the nature of low cost public housing that there was considerable churn of occupants, people moving in and out of the blocks meant it was never possible to know who lived there and who was an ‘outsider’. This reduces the sense of personal safety. A similar point was made by an architect (EX2) who related the density of LCHR to a

diminishing sense of personal safety. Residents felt safe when they knew their neighbours but with 300 families in each block this was not possible. A person passing you by may be on the way home or on the way to rob, you would not know.

Police interventions were mentioned by residents but were seen as having no lasting effect. City Hall did not appear to have a role in providing security and residents reported being left to take care of themselves through residents' committees and neighbourhood watch patrols. At some sites, it appeared these patrols had cease to operate. There were no reports of CCTV being in place and none was observed.

### 6.2.4 Crime against property

Fears for personal safety were matched by a perceived threat to property. Crime against property was reported to be rife. LCHR housing with the absence of authority maximises opportunity and minimises the risk of being caught. Both auto crime and burglary feature strongly. Cars and motorbikes were stolen or parts like batteries and music players removed. Owners of more valuable motorbikes brought them up to their unit in the lift, which damaged the lifts and inconvenienced fellow users.

> We have a lot of motorbike theft cases. We also have snatch thieves problems. For those with a newer motorbike they will take it to their flats above to avoid being robbed, the lifts are not meant to carry their motorbikes, but they say they have got no choice. Even the car batteries get stolen. They break into the cars to steal the radios and CD players. Those robbers even cut the motorbike petrol connection to steal the petrol. So, robbery is also a big problem here. (FG4)

It seemed that almost anything left unattended was at risk of being stolen with clothes left outside the unit to dry being a common target, even school uniforms.

Burglaries were also a major problem particularly on the upper floors because they were less occupied, and the robbers lacked the courage to operate on the fully occupied lower floors, although a robbery in the third floor at one site was also reported (FG2). Again, it was widely believed that the perpetrators were from outside the development possibly working with a resident accomplice.

Field observation confirmed the widespread use of iron grilles on fenestration placed in an attempt to discourage break-ins.



Figure 6-5: Grilles fenestration was observed to be commonplace

Apart from the residents' own use of iron grilles there was a palpable lack of deterrence or security against property crime observed, as shown in Figure 6.5. Accounting in part for why there was so much of it.

### 6.2.5 Drugs, gangs and outsiders

Drug use also appeared widespread with both addicts and dealers having a presence there. These activities seemed to go on despite the nearby presence of police. Drug dealers looking like despatch riders sell their wares in the stairways. The data contained substantial evidence of widespread drug selling and using. Residents had first-hand experiences of seeing drugs being sold and used. In FG1 a resident refers to their development as a ‘drugs hub’, a place where outsiders came to when no supplies were available through their normal channels. Despite having, in some cases, nearby police posts there was still a visible presence of drug pushers. One architect (A2) also referred to the drugs problem arising at high-rise blocks built under the PPR programme. He points to poor enforcement which sees drug dealers picked up by police only to be released without charge and reappear within a couple of days. One resident (FG5) explained that a nearby abandoned City Hall project had become a magnet for drug addicts. Younger children were believed to start by smoking marijuana, teenagers were said to widely use ‘shabu’ (methamphetamine).

The local MP particularly highlighted were the role of empty units in the drugs problem:

> … because of DBKL policy there are still empty units. These places are where drug addicts hang out, because the units can easily be broken into … units being left alone with no supervision, no one moving in, empty and that becomes a new place for drug addicts. EX4

Turning to the related issue of gangsterism, data strongly suggested the existence of gangsterism at the sites. Some graffiti was said to be gang related drawn to mark territory, and this was confirmed by field observation.




Figure 6-6: Graffiti was widespread, but field observations confirmed that some was gang related.

Organised criminality may be attracted by the drugs market. In FG1 we heard that "*Gangsterism is all over the place. Now they are recruiting gangsters…Not only males but also females."*

As well as gang-related activity residents perceived the sites as attracting undesirables from outside who see the high density LCHR housing as offering opportunities for drug dealing, and other criminal enterprise (see Figure 6.6). Robberies and burglaries were mainly attributed to outsiders (FG4) though elsewhere it was acknowledged that due to the churn at the sites it was difficult to know who was and who was not a resident (FG5).

### 6.2.6 Discussion

In some ways the LCHR housing in this study presents as the reverse of Bentham's all-seeing Panopticon (Bentham, 1843). While Bentham's design

was aimed at removing the dark corners and hidden spaces and to surveil the building's users (in his case prison inmates) the sites in our study seemed in many respects to create both structures and a social environment in which anti-social behaviour and crime can thrive away from the gaze of authority and free from the threat of sanction. The lack of deterrence, from security lighting and CCTV to the physical presence of 'authority' was clear to see in this research and was confirmed in all three studies. Restrictions on access common at medium and high cost high-rise and other buildings such as manned main access gates and programmed lifts restricting access to cardholders are not seen at LCHR housing.

While the social environment and buildings themselves were permissive to ASB it is also clear from the present research that many residents saw this as the single most important negative aspect of living where they did. Demographic data was not collected from focus group participants so as not to inhibit participation; however, it was clear that they represented older generations. From this research, it is possible to tentatively assign a generational factor to the phenomenon of ASB. The focus groups suggested that children, youth and younger adults were more likely to engage in this behaviour than older residents; not least because older residents tended to live on the lower floors which are more fully occupied. Juvenile males featured prominently in discussions of ASB.

The levels of ASB and crime have significant bearing on the social sustainability of LCHR housing. Arguably, if a significant number of residents fear for their personal safety, then the social sustainability criteria is not met. Low levels of residential satisfaction have been recorded for residents of Kuala Lumpur LCHR public housing in previous studies for measures associated with crime and personal security (Mohid, Ibram & Rashid, 2010; Goh and Yahaya, 2011).

Beyond Malaysia, LCHR public housing has been linked to high levels of intravenous drug use (Parkin & Coomber, 2011).

Authorities must also look to these findings and consider their part. Wilson and Kelling (1982, p.15) wrote, "… if a window in a building is broken and is left unrepaired, all the rest of the windows will soon be broken." Their 'broken windows' theory suggested that failure to tackle anti-social behaviour and low-level crime such as vandalism can lead to a 'criminal invasion' and higher levels of more serious crime. Leaving the original window unrepaired demonstrates that no one cares. The residents in our study had a sense of being abandoned and of living in a lawless neighbourhood and the lack of maintenance appeared symptomatic of this. Built environment design can assist in ameliorating perceptions of lack of safety and security but as some examples from the United States have shown the physical presence of 'Authority' is also critical (Bloom, 2012).

Furthermore, policy and processes seem to lead to systematic under-occupation of the sites. These empty units attract crime. Authorities need to pursue high occupancy rates with the same vigour that hotels do. Unoccupied units should be avoided at all costs because they are a magnet for ASB and ferment degradation. Fittings and fixtures are stolen from empty units leaving a bill to fix them up for eventual habitation, overall it is far better to keep them occupied.

Finally for this section, this research provides support for the notion that there are fundamental anomalies between the quest for economically affordable high density low cost public housing and creating harmonious communities. While in theory LCHR housing occupies less land area leaving more for greenscaping and ground level facilities in practice this is barely realised, partly because of

the high levels of car ownership and consequent demand for parking areas and partly because these ground level areas can become "… a dangerous no-man's land controlled by undesirable elements" (Gifford, 2007, p.4).

(As a post script to this section, it should be included that in January 2018 the fears of the residents regarding items being thrown down from above were tragically realised. A 14-year old boy died when struck by a chair thrown from the upper floors of the PPR Seri Pantai flats in Pantai Dalam. This is one of the developments included in the present study (Mustafa and Palanisamy, 2018))

### 6.3 The Youth

The previous section presented the findings for anti-social behaviour including crime. It is clear from the data that a lot of this behaviour is associated with the local youth but there were other themes to emerge concerning younger residents and they are presented and discussed here. Young people, both children and teenagers, live in large numbers at the research sites with many families above average size. The thematic analysis revealed three subthemes related specifically to the younger generation.

Firstly, there was the lack of activities and opportunities for positive social interaction afforded at the research sites and the consequences of this for the social environment as the youth spent their time 'just hanging around'. Secondly, the data showed evidence that there may be an inherent educational disadvantage in growing up in LCHR housing beyond the 'normal' disadvantage of simply being in a low income socio-economic group. The findings for these two subthemes are now presented after which they are discussed.

### 6.3.1 Just hanging around

Bored youth is certainly not a phenomenon found only in LCHR housing in Kuala Lumpur, it is a worldwide issue. In the present study, however, our main interest is in examining whether there are dimensions of the phenomenon which are attributable to the inherent characteristics of LCHR housing.

One piece of evidence that LCHR housing may exacerbate social problems associated with youth came from FG3. One resident commented that while living at the long house the children could be controlled and were better behaved and able to find a place to study. This seemed to result from the greater flexibility of the living spaces and the fact that being low rise the long house meant that children were easier to supervise.

A large generational gap was evident among residents one of who stated that *"The kids here get rotten very fast" (FG1)*. Not that older residents blamed the juveniles themselves for their predicament there was sympathy for the lack of green space and facilities and more constructive alternatives to just hanging around. Large families, small units and high density see large numbers of children and teenagers in search of something to do but most of the time there just wasn't.

> There's no recreation place for kids. There is one football field. Around here, there are many flats. Everybody wants to play. If we go there sometimes they show us their unhappy faces. The kids don't know what to do. Just hang around. (FG1)

Residents reported children playing truant from school and field observation confirmed the presence of groups of boys seen loitering around the open spaces during school hours as shown in Figure 6.7.



Figure 6-7: Boys loitering at ground level

An architect pointed to City Hall budget restrictions and guidelines limiting green spaces to just 10% of the overall area as reasons why ground level play areas are inadequate pushing some children to seek the air-conditioning and games arcades of the nearest shopping mall (EX1).

### 6.3.2 Educational disadvantage

The data raises the question of whether LCHR housing set children at an educational disadvantage above and beyond the disadvantage that is known to come with being in lower socio-economic groups. One parent explained the dilemma facing them and their efforts to encourage their offspring to study:

> That is one reason why the kids become problematic and their study does not progress well, they end up being problem youth because their housing is not comfortable. So they go down to the ground level and loiter around until midnight when they return only to sleep. The environment in the house is not appropriate. Even though we try to teach them, if they are not comfortable then they can't study effectively. (FG3)

Parents saw the youth as being surrounded by bad influences once outside the unit. Inside the unit, the lack of space to study was raised several times; in particular the children's bedrooms were too small to include a desk.

One telling contribution suggested that the government and perhaps society as a whole perceived the ex-squatter residents as having low aspirations and therefore little interest in quality education: "They think … just give us a motorbike and we will go around and be ok" (FG1). This perception results in poor quality education and crowded classrooms.

### 6.3.3 Promiscuity

Residents reported promiscuity among young people at the sites. In FG1 we heard a resident recall, "*I happened to go up to Block D, I couldn't believe it. A teenage girl putting on her panties.... condoms are everywhere. Terrible."*

With families so large and indoor space and privacy in such short supply there was perhaps little option but to engage in certain behaviours outside the unit. Lack of the presence of authority also contributes as may the existence of empty units.

### 6.3.4 Discussion

Large families, small units and high density see large numbers of children and teenagers in search of something to do outside the units. The facilities designed into the research sites varied from one site to another but were overall minimalist. Children at greatly differing stages of development competed for use of the same facilities and open spaces. While the youngest children stayed

mainly in the corridors once they had past the age of 10 or 11 they were mixing with young adults of 16 or 17 with predictable results. They are drawn into ASB and start experimenting with drugs and alcohol at a very young age. Teenagers are drawn into gangs and crime and we learned of incentives being offered by gangs to by the compliance and admiration of children.

Due to the nature of LCHR housing once children are old enough to spend their time at the ground level areas they are largely unsupervised by parents or any other form of 'authority'. The present research shows that for children living in LCHR housing the 'age of innocence' is a short lived one. Older residents expressed fear of the youth and their unpredictable behaviour and seemed to have largely withdrawn from ground level areas, particularly after dark. City Hall's frugality regarding facilities, including their unwillingness to formalise and make permanent hawkers stalls, perhaps offering retail units, removes the opportunity for collective adult supervision and monitoring. Youths involved in ASB have little fear of sanction.

The rise of juvenile delinquency in Malaysia has been widely reported in the media (Satar, 2017; Mcintyre, 2018) and confirmed in official crime statistics particularly for property related crimes and drug offences (Department of Statistics, 2016). While there is no empirical evidence that the growing phenomenon of juvenile crime correlates with the move in housing policy toward LCHR housing, the present research at least suggests that such further research would be worthwhile.

Turning to the educational disadvantage associated with living in LCHR housing the specific link appears to be the size of families relative to the size of unit. A child living in a home which afforded a quiet room to undertake study is likely to fare better than one sharing a small dwelling with five siblings and with no such

quiet room or space, but this is not necessarily a function of the height of the building. The home environment such as access to books, computers and parental distress have been found to be related to literacy progress (Aikens & Barbarin, 2008). Sharing play facilities with teenagers exposes younger children to behaviours not conducive to positive educational outcomes. Empirical studies have found a strong correlation between ASB and negative educational outcomes (McEvoy & Welker, 2000).

On the question of educational disadvantage, further research may be required to increase understanding of the possible link between LCHR housing and poor educational outcomes to establish whether in fact it extends beyond the disadvantage associated with economic disadvantage.

### 6.4 Community and facilities

This section presents the findings of the three studies as they pertain to the linked themes of community and facilities. Linked because the absence of facilities is considered an important contributing factor to the apparent absence of a sense of community. Riger, LeBailly, and Gordon (1981) identified four components required for a sense of community and one of those was the use of local facilities. The others were the degree of interaction with neighbours, the extent of residential roots and feelings of bondedness. This section presents the findings of the three studies as they pertain to the linked themes of community and facilities. Linked because the absence of facilities is considered an important contributing factor to the apparent absence of a sense of community.

### 6.4.1 Sense of community

At one focus group the absence of neighbourhood spirit was not blamed on the density or the fact that the buildings were high-rise but instead on the residents themselves who were described as selfish. At the long house, it was suggested that people were 'together in … hardship' but now here a resident may not even know their neighbour.

> One more thing about the community here. Sometimes people don't even know who their next-door neighbour is. It's a selfish thing. Before when we were staying at the long house, we were together in our hardship, smiling and saying hello to each other. When we encounter other people here there is no friendliness. (FG1)

Where some communal facilities were available there were more positive comments. Fellow residents were described as 'friendly' (F3) and the opportunity for interaction was taken whether in the corridors, at ground level, or in a meeting hut (F2). Being ex-squatters from Kampung Kerinchi gave the residents something in common (F5). The ethnic mix of the residents was also not seen as a barrier to a sense of community (F2). From these findings, it can be concluded that perceptions of community vary from site to site. Though crucially the most negative comments were heard at the focus group living at the site with least facilities (check).

An architect questioned whether it was possible to know your neighbours when there were 300 families in one block, arguing *"the smaller the numbers of people, the smaller the numbers of risks and the greater the sense of community" (Ex2).*



Figure 6-8: A communal seating area was in use

Communal areas, while subjected to vandalism, were well used such as the seating area at one site (Figure 6-8) they appeared popular with residents not in full-time employment such as the elderly and housewives though men tended to outnumber women and were observed relaxing and smoking. In addition to communal areas the small shops on the developments appeared to act as points of interaction and appeared busy during the observations. They sold basic daily needs for the residents such as canned food, bottled drinks, bread, milk, and some baby products. Residents could also top up their mobile phones there. At one site the shop seemed to be of particular significance in terms of social interaction as not communal ground level seating area could be found, here interaction was also observed in the lift lobby area. Further interaction took place in shared corridors outside the units and ground level pathways.

### 6.4.2 Facilities

Each of the developments had a basic set of facilities including car and motorcycle parking, children's play areas, rubbish collection centres. However,

lack of further facilities beyond these basics was a recurrent theme in the data though it should be added that the level of provision varies greatly from one site to another.

One resident pointed out that at a site of 1000 units there was one shared kindergarten (FG4).

The expert interviews revealed that architects do request additional facilities but that these are mostly rebuffed reported by City Hall. The also showed that facilities were an important priority for architects. While recognising that the starting point for architects of LCHR developments is the need to fit a certain number of units into the development site, he argued that the second design consideration should be steps to maximise the space available for facilities.

*You need to fix certain numbers of units in that particular site, right? Then of course, that'll be the first criteria. Then no. 2, ask yourself whether you can provide better facilities?"*

As a specific suggestion, the architect argued that if a separate car park building were constructed then more space would be available at ground level for facilities and landscaping. As an architect involved in low cost projects he recognised that as far as the units themselves were concerned there was little flexibility but at ground level and in communal areas designers can make an impact (see Figure 6.9). While little had changed on unit design or size since the start of the PPR program, the architect was hopeful that any new developments would play much more attention to the provision of facilities, which had hitherto been neglected (EX1).

While both EX1's priorities for facilities related to children he rated the provision of a kindergarten/ nursery as the most important. In his own architecture

practice, there was a kindergarten so the benefits were clear to see and would provide a major benefit to parents who could drop their children there before they went to work.

A policy toward hawkers needs to be introduced - they need to be formalised and licensed and perhaps rented and enforced. Certain number of fixed units required. "*We don't have basic facilities like the kindergarten, multi-purpose hall. They promised to build one but until now we don't have that." (FG4)*

Lack of facilities affected all age groups but in particular younger children seemed deprived of opportunities to develop. Kindergarten provision was reported to be inadequate and overcrowded (FG4) though at another site they were described more positively (FG2). Beyond schooling, these younger children had to compete in the ground level spaces with bored youth with many opting to head to the nearest mall instead (EX1).



Figure 6-9: Substantial recreational area at one research site

The 'hanging around' youth passed time on and around the play facilities meant for younger children which discouraged their age appropriate use and led to damage and dilapidation (FG2).

### 6.4.3 Getting together

Social gatherings encourage a sense of community but these gatherings require facilities which in turn cost money. In many cases residents need to go off site for their events. Which is not that unusual in itself. One resident raised the need for social spaces to house activities like dancing and cooking classes (FG4). Another said a wedding gathering would have to take place in the car park due to the lack of a communal hall (FG4). A third would like to use such a hall for prayer recitals and festivals (FG4). While an all-purpose hall was lacking, the sites did have a small mosque (masjid) which were observed by the researcher (Figure 6-10) and discussed by bother residents and experts.

One observation note recorded that a small mosque was left unlocked for all day access and also announced its availability for weddings and funerals. It was also observed that during midday prayer around 15 -20 people used the small mosque.



Figure 6-10: Small mosque open all day

Creating quality social space costs money whether it is inside the unit, inside the block or on the site as a whole. The research sites were multicultural as is

Kuala Lumpur as a whole. This also raises issues related to facilities. There are three main ethnic/ cultural backgrounds represented in the block, Malays, Indians and Chinese. Each has their own set of cultural values and traditions as well as religious observance practices.

In one group of users an interesting insight was given into the effect of differing funeral arrangements. It concerned the difference between bereavement and funeral rituals between the Hindu Indians and the two other ethnic groups. It appeared to be a source of potential division.

The most sensitive issue is the need for an Indian mortuary. Indians, if they die, it takes 2-3 days until all their family has arrived. While waiting, they spray rose water. I know our neighbours cannot accept this. They will give us sour looks.

With Muslims requiring their dead to be buried without delay the Indian process is hard to understand. As a Muslim user explained,

> For Muslims it's different. We have masjid. We bring the body straight to the surau, pray and then bury it immediately even if it is 11 or 12 at night. I used to go. But not for Indians. The Chinese also do it more like us.

It appears, and it is certainly felt by users, that the developers of these high-rise blocks did not take into consideration the cultural/religious needs of the various ethnic groups.

### 6.4.4 Discussion

Is it possible to have a sense of community in a LCHR housing development? There were hints of it in the words of residents but overwhelmingly it seemed absent. When, as discussed earlier, people threw things down from above, onto

the heads of their fellow residents they seemed to be making the clearest possible statement that for them there was no community.

Cho and Lee's (2011) conceptual model introduced in chapter four put the creation of a sense of community at the heart of sustainable high-rise living and argued that this can be developed through community spaces, community programmes and residents' participation. The current study can be seen as supportive of this view in that it has explored and revealed the extent of the lack of sense of community not just expressed directly through the voices of residents but also in the consequence of this deficiency in terms of the crime and anti-social behaviour referred to throughout the findings.

This study tends to confirm that high-rise living creates patterns of social interaction that mitigate against a sense of community. There is also support for the assertion that the adequate provision of communal spaces including green spaces can help to generate patterns of interaction which are indeed capable of engendering a sense of community. Yuen (2011, p.140) asserts that "Public spaces provide conduits where people-to-people relations may form as residents go about their daily activities." The observation study found that social interaction took place at sheltered ground level areas particularly including older residents and with more males than females. Four out of five locations had such a ground level seating area. At the one block where none was observed the shop and the area around it together with the lift lobby seemed to be a place of social interaction. Further interaction took place in shared corridors outside the units and ground level pathways. Another contribution of ground level facilities such as shops is that they level help to create an active frontage, offering natural surveillance to discourage anti-social behaviour as well as delivering opportunities for social interaction.

In the current study, we heard that residents may not even know their own neighbours there was potential for but no real evidence of inter-ethnic. In fact, conflict seemed to have a more generational basis with older residents mistrustful and disapproving with the youth's contribution to life on the developments. The resident study revealed instances where older people felt unsafe and trapped in their units. This supports Rollwagen (2016, p.381) who expressed concern that "individuals become physically and socially isolated from the surrounding neighborhoods."

Appold (2010) reminds us that the literature on community in high-rise residential buildings has tended to focus on those aimed at and occupied by the poorest groups in society and indeed this is true of the current study. When economically poor residents combine with poor quality housing then, argues Appold, you are unlikely to have a successful outcome whether it is high-rise or not with "the least desired people found in the least desired housing" (2010, p.165). The inference here is that high-rise housing may not be inherently lacking in community or destined to always be a hotbed of crime but that when constructed at low cost for low income groups it may well be. The current study found evidence of both social interaction opportunities being taken up when they were available, even if rudimental, but also the daily rejection of community through countless acts of anti-social behaviour. The most prominent factor dividing the residents appeared to be age.

Cho and Lee's (2011) conceptual model introduced in chapter four put the creation of a sense of community at the heart of sustainable high-rise living and argued that this can be developed through community spaces, community programmes and residents' participation. The current study can be seen as supportive of this view in that it has explored and revealed the extent of the lack of sense of community not just expressed directly through the voices of

residents but also in the consequence of this deficiency in terms of the crime and anti-social behaviour referred to throughout the findings.

The development of community has numerical limits according to the findings of the Expert interviews where participants argued that LCH needed to be 'more spread out' (i.e. lower density). Unfortunately, this step to increase a sense of community may be in direct conflict with the economic sustainability goals of the PPR programme. Simply put, LCHR housing makes the most effective use of the scarce resource of land when, which cannot be matched by, for example, terraced housing. The alternative, according to the Malaysian government, is urban sprawl which is viewed as environmentally undesirable not least because of the long commuting journeys it causes.

### 6.5 Construction, materials and maintenance

#### 6.5.1 Painting over the cracks

Unsurprisingly the quality of materials and workmanship in LCHR housing is an issue. Wear and tear was observed beyond what would be expected in relatively young buildings. Poor quality of either or both quality of materials and workmanship leaves a legacy of cracking and chipping walls compounded by leaking pipes.

"To me after 4 years we already have damage. The unit's paint has already faded, the paint has peeled off, there are leakages, and the materials are not of good quality. The material used is not proper and not durable. (FG5)

One of the architects described the quality as, “below standard” (EX3)

> A major contributor to the degradation of the buildings appeared to be water both from leakage and lack of drainage. Stalactites, mould and staining were all reported or observed. An architect suggested that internal corridors could go a long way to resolving the water problems (EX3).

Residents reported walls cracking easily and being advised by City Hall to paint over the cracks (FG1). At another group a resident suggested that the building was leaning and that the verandas were in such a poor state it was feared they would collapse (FG3). There was a widespread feeling that the blocks had aged rapidly belying their relatively recent construction (between 2000 and 2009).

The observations confirmed that the developments were each made from RC frames with brick infills. They used mainly local materials, something verified from documentation obtained at the site. At one site it was noted that toilet pipes and water pipes were exposed and not embedded in the wall or risers. Traditional cast iron pipes were used but all piping used UPVC pipes. The wall facing the external area at level 6 showed flaking and peeling. At another site the building appeared well-constructed using RC frame and brick infill..

The building structure and walls had no sign of major cracks and the only problems observed were that some pipe joints show signs of leaking as there were stains visible. At one of the newer sites (less than five years old at the time) it was observed that some areas need repainting despite the building being less than 5 years old. It was also noted that there was water leakage and pump noise at the pump room.

### 6.5.2 Maintenance in need of a lift

The responsibility for maintenance of the research sites lies with City Hall. Based on his own experiences one architect stated the belief that there was a general problem in the approach to maintenance across Kuala Lumpur and that this maintenance blind spot could even be seen in government buildings (EX1). The data on maintenance revealed opposing interpretations, one from the residents and the other from the experts. While the residents acknowledged that many maintenance problems arise from the actions of the people living there their main interpretation of the problem was a lack of responsiveness from City Hall. For the experts, the non-payment of maintenance fees and the general sense of entitlement on the part of the residents was the ultimate factor. The local MP (EX4) estimated that only 60%-70% of residents paid maintenance fees and an architect (EX3) explained that this non-payment led directly to inadequate resources for maintenance. See the results of lack of maintenance encourages the residents still further in withholding fees and the downward spiral continues.

Wherever it is in the world, high-rise buildings are dependent on lifts. It is difficult to exaggerate the prominence of issues related to lifts in the present study. Problems with lifts were especially evident and lift breakdowns appeared routine. Some of the reasons for lift breakdowns were put down to the actions of residents such as overloading the lift (EX4) and pressing the buttons for too long (FG2) or even burning the buttons. Many residents appeared to treat the lifts with disdain despite their importance to the daily lives of residents: “People pooed, peed in the lift. Sometimes they just put their rubbish inside. It’s vandalism. “(FG1)

Lift breakdowns were routine, described variously as daily (FG2) or 5 or 6 times a month (FG3). Instances of lifts staying out of service for weeks on end were recounted (FG4) as well as lifts only working up to a certain floor and not beyond (FG5). At one focus group a participant recalled how a child nearly died from being trapped in a lift (FG2).

### 6.5.3 Water everywhere

While lifts dominated discussion of maintenance there were other manifestations of the general malaise notably water leaks and drainage. During field observations drains blocked by littering and otherwise poorly maintained drains were in evidence poorly could be seen as observed in Block 102 in Appendix 5.

Water leaked at some areas for a variety of reasons due to broken pipes, poor installation and maintenance. Water was staining walls as residents dried their clothes. There were drainage problems from blocked drains and missed opportunities to collect and recycle the water.

> There is water seepage when it rains. The water seepage comes from the ventilation grilles. I am not able to mop the mess, I told my husband to inform the City Hall if they don't believe how bad the water seepage is. The heavier the rain the worse the rainwater gets into [the unit]. (FG2)

The water problem contributed to the cracking walls already mentioned. Kuala Lumpur experiences heavy rain and this rainfall is not adequately defended against by the design of the PPR blocks. Unit windows did not appear to be rainproof with rain pouring in like "a fireman's hose" (FG2). Corridors were reported to flood sometimes due to blocked scupper drains (FG2). Inside the

units, toilets and showers leaked and participants reported that until a toilet collapsed entirely there would be no response from City Hall (FG3).

### 6.5.4 Discussion

The lift sees the problems of LCHR housing concentrated into an area of a few square metres. A distillation of, on the one hand, the anti-social behaviour and lack of consideration for others shown by the residents, and on the other, the failure of the authorities to get to grips with the very concept of maintenance or to enforce the obligations of tenants regarding payment of rents and maintenance fees. The importance of lifts to city life should not be underestimated, according to one author, “Spatially speaking, the elevator’s role has been no less profound than that of the automobile in transforming modern cities.” (Al-Kodmany, 2015, p. 1071).

It is interesting to compare the picture revealed in this study with certain statistics on lifts in public housing in New York. In 2011, the New York City Housing Authority had a team of 400 repair staff to cover the 3,324 lifts they were responsible for. The average number of times a lift broke down in a month was 1.08 and when they did break down they were return to service within an average of 5.2 hours, something partly made possible by the remote monitoring of the lifts that are equipped with sensors (Bloom, 2012). To say this situation is a great contrast with Kuala Lumpur is understating the gulf between the two cities.

Whether the ultimate factor for the maintenance problem at LCHR housing in Kuala Lumpur is the residents, City Hall or indeed the inherent nature of high-rise living and vertical transportation cannot be definitively established from this

study. Lifts matter to people's lives when they are living many floors up, they also matter environmentally with between 2% and 10% of a buildings energy use attributable to lifts (Al-Kodmany, 2015).

According to news reports half of the 50,000 PPR households in Kuala Lumpur refuse to pay their rent despite the rent being less than US$30 Dollars per month (cite) and less than a typical Astro satellite TV package so widely subscribed to across the research sites. This is threatening the economic sustainability of PPR as well as contributing to the general maintenance malaise as funds are not available to maintain proper levels of maintenance.

Concerning the elements, the climate in Malaysia means that substantial attention needs to be paid to the effects of wind and rain. Internal corridors may be the answer to part of the water problem (and for that matter the problem of people throwing down objects from above) but these corridors were observed to be dark and were reported by residents to lack privacy. In the end, as with so many things associated with LCHR housing the discussion will be about compromise and priorities.

### 6.6 The Unit

There was little positive said about the units though satisfaction was mainly linked to household size. Poor quality and poor maintenance was also referred to. The smaller bedrooms were difficult to furnish with anything but a bed. There were privacy issues.

### 6.6.1 Standardisation and design

The architects confirm the standardisation of LCHR housing under PPR and discuss the limited role they had in design which in some cases was restricted to fitting the blocks into the site and orienting them. Proposals on facilities could be made but were often not followed. Cost was king. Room for environmental innovation was virtually non-existent. Standardisation precludes innovation which means there is no learning process about what works and what does not. Which is one reason research like this is important.

> All these squatters need to go to proper housing so that's why the Housing Department need to standardize. First, they want it fast. Second maybe they've tried before. They find it to be quite comfortable. The design, etc. and also, the database is already there. EX1

Clearly standardisation does assist towards two PPR goals. It speeds up the rehousing of squatters and it is cheaper than exploring other options such as allowing modifications site by site and providing a range of unit sizes at each site.

### 6.6.2 One size does not fit all

Notwithstanding the aforementioned advantages of standardisation, it was clear from both residents and experts that the inflexibility of provision this led to was giving rise to serious problems. Also clear from the focus groups was that large families were common at the research sites. One resident brought this point home succinctly when tell the group that the 3-bedroomed unit was fine for her because she "only had five kids" (FG1). As a result, household sizes vary greatly while unit sizes are uniformed.

Sleeping arrangements were complicated and some residents had family members sleeping in the living area. Hosting guests overnight was also a complicated if not impossible task. During the day, the lack of space encourages family members to stay outside the unit, including children who could as a result be exposed to negative behaviours of those older than them.

Kitchen areas were also described as too small and could only be used by one person at a time (FG3) and its closeness to the living area led to problems with cooking smells. There was also concern that the toilet could be seen from the entry to the unit (FG5).

Overall for residents their opinions on the units were mostly based on the size of their household. The larger the household the more uncomfortable there living experience was.

Expert interviews also saw the issue of unit size raised. EX2 suggested a greater level of flexibility in unit offerings to avoid under- or over-occupation.

> You provide it all. Within a block you can have may be 50% 3 bedrooms, 2 bedrooms, 1 bedroom. For newlyweds, why do you need 2 bedrooms? I'm going to have a child. OK go have a child. After 2 years then you are eligible to move in there. Then you can apply.

A further matter was raised considering the appropriateness of square feet limited pre-determined floor plans being drawn up on an unfurnished basis. Issues arose from the interior layout once furniture was brought in to the unit, with cramped spaces being created or in some cases insufficient room to walk around or open doors.

The researcher suggested and EX2 agreed that anthropometric design techniques which took furniture placement into consideration would result in

better layouts. A resident referred how much they liked their unit when they first saw it unfurnished and how they realised how small the rooms were when they tried to fit a bed in **(**FG2**).** EX3 also confirmed the merits of thinking in terms furnished space rather than unfurnished.

It was recognised that the size of the unit (650 sq.ft.) was a function of the density requirements in urban areas. For example, while this size may be considered small compared to some developed countries, in those where density is exceptionally high 650 sq.ft. may seem generous.

> But if you talk to people in Hong Kong, 650 is very lavish. Because you when you have 300-400sqft in Hong Kong it is considered as a comfortable house already. You sleep in the living room at night. But that's Hong Kong. If we were in a developed country maybe 1000 square feet is still considered low cost. Ours .. it is all 650 square feet now.

EX3 recognised that low cost housing units were rather small but that all parties had to be realistic of what could be achieved for low cost public sector housing. Nevertheless, this architect believed that the kind of LCHR housing being built under the PPR program is too high density.

Furthermore, EX3 believed that the three-bedrooms standard was based on an assumption of a family consisting of two adults and three children while in reality many families in PPR were much larger. The architect recognised that any household with more than three children would have difficulty living comfortably in a PPR unit.

The issue of family size was also highlighted by the MP (EX4). Who viewed the space allocated to each family as insufficient because of the number of children.

While the size of the units is dictated by the Ministry of Housing another factor is behind the requirement for three bedrooms.

> Muslims must have 3 bedrooms. Parents in one room. Daughters in one room and sons in one room. They cannot put both daughters and sons in one room. Two bedrooms in this country is not allowed because of Islamic influence. Islamic value system. You must have 3 bedrooms. But then people cannot afford it. It's ok. According to fatwa or hadith, sons are being separated and all this. This is the thing. We are complicated by our own doing but we are not firm. **(**EX4**)**

As found in the previous chapter, many families living in PPR developments have a lot of children. This causes cramped living conditions. EX2 raises the issue of family size from another perspective. He suggested that those residents with large families who complain about the size of their units should have considered their status as squatters and former squatters when embarking on such large families suggesting they should "measure their capabilities".

### 6.6.3 Corridors and drying clothes

Like lifts corridors played an important part in resident's lives. These corridors were either external (verandas) or internal. Both types had their problems. External verandas created the problem of things being thrown down from above while the internal ones were dark and lacked privacy. Observations showed that for some the corridor added significantly to the unit while for others it was just a source of problems.

With an external corridor came the possibility to dry clothes outside although this risked them being stolen. An external corridor could also function in some cases as an extension of the unit if it was unshared (for example an end unit).

"*Children too young to go down to ground level unsupervised used corridors for play* "(FG4).

The simple daily chore of drying washed clothes was problematic for the PPR residents. External verandas were one possibility but in the case of shared verandas hanging laundry there could cause friction with neighbours (FG1). An alternative is to hang clothes from front windows. Wet clothes could be observed to have stained walls.

### 6.6.4 Pollution, ventilation and lighting

Exposure to pollution varied from site to site, block to block and floor to floor. One resident reported a serious problem of a stench borne on wind and rain and coming from an oxidation pond (FG2).

The same problem was reported by residents at two other focus groups (FG4, FG5). In contrast, some residents benefited from a 'beautiful' view of the River Klang (FG5). Traffic caused air pollution particularly for those living close to road level. Rail and traffic cause noise pollution. While residents enjoyed easy access to and from the highway the location also brings with it pollution problems in the form of both noise and smog which results in dust being spread into the units.

> The location of the PPR (building) is in the middle, in front is the highway. We have access but it is too noisy, lorries come and go. But we do have a better view [of the river] than other places. The environment here that I have experienced is that I always have to sweep due to dust, I stay at level 11, the air is affecting the children, it is not healthy. (FG5).

Another user confirmed the problem with dust. Although there was appreciation for the view over the Klang River which was described as 'beautiful' by one user.

Poor ventilation appeared to be responsible for a number of problems. Smoke and smells from cooking can be intense according to one resident because not enough fresh air gets into the house (FG2). The opposite problem was recounted at another site where a resident recalled that because the block was situated in crosswinds the winds are so strong that the roof was actually blown off the previous year (FG5). At another group, the construction was blamed for the lack of ventilation because no ventilation holes were included (FG3). In contrast, another resident reported good ventilation from front and back and praised the design (FG5).

As well as the smell, lack of ventilation means cooking heat is trapped inside the unit. Those in higher floors seemed to enjoy somewhat better ventilation but the drawback is that in heavy rain the same airflows sweep the rain into the units.

Regarding lighting, residents at one site had multiple issues related to lighting or lack of it (FG2). The lift was without lighting for months and the street lighting did not work either. Similar problems were reported at FG4 where users referred to insufficient light points inside the unit, the fact they had to do their own wiring in the unit and again, lift lighting not working.

During field observations, at one site smoke was observed from a nearby construction site and also from cooking from informal (presumably illegal) food stalls. Subsequently, the presence of rats was noted near these stalls. Corridors leading to the lift area were dimly lit although strip lighting on the staircase was on even during daylight hours. Some residents had an iron grill encased area in front of the windows of their kitchen areas and had added an awning above. It

was unclear from the observation whether these changes were approved or not. Similar adjustments were noted at other sites where the kitchen windows and ventilation area were used as an extension for the storage of kitchen utensils.

### 6.6.5 Discussion

Units built under PPR such as the ones at the developments examined in this research are built to a standard design and size. The starting point for this design is the average household size. Official data based on the 2010 census revealed that the average household size in Kuala Lumpur was 3.7 persons (DoS, Malaysia, 2014, p.4). Such a household would fit comfortably into the prevailing 3-bedroom PPR design.

However, the current study found that residents in larger households, which appeared to be very common, experienced overcrowding. The census statistics also revealed that as many as one in five households are not the classic nucleus-type family but extended with multiple generations and siblings' this was also supported in the current study. A further miss match occurs at the smaller household end as 8.3% of households comprised just one person (DoS, Malaysia, 2014, p.5).

Matching public housing provision to the needs of users is highly problematic. Demand for public housing always tends to exceed supply and ensuring a fit between the users' household and the provision is difficult. In the UK moves to match this provision has proved to be one of the most controversial political issues of the last decade. The government introduced a financial penalty for public housing users living in a home with more than the legally required number of bedrooms. Official policy statements explained:

> There is a shortage of social housing across the UK and this change helps to make the best use of our limited social housing. This change helps families who live in overcrowded accommodation to find a new home and helps reduce the number of people on waiting lists. (Department of Work & Pensions, 2013).

In Kuala Lumpur, there appears to be a need for a mechanism whereby flexibility is introduced to the system – to enable residents to move between different sized units as family circumstances change – this will make better use of the public housing stock.

### 6.7 Money Matters

Earlier in the chapter the issue of non-payment of rent and maintenance fees and how this impacted on City Hall's ability to maintain adequate levels of maintenance was mentioned as a view held by the experts. In this section, this and other financial aspects found in the data are presented.

One resident stated that purchase prices were low and there would still be interest in buying if this price was raised (FG1). Another suggested that public sector 'pigeonholes' (LCHR) were the only option open to them as there were no terraced houses to be found in the city and a private sector apartment was beyond their means (FG3). Low incomes, large families and the large number of sick and elderly residents suggest that renting will be the only option for many in the PPR programme.

The size of many of the families discussed earlier also stretches family finances making it impossible for some to either buy their unit for RM 35, 000 let alone move out of PPR.

There were very mixed comments made on water bills with some residents suggesting they paid RM 30 (US$7) per month and others far more.

For the experts, there were also important financial aspects to LCHR housing. Construction costs are limited to RM 35,000 per unit (the same as the purchase price including the RM 7,000 discount offered to PPR renters). The cost ceiling rules out certain design innovations which could alleviate some of the issues raised by residents. One expert gave the example of replacing ground level parking with underground parking or a separate multi-storey parking building (EX 1). Such a step has the potential to be transformative but as ground level parking is the cheapest form that is what is provided.

In sustainability terms, the cost ceiling on LCHR housing under the PPR programme means that very few design innovations can be introduced to improve sustainability. One architect explained this concisely.

> .. for a green building no.1 – you have to use sustainable materials. For example, paint. Instead of normal paint like this you would have to have heat reflective paint which costs more. For glass, you would want to use low-e glass [Low-emissivity glass] which prevents heat escaping. But how much do you want to pay? Then there is the choice of brick walls or aerated blocks which are fire and water resistant and offer better acoustic insulation. These good choices are often expensive choices. I did one low cost development where we collected rain water. The rain water is use for example to water the plants. Then you need to have a storage tank piping and a circulation pipe. Then you need somebody to take care of it. If not you get vandalism. So, of course you want something better but it comes at a cost.

Adding significant elements of environmental sustainability to LCHR housing is perceived as increasing costs overall, and this may well be factually true. The templated standardisation approach that has been adopted by City Hall has

prevented innovation aimed at improving environmental sustainability though the options are clearly there should greater priority be given in the future.

From the contributions of the experts, environmental sustainability seems to be a low priority for the PPR programme. There is little sign that a sustainability tool such as the GBI would be part of the planning and design process any time soon.

### 6.7.1 Discussion

The financial/ economic dimension of LCHR housing is highly problematic. On the one hand, the fact that the government can afford to run such programmes as the PPR suggests that at the highest level it is economically sustainable. However, the reality is that the financial components PPR are broken.

City Hall fixed rents for PPR units is RM124 per month. The same units when privately advertised command a rent of RM700 or more. The size of this gap has itself created problems as it has made PPR units lucrative business opportunities, for example, by sub-letting. In particular, there have been problems with the units being let to illegal immigrants (Rakyat Post, 2016).

Over the years City Hall has tried various approaches to the financial basis of PPR, mixing renting with purchase, moving to renting only and most recently a rent-to-own scheme. PPR units in Kuala Lumpur are for sale for RM 35,000 (approx. $8,000) making them exceptionally cheap compared with open market prices. The limitations on resale of the units also means that PPR unit owners are effectively shut out of the open market as the price gulf makes it almost impossible to trade up and out of low cost public housing.

Azizah Salim (1998) argued that owner occupiers of public housing stock are likely to seek to transform their houses either to provide better living accommodation to their family or as an investment ahead of selling the home. Salim (1998) sees the presence of owner occupiers in low cost public housing as a good thing but elsewhere private ownership of low cost housing built by the public sector has been criticised as going against the principles of social housing (UNECE 2006).

### 6.8 Power at a distance

The users in our study have had a longstanding relationship with City Hall at least in regard to their housing. Having been squatters first and then residents at a transit house for a long time before being placed in their current homes under the PPR program, City Hall has effectively been their landlord for a long time. With City Hall directly responsible for maintenance and property management the existence of dissatisfaction and conflict is perhaps inevitable. The overwhelming impression left by the data is one of a perceived lack of responsiveness to both the day to day issues such as broken down lifts to longer term concerns over crime, antisocial behaviour and lack of facilities.

The data revealed a theme of the absence of authority in a number of respects. There was the lack of maintenance and site management already discussed in this chapter. Also, there was the perception among residents that City Hall did not want to engage with them or care about their daily problems. Thirdly, there was the lack of implementation of tenants' obligations in terms of rent and maintenance payments. Finally, there was a lack of physical presence of authority with police only making brief forays into the sites and regular patrolling left to the residents. There appeared to be no structured communication

between the residents and City Hall. At one site the only formal representative of the residents for the combined blocks at the site, the head of community, did not even live at the site (FG4). Inspections were reported to be rare (FG5) and residents had to go to City Hall to raises concerns (FG4) and when concerns were raised it was perceived that City Hall would sometimes take years to act, if at all (FG5).

One focus group participant encapsulated the perception that the authorities felt more comfortable at a distance from the research sites and the people living in them:

> If you look from here, it looks nice. But try to go up, even the Mayor doesn't want to go up and see. He wouldn't even want to see the surroundings. He just thinks it is nice because it looks nice from the outside. Try to go up and see, it's really like a pigeonhole. Uneven floors, water drainage and water sanitation all always clogged. Lift problems. In a month, the lift breaks down 5 or 6 times. (FG3)

The anti-social behaviour described earlier in this chapter can thrive in an unsupervised environment.

In Kuala Lumpur housing is politics. This situation was confirmed in various ways in the data. An architect explained his belief that politicians want to see their supporters living in the same area and that they base their housing allocation policies on political calculation (EX3). A colleague architect recalled a conversation he had had with a PPR resident

> 'that's why I don't want to pay the service charge. I complained about this and that's why I don't want to pay the [rental or purchase] instalment. That's why I didn't support Barisan Nasional. I will go for the opposition. See what happens at the next election. I'll vote for the opposition' (EX2 citing resident)

Malaysia's ethnicity-based politics is perceived to be reflected in housing provision with different ethnic groups receiving different treatment. An architect recalls an event concerning the rehousing of squatters, when Malay squatters who were occupying private land were transferred to PPR housing but non-Malay squatters at the same location were not (EX3). The MP recalls a related situation regarding empty units. In the previous chapter users reported problems arising from break-ins at units that had been left unoccupied. On this matter, the MP argues that having empty units may have political motives.

> …because of DBKL policy there are still empty units these place where drug addicts hang out, because the units can easily be broken in to. You leave them to rot for so long, so they [DBKL] can at their whim and fancy decide who can move in who can move out at different places at different times. So there is a problem. (EX4).

The PPR low cost housing program was aimed at solving Kuala Lumpur's squatter problem. Yet even the treatment of squatters is, according to the MP, a matter of ethnicity and hence politics. She recounts how ethnic groups are treated differently when it comes to rehousing squatters. Squatters on private land at Bukit Bangsar Kerinchi were majority Malay and were rehoused whereas majority Chinese squatters at Sri Sentosa have been left there for 30 years.

### 6.8.1 Discussion

A number of factors revealed in the data created a sense of abandonment among residents. These included personal experience of difficulties in getting reactions from the development managers (City Hall), perceptions of inadequate maintenance arrangements and even a perceived lack of caring.

The concern among residents at FG3 and about the Certificate of Fitness from the Fire Department, also referred to by one of the architects, confirms a much earlier finding of Haber (1977) who found that high-rise living was associated with fear over fire safety.

There are signs that DBKL is becoming more proactive in establishing a presence of 'authority' at the PPR developments. To address crime and anti-social behaviour the DBKL has started a programme of CCTV installation under which cameras would be installed in lifts, at waste collection areas, parking areas and other secluded places (Wahida, 2014). In addition to this, there are more instances of tenants being evicted for abuse of the public housing provision. This abuse can take the form of tenants not surrendering their units when their incomes exceed the qualifying threshold, or renting out units they have vacated because they had bought their own home (The Sun Daily, 2014).

It appears that it is not just the DBKL who have appeared to have been unable to put proper maintenance arrangements in place. Media reports recently highlighted the deaths of two children in Selangor who fell through unrepaired railings at PPR flats in Petaling Jaya (Ch'ng and Nathan, 2015).

The Eleventh National Plan covering the period from 2016 to 2020 announced that public security would be a key focus area during that period (Economic Planning Unit, 2015). This study revealed a sense of abandonment among residents of LCHR housing in Kuala Lumpur so the government's intention to establish "omnipresence" would appear highly appropriate, although it is too early to evaluate the impact of this.

Consider the experience in New York, 400,000 low income people are housed in public housing, mostly high-rise. Bloom (2012) attributes the success of this provision as the presence of authority. The city maintains significant staff at the

developments (one 1100-unit development had a permanent staff of 36 working at the site itself). Compare this to PPR developments where those employees with responsibilities for the PPR sites are sat in their departments in City Hall. Rents are collected door-to-door, there is electronic monitoring and security card entry systems. Superintendents carry out vertical patrols. Overall there is the strong sense of presence of authority (Bloom, 2012). In the case of the research sites there are no City Hall employees based full-time at the sites and residents pay their rent through their bank accounts.

### 6.9 Summary of findings

Of course, each of the five blocks in this study had its own issues and variations but having said this an analysis of the data shows very clear common themes in terms of the perceptions and experiences of the residents of public sector LCHR housing. These have been presented in this chapter. How this type of housing is experienced is also influenced by the individual circumstances of the residents including the size of their family, their age and health, and their expectations based on their previous living arrangements and their current financial situation. In particular, perceptions of comfort either negative or positive ones were firmly rooted in family size and previous accommodation meaning they were at least in part relative rather than absolute.

Beyond this the picture painted by the users of life in public sector LCHR housing was a grim one despite their modest expectations. Crime and anti-social behaviour was rife, maintenance was seen as inadequate and cleanliness far below an acceptable standard. There were clear tensions between user and City Hall which was responsible for maintenance and management of the developments. Such tensions are not unusual in landlord-tenant relationships

but as the relationship is central to the way users experience their life in LCHR housing it should not be ignored. A series of points of conflicts in relations between users also emerged from the data, crime, anti-social behaviour, lack of consideration for others regarding waste disposal and other types of behaviour all featured. Both these sets of relations are important if a community is to be sustainable..Overall there was no direct indication in the data that LCHR public housing was seen as unsustainable as a format and a solution to low cost housing provision by the focus group participants who were users of such housing. To an extent this may reflect the low expectations and former, harsher living conditions the participants had experienced.

Individual aspects of living in such housing were often described negatively and many of these comments were supported by the photographic and field notes data collected by the researcher during site visits. Whether the aggregation of the problems describe amount to LCHR housing being unsustainable will be considered in chapter eleven when all the findings are evaluated.

Turning to the Expert interviews, in some respects, among the three architects and one politician there was a good level of awareness of the issues that the residents had raised in the focus groups. Unsurprisingly, they also had a lot of additional points to make on the role of developers, the politics of the PPR program, public-private issues and so forth which were less prominent among the residents. As with the findings in the previous chapter, while there was evidence that some examples of LCHR housing developments were better than others, the overall impression emerging from the data was that this type of housing at such high density was highly problematical. Some references to improvements being introduced to more recent projects were evident but not of such a magnitude that they changed the general picture.

High density LCHR housing was not viewed as sustainable by the experts in our study. This lack of sustainability arose from multiple factors including; lack of flexibility in the provision in terms of number of bedrooms/ overall size of units; the financial basis of the PPR programme including non-payment of rent, finance repayment instalments and service charges; the inadequate provision of facilities; the crime and anti-social behaviour consequences of such high density living; and a number of other contributory factors.Overall the photographic data collected during observations satisfactorily supported the findings from the focus groups and interviews. There was clear evidence of anti-social behaviour, of the sense of the developments being overwhelmed by cars and motorbikes, of lack of maintenance, of cases of poor lighting and ventilation, but also of residents making good use of the sometimes sparse facilities.

Finally, the GBI consultant who contributed to this study arrived at a score of 55 out of 100. A score between 50 and 65 is classed as ‘certified’ under GBI, the lowest classification that does not represent a fail. Significant marks were lost in areas such as energy efficiency and innovation. Although for the latter the fact that this building was part of a PPR LCHR housing project means room for innovation is negligible. It should also be noted that certain subsections of the GBI tool needed to be assessed by assumption rather than actual documentary evidence. Another limitation is the fact that this assessment represents the evaluation of just one GBI consultant.

In the following chapter, this study is summarised, final conclusions are drawn and the significance of the study is evaluated. In the second part of the chapter the contributions that the study can make to policies and practices for LCHR housing are drawn together in to a best practices framework and recomendation.

# Chapter 7 : RESIDENTIAL SATISFACTION AT LCHR HOUSING IN KUALA LUMPUR

## 7.1 Introduction

The researcher concluded that in order to obtain the fullest possible understanding of the sustainability of LCHR housing, particularly along the social dimension, multiple data sources and mixed methods were required. A community is only socially sustainable if residents want to live there, therefore it was decided that the quantitative element of the research would comprise a residential satisfaction survey conducted at the same five research sites that the qualitative study of chapter six had been.

The survey instrument was a modified version of the Residential Environmental Satisfaction Scale (Adriaanse, 2007). The main modification being that it was issued in English with a Malay translation given underneath all items and other text (see Appendix 2). There were 18 satisfaction items with a five-point Likert scale printed next to each on which respondents were asked to select a) Strongly agree, b) Agree, c) Neutral d) Disagree, e) Strongly disagree. To emphasis the straightforward and concise nature of the questionnaire it was designed to fit on two sides of one sheet of A4 paper which was useful when the researchers were encouraging participation among the residents. A second modification was the addition of four items enabling profiling of the sample and some bivariate analysis to be conducted.

The quantitative survey data was collected using a modified version of the Residential Environmental Satisfaction Scale (Adriaanse, 2007). This 18-item instrument was supplemented with some profiling items that the previous

(qualitative) findings had suggested would be significant (floor number, length of residency, tenure type etc.). The survey was prepared using both English and Malay

This chapter presents the results of that survey starting with a descriptive analysis of the sample itself. This is followed by the results on the overall satisfaction levels reported. Next, bivariate analysis is reported to show whether the variables of length of residency, tenure type, level (floor number) and household size have an effect on satisfaction. This is then followed by a discussion of the results.

## 7.2 The sample described: descriptive statistical analysis

Five items were added to the residential satisfaction survey to profile the respondents and measure the effect of these variables on satisfaction. The variables were inductively chosen based on the qualitative study presented in chapter six and are: tenure, vehicle ownership (2 items), household size, and length of residency. A sixth variable, level, was recorded on the questionnaire by the data collector.

### 7.2.1 Tenure

Residents at the five data collection sites, in Figure 7.1, either rented their unit (31%) or owned it (69%). DBKL and National Housing Board data indicates that the ownership rate across PPR projects in Kuala Lumpur approximately 70%.

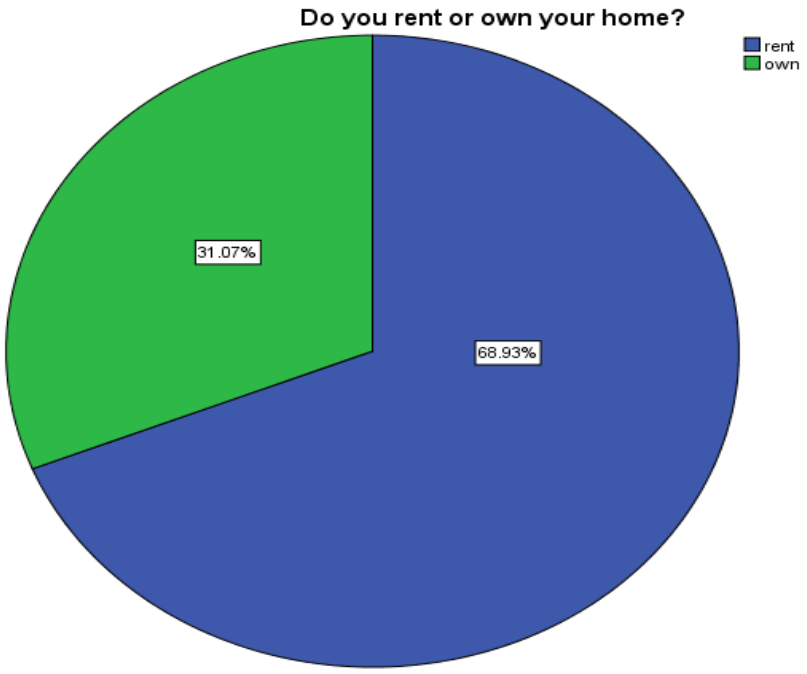



Figure 7-1: Tenure status of sample

### 7.2.2 Vehicle ownership

7.2.2.1 Cars

The 280 households responding owned a total of 258 cars. Multiple car ownership was reported by 12.8% of respondents and non-ownership by 21.4%.

Table 7-1: How many vehicles does your household have?

**How many vehicle does your household have? (car)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | .00 | 60 | 21.4 | 21.4 | 21.4 |
| | 1.00 | 184 | 65.7 | 65.7 | 87.1 |
| | 2.00 | 34 | 12.1 | 12.1 | 99.3 |
| | 3.00 | 2 | .7 | .7 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

7.2.2.2 Motorbikes

The 280 households responding owned a total of 312 motorbikes. Multiple motorbike ownership was reported by 24.5% of respondents and non-ownership by 16.7%.

Table 7-2: Motorbike ownership

**How many vehicle does your household have? (motorbike)**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | .00 | 47 | 16.7 | 16.8 | 16.8 |
| | 1.00 | 164 | 58.4 | 58.6 | 75.4 |
| | 2.00 | 61 | 21.7 | 21.8 | 97.1 |
| | 3.00 | 6 | 2.1 | 2.1 | 99.3 |
| | 4.00 | 2 | .7 | .7 | 100.0 |
| | Total | 280 | 99.6 | 100.0 | |
| Missing | System | 1 | .4 | | |
| Total | | 281 | 100.0 | | |

### 7.2.3 Household size

Mean household size (Figure 7.2) was reported to be 4.9 persons with the most common household size being 5 persons. Approximately one in six households could be described as very large for the size of unit, having 7 or more persons living in it.

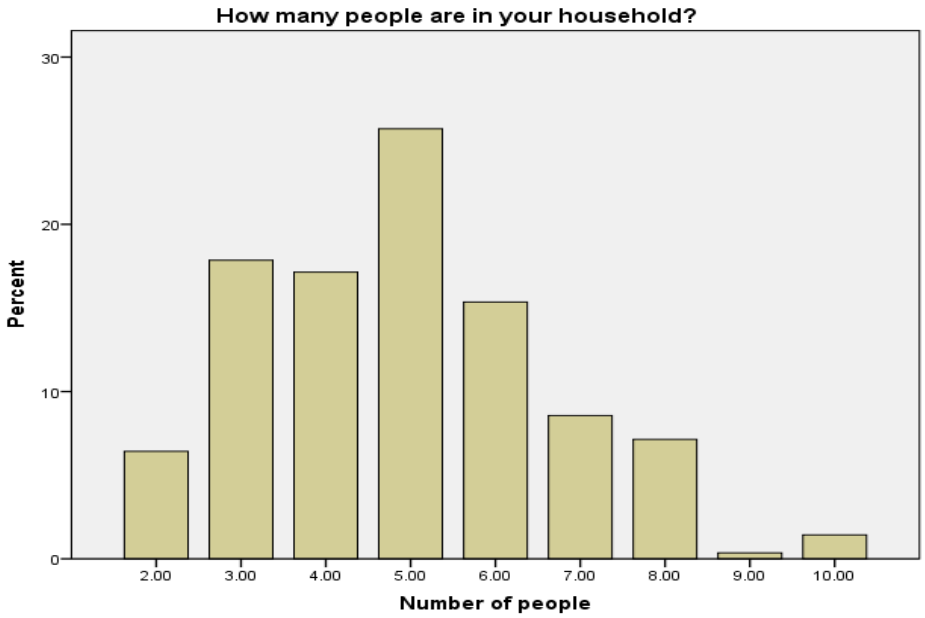



Figure 7-2: Size of Household

### 7.2.4 Length of residency

Respondents had lived at the site for as little as one year and as much as sixteen years (Figure 7.3). The mean length of residency was 6.98 years.




Figure 7-3: Length of residency in years

### 7.2.5 Level

The level the respondent lived on was noted on the completed survey questionnaire by the data collector. The researcher had planned the data collection process to ensure that all floors were represented in the sample though an exact proportionality was not practically possible. Floors one to sixteen all came within the range of 13 to 18 respondents in total. The outliers were floor 17 (23 respondents) and floors 18 to 21 which were each represented by just 3 respondents. The reason for the overrepresentation of floor 17 is uncertain although data collectors started from the highest floor (17$^{th}$ in 4 out of 5 sites) and worked downwards. The small representation of floors 18 to 21 was because only one research site had these floors.

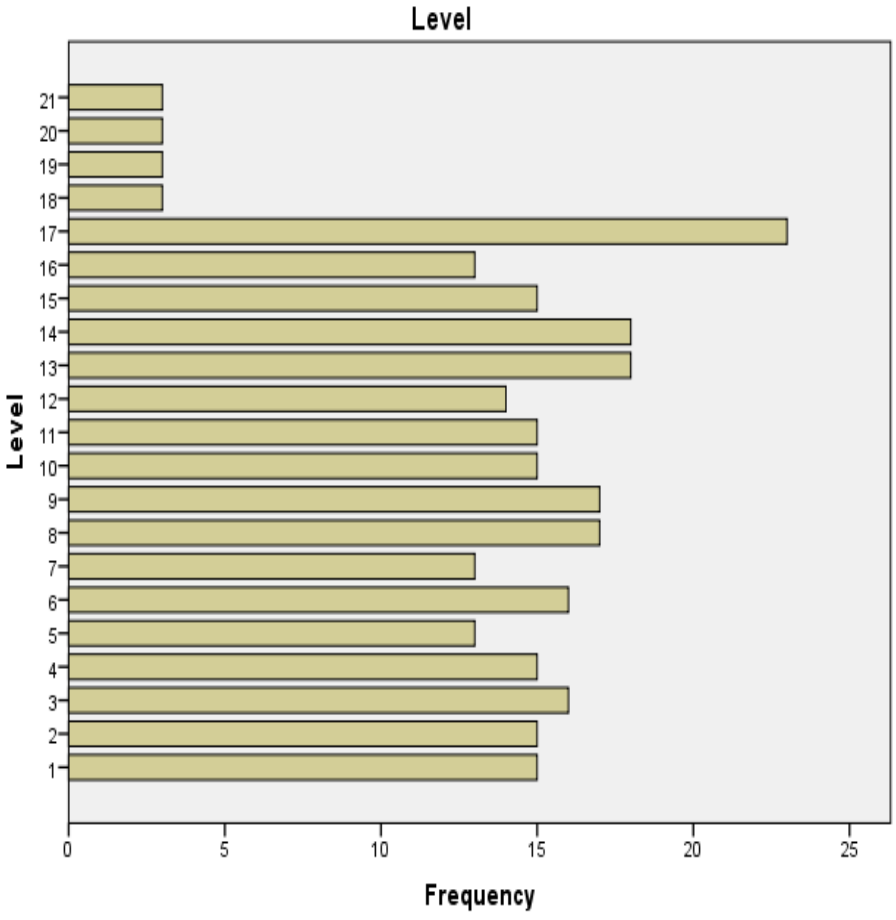



Figure 7-4: Frequency of unit level in sample

There are no sources of official data on PPR residents to verify the representativeness of the sample though the data collection design is believed to have achieved a sample broadly representative of the population. The population being all PPR residents in Kuala Lumpur.

Other demographic data such as gender and age of respondent was not collected as this would have been significantly skewed by the time/ day of the data collection. For example, at certain times more of the non-retired male residents would have been away at work than retired males and female residents.

### 7.3 Overall levels of satisfaction

The residential satisfaction survey items can be categorised into three groups. The first four items concern the unit itself. This is then followed by three items on the physical environment of the development beyond the unit. The next 11 items are more psychological and emotional in nature and concern the social climate.

#### 7.3.1 The unit

A low frequency of dissatisfaction was reported by respondents. To the statement “I am satisfied with my flat”, no respondents selected “Strongly Disagree” and just 7.1% (n=20) selected “Disagree”. In contrast, 61.4% (n=172) chose “Agree” and 10.7% (n=30) selected “Strongly Agree” as their response. Similarly, the layout of the flat was most viewed as convenient with only 11% (n=31) disagreeing or strongly disagreeing to this. Furthermore, 62.5% (n=176)

either agreed or strongly agreed that their flat had a pleasant ambience, with only 8.6% (n=24) disagreeing with this statement.

There was less satisfaction expressed over maintenance of the flats and opinion was more divided. To the statement “The flat is poorly maintained” 37.5% (n= 105) agreed or strongly agreed, 29.3% (n=82) disagreed or strongly disagreed, with 33.2% (n=93) selecting “Neutral”. See Table 7.3 showing the mean satisfaction score

Table 7-3: Mean scores for unit satisfaction items

**Unit Satisfaction means**

| | N | Mean |
|---|---|---|
| I am satisfied with my flat | 280 | 2.2429 |
| The layout of this flat is convenient | 280 | 2.4393 |
| The flat is poorly maintained | 280 | 2.8964 |
| The flat has a pleasing ambience | 280 | 2.4357 |
| Valid N (listwise) | 280 | |

### 7.3.2 The development

Following the items related to the unit, a further 3 items elicited levels of satisfaction with the development concerning the amount of green space, satisfaction with living environment and the attractiveness of the buildings. A lack of green space emerged as a theme in the qualitative study. Notable was that no respondent strongly agreed that there was enough green space; 17.1% (n=48) agreed while 28.2% (n=79) had a neutral attitude. A small majority of respondents either disagreed 47.1% (n=132) or strongly disagreed 7.5% (n=21) indicating that the majority view was that there was insufficient green space.

Table 7-4: The neighbourhood has enough green space

**The neighbourhood has enough green space**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Agree | 48 | 17.1 | 17.1 | 17.1 |
| | Neutral | 79 | 28.2 | 28.2 | 45.4 |
| | Disagree | 132 | 47.1 | 47.1 | 92.5 |
| | Strongly disagree | 21 | 7.5 | 7.5 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

Another item concerning the wider area beyond the unit itself stated “I am satisfied with my living environment”. The responses showed that more than two-thirds (68.1% n=190) agreed or strongly agreed while 10.7% (n=30) disagreed. The balance (21.1% n=59) gave a neutral response.

Table 7-5: I am satisfied with my living environment

**I am satisfied with my living environment**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 5 | 1.8 | 1.8 | 1.8 |
| | Agree | 185 | 66.1 | 66.3 | 68.1 |
| | Neutral | 59 | 21.1 | 21.1 | 89.2 |
| | Disagree | 30 | 10.7 | 10.8 | 100.0 |
| | Total | 279 | 99.6 | 100.0 | |
| Missing | System | 1 | .4 | | |
| Total | | 280 | 100.0 | | |

Low cost high-rise housing is not renowned for its attractiveness wherever in the world it is constructed. The statement “The buildings in this neighbourhood are attractive” was put to respondents. While only 1.1% (n=3) strongly agreed a further 65% (n=182) agreed. Only 6.1% (n=17) disagreed and no respondents disagreed strongly. A balance of 27.9% (n=78) gave a neutral response.

Table 7-6: The buildings in this neighbourhood are attractive

**The building in this neighbourhood are attractive**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 3 | 1.1 | 1.1 | 1.1 |
| | Agree | 182 | 65.0 | 65.0 | 66.1 |
| | Neutral | 78 | 27.9 | 27.9 | 93.9 |
| | Disagree | 17 | 6.1 | 6.1 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

### 7.3.3 Emotional attachment and the social climate

7.3.3.1 Emotional attachment

Two items aimed to test emotional attachment to the development. The statement “I feel attached to this neighbourhood” was followed by “I feel at home in this neighbourhood”. Figure 7-5 shows that there was a substantial majority of respondents reporting agreement (67.9% n=190) or strong agreement (6.1% n=17) over those reporting disagreement (8.9% n=25). No respondent reported strong disagreement while 17.1% (n=48) gave a neutral reponse.

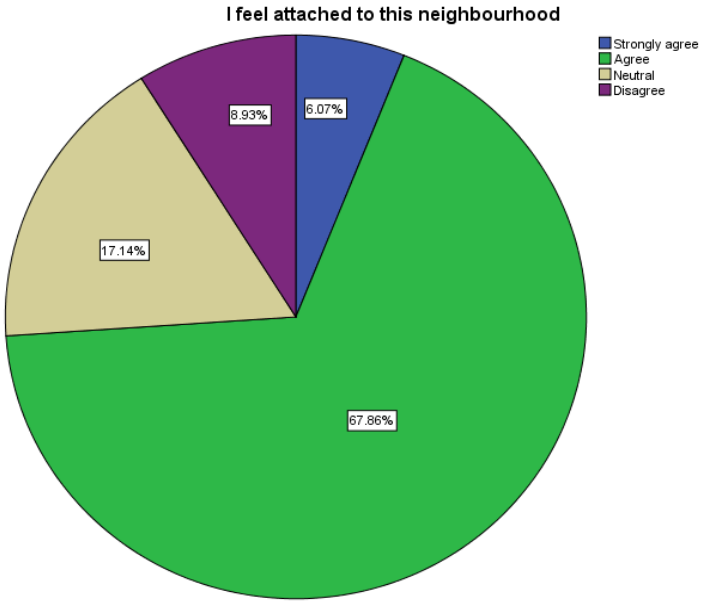



Figure 7-5: I feel attached to this neighbourhood- percentages

Less than one in ten respondents disagreed with the statement “I feel at home in this neighbourhood” though compared with the previous item there was a higher percentage giving a neutral response (28.2% n=48).

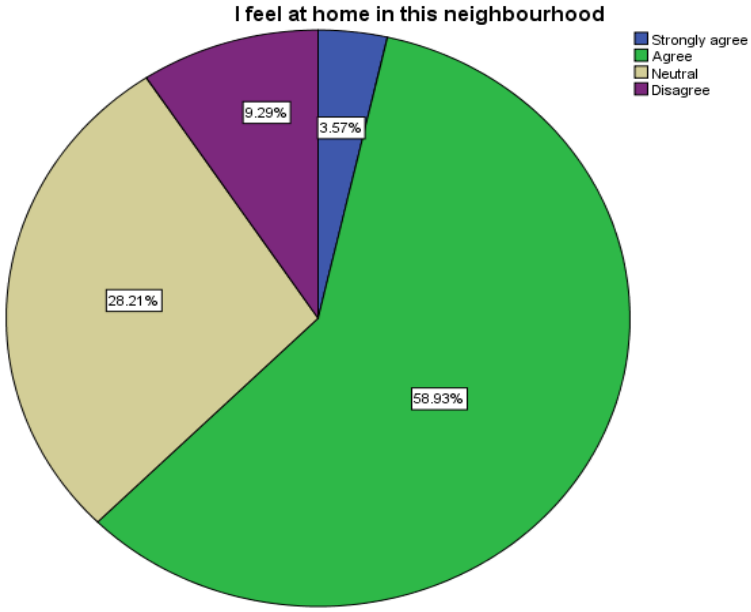



Figure 7-6: I feel at home in this neighbourhood - percentages

The apparently high level of emotional attachment (figure 7.6) may be a result of the high mean length of residency which was recorded as 7 years.

7.3.3.2 Social climate

If the social sustainability of a community is dependent on residents wanting to be there then the survey item “I feel an urge to move out of this neighbourhood” addressed this directly. The results reveal in Figure 7.7, that the vast majority of residents do not agree with this statement. Only 2.5% (n=7) strongly agreed and a further 12.9% (n=36) agreed. Of those disagreeing 47.1% (n=132) disagreed and 20.7% (n=58) strongly disagreed. A further 16.8% (n=47) expressed a neutral view.

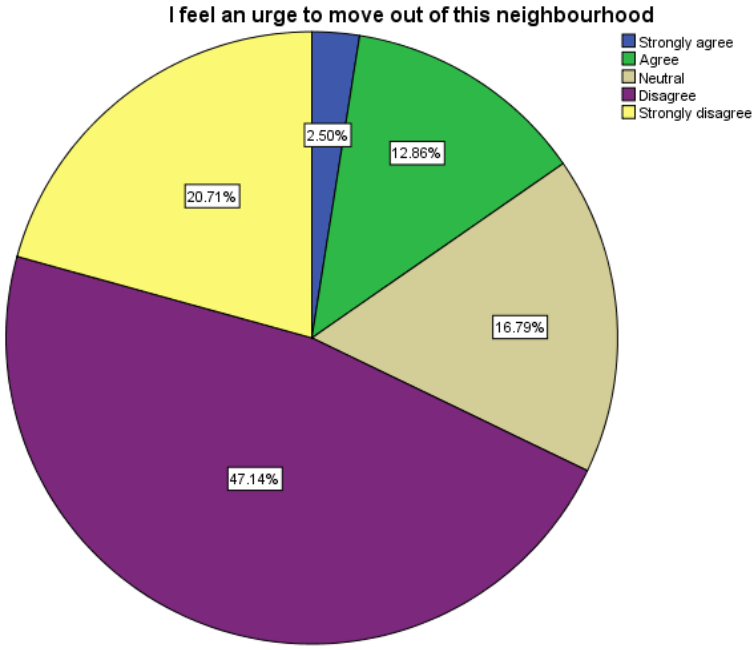



Figure 7-7: I feel an urge to move out of this neighbourhood

Interestingly, large households were not more inclined to move out than smaller ones, indeed there was stronger disagreement with the statement from those residents in 7 and 8-person households than from 2 and 3-person households.

A further item sought to measure what may be a lower level of dissatisfaction than the ‘move out’ option; it stated, “Living in this neighbourhood is annoying”.

With this lower bar for expressing dissatisfaction 24.3% (n=68) either agreed or strongly agreed with only 3 residents taking the latter option. A small majority (50.4% n= 141) agreed or strongly agreed. As in Table 7.7.

Table 7-7: Living in this neighbourhood is annoying

**Living in this neighbourhood is annoying**

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly agree | 3 | 1.1 | 1.1 | 1.1 |
| Agree | 65 | 23.2 | 23.2 | 24.3 |
| Neutral | 71 | 25.4 | 25.4 | 49.6 |
| Disagree | 127 | 45.4 | 45.4 | 95.0 |
| Strongly disagree | 14 | 5.0 | 5.0 | 100.0 |
| Total | 280 | 100.0 | 100.0 | |

Perceptions of a lack of sense of community were found in the qualitative study. Items on the survey questionnaire addressed this aspect of the social climate. Two items elicited data on whether respondents had contact with first, their neighbours and second other residents in the neighbourhood. A third related to respondent's perception of others' social engagement. The results are shown in Table 7-8, Table 7-9 and Table 7-10. Only 5.7% (n=16) disagreed with the statement "I have a lot of contact with my neighbours" and none strongly disagreed. In contrast 66.4% (n=186) strongly agreed and 13.9% (n=39) strongly agreed. These results suggest a high level of neighbourly interaction at the research sites.

Table 7-8: I have a lot of contact with my neighbours

**I have a lot of contact with my neighbours**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 39 | 13.9 | 13.9 | 13.9 |
| | Agree | 186 | 66.4 | 66.4 | 80.4 |
| | Neutral | 39 | 13.9 | 13.9 | 94.3 |
| | Disagree | 16 | 5.7 | 5.7 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

Wider interaction among residents was also tested. The results indicated a reasonable level of interaction but less than for immediate neighbours. Only 12.9% of respondents disagreed or strongly disagreed with the statement “I have a lot of contact with other residents in my neighbourhood”.

However, a significant 28.9% (n=81) gave a neutral response perhaps due to a lack of clarity of what constituted ‘a lot’ or perhaps a way of indicating they have some contact but perhaps not really ‘a lot’.

Table 7-9: I have a lot of contact with other residents in my neighbourhood

**I have a lot of contact with other residents in my neighbourhood**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 9 | 3.2 | 3.2 | 3.2 |
| | Agree | 154 | 55.0 | 55.0 | 58.2 |
| | Neutral | 81 | 28.9 | 28.9 | 87.1 |
| | Disagree | 28 | 10.0 | 10.0 | 97.1 |
| | Strongly disagree | 8 | 2.9 | 2.9 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

A third item on the topic of interaction stated “People in this neighbourhood hardly know each other” so the subject changed from self to others. However, the results were consistent with the previous two items in that the proposition in the statement only found strong agreement from 1.1% (n=3) and agreement from 11.4% (n=32).

Table 7-10: People in this neighbourhood hardly know each other

**People in this neighbourhood hardly know each other**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 3 | 1.1 | 1.1 | 1.1 |
| | Agree | 32 | 11.4 | 11.4 | 12.5 |
| | Neutral | 69 | 24.6 | 24.6 | 37.1 |
| | Disagree | 170 | 60.7 | 60.7 | 97.9 |
| | Strongly disagree | 6 | 2.1 | 2.1 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

There were four items related to the concept of sense of community. The first related to the respondent's sense of co-responsibility for the liveability of the neighbourhood a measure of the degree to which it is understood that liveability is to an important degree dependant on individual contributions to the whole. As Table 7-11 shows, overall 71.1% (n=199) agreed or strongly agreed with this statement and 16% (n=45) disagreed or strongly disagreed. The balance 12.9% (n=36) gave a neutral response.

Table 7-11: I feel co-responsible for the liveability in this neighbourhood

**I feel co-responsible for the liveability in this neighbourhood**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 71 | 25.4 | 25.4 | 25.4 |
| | Agree | 128 | 45.7 | 45.7 | 71.1 |
| | Neutral | 36 | 12.9 | 12.9 | 83.9 |
| | Disagree | 34 | 12.1 | 12.1 | 96.1 |
| | Strongly disagree | 11 | 3.9 | 3.9 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

The second item in this group concerned how respondents perceived that residents treated each other (Table 7-12). The results reported an overwhelmingly positive perception. Only 4.3% (n=12) disagreed with the statement “In this neighbourhood residents treated each other pleasantly” see Table 7-12. No respondent strongly disagrees.

Table 7-12. In this neighbourhood resident treat each other pleasantly.

**In this neighbourhood residents treat each other pleasantly**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 23 | 8.2 | 8.2 | 8.2 |
| | Agree | 204 | 72.9 | 72.9 | 81.1 |
| | Neutral | 41 | 14.6 | 14.6 | 95.7 |
| | Disagree | 12 | 4.3 | 4.3 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

Refering to Table 7-13. almost 70% of respondents (n=195) agreed to the statement “I live in a cosy neighbourhood with a lot of cohesion”, a further 2.9% (n=8) strongly agreed. Again, no respondents strongly disagreed but a significant 25.7% (n=72) gave a neutral response.

Table 7-13: I live in a cosy neighbourhood with a lot of cohesion

**I live in a cosy neighbourhood with a lot of cohesion**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 8 | 2.9 | 2.9 | 2.9 |
| | Agree | 195 | 69.6 | 69.6 | 72.5 |
| | Neutral | 72 | 25.7 | 25.7 | 98.2 |
| | Disagree | 5 | 1.8 | 1.8 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

Dissatisfaction with the social mix of the neighbourhood was found to be a minority attitude with only 10.4% (n=29) disagreeing and 0.4% (n=1) strongly disagreeing that they were happy with the social mix of the neighbourhood. That only one respondent out of the sample (n=280) strongly disagreed appears to be a highly significant result.

Table 7-14: I am happy with the social mix of the neighbourhood population

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Strongly agree | 21 | 7.5 | 7.5 | 7.5 |
| | Agree | 167 | 59.6 | 59.6 | 67.1 |
| | Neutral | 62 | 22.1 | 22.1 | 89.3 |
| | Disagree | 29 | 10.4 | 10.4 | 99.6 |
| | Strongly disagree | 1 | .4 | .4 | 100.0 |
| | Total | 280 | 100.0 | 100.0 | |

## 7.4 The effect of tenure, level, household size and length of residency: Bivariate analysis

### 7.4.1 Tenure

Tenure can be hypothesised to have an effect on residential satisfaction as it may be assumed that buying the home is a statement of commitment to the unit, the development and the wider neighbourhood. There was some evidence of

this tenure effect in the survey data as in Table 7.15. Regarding the unit, mean scores on all four items showed more satisfaction among owners than renters. Overall there is high degree of renters dissatisfied with the maintenance

Table 7-15: Satisfaction with unit by tenure

**Satisfaction with unit by tenure**

| | | N | Mean | Std. Deviation |
|---|---|---|---|---|
| I am satisfied with my flat | rent | 193 | 2.2746 | .75155 |
| | own | 87 | 2.1724 | .70227 |
| | Total | 280 | 2.2429 | .73686 |
| The layout of this flat is convenient | rent | 193 | 2.4715 | .79088 |
| | own | 87 | 2.3678 | .63089 |
| | Total | 280 | 2.4393 | .74528 |
| The flat is poorly maintained | rent | 193 | 2.8860 | .91712 |
| | own | 87 | 2.9195 | .97906 |
| | Total | 280 | 2.8964 | .93517 |
| The flat has a pleasing ambience | rent | 193 | 2.4715 | .72202 |
| | own | 87 | 2.3563 | .57013 |
| | Total | 280 | 2.4357 | .67956 |

For the three items concerning satisfaction with the development the results also showed somewhat greater satisfaction among owners than renters (Table 7.16).

Table 7-16: Satisfaction with development by tenure

**Satisfaction with development**

| | | N | Mean | Std. Deviation |
|---|---|---|---|---|
| The neighbourhood has enough green space | rent | 193 | 3.4819 | .86659 |
| | own | 87 | 3.3793 | .85238 |
| | Total | 280 | 3.4500 | .86198 |
| I am satisfied with my living environment | rent | 192 | 2.4323 | .71308 |
| | own | 87 | 2.3563 | .68160 |
| | Total | 279 | 2.4086 | .70307 |
| The buildings in this neighbourhood are attractive | rent | 193 | 2.4249 | .65016 |
| | own | 87 | 2.3103 | .53506 |
| | Total | 280 | 2.3893 | .61803 |

The pattern of higher satisfaction among owners was also found in the social climate items. The mean scores indicated greater satisfaction across nine out of eleven items (see Table 7.17). A sense of co-responsibility for the liveability of the neighbourhood was significantly stronger among owner occupiers.

The two exceptions were the item stating “I have a lot of contact with my neighbours” for which the mean scores were almost identical and the item stating “People in this neighbourhood hardly know each other” to which there somewhat more agreement from owners than renters.

Table 7-17: Satisfaction with Social Climate

**Satisfaction with Social Climate**

| | | N | Mean | Std. Deviation |
|---|---|---|---|---|
| Living in this neighbourhood is annoying | rent | 193 | 3.2642 | .93409 |
| | own | 87 | 3.3793 | .87924 |
| | Total | 280 | 3.3000 | .91738 |
| I feel an urge to move out of this neighbourhood | rent | 193 | 3.6788 | 1.03603 |
| | own | 87 | 3.7701 | .97290 |
| | Total | 280 | 3.7071 | 1.01598 |
| I feel attached to this neighbourhood | rent | 193 | 2.2902 | .72079 |
| | own | 87 | 2.2874 | .69730 |
| | Total | 280 | 2.2893 | .71233 |
| I feel at home in this neighbourhood | rent | 193 | 2.4611 | .72154 |
| | own | 87 | 2.3678 | .68395 |
| | Total | 280 | 2.4321 | .71017 |
| I have a lot of contact with my neighbours | rent | 193 | 2.1140 | .68272 |
| | own | 87 | 2.1149 | .75368 |
| | Total | 280 | 2.1143 | .70417 |
| I feel co-responsible for the liveability in this neighbourhood | rent | 193 | 2.3109 | 1.13502 |
| | own | 87 | 2.0690 | .93750 |
| | Total | 280 | 2.2357 | 1.08169 |
| I have a lot of contact with other residents in my neighbourhood | rent | 193 | 2.6062 | .85413 |
| | own | 87 | 2.4023 | .75421 |
| | Total | 280 | 2.5429 | .82845 |
| I live in a cosy neighbourhood with a lot of cohesion | rent | 193 | 2.3212 | .54046 |
| | own | 87 | 2.1379 | .50973 |
| | Total | 280 | 2.2643 | .53696 |
| People in this neighbourhood hardly know each other | rent | 193 | 3.5544 | .72053 |
| | own | 87 | 3.4253 | .85769 |
| | Total | 280 | 3.5143 | .76656 |
| In this neighbourhood residents treat each other pleasantly | rent | 193 | 2.1554 | .59221 |
| | own | 87 | 2.1379 | .66774 |
| | Total | 280 | 2.1500 | .61551 |
| I am satisfied with the social mix of the neighbourhood population | rent | 193 | 2.4041 | .79869 |
| | own | 87 | 2.2759 | .74224 |
| | Total | 280 | 2.3643 | .78252 |

Overall the study revealed a small but consistent tenure effect which indicated higher satisfaction for owner occupiers compared to renters.

### 7.4.2 Level

Qualitative data indicated there may be a 'level effect' on residential satisfaction with lower floors possibly being more satisfied than higher ones. However, the survey results suggest this is not the case. Once the 18th to the 21st floors are taken out of consideration because there are only 3 cases of each, there appears no discernable level effect. Lowest mean satisfaction with flat was found on floors 6 and 12 while the highest mean satisfaction (with the aforementioned exclusions) were 5 and 15 (Figure 7-8). Furthermore, the 17th floor, which is the top floor for four out of five of the blocks recorded the third highest level of satisfaction with flat. The residents of the 17th floor do benefit from not having anything thrown down in their direction and have the clearest views which may have affected this result, furthermore benefit from lesser noise and the best view. The lower the mean score the higher the satisfaction.

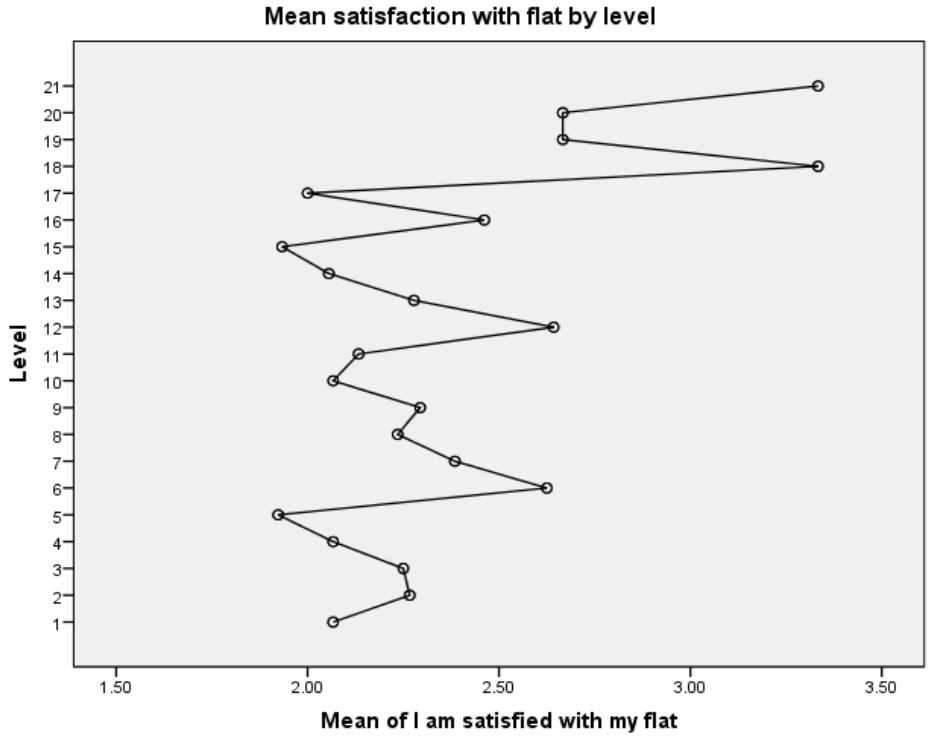



Figure 7-8: Mean satisfaction with flat by level

Three items enabled analysis of satisfaction with the development beyond the unit itself referring to the amount of green space, the attractiveness of the buildings and satisfaction with the living environment. As Figure 7-9 shows there was no discernible level effect on the level of satisfaction in development.

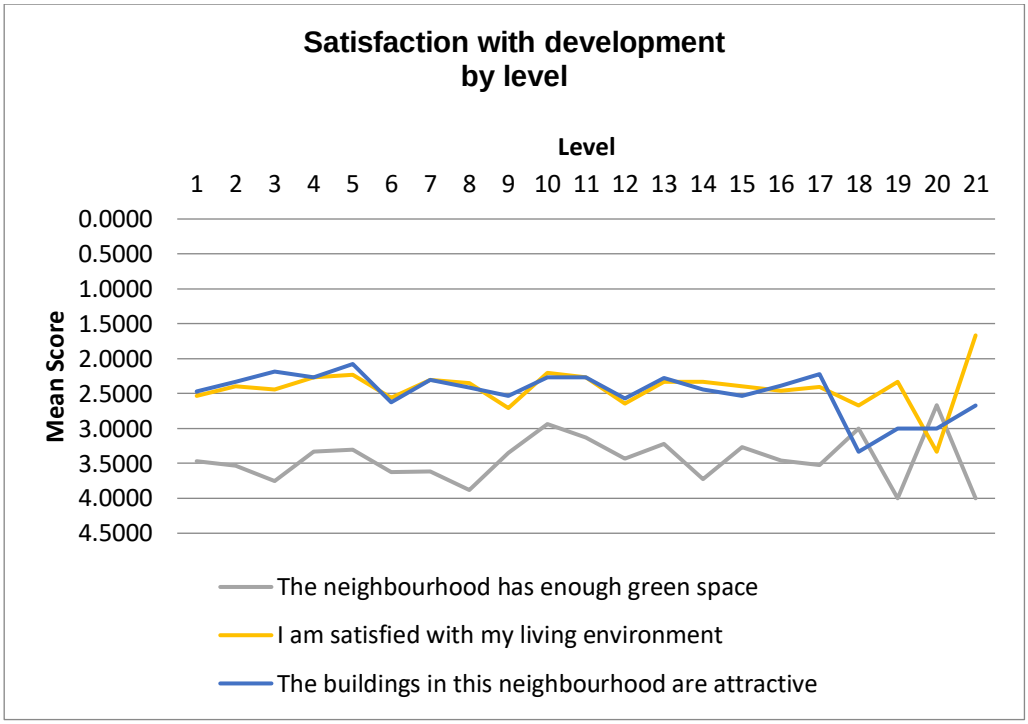



Figure 7-9: Satisfaction with development by level

The qualitative study also gave reason to assume that level may also have an effect on satisfaction with the social climate of the neighbourhoods. Lower floors simply through their proximity may experience a greater sense of community than residents of the upper floors.

Figure 7-10 shows the mean scores on two contact items, one on contact with direct neighbours and the other with other residents. A higher mean indicates greater disagreement to the statements of having contact. There is no level effect detectable, however, there is a noticeable trend for respondents to report more contact with direct neighbours than with the wider neighbourhood.

The mean score for the total sample on contact with neighbours was 2.11 while contact with other residents scored 2.54.

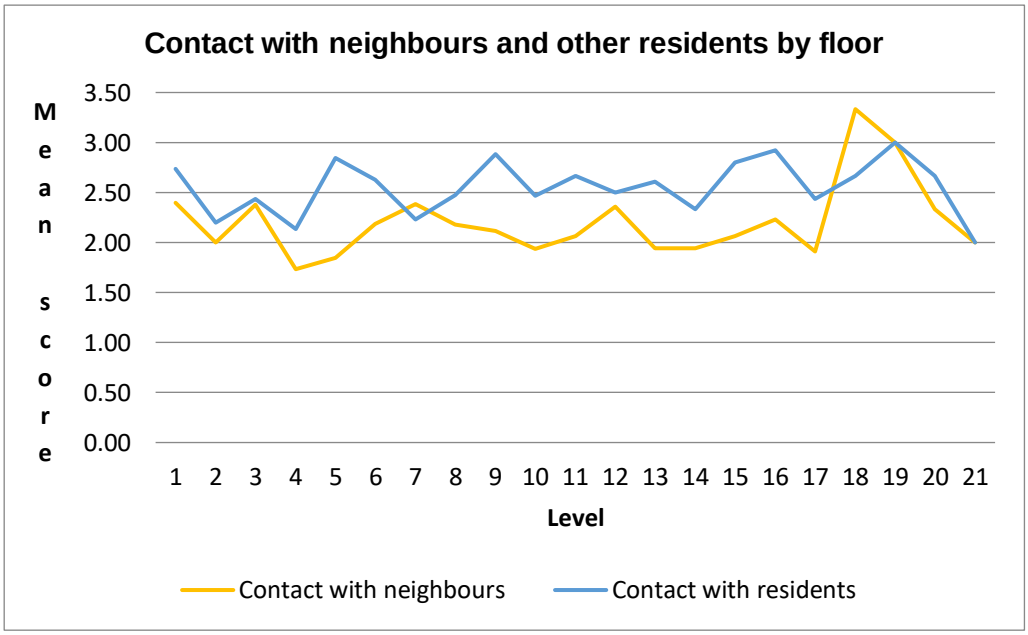



Figure 7-10: Contact with neighbours and other residents by level

Overall there is no significant level effect detectable in the data for satisfaction with the unit, the development and the social climate items.

### 7.4.3 Household size

The qualitative study indicated that large families struggled with the size and layout of their dwelling. The survey results did not reflect this in terms of reported satisfaction levels. The lower the mean score the greater the satisfaction and as Figure 7-11 demonstrates there was no trend of larger households expressing less satisfaction. The apparent dissatisfaction among 9-person households represents only one response and is confounded by the mean score of 10-person households (n=4).

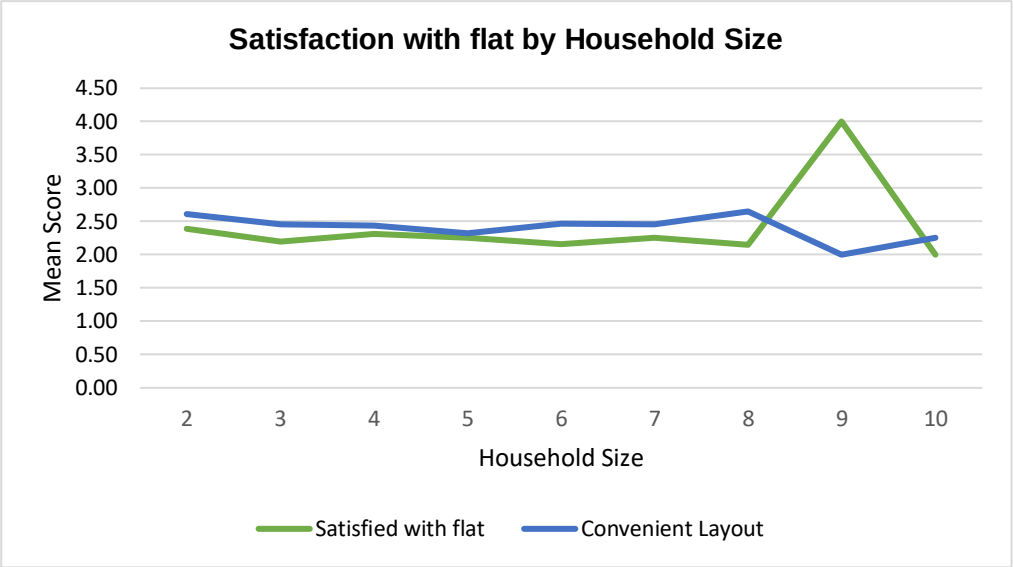



Figure 7-11: Satisfaction with flat by household size

A small household size effect could be detected when comparing the satisfaction with the amount of green space of those in the largest families with two-person households. The mean score for two-person households is 3.28 (n=18) while the mean score for households with 8, 9 or 10 persons was 3.44 (n=25).

Large households were not more likely to want to move out of the neighbourhood. Furthermore, larger families reported having more contact with neighbours and other residents than smaller ones. Mean scores for the largest families (8,9,10) were 1.88 (n=25) for contact with neighbours and 2.29 (n=25) for contact with other residents. This compared with the mean scores for 2-person households of 2.55 (n=18) and 2.67 (n=18) respectively. Larger households have more people to engage in contact, so the result is not surprising. A household effect could only be seen by comparing the largest and smallest households as there were no consistent trends for other household sizes.

### 7.4.4 Length of residency

The length of residency variable enabled analysis of whether satisfaction levels changed over time. No length of residency effect resulted from satisfaction with flat items as shown in Figure 7-12 where lower mean scores indicate greater satisfaction. The lack of consistency in results beyond 10 years is a result of the small number of cases with residency 11 years or more (n=18).

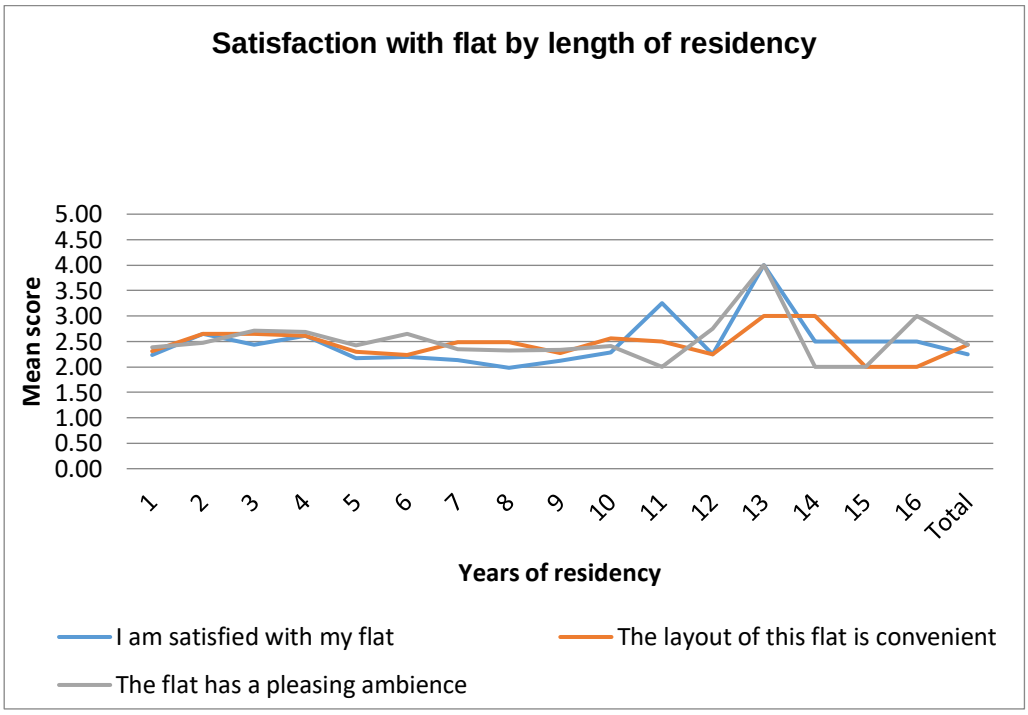



Figure 7-12: Satisfaction with flat by length of residency

There were similar results for the satisfaction with development items. No significant length of residency effect was detected regarding satisfaction with the development though on two items there was a small trend towards greater satisfaction the longer the respondent had been resident as shown in Figure 7-13.

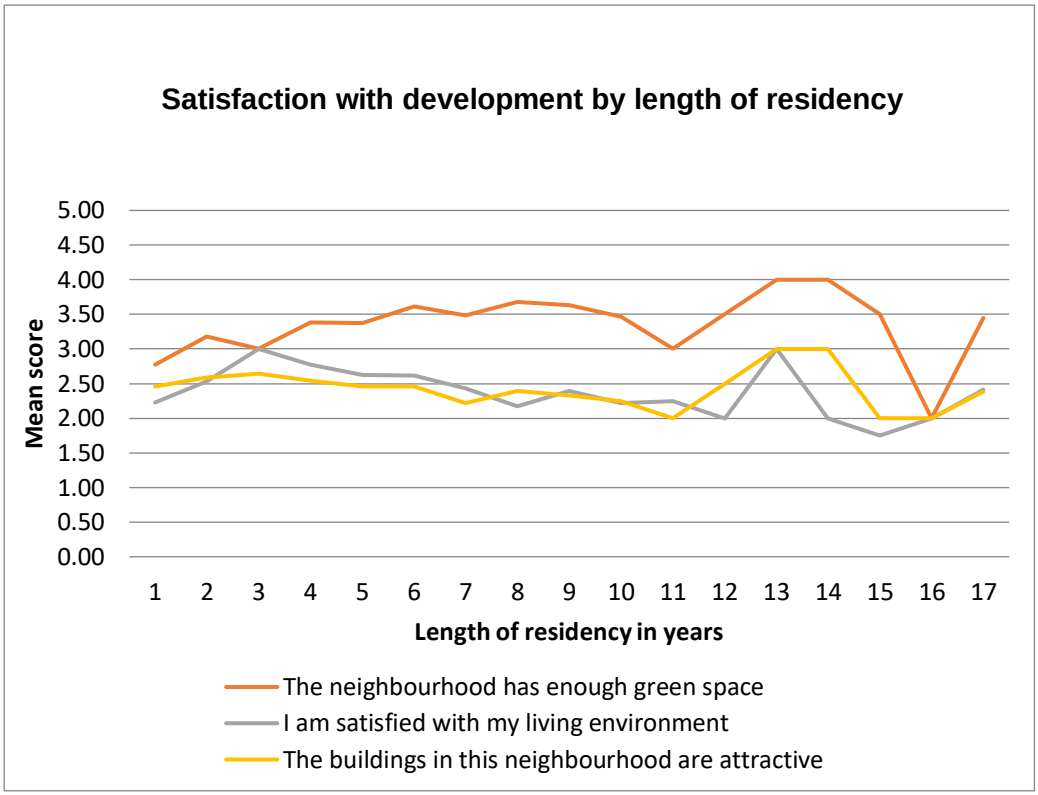



Figure 7-13: Satisfaction with development by length of residency

No length of residency effect is found for urge to move out or for finding the neighbourhood annoying. There was also no clear evidence for a consistent increase in attachment to neighbourhood the longer a respondent had been resident. The mean score for one-year residents is 2.38 (n=13) while for ten-year residents it is 2.31 (n=32) indicating only a very minor increase in attachment.

The analysis tests the assumption that contact with neighbours and residents increases in line with length of residency. Figure 7-14 indicates a small but consistent trend towards greater contact from 1 year through to 10 years. The consistency ends from the 11$^{th}$ year due to the small number of cases in the sample (n=18).

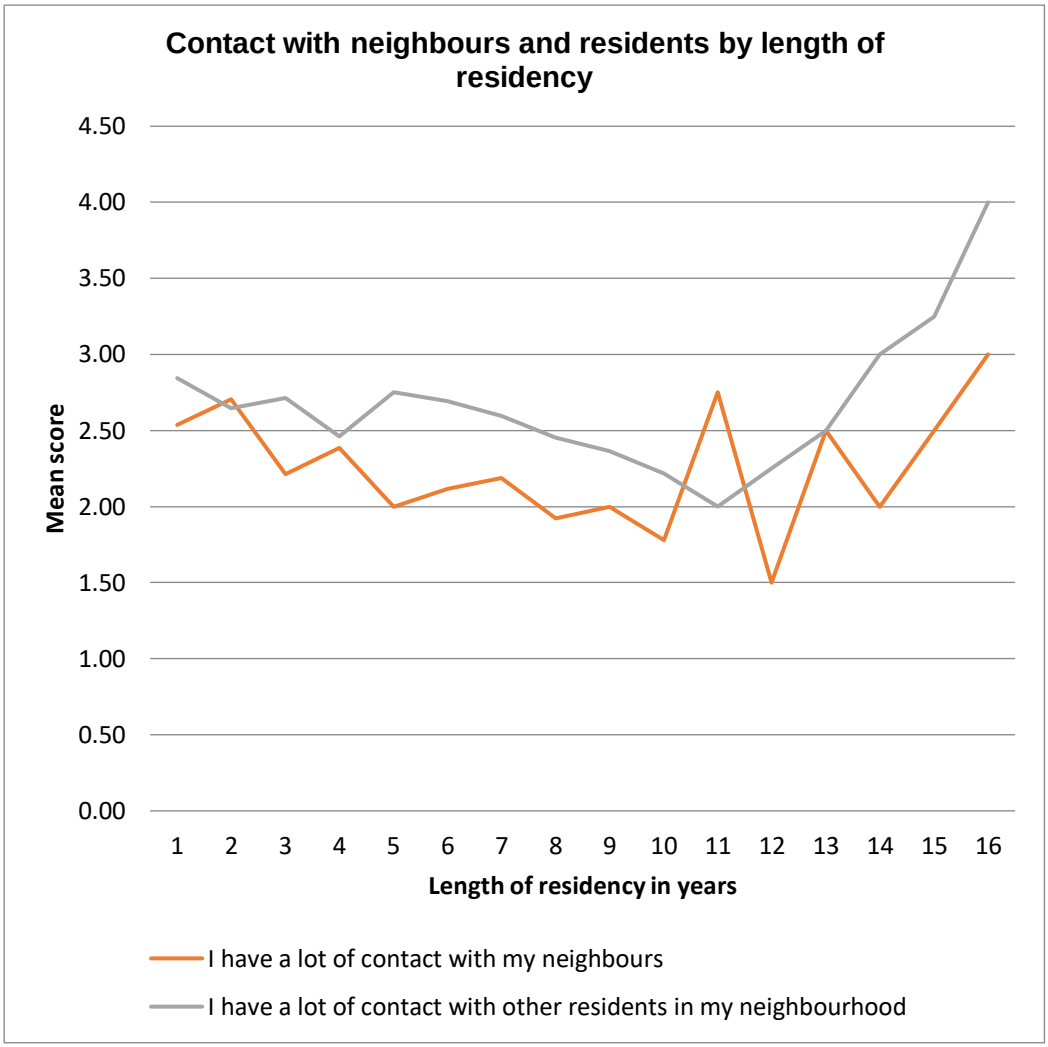



Figure 7-14: Contact with neighbours and residents by length of residency

Figure 7-15 shows a small but consistent increase in satisfaction across four social climate items from 1-year residents through to 10-year residents. Consistency ends from the 11$^{th}$ year due to the small number of cases of residents resident between 11 and 16 years (n=18).

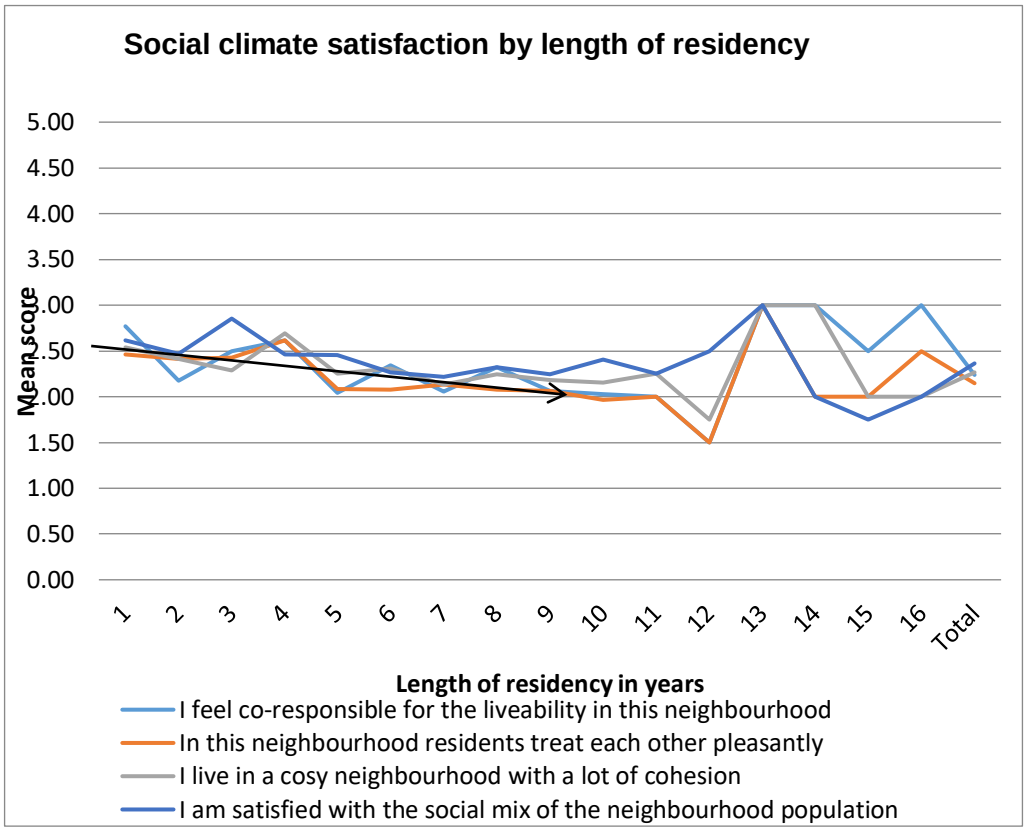



Figure 7-15: Social climate satisfaction by length of residency

Overall a small length of residency effect can be found on some but not all items where greater satisfaction is found among those who have lived their longer. After 10 years of residency the results are not reliable due to the small number of cases.

### 7.5 Comparisons between developments

The final set of analyses measure satisfaction at the five research sites and compares the results to see if there are differences or similarities. Before this analysis a summary profile of each block is shown in Table 7-18: A summary profile of each block.

Table 7-18: A summary profile of each block

| Block Name | Block A | Block D | Block 102 | Kg Limau | Pantai Dalam |
|---|---|---|---|---|---|
| Year of completion | 2008 | 2009 | 2001 | 1999 | 2007 |
| No. of blocks in Development | 3 | 3 | 2 | 2 | 4 |
| Number of floors | 18 | 18 | 22 | 17 | 17 |
| Units per floor | 12 to 20 | 12 to 20 | 24 | 16 | 16 |
| Total number of units in block | 316 | 316 | 396 | 272 | 272 |
| Number of units in development | 348 | 948 | 948 | 544 | 1264 |
| Internal or external corridors | internal | internal | internal | external | external |
| Standard unit size in Sq. Ft. | 650 | 650 | 650 | 650 | 650 |
| Owner occupation % | 25 | 41 | 34 | 30 | 25 |
| Mean length of residency | 7.2 | 7.8 | 6.6 | 7.1 | 6.3 |
| Mean number of cars | 0.96 | 0.84 | 0.77 | 1.00 | 1.03 |
| Mean number of motorbikes | 1.14 | 0.96 | 0.87 | 1.29 | 1.30 |
| Mean household size | 5.0 | 5.0 | 4.6 | 5.1 | 4.8 |

### 7.5.1 Satisfaction with flat

Three items on satisfaction with flat were cross-tabulated with block and produced the results shown in Figure 7-16 whereby the higher the mean score the lower the level of satisfaction. Some significant differences were found. Overall Block 102 showed the lowest level of satisfaction on all three items. A mean score at Block 102 of 2.84 (n=56) on the item “I am satisfied with my flat” compared with a mean score of 1.96 (n=56) at Block A indicating that within the PPR there was significant variation in levels of satisfaction with the flat.




Figure 7-16: Satisfaction with flat by block

Block A and Block D returned near identical scores which is a positive indication for the reliability of the survey because these two blocks are identical, being part of the same development at Jl. Pantai Permai.

### 7.5.2 Satisfaction with wider development

Three items tested satisfaction with the wider development, specifically satisfaction with the living environment, the amount of green space and the aesthetics of the buildings. The higher the score the lower the satisfaction. As Figure 7-17 shows there was consistent dissatisfaction with the amount of green space, with Kg Limau the most dissatisfied, with a mean of 3.84 (n=56) compared to a mean of 3.45 (n=280) for the whole sample. On the other two measures results were consistent across the five blocks with marginally more dissatisfaction reported at Block 102.

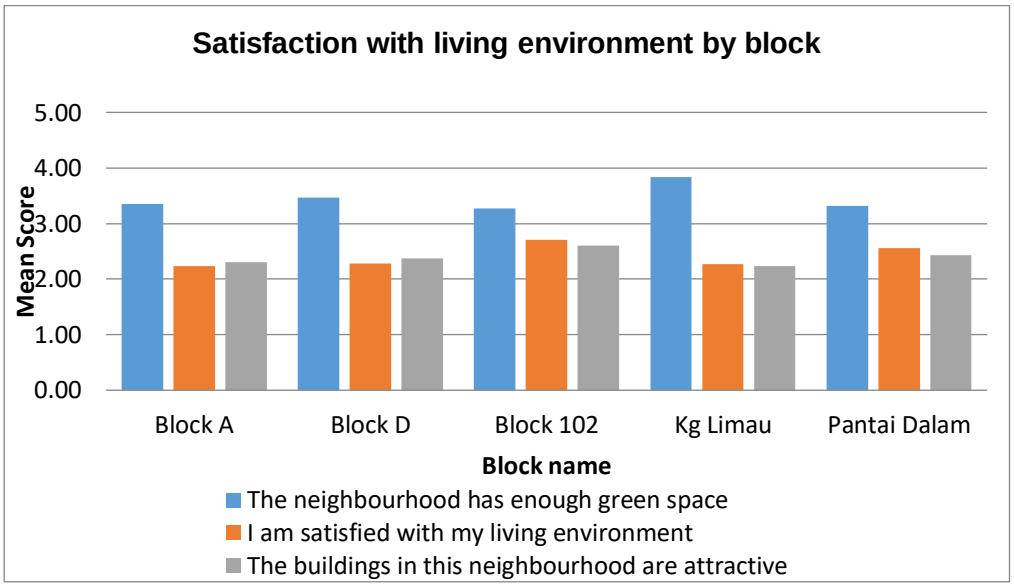



Figure 7-17 Satisfaction with living environment by block

### 7.5.3 The desire to stay or go

Two items enabled analysis of the desire to stay or go (see Table 7.19 and Table 7.20). One item had the statement “Living in this neighbourhood is annoying” and the other the more unequivocal “I feel an urge to move out of this neighbourhood”.

For the total sample the milder ‘annoying’ item gained agreement or strong agreement from 24.3% (n=68) but this figure reduced to 15.4% (n=43) for the move out item. Concerning block comparisons there was an anomalous result on the two items. The qualitative study revealed many different sources of annoyance from antisocial behaviour to parking and lack of cleanliness and maintenance. Block A and Block D had the highest number of annoyed residents (n=18, 21 respectively) but few feeling the urge to move out (n=6, 7 respectively). In contrast, Block 102 had 10 annoyed residents but 15 feeling the urge to move out.

Table 7-19: Living in the neighbourhood is annoying

**Crosstab**

Count

| | | Living in this neighbourhood is annoying | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Strongly agree | Agree | Neutral | Disagree | Strongly disagree | |
| Type of Block | Block A | 0 | 18 | 12 | 21 | 5 | 56 |
| | Block D | 1 | 20 | 12 | 20 | 3 | 56 |
| | Block 102 | 0 | 10 | 18 | 26 | 2 | 56 |
| | Kg Limau | 0 | 8 | 15 | 30 | 3 | 56 |
| | Pantai Dalam | 2 | 9 | 14 | 30 | 1 | 56 |
| Total | | 3 | 65 | 71 | 127 | 14 | 280 |

The results indicate that it is possible to have satisfaction with the unit and the development but still have reasons to be annoyed such as those revealed in the qualitative study.

Table 7-20: I feel an urge to move out of this neighbourhood

**Crosstab**

Count

| | | I feel an urge to move out of this neighbourhood | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Strongly agree | Agree | Neutral | Disagree | Strongly disagree | |
| Block Name | Block A | 1 | 5 | 5 | 26 | 19 | 56 |
| | Block D | 1 | 6 | 5 | 28 | 16 | 56 |
| | Block 102 | 1 | 14 | 18 | 23 | 0 | 56 |
| | Kg Limau | 1 | 5 | 7 | 25 | 18 | 56 |
| | Pantai Dalam | 3 | 6 | 12 | 30 | 5 | 56 |
| Total | | 7 | 36 | 47 | 132 | 58 | 280 |

Not one respondent at Block 102 strongly disagreed with the move out statement whereas the average of the other four blocks was 14.5 residents strongly disagreeing to this. At Block 102, 26.8% of respondents (n=15) agreed or strongly agreed with feeling the urge to move out indicating a significant problem at that block. For the other four blocks an average of one in eight residents reported an urge to move out, a markedly smaller issue.

### 7.5.4 Levels of contact

Two items collected data on the level of contact between firstly neighbours and secondly other residents in the neighbourhood. Higher combined mean scores indicated less contact. As with many other items Block 102 resulted in lower self-reported contact than the other blocks (Figure 7-18).

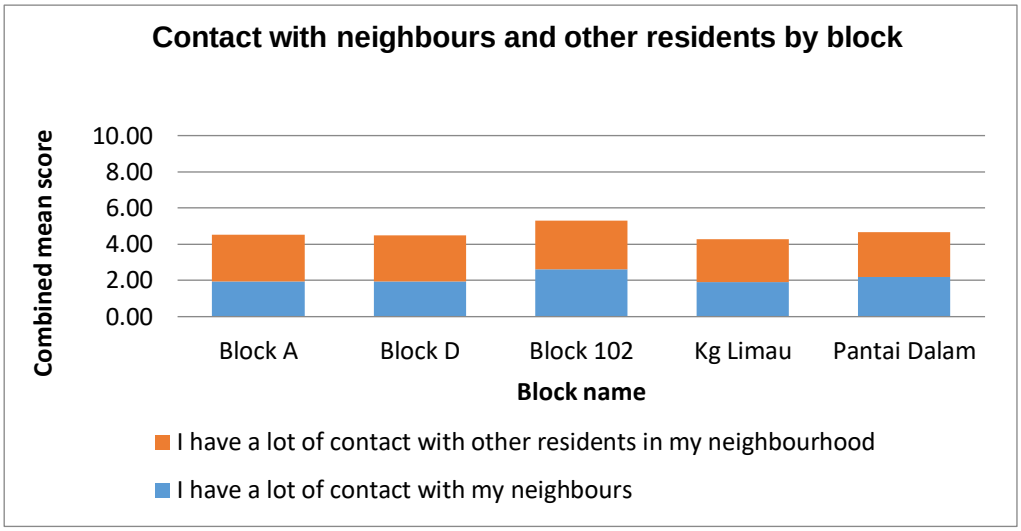



Figure 7-18: Contact with neighbours and other residents

On the social climate items, the results showed that significantly contrasting levels of satisfaction with the social climate exist among PPR residents in Kuala Lumpur. Overall there was a significant expression of satisfaction with the social climate at the blocks. For example, of the 224 respondents at Block A, Block D, Kg. Limau and Pantai Dalam not one disagreed or strongly disagreed with the statement “I live in a cosy neighbourhood with a lot of cohesion”; 5 disagreed at Block 102.

### 7.5.5 Satisfaction with the social climate

Across six social climate items Block 102 resulted in lower satisfaction each time. Higher scores indicate lower satisfaction. As Figure 7-19 shows Block 102 resulted in lower satisfaction across all social climate items included. To give a frequency example, at Pantai Dalam 51 respondents out of 56 agreed or strongly agreed to the statement “I feel at home in this neighbourhood”. At Block 102 only 26 out of 56 agreed or strongly agreed to the same statement.

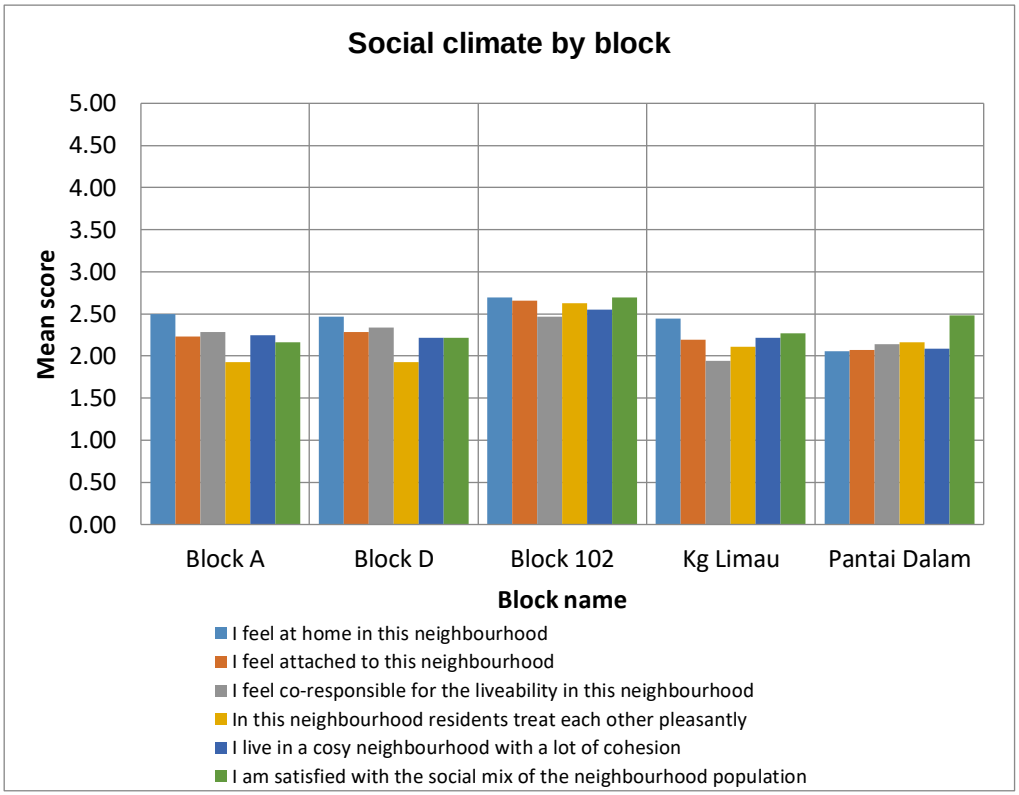



Figure 7-19: Social climate by block

The comparative analysis reveals generally lower levels of satisfaction at one block, Block 102, compared to the other four. As in Table 7- shows, the key difference between Block 102 and the other blocks is that it has more floors (22) compared to 17 at the other blocks.

### 7.6 Discussion

The two main aims of this discussion are to draw out the main findings of the quantitative study, compare them to the qualitative study and then situate the present study within other survey-based studies of low cost public housing in Malaysia.

The two main reasons for including a quantitative residential satisfaction survey was the need to seek further evidence on the social sustainability of LCHR housing to add to the findings of the qualitative study and also the evidence from literature that social sustainability is associated with residential satisfaction as this satisfaction is an expression of wanting to live in a given place which is part of the definition of social sustainability adopted in the present study.

Firstly, we can consider some points arising from the profile data collected. Two results in particular were noteworthy, concerning household size and vehicle ownership. The qualitative study suggested that residents of PPR blocks in Kuala Lumpur lived in above averagely large households. The 2010 national census reported a falling trend in average household size at 4.31 down from 4.62 ten years earlier. However, in Kuala Lumpur the figure had not fallen over that period and was substantially higher at 5.9 persons per household (Dept. of Statistics, Malaysia, 2011b). The present study reports an average household size of 4.9 persons significantly less than the average for the Federal Territory of Kuala Lumpur. The popular perception of PPR residents as raising unsustainably large families, something that surfaced in the qualitative study, is called into question by the survey results.

Car ownership in Malaysia has some exceptional features. A Neilson report entitled *The Nielsen Global Survey of Automotive Demand* reported that multiple car ownership was higher in Malaysia than any other country in the world with 54% of Malaysian households owning more than one car (Nielson, 2014). It is no surprise then that the qualitative study revealed that vehicle related issues were prominent in the mind of participants. What was surprising was that the survey found that only 12.8% of respondents lived in households with more than one car far below the national figure. There are three potential reasons for this discrepancy that suggest themselves.

The residents of PPR housing are by definition low income people and may not be able to afford more than one car. Secondly, the strategic location of the research sites at Kampung Kerinchi with its underground, light rail and bus and coach stations mean that residents can do without a car, either altogether or in favour of a motorbike. Thirdly, those households with one car already may be dissuaded from buying another due to the difficulty in finding a parking space for it. Whatever the reasons for the low rates of multiple car ownership the current study suggests that having more than one car per household would be highly problematic and that if multiple car ownership was at the national level the situation would be totally unsustainable. Further than this, measures to discourage multiple car ownership seem a good idea. As with household size, this result runs counter to the public perception that PPR households are not actually low income as they can afford multiple cars.

Turning now to residential satisfaction, the survey revealed a moderate level of satisfaction among the respondents and a near absence of strong dissatisfaction. To exemplify, only 7 out of 280 strongly agreed that they felt the urge to move out. Likewise, nobody opted to strongly disagree with “I am satisfied with my flat” and just 7.1% disagreed. These two results are clear evidence that PPR residents were not overall dissatisfied with their housing conditions. However, the qualitative study did reveal rich descriptions of a wide range of negatively perceived issues that had also emerged in earlier studies and in many cases could be directly confirmed through the field observations undertaken for the present study.

We can suggest possible explanations for the apparently greater dissatisfaction voiced at the focus groups compared to the survey. The focus group sample was self-selecting which may mean those with grievances to air were overrepresented. The sampling for the survey was partially randomised and

stratified by level so may be more representative. Alternatively, survey respondents may have been reluctant to record strong dissatisfaction for misguided fear of adverse reaction from the DBKL even though the survey was anonymous. A third possibility is that improvements had been made at the research sites between the time of the focus groups and the conducting of the survey though this seems unlikely and did not concur with the field observations conducted only 12 months before the survey.

Most likely seems to be the nature of the two methods used with residents, focus groups and questionnaire survey. At the focus groups the facilitator encouraged discussion of issues and participants were encouraged to follow up on the contributions of others. It is not surprising that the majority of the data generated concerned negatives. In contrast the survey was completed in private free of third party influences. Also, the survey items were designed to elicit responses indicating general satisfaction or dissatisfaction with the unit, the development, and the social climate. It did not offer the opportunity to express satisfaction or dissatisfaction with individual aspects such as the kitchen, clothes drying, the lifts, litter etc. whereas in the focus groups any issue could be raised. In sum, the two studies should not be viewed as contradictory but complimentary.

Turning now to situating the present survey with previous quantitative studies of residential satisfaction at low cost public housing in Malaysia. Comparing the present survey with earlier residential satisfaction studies is problematic as different instruments have been used. However, a tentative comparison is worthwhile. The earliest such survey was conducted by Sulaiman and Yahaya (1987). For satisfaction with the dwelling unit, 41% of respondents reported low satisfaction. In the present study, 71.2% agreed or strongly to the statement “I am satisfied with my dwelling unit” suggesting far greater satisfaction than the earlier study. Overall, Sulaiman and Yahaya (1987, p.37) found residents of

Dewan Bandaraya Kuala Lumpur to be “generally satisfied with their housing conditions and environment” a statement that could be associated with the present study. At the time of the 1987 study many residents had smaller units sometimes with just one bedroom and no separate toilet/bathroom or dining space (Sulaiman and Yahaya, 1987).

Penang and Terengganu were the research locations for a large sample survey (n=795) of residential satisfaction in low rise low cost housing built by the private sector (Salleh, 2008). Overall the author found that “the residents in both states were generally satisfied with dwelling units, services by developers and neighbourhood facilities and environment” (p.490). There is a suggestion made that where dissatisfaction was recorded it may have arisen though the private sector developer reducing costs to increase their profits at the expense of facilities and quality of construction (Salleh, 2008). However, some of the items of dissatisfaction could also be found in the present study where the private sector had not been involved.

For the period of the 8th Malaysia Plan (2001–2005), size and layout improvements were applied to the near 25,000 public low-cost units constructed during that plan. One study conducted with residents of the improved specification units was that by Mohit, Ibrahim and Rashid (2010) who surveyed a sample of 102 households at Sungai Bonus, a low-cost public housing development 20kms from the city centre. Overall, they found that respondents “perceived [a] moderate level of satisfaction … with their overall housing situation” (Mohit, Ibrahim & Rashid, 2010, p.23). Differences in methodology make direct comparisons with the present study problematic, however, we can tentatively compare low satisfaction among 37.3% in social environment in the 2010 study with 27.5% in the present study who disagreed (1.8%) or were neutral (25.7%) with the statement “I live in a cosy neighbourhood with a lot of

cohesion" (none strongly disagreed). Mohit, Ibrahim & Rashid (2010) reported that floor level and length of residency were both positively correlated with residential satisfaction. In the present study there was a small but consistent length of residency effect on satisfaction with social climate but not for satisfaction with unit or the development. Across the 18 satisfaction items in the present study, floor level appeared to have little effect on satisfaction.

In a study of medium and high cost public housing, Teck-Hong (2012) found a significantly higher level of satisfaction for owner occupiers compared to renters. In the present study of low cost housing a small but consistent tenure effect was also reported.

In the comparative analysis, consistently lower levels of satisfaction were reported at Block 102. Reviewing the focus group held at Block 102 participants highlighted problems with lifts, an absence of activities, lack of cleanliness, anti-social behaviour and crime and issues related to the size and layout of the unit. The survey results are consistent with the data collected at the focus group as this group reported a wide range of serious grievances which still appears to be reflecting in residential satisfaction levels. Far more Block 102 residents appeared to want to move out than at the other four research sites. The reported lack of activities at Blok 102 and the low satisfaction of the residents is in line with the findings of Cho and Lee (2011).

Cho and Lee (2011) also support the link between satisfaction and sustainability and in particular provide evidence that satisfaction is positively related to the provision of community spaces and programs with active resident participation. Goh and Ahmad (2011) conducted a questionnaire survey of 50 PPR residents at three different PPR developments of LCHR housing. In line with other studies they concluded that "Generally, low-cost dwellers are satisfied with the existing

PPR schemes" (p.17). They also reported that the gap between perceived degree of importance and reported satisfaction was greatest for public amenities and personal safety.

Hashim, et al. (2012) conducted a mixed methods study of residential satisfaction at four PPR developments at Selangor a state on the west coast of Peninsular Malaysia, encircling Kuala Lumpur. Unlike the present study these authors reported that "many residents wanted to move out from their house" (p.791) though the actual percentage was not given. In common with the other studies a general level of satisfaction was found, and it was tentatively suggested that overall density of the neighbourhood and/or household size were determinants of satisfaction. The higher the density and larger the household, the lower the satisfaction, the authors suggested (Hashim, et al., 2012). There was no significant evidence in the present study to support a household size effect.

## 7.7 Conclusion

In chapter four the targets and outcomes for low cost housing provision for each period of five-year national plans were discussed. However, policy success cannot be measured simply in quantitative terms equally important is the quality of life experienced by residents as expressed through residential satisfaction. This chapter has presented the results of a residential satisfaction survey conducted at five LCHR PPR blocks in the Kerenchi area of Kuala Lumpur. First a descriptive analysis was applied to the sample showing the tenure, vehicle ownership, household size, length of residency and level composition of the sample. After this there was an analysis of the overall levels of satisfaction for the sample. Next the results of a factor analysis aimed at examining the effect

of tenure, vehicle ownership, household size, length of residency and level on satisfaction are presented. Following this a comparative analysis is presented in order to examine whether significant differences existed between blocks. The results were then discussed.

The profile data revealed two results that questioned elements of the public perceptions of PPR residents. Household size was significantly lower than the average for Kuala Lumpur and multiple car ownership was much rarer. On overall satisfaction and in line with the other studies discussed earlier in this chapter, there was a generally positive level of satisfaction found and little evidence that the respondents were motivated to leave. The study gave some evidence for higher satisfaction among owner occupiers than renters but no effect was reported from floor level. Household size did not produce a significant effect, indeed larger households were more satisfied with their unit than small households. Length of residency did not affect satisfaction. Comparisons between the blocks revealed that differences in levels of satisfaction did exist and in particular one block, which was also the one with the most floors, had the lowest satisfaction across most measures.

In the next chapter the two studies are evaluated.

# Chapter 8 : EVALUATION - HOW SUSTAINABLE IS LOW COST HIGH-RISE HOUSING IN THE MALAYSIAN CONTEXT?

## 8.1 Introduction

Malaysia has had a growing and urbanising population in recent decades and policymakers' response to this in housing terms was clear - "There are two options to accommodate growth, building up or building out. Building out, or sprawl, brings long commutes, congestion and pollution as well as adverse effects on environmentally sensitive land" (10th Malaysia Plan p.251). In this chapter the overall aim is to evaluate whether this approach has proven to be the right one, or at least a sustainable one. In order to arrive at this point, the chapter will be divided into three main sections each covering one of the dimensions of sustainability – social, economic and environmental. I will draw on the findings presented in the previous three chapters, and where appropriate support my argument with the literature that was first discussed in chapters one through six. This is done to facilitate the most reliable possible answers to the questions set. After addressing the research questions separately, I then evaluate what this study has revealed regarding LCHR housing in Malaysia in terms of its sustainability as expressed in terms of the three dimensions – social, economic and environmental.

## 8.2 Findings evaluated under the three dimensions of sustainability

As discussed in chapter two the Brundtland Commission published the report 'Our Common Future' in 1987 and established the generally accepted principles

of sustainable development (WCED (1987). Sustainability was seen as having three dimensions – social, economic and environmental (Figure 8.1).

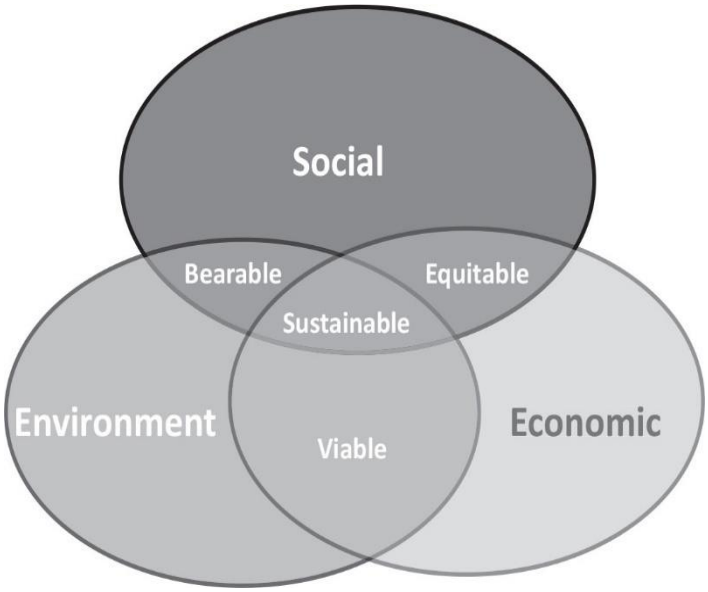



Figure 8-1: The three dimensions of sustainability

### 8.3 Social sustainability of low cost high-rise public housing

In chapter two it was discussed how sustainable housing was not only a matter of the environment and ecology but extends to social cohesion, citizen participation, sustainable communities. This approach to sustainable housing was also support by Premius (2005) in another review of literature. Furthermore, the quality of housing and the type of tenure (owned or rented) have an impact on these latter components of sustainability and in turn the long-term quality of housing environments is dependent on the standard of maintenance (Ariff, Rima & Davies, 2009).

The focus group study proved to be an effective way to study the social sustainability of LCHR housing. As presented in chapter six, the residents of the five developments featured in this study expressed informed views on a wide

range of issues related to their housing. These perceptions were particularly pertinent to the consideration of the social dimension of the sustainability of LCHR housing in Malaysia.

It should be restated that the participants were almost all former squatters, and this would affect their expectations. Secondly, it was also noted that the perceptions held were not uniformed across the five groups; residents of some blocks appeared more likely to report positive views than some others though this was not measured in any quantitative way until the questionnaire survey was undertaken. The survey did reveal that satisfaction was significantly less at on block (Block 102) than the other four. The two studies are aligned with the focus group revealing a particularly long list of issues at Block 102 the lifts, lack of activities, break ins, vandalism, theft, lack of cleanliness and absence of street lighting all mentioned.

### 8.3.1 Crime and insecurity degrades the social environment?

Having said this, the residents described a social environment characterised by crime and anti-social behaviour. We heard of the complete gamut of criminal activity from serious gang-related crime to petty theft. The kind of anti-social behaviour reported included dumping of household waste, promiscuity and drug abuse. The observation study discussed in chapter eight confirmed the widespread presence of graffiti, vandalism and urination.

The findings supported an earlier study by Mohit et al. (2010) whose residential satisfaction study set at a LCHR development just outside the city centre revealed that crime and security control had among the lowest habitability ratings, in other words, were one of the greatest sources of dissatisfaction.

This study provides further evidence of the amount of priority residents place on their personal safety and security and their desire to live in an orderly environment. Mohit, Ibrahim and Rashid (2010) found that the social environment (including crime and safety) was the most likely source of dissatisfaction among residents of LCHR public housing in Kuala Lumpur. Similarly, Goh and Yahaya (2011) measured residential satisfaction at post-1998 developed PPR housing in Kuala Lumpur and found that the most important factors highlighted by the respondents were safety and security. This study adds further evidence to this though the analysis of the qualitative data does reveal that the amount of prominence given to the issue of crime did vary widely from block to block.

Wilson and Kelling (1982) wrote, “if a window in a building is broken and is left unrepaired, all the rest of the windows will soon be broken.” Their ‘broken windows’ theory suggested that failure to tackle anti-social behaviour and low-level crime such as vandalism can lead to a ‘criminal invasion’ and higher levels of more serious crime. The residents in our study had a sense of being abandoned and of living in a lawless neighbourhood and the lack of maintenance appeared symptomatic of this. Drug dealing appeared widespread in LCHR public housing in Kuala Lumpur. The built environment design can assist in ameliorating perceptions of lack of safety and security but as some examples from the United States (Bloom, 2012 have shown the physical presence of ‘Authority’ is also critical.

This study provides further evidence of the amount of priority residents place on their personal safety and security and their desire to live in an orderly environment. Mohit, Ibrahim and Rashid (2010) found that the social environment (including crime and safety) was the most likely source of dissatisfaction among residents of LCHR public housing in Kuala Lumpur.

Similarly, Goh and Yahaya (2011) measured residential satisfaction at post-1998 developed PPR housing in Kuala Lumpur and found that the most important factors highlighted by the respondents were safety and security.

The Eleventh National Plan covering the period from 2016 to 2020 announced that public security would be a key focus area during that period (Economic Planning Unit, 2015). This study revealed a sense of abandonment among residents of LCHR housing in Kuala Lumpur so the government's intention to establish "omnipresence" would appear highly appropriate, although it is too early to evaluate the impact of this.

### 8.3.2 Sense of community

Is it possible to have a sense of community in a LCHR housing development?

One the one hand, the qualitative study tends to confirm that high-rise living creates patterns of social interaction that mitigate against a sense of community. However, the social climate items on the survey suggest that the blocks were not entirely without such a sense of community with, for example, at Pantai Dalam 51 respondents out of 56 agreed or strongly agreed to the statement "I feel at home in this neighbourhood".

There is also support for the assertion that the adequate provision of communal spaces including green spaces can help to generate patterns of interaction which are indeed capable of engendering a sense of community. Yuen (2011, p.140) asserts that "Public spaces provide conduits where people-to-people relations may form as residents go about their daily activities." The observation study found that social interaction took place at sheltered ground level areas particularly including older residents and with more males than females. Four

out of five locations had such a ground level seating area. At the one block where none was observed the shop and the area around it together with the lift lobby seemed to be a place of social interaction. Further interaction took place in shared corridors outside the units and ground level pathways. The survey study found that the provision of green space resulted in the lowest levels of satisfaction emphasising its importance.

In the qualitative study we heard that residents may not even know their own neighbours there was potential for but no real evidence of inter-ethnic problems. In fact, conflict seemed to have a more generational basis with older residents mistrustful and disapproving with the youth's contribution to life on the developments. The focus groups revealed instances where older residents felt unsafe and trapped in their units. This supports Rollwagen (2016, p.381) who expressed concern that "individuals become physically and socially isolated from the surrounding neighborhoods." The results of the survey, however, showed little support for the perception expressed of neighbours not knowing each other, although what support for it there was was highest at Block 102.

Appold (2010) reminds us that the literature on community in high-rise residential buildings has tended to focus on those aimed at and occupied by the poorest groups in society and indeed this is true of the current study. When economically poor residents combine with poor quality housing then, argues Appold, you are unlikely to have a successful outcome whether it is high-rise or not with "the least desired people found in the least desired housing" (2010, p.165). The inference here is that high-rise housing may not be inherently lacking in community or destined to always be a hotbed of crime but that when constructed at low cost for low income groups it may well be. The qualitative study found evidence of both social interaction opportunities being taken up when they were available, even if rudimental, but also the daily rejection of

community through countless acts of anti-social behaviour. Based on the focus groups, the most prominent factor dividing the residents appeared to be age.

Cho and Lee's (2011) conceptual model introduced in chapter four put the creation of a sense of community at the heart of sustainable high-rise living and argued that this can be developed through community spaces, community programmes and residents' participation. The current study can be seen as supportive of this view in that it has explored and revealed the extent of the lack of sense of community not just expressed directly through the voices of residents but also in the consequence of this deficiency in terms of the crime and anti-social behaviour referred to throughout the findings.

The development of community has numerical limits according to the experts who argued that LCHR needed to be 'more spread out' (i.e. lower density). Unfortunately, this step to increase a sense of community may be in direct conflict with the economic sustainability goals of the PPR programme. Simply put, LCHR housing makes the most effective use of the scarce resource of land when, which cannot be matched by, for example, terraced housing. The alternative, according to the Malaysian government, is urban sprawl which is viewed as environmentally undesirable not least because of the long commuting journeys it causes.

### 8.3.3 A problem of management: the sense of abandonment

A number of factors revealed in the data created a sense of abandonment among residents. These included personal experience of difficulties in getting reactions from the development managers (City Hall), perceptions of inadequate maintenance arrangements and even a perceived lack of care

The concern among residents at FG3 about the Certificate of Fitness from the Fire Department confirms a much earlier finding of Haber (1977) who found that high-rise living was associated with fear over fire safety.

There are signs that DBKL is becoming more proactive in establishing a presence of 'authority' at the PPR developments. To address crime and anti-social behaviour the DBKL has started a programme of CCTV installation under which cameras would be installed in lifts, at waste collection areas, parking areas and other secluded places (Wahida, 2014). In addition to this, there are more instances of tenants being evicted for abuse of the public housing provision. This abuse can take the form of tenants not surrendering their units when their incomes exceed the qualifying threshold, or renting out units they have vacated because they had bought their own home (The Sun Daily, 2014).

It appears that it is not just the DBKL who have appeared to have been unable to put proper maintenance arrangements in place. Media reports recently highlighted the deaths of two children in Selangor who fell through unrepaired railings at PPR flats in Petaling Jaya (Ch'ng and Nathan, 2015). In the survey study there was some evidence to suggest that residents did not feel that all their woes could be laid at the door of the DBKL and that they understood that the liveability of the neighbourhood also depended on the actions of the residents themselves.

### 8.3.4 An inflexible solution

Units built under PPR such as the ones at the developments examined in this research are built to a standard design and size. The starting point for this design is the average household size. As reported in chapter seven for the

Federal Territory of Kuala Lumpur, the average household size was reported as 5.9 persons compared to the 4.9 people among the PPR residents of the present study. The survey therefore disproved the perception arising from the focus groups and expert interviews that PPR housing was home to unusually large households. However, that is not to say that there are no large households at all. Of the 280 respondents 49 lived in households of 7 or more which may be difficult to accommodate in a standard PPR unit.

In the qualitative study both the residents and experts revealed that the units built under PPR were perceived to be often a mismatch with the needs of occupants with the most common reason for that being that families were too large to be accommodated satisfactorily. In contrast, the survey showed no effect on unit satisfaction from household size.

Matching public housing provision to the needs of users is highly problematic. Demand for public housing always tends to exceed supply and ensuring a fit between the users' household and the provision is difficult. In the UK moves to match this provision has proved to be one of the most controversial political issues of the last decade. The government introduced a financial penalty for public housing users living in a home with more than the legally required number of bedrooms. Official policy statements explained:

> There is a shortage of social housing across the UK and this change helps to make the best use of our limited social housing. This change helps families who live in overcrowded accommodation to find a new home and helps reduce the number of people on waiting lists. (Department of Work & Pensions, 2013).

In Kuala Lumpur there appears to be a need for a mechanism whereby flexibility is introduced to the system – to enable residents to move between different

sized units as family circumstances change – this will make better use of the public housing stock.

### 8.3.5 Owner occupation, mixed communities and social sustainability

Azizah Salim (1998) argued that owner occupiers of public housing stock are likely to seek to transform their houses either to provide better living accommodation to their family or as an investment ahead of selling the home. Salim sees the presence of owner occupiers in low cost public housing as a good thing, but elsewhere private ownership of low cost housing built by the public sector has been criticised as going against the principles of social housing. In the survey study there was a small tenure effect with higher satisfaction being associated with owner occupation on some items.

The PPR housing programme was introduced primarily to address the squatting problem Kuala Lumpur was experiencing at the time. Most of the participants in the focus groups were former squatters who had arrived at the PPR developments via often lengthy stays at long houses. As well as a roof over their head these squatters needed to be brought into the social infrastructure of the city, including access to employment and to public services. On this measure, based on the results of this study it can be concluded that this has happened to a satisfactory degree. Having said this, there remain question marks over whether these PPR developments can be described as sustainable communities. We could here reflect back on the definition of a sustainable community which was adopted in the UK:

> Sustainable communities are places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all. (Department of Communities and Local Government (UK), 2005, para 4)

On this definition the only conclusion that can be reached based on the findings of the qualitative study is that LCHR public housing developments in Kuala Lumpur do not constitute sustainable communities. The diverse needs of residents seemed unmet due to the rigid provision and the residents cannot be said to be enjoying a high quality of life. The sites in this study were neither particularly safe nor were they inclusive as evidenced by the lack of a sense of community. The development projects were reasonably well planned although within tight constraints. The construction was of reasonable standard but post-completion management has, according to this study, been haphazard. Whether we can apply the equality of opportunity criterion is doubtful and the services available may not be ideal but for the ex-squatters they probably represent a great improvement. The survey study qualified the findings of the qualitative study to the extent that there was only a limited number (15.4%) of residents who indicated a desire to move away. On balance, it appears that social sustainability may be possible for LCHR housing in Kuala Lumpur provided that certain best practices are adhered to. The following and final chapter includes a framework of best practices to this end.

### 8.4 Economic sustainability of low cost high-rise public housing

Most of the positive aspects of LCHR housing are associated with their economic sustainability. This sustainability is based on the high-density nature

of such housing which enables policymakers to meet housing needs with a minimum of land use which in turn contains urban sprawl and preserves green spaces which may have been taken up by low rise developments (Appold, 2010). While at this most general level there is evidence of the economic sustainability of public sector LCHR housing, at a more detailed level this study found that the economic basis on which the LCHR housing in Kuala Lumpur has been developed is shakier. Firstly, architects argued that the caps set on the costs per unit preclude the achievement of anything other than very rudimental environmental sustainability. From the missed targets reported in chapter four to the views expressed in by our experts which emphasised the lack of enthusiasm for low cost housing among private developers and the poor enforcement of agreements by governments with such developers there is little evidence that the private sector will transform the economic sustainability of LCHR housing. Though with proper contractual enforcement backed up by financial penalties it may be possible to plan mixed developments in the future.

If it is the density the makes it economically sustainable then this same factor may be the key causal factor in making LCHR housing socially unsustainable. In the expert interviews architects suggested that beyond 10 floors a sense of community is increasingly hard to maintain.

Post-occupation treatment of LCHR housing by both residents and the providers leads to rapid degradation, public stigmatisation of these developments and reduced or no capital growth in the assets. From the residents' side this mistreatment takes the form of failure to maintain their units, vandalism and other anti-social activities including crime as well as, in many cases, the failure to pay management fees. The providers, in this case the DBKL also contribute to the degradation by failing to maintain the developments and their facilities and also failing to provide a secure environment.

Housing provision for low income urban groups is essential to support both city and national economies. In Malaysia as well as in other countries engaging the private sector in low cost housing development has proven problematic, the performance against targets in the national plans published by the Malaysia governments show this. Specifically, in Kuala Lumpur, this study has revealed that the economic sustainability of LCHR was being undermined by a range of factors including residents' non-payment of maintenance charges or even the rent itself, non-residents buying units and sub-letting them.

One possible measure of the threat to the economic sustainability of LCHR housing in Kuala Lumpur is the fact that the gap between the cost of a unit at a PPR development and the and average market prices has and continues to grow exponentially. PPR LCHR units are sold for between RM30,000 and RM35,000. However, recent data show that the average price of a high-rise apartment in Malaysia is RM296,826 (higher still in Kuala Lumpur) (Global Property Guide, 2016). Such a distortion creates incentives for unscrupulous speculators including those who may sublet to non-citizens or who may for other reasons not qualify for such public housing. The low sales price and low rental payments also put downward pressure on the funds available for maintenance and improvements.

The field observations confirmed what some residents and experts had mentioned about parking problems (i.e. there were more cars than designated parking bays). It seemed that even though PPR LCH provision was for the lowest income citizens of Kuala Lumpur, the overflowing parking capacity (set by DBKL at 1 space per unit + 10% to cover visitors) showed that many households had more than one vehicle and the satellite dish covered exterior walls suggest many subscribed to Astro or similar. The survey revealed, however, that while there was some multiple car ownership, in fact the average

number of vehicles per household was less than 1. This suggests further examination of what is causing the problem should be undertaken.

There is still at least a strong perception that for LCHR housing to be economically sustainable there have to compromises which will inevitably limit the environmental sustainability of such developments. The simulated GBI evaluation undertaken for this research and reported in chapter eleven revealed a modest assessment in environmental terms. As already hypothesised, it is entirely plausible that the very limitations that are making LCHR housing economically sustainable are endangering its environmental sustainability.

Nevertheless, despite these deficiencies and question marks over the economic sustainability of LCHR housing the overriding fact that such provision has been part of policy and national budgeting in some form since the nation's independence is an indication that such programmes are economically sustainable at a national level. Furthermore, the basic fact of high-rise being an economically efficient use of scarce city centre land will always remain true.

### 8.5 Environmental sustainability of low cost high-rise public housing

The Tenth Malaysia Plan (2010, pp. 252-254) made it clear that environmental concerns were behind the continued preference for LCHR housing. Cities were to be "compact and efficient" rather than allowing urban sprawl which would lead to commuting and hence increase pollution. This may be so, but the current study suggested that these centrally located developments had not resulted in a shift from private transport to public transport as one of the key findings of the study was the swamping of the ground level areas with cars and motorcycles,

or perhaps put another way the inadequate supply of parking facilities which created such an impression.

The GBI-based evaluation of one of the five sites included in this research, the findings of which were presented in chapter six, showed that PPR high-rise developments could barely be described as ‘green’. Energy efficiency scored poorly (8 out of 23 marks) and water efficiency was adjudged to be even less optimal scoring just 3 out of 12. While this assessment was on just one site by only one assessor, the commonalities from one development to the next in terms of cost limitations, design template and limitations on greenscape suggest that results would be similar across Kula Lumpur.

A 2009 study investigated levels of awareness of the concept of sustainable construction amongst Malaysia’s developers. It found that while there was a general increase in awareness there was only minor implementation effort taking place in this group (Abidin, 2009). Another deduction was that these developers saw sustainability in the construction sector as a matter of environmental protection without social or economic dimensions (Abidin, 2009).

We learned from the qualitative study that architects have a negligible role in the planning and design of LCHR housing which is governed by cost constraints. However, a side effect of this is to stifle innovation which could increase the environmental sustainability of these developments.

From the current study we cannot conclude that LCHR housing is definitely environmentally unsustainable and improvement to design and practices could feasibly enhance the relatively modest environmental performance. Permitting greater input from architects would be one step in the right direction.

### 8.6 Summary

It simply not inconceivable that sufficient resources will be available to demolish and replace the existing stock of public LCHR housing both for purely financial reasons and policy objectives. It may also not be necessary or even desirable, after all the developments in this study were relatively new, being completed between 2000 and 2009.

Bloom's statement about public housing in the United States that high-rise public housing is viable "provided that sufficient attention is paid to design, tenancy, financing, and social control" (2012, p.418) could well be reapplied to Kuala Lumpur. However, each of these comes at a cost – remember the New York City Housing Authority once deployed its own public housing police force which at one time exceeded 2700 officers in manpower. It has since been merged with the NYPD (Bloom, 2012).

The PPR housing programme was introduced primarily to address the squatting problem Kuala Lumpur was experiencing at the time. Most of the participants in the focus groups were former squatters who had arrived at the PPR developments via often lengthy stays at long houses. As well as a roof over their head these squatters needed to be brought into the social infrastructure of the city, including access to employment and to public services. On this measure, based on the results of this study it can be concluded that this has happened to a satisfactory degree.

The voices of the residents and experts in the qualitative study painted a rich but also troublesome picture of life in a LCHR PPR development and yet the survey revealed modestly positive levels of satisfaction. This could be the self-selecting nature of the focus groups where the less satisfied were the most

motivated to attend. However, many of the issues raised by the residents were confirmed by the field observations.

In summary, LCHR housing in Kuala Lumpur is economically sustainable, environmentally somewhat neutral and socially the picture based on the present research is mixed with the qualitative study suggesting so many social issues as to be unsustainable but the survey study presenting a more stable and moderately positive outlook.

In the final chapter, the conclusions of this study are summarised and a set of best practice recommendations for policymakers and designers are presented.

# Chapter 9 : SUMMARY CONCLUSIONS AND RECOMMENDATIONS

## 9.1 Summary

In CHAPTER ONE I set out the background to the current research study and explained that the aim was to enhance understanding of the potential for LCHR housing as a solution to the challenge of housing Malaysia's urban low-income groups as well as evaluating to what extent this solution could be viewed as sustainable. The research questions were set which would act as delimitations for the entire study. The significance of the study was explained. It was argued that this lay not just in the academic interest in understanding this key aspect of the built environment but also in its recommendations for design parametres that can be taken up by the builders of affordable high-rise housing. The chapter ended with a description of the structure of the thesis chapter by chapter.

CHAPTER TWO was presented in two parts. The first focussed on sustainable development and, in particular, how the concept evolved from the 1960s to the present day. The first part also established and discussed the three dimensions of sustainable development - the social, the economic and the environmental. These dimensions would be remembered and applied throughout the research. In the second part attention turned to sustainable housing and the way that the built environment was increasingly having quantifiable measures applied to it to establish to what extent it can be described as sustainable. The relationship between the built environment and the environment as a whole was discussed. Of particular interest here was the Green Building Index as it was an assessment tool developed in Malaysia and the GBI would be returned to later in the thesis in the presentation and discussion of the findings of this research.

CHAPTER THREE comprised an analysis and discussion of the emergence and development of high-rise housing around the world. As Malaysia aspires to reach developed nation status in the near future, the chapter examined the experience of four developed nations - the UK, Germany France and the US – in order to see what lessons could be learned for Malaysia. It was established that the early hopes for LCHR housing in these countries had, more often than not, not been realised. A more hopeful picture was seen in Asian cities like Hong Kong and Singapore, though not necessarily at the low-cost end.

CHAPTER FOUR was presented in two parts. The purpose of part one was to discuss the Malaysian context and all aspects of that context which present a backdrop to housing and housing policy. This included natural factors of climate and natural disasters to social ones such as urbanisation and other environmental stresses and pressures. There is analysis of what the government has put in place to incentivise sustainable housing and to close the chapter some high-level data was presented on number of dwellings, average size of households and the prevalence of certain materials and facilities. The aim of the second part was to present a chronological account of the history of low cost housing policy in Malaysia from 1950 to the present day. This part was organised into 5-year planning periods and gave details on the number of units added to the low cost housing stock in each period. It was established that the Malaysian government had had a consistently poor record of achieving their own targets for low cost housing provision which may be partly attributable to the lukewarm attitude of the private sector. The second part ended with a discussion of the concept of residential satisfaction and an overview of a number of relevant empirical studies.

CHAPTER FIVE explained the research methodology used in the current study from the research paradigm underpinning it to the research design and then

moved on to a description of how the data was collected and analysed. The ethical considerations which arose from this research were also discussed.

CHAPTER SIX presented and discussed the findings of the qualitative study drawing together multiple data sources in order to achieve a triangulated understanding of the sustainability of LCHR housing in Kuala Lumpur. The transcripts of the residents' focus groups and expert interviews were analysed using Computer Assisted Qualitative Data Analysis Software to establish a series of headings under which the findings were presented. This data was supported by photographic data from researcher field observations and data collected by and from a GBI consultant. It was found that despite having modest expectations as a result of being, in many cases, former squatters, the focus group participants held largely negative perceptions of the sustainability of LCHR housing particularly along the social dimension, with crime and anti-social behaviour prominent. Issues arising from the 'one size fits all' approach including overcrowding in units occupied by large families were also in evidence as were the problems caused by inadequate and inconsiderate parking of both cars and motorbikes. Expert interviews (three architects and one politician) revealed perceptions that high density LCHR housing was not a sustainable housing solution. There were indications that some improvements had been made in newer developments. Among the reasons given for unsustainability were the lack of flexibility in the provision in terms of number of bedrooms and overall size of units; the financial basis of the PPR programme including the widespread non-payment of rent, finance repayment instalments and service charges; the inadequate provision of facilities; the crime and anti-social behaviour consequences of such high density living.

CHAPTER SEVEN presented the results of a quantitative survey study undertaken at the same five PPR blocks that hosted the focus groups and field

observations. Statistical analysis began with a descriptive analysis of the sample itself. This was followed up with the results for the overall satisfaction levels reported. After this, bivariate analysis was reported to examine whether the variables of length of residency, tenure type, level (floor number) and household size have an effect on satisfaction. This is then followed by a discussion of the results. Overall the chapter reported higher levels of satisfaction and less desire to move away than the focus groups has suggested might be the case.

CHAPTER EIGHT aimed at evaluating the overall study, in particular the findings of the qualitative and quantitative studies. This was presented under the three dimensions of sustainability – social, economic and environmental. The research design meant that the first of these predominated. It was found that while it could not be proven that LCHR housing was economically unsustainable and also while the environmental sustainability was at best modest, the study found that based on the triangulated data LCHR housing in Kuala Lumpur as exemplified by the PPR programme was potentially sustainable but that there were an extensive set of actions and practices required to realise this potential.

## 9.2 Conclusions

Sustainable buildings clearly have a vital role to play as Malaysia strives to achieve its sustainable development goals and commitments. To be sustainable a building must satisfy the three dimensions of sustainability – economic, social and environmental.

The evaluation in the previous chapter demonstrated that seeking to satisfy the three dimensions of sustainability in order to reach the sustainable position at the heart of the Venn diagram (Figure 8-1) is highly problematic. Steps to increase social sustainability (e.g. reducing density) can undermine economic sustainability; moves to achieve economic sustainability can limit achievement of environment sustainability, it is a difficult balance and this difficulty is by no means restricted to Malaysia.

It is in the area of social sustainability that this study raises the greatest concerns. A wide range of social problems were revealed that almost justified the label *dysfunctional*. The sense of abandonment and absence of authority that the study revealed is particularly worth highlighting. Yet the quantitative survey revealed that residents were more satisfied than dissatisfied and that there was little in the way of desire to move away.

For economic sustainability it can be concluded that the simple longevity of housing programmes such as the PPR is an indication that despite the financial/ economic problems identified in this study over the long term LCHR housing has proven to be economically sustainable. Though, it should be said, this sustainability is based on the government allocating sufficient funds to these programmes. Hence sustainability is reliant on the government continuing to be able to provide such funding and so ultimately on the state of the Malaysian economy.

The fundamentals of high-rise solutions will always remain to preserve its economic sustainability. LCHR housing offers space optimisation, lowers the cost of public infrastructure and maximises value for money from scarce land resources but against this is the questionable social sustainability of high density neighbourhoods.

### 9.2.1 Reviewing the research objectives and questions

In the first chapter the research objectives and research questions were set. These are now briefly reviewed.

*Research objectives*

- To provide a summary of the current knowledge base on the subject in the form of a review of literature first on the concept of sustainability and second on how sustainability is being applied in current design approaches and parameters in the Malaysian context.

Following the introductory chapter three chapters presented a comprehensive discussion of literature on three aspects of the research area – the development of the concept of sustainable development and its application to housing; the history of and issues related to high-rise housing; and the Malaysian context of the present study including low cost housing policy.

- To develop a methodological framework for the research which is designed to collect reliable and valid data relevant to the research questions and facilitate the systematic analysis of this data.

In chapter five the methodological choices made by the researcher were presented and discussed. The research design enabled the researcher to collect both qualitative and quantitative data and to achieve person triangulation by collecting data from subjects with different relations to the research problem, i.e. residents, experts such as architects, a politician, and a green building assessor. This multi-dimensional triangulation added to the validity of the research.

- To give voice to the perceptions of the residents and providers in the setting.

A combination of focus groups and interviews gave both residents and providers an opportunity to voice their perceptions of a wide range of issues related to LCHR housing and how they were experiencing it.

- To evaluate this study's findings using both existing literature and the findings of other studies.

Chapter eight discussed and evaluated the finding presented in chapters six and seven. Through the chapter a wide range of sources are used to substantiate, contrast and generally shed light on the findings of the present study.

- To reach conclusions and make recommendations for both practice (specifically improvements to current and future LCHR housing in Kuala Lumpur) and for further research in this field.

This chapter reflects on the thesis in its entirety and draws the final conclusions on the research questions. A framework of recommendations for best practices (Table 9-1) is also included in this chapter.

- To assess the overall suitability of high-rise solutions to the joint objectives of providing affordable housing to low income groups while achieving ambitious sustainability targets.

On the question of whether or not LCHR public housing can be a sustainable solution to the housing needs of Kuala Lumpur's low-income groups, the thesis concludes that while economic and environmental sustainability can be associated with this form of housing provision, there are major question marks over its social sustainability. However, it is further concluded that the social sustainability and liveability of these developments can be significantly enhanced if the correct actions are taken by those in authority.

*Research questions*

- RQ1 How sustainable is the low-cost high-rise model of public housing in Kuala Lumpur?

This research question has been discussed extensively in the light of the study's findings. Taking the three-dimension model of sustainability first introduced in chapter two. The study concludes that this model of housing

provision can be economically and environmentally sustainable if properly administered and designed. The picture of social sustainability is less clear. The qualitative data revealed a somewhat dire story of anti-social behaviour and lack of community spirit; however, the survey data was more positive. Ultimately it can be concluded that a satisfactory degree of social sustainability could be reached it certain best practices were followed.

- RQ2 How satisfied are the residents of LCHR housing in Kuala Lumpur with their unit, their neighbourhood and its social climate?

This question was addressed both qualitatively and quantitatively. The voices of residents were heard directly at focus groups and a larger number responded to a residential satisfaction survey. The focus groups elicited rich descriptions of the lived experiences of residents that, with some notable exceptions, were mostly negative. The survey, with its sample of 280 residents, gave a generally more positive picture with moderate to high levels of satisfaction across many items, in line with other studies.

- RQ3 How do experts perceive the sustainability performance of LCHR housing?

Interviews with architects, a politician and a report from a green building assessor produced data on how 'experts' perceived the sustainability of LCHR housing in Kuala Lumpur. A wide range of deficiencies with this model of housing were identified though there was a theme of solvability across the three dimensions of sustainability.

- RQ4 How would PPR LCHR housing perform if assessed using the Green Building Index?

In chapter six, it was explained that GBI assessor undertook a hypothetical assessment of one of the blocks in this study. Although the assessment was incomplete for lack of some documentation, he arrived at a score of 55 out of 100 which means that the building would be certified in the lowest category that does not represent a fail.

- RQ5 What best practices can be used to enhance the sustainability performance of LCHR housing?

Throughout the study the researcher recorded notes on specific practices that would ameliorate the sustainability of LCHR public housing provision in Kuala Lumpur. These were drawn both from the review of secondary sources and the findings from the primary data. The output from this is published below in the form of a best practices framework.

### 9.3 Contribution of the study

Assuming that it is impractical to replace high rising public housing with a low-rise alternative then policy focus in the short and medium-term should be on taking a range of steps to improve the sustainability of the current high-rise provision. Again, we can look at these under the three dimensions.

This study has confirmed that there are issues concerning the financial/ economic aspects of LCHR housing although they do not arise from the high-rise nature of the housing. Rent arrears and non-payment of maintenance fees are a significant problem and contribute to the poor level of maintenance that

featured so strongly in this research. Another issue which the authorities have already begun to clamp down on is the subletting of units by tenants. This has been a particularly sensitive issue because many of the 'unofficial' tenants would not normally qualify for such housing (such as migrant workers).

The cost ceiling on the LCHR units has a number of consequences which impact on sustainability as it severely restricts the input architects have on new developments. It also means that facilities at the developments are often minimal. The providers study heard opinions expressed that

Of course, there will always be budgetary constraints and LCHR housing will always be subject to compromises when it comes to the goal of sustainability and the economic constraints of public housing which existed worldwide. Finally, the role of the private sector in LCHR housing provision was discussed in chapter 6. Economic factors have made the participation of the private sector highly problematic, cost ceilings, scarcity of land and rising land prices have made private developers reluctant to construct low cost housing and play a full role in housing all income groups in the country.

Ultimately, this study has established that the main barrier to sustainability is to be found within the social dimension. Crime and anti-social behaviour was found to be widespread and the residents reported a sense of abandonment. To a degree these issues are within the remit of the DBKL who can establish the presence of 'authority' through a number of measures including patrols and a strengthening of neighbourhood watch schemes, closed circuit cameras and more responsive practices when residents complain. However, there is substantial evidence from around the world that high density, high-rise housing is associated with the kind of social problems reported in this study particularly when it is low cost public provision. Authorities should also act as a catalyst for

initiatives aimed at instilling as much sense of community as possible in this form of housing.

As a further contribution from the present study the findings from both the present study and the review of literature have been distilled into a framework of best practices in the provision of LCHR housing in Kuala Lumpur. This framework is not presented.

### 9.4 Recommendations: A framework of best practices and indicators

Based on the present study and the thorough review of other literature discussed in chapters two, three and four a framework for best practice in the provision of LCHR housing in Kula Lumpur is presented as Table 9-1. The framework offers practices, their benefit and identifies the responsible party; it is divided into the three dimensions – social, environmental and economic.

Table 9-1 Best Practices Framework

| Best Practices Framework | | |
|---|---|---|
| **Social Sustainability Practices** | | |
| Practice | Benefit | Responsibility |
| Design and promotion of social activities and provision of social spaces | Increased social interaction, sense of community and co-responsibility | DBKL, designers, community leaders & residents |
| Increase 'authority' presence both sentient and technological | Reduced sense of abandonment, improved personal security, reduced crime | DBKL, police, community leaders |

| | | |
|---|---|---|
| Eliminate empty units and low occupancy floors. | Improved personal security, reduced crime and anti-social behaviour | DBKL |
| Flexible provision – different sized units | Reduced overcrowding, meeting demand more appropriately, reduced under-occupation. | DBKL, Providers, architect |
| Incorporate adequate health and educational facilities | Improve education and awareness of occupants and children | DBKL, health department, community leaders and resident |
| Lift maintenance, | Improve cleanliness via community engagement/working together. | DBKL and residents |
| Provide interactive and social space for community to communicate | Will help community to interact at upper floors and not at ground level only | Architects |
| **Environmental Sustainability Practices** | | |
| The interception and control of rainwater, rainwater harvesting and reuse | Water efficiency | DBKL, planners/ architects |
| Integrate chute waste disposal into building design | Convenient waste disposal, reduced fly tipping, increased recycling, cleaner living environment, easier collection | DBKL, designers |
| Use underground or separate multi-storey parking buildings | Reduces on-road parking improving access, frees up additional space for greening | Providers (Housing ministry guidelines), Architect |
| Canopy design to windows and opening | To avoid direct sun and provide better shading (avoid heat gain to windows) | Architect, authorities |
| Air well and light well in between units to have bigger dimension | To provide better light into building and improve ventilation | Architect, authorities |
| Better shaded area for access to buildings/block | Providing protected walkway into | Architects |

| | | |
|---|---|---|
| | buildings/unit against rain and other elements | |
| The interception and control of rainwater | Rain water harvesting. An be use for potted plants and landscape watering. Also, to clean corridors and pathways. | DBKL, planners/ architects |
| **Economic Sustainability Practices** | | |
| Optimise occupancy levels | Increased rental income | DBKL |
| Consistent enforcement in the event of rent or maintenance fee arrears | Increased rental and maintenance fee income. | DBKL |
| Formalise hawking arrangements, improve stall/unit provision | Licensing revenue and greater control | DBKL and Ministry of housing |
| Eliminate speculation | Keep the saleable apartment cost within the low-income group, easing the housing loan. (Introduce property gain tax for longer period) Units can only change hand after 15-20 years. | Ministry of housing, DBKL |
| Encourage mixed developments (low cost/medium cost – owner occupation/ rented) | More likely to attract private sector involvement. Less stigma than purely low cost rented housing | DBKL,<br><br>Planners/architect |
| Discourage multiple car ownership through parking permit system | Revenue from parking permits for second cars. | |
| Allow some area for business/retail/vendor for the user to use | Provide some business/ commercial opportunity i.e. regulated hawkers | DBKL, planners |
| Some blocks can be used as cellular tower | Rental and share the income to offset maintenance cost | Management Authorities and DBKL |
| Allow for commercial advertisement at gable end area to generate income for the block users | Income gain can be used for upkeeping the block | Management Authorities and DBKL |

### 9.5 A research agenda for sustainable low-cost housing

Current PPR plans include both LCHR apartments and terraced houses making it possible to conduct comparative research on these two forms of housing and evaluate their respective sustainability across the three dimensions – economic, social and environmental. The residential satisfaction survey presented and discussed in chapter seven suggested tentative evidence that there may be a negative association between the number of floors in a block and residential satisfaction. Residents at the 21-storey block appeared generally less satisfied. However, as there was only one block that had additional floors there could be other confounding factors at play meaning further research would be needed to understand the association between the number of floors and residential satisfaction.

The current study could also be built upon by further qualitative research possibly using the same focus group approach. Researchers should continue to give voice to the lived experiences of those citizens living in LCHR housing and the rich data from qualitative methods facilitates a level of understanding that surveys alone cannot.

Comparative research would also have good potential in this area as we aim to learn what is working and what is failing in the domain of low-cost housing sustainability as replication of best practice is one of the fastest and surest routes to progress.

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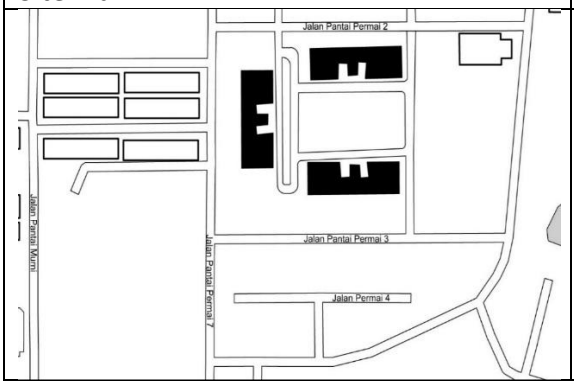
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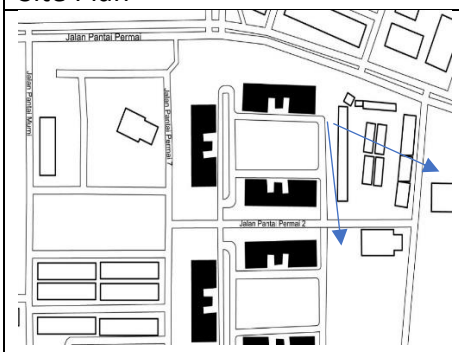
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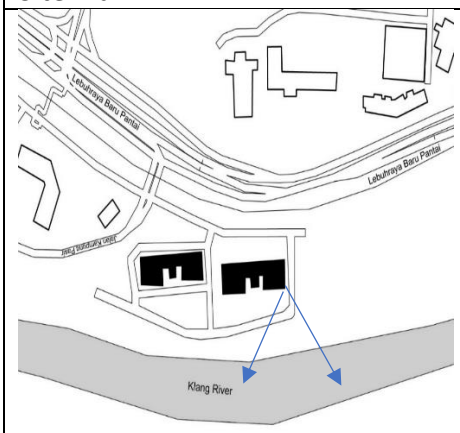
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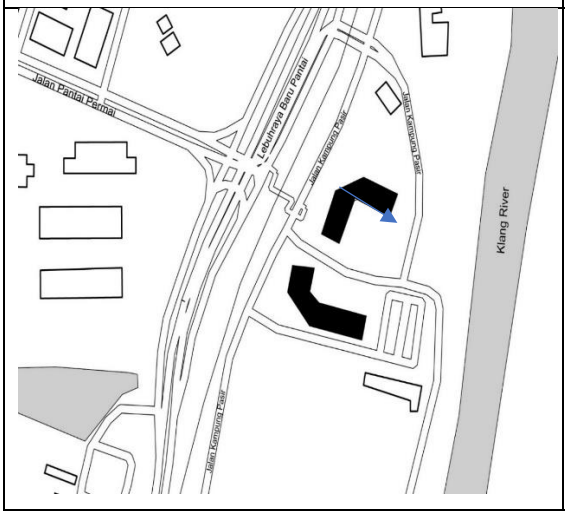
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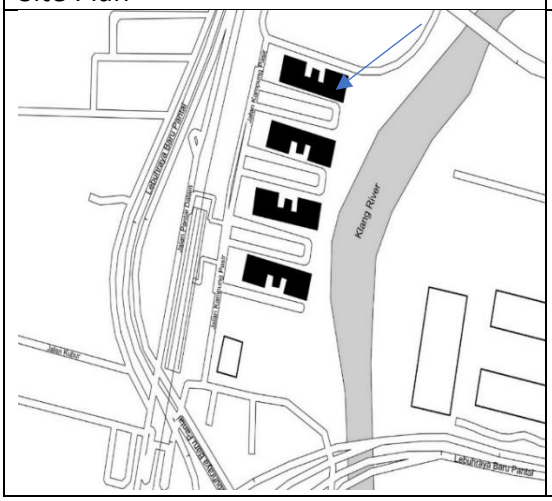
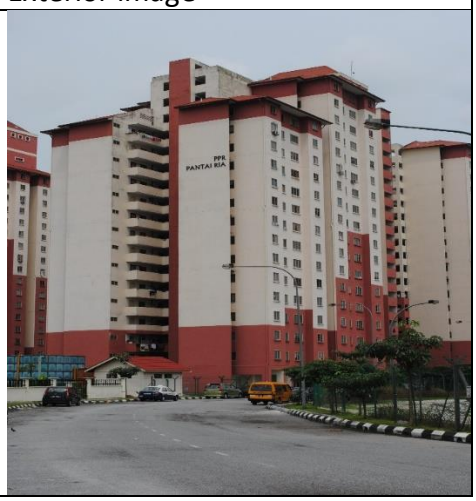
## Appendix 1: The five research sites and Architectural drawings

| PPR Pantai Permai Block A | |
|---|---|
| Site Plan | Exterior image |
|  |  |

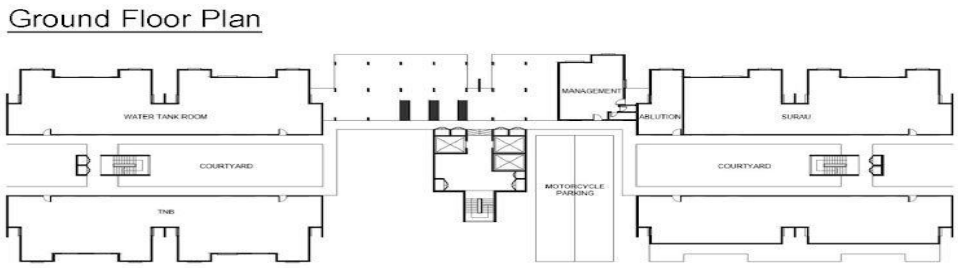
| PPR Pantai Permai Block C-D | |
|---|---|
| Site Plan | Exterior image |
|  |  |

| PPR Kampung Limau | |
|---|---|
| Site Plan | Exterior image |
|  |  |

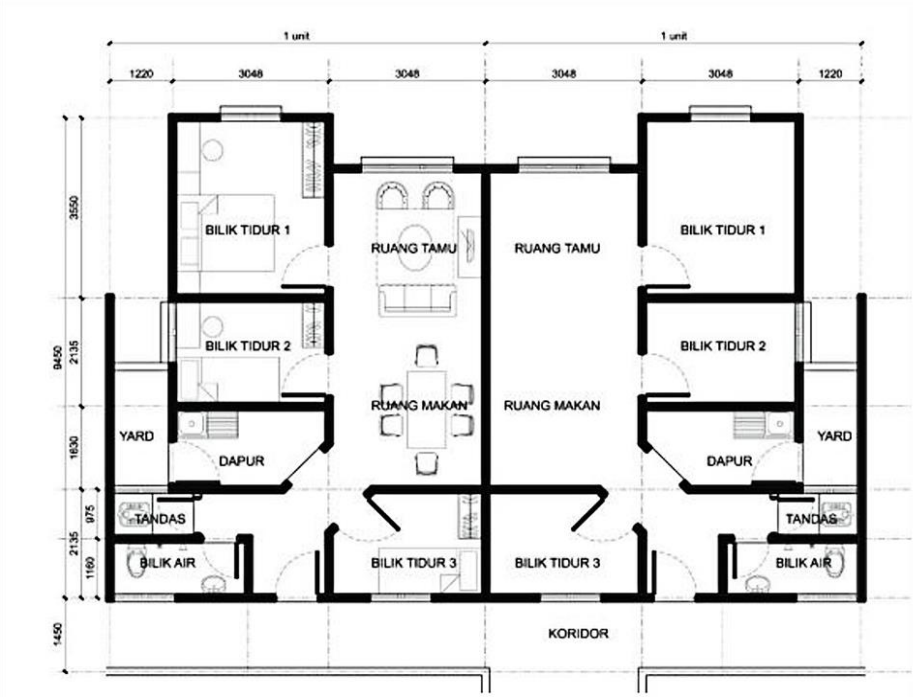
| PPR Seri Pantai Block 102 | |
|---|---|
| Site Plan | Exterior image |
|  |  |

| PPR Pantai Ria Jalan Kampung Pasir Dalam | |
|---|---|
| Site Plan | Exterior image |
|  |  |

Architectural Drawings




Symmetrical floor plan design
Ground floor spaces
1. Water Tank room
2. TNB
3. Management Office
4. Ablution Room
5. Surau
6. Motocycle parking




Typical PPR Low cost housing layout (Source Jabatan Perumahan Negara 2006)

Bilik Tidur=Bedroom

Ruang Tamu=Living space

Ruang Makan=Dining space

Dapur=Kitchen

Tandas=Toilet

Bilik Air=Bath room

Floor Layout



20 Typical Unit Per FLoor



Single Loaded Corridor with 2 symmetrical void



2 Passenger lift + 1 Bomba Lift



3 set Fire escape staircase

**Appendix 2 : Survey Instruments**

1) Letters
2) Attendance sheet
3) Interview sheet
4) Questionaires.

Asrul Mahjuddin
*(Asrul Mahjuddin Ressang Aminuddin)*
Student ID:4092974 -University of Nottingham, UK.
Email: laxamra @nottingham.ac.uk & asrulmahjuddin@hotmail.com

Alamat *(Address)*
38 Jalan Desa Makmur
Taman Desa
Kuala Lumpur 58100

Tarikh :
*(Date)*
Rujukan :
*(Reference)*

Tuan,
(Sir),

**KEPADA SESIAPA YANG BERKENAAN**
*(To whom it may be concern)*

Data dan Dokumentasi Untuk Kajian PhD Bagi topik Perumahan Kos Rendah Bangunan Tinggi.
*(Data and documentation for PhD research topic Low Cost High Rise Housing)*

Saya pelajar daripada Universiti of Nottingham,UK ingin mendapatkan maklmat seperti diatas daripada pihak tuan. Ini untuk kajian pelajaran dan penyelidikan PhD. Sebarang maklumat yang akan diperolehi akan saya rahsiakan sebagaimana peraturan sedia ada.
*(I am a student of Nottingham University UK and would like to obtain some information for the use my my PhD research. Any information shall be confidential as of the existing regulation)*

Sekian terima kasih, bantuan tuan amatlah dihargai.
*(Thank you, your assistance is greatly appreciated)*

Yang benar(*Yours sincerely)*

Asrul Aminuddin

Asrul Mahjuddin
*(Asrul Mahjuddin Ressang Aminuddin)*
Student ID:4092974 -University of Nottingham, UK.
Email: laxamra @nottingham.ac.uk & asrulmahjuddin@hotmail.com

Alamat *(Address)*
38 Jalan Desa Makmur
Taman Desa
Kuala Lumpur 58100

Tarikh :
*(Date)*
Rujukan :
*(Reference)*

Alamat
*(Address)*
……..
……..

Tuan,
(Sir),

Permohonan sesi temuduga Untuk Kajian PhD Bagi topik Perumahan Kos Rendah Bangunan Tinggi.
*(Application for interview session for PhD research topic Low Cost High Rise Housing)*

Saya pelajar daripada Universiti of Nottingham,UK ingin mendapatkan maklumat seperti diatas daripada pihak tuan. Ini untuk kajian pelajaran dan penyelidikan PhD. Sebarang maklumat yang akan diperolehi akan saya rahsiakan sebagaimana peraturan sedia ada.
*(I am a student of Nottingham University UK and would like to request yout time for an interview session for the use my my PhD research. Any information shall be confidential as of the existing regulation)*

Sekian terima kasih, bantuan tuan amatlah dihargai.
*(Thank you, your assistance is greatly appreciated)*

Yang benar(*Yours sincerely)*

Asrul Aminuddin

**1. Kehadiran***(attendance)*

**Blok***(block):* **Tarikh** *(date)***:**

| **No** | **Nama** *(name)* | **Unit** *(unit)* | **Tandatangan** *(sign)* |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
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| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## Interview session with providers – Architect/designers

**Aims**

1. To obtain information on the design requirements
2. To acquire views and criticism on the housing design and development.
3. To acquire sustainable input and feed back.

| Topic | Interview Questions | Follow-up questions |
|---|---|---|
| General | Tell me about your practice.<br><br>How many housing scheme of What experience do you have in designing housing?<br><br>How do you define sustainability? | <br><br><br><br>How do you adopt? |
| Development | What was the brief given?<br><br>How do you find the overall development?<br><br>Is there any critical part you wish to address more?<br><br>Do you think you have reached your sustainable objectives? | <br><br><br><br>What is the reason?<br><br><br>In what way do you achieve? |
| Building Design | How the design conceptualized<br><br>Are you satisfied with the design?<br><br>How did you achieve sustainable design in particularly? | <br><br>Can you give precise reason? |
| Environment (indoor & outdoor) | What do you think about the environment of the housing scheme?<br><br>What about the external environment?<br><br>Is the project/design environmental friendly. | <br><br><br><br>If yes how.<br>If not why and how to improve. |
| Facilities provided | What type of facilities provided? | <br><br>If not why and what is needed. |

| | | |
|---|---|---|
| | Are they appropriate and good enough? | |
| Open | Is there any other matters relate to the development and design?<br>Do you have any experience in EAT's?<br>Can environmental assessment tools help your design process? | What and why?<br><br>If yes, in what way. |

## Interview session with users – Housing occupiers

### Aims

4. To obtain information on the users requirements and the housing.
5. To acquire views and criticism on the housing design and development.
6. To acquire sustainable input and feed back.

**Part 1**

| Topic | Questions |
|---|---|
| • General<br>• Development of the scheme<br>• Building design<br>• Environment (indoor & outdoor)<br>• Facilities | To allow for the user to talk and discuss openly within the topic before giving a series of questions.<br>*Membenarkan para pengguna bercakap dan berbincang secara terbuka berkenaan topic sebelum soalan lainya.* |

**Part 2**

| Topic | Interview Questions | Follow-up questions |
|---|---|---|
| **General**<br>***Am*** | Tell me about your family.<br>*Terangkan berkenaan dengan keluarga anda?(bilangan)*<br><br>How long have you been in this home?<br>*Berapa lama telah tinggal diperumahan ini?*<br><br>Would you choose any other housing scheme?<br>*Adakah anda ingin memilih tempat perumahan yang lain?* | If yes why.<br>*Kalau iya, kenapa?*<br><br>If not what is the main reason.<br>*Kalau tidak kenapa sebab nya?* |
| **Development**<br>***Pembangunan*** | Why did you choose this housing development?<br>*Kenapa memilih pembangunan perumahan ini?*<br><br>How do you find the development?<br>*Apakah pendapat anda berkenaan pembangunan ini?*<br><br>Any part you like or dislike about this development?<br>*Ada tak perkara yanbg disukai dan tidak disukai dengan pembangunan ini*? | What is the reason?<br>*Apakah sebabnya?* |
| **Building Design**<br>***Rekabentuk Bangunan*** | Tell me about your home?<br>*Ceritakan bagaimana rupa kediaman anda?*<br><br>Is that unit to you expectation?<br>*Adakah unit itu seperti yang dijangkakan?* | Size, type and floor area.<br>*Saiz, taip dan keluasan lantai.*<br><br>Can give precise reason.<br>*Boleh terangkan lebih terperinci* |

| | | |
|---|---|---|
| | Which part you think the best and the worst?<br>*Bahagian manakah yang baik dan tidak baik (dengan rekabentuk kediaman anda)?* | |
| **Environment (indoor & outdoor)** ***Alam sekitar (dalaman & luaran)*** | What do you think about the environment in this housing block? *Apa pendapat anda berkenaan alam sekitar perumahan blok ini?*<br><br>What about the external environment?<br>*Bagaimana dengan di bahagian luar?*<br><br>In what way does the environment influence you as user?<br>*Dengan cara bagaimana alam sekitar mempengaruhi kehidupan anda?(kediaman panas, hujan, angin, pengudaranaan)* | Air, water, sanitation and maintenances.<br>*Udara, bekalan air, pembentungan dan penyelengaraan.* |
| **Facilities provided**<br>***Fasiliti diberikan*** | What about the current facilities? *Bagaiman dengan faciliti (fasarana) yang sedia ada?*<br>Are they appropriate and good enough?<br>*Adakah ianya memadai dan cukup baik?* | If not why and what is needed. *Kalau tidak dan apa yang diperlukan.* |
| **Open**<br>***Terbuka*** | Is there any other matters relate to the development and design?<br>*Ada apa-apa perkara yang berkaitan dengan pembangunan dan reka bentuk?(ada tidak komen tambahan)* | What and why?<br>*Apa dan kenapa?* |

# QUETIONAIRES

| KAJIAN PERUMAHAN<br>*(Housing Reseach)* | | | Blok<br>*(Block)* | Aras<br>*(Level)* |
|---|---|---|---|---|

**Soal selidik ini adalah sebahagian daripada kajian penyelidikan Perumahan di Kuala Lumpur. Semua jawaban anda adalah sulit dan tanpa nama dan hanya akan digunakan untuk tujuan penyelidikan akademik.**

*This questionnaire is part of a research study of housing in Kuala Lumpur. All your answers are confidential and anonymous and will only be used for academic research.*

- Se*lepas membaca setiap kenyataan sila pilih jawaban yang sesuai dengan pendapat anda*.
  *After reading each statement please select the response that represents your opinion.*
- Setelah selesai menjawab sila berikan terus jawaban tersebut pada wakil kami yang ada
  *Once you have completed the questionnaire please return it to our representative.*

**AM** *(General)*

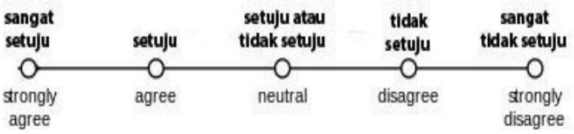
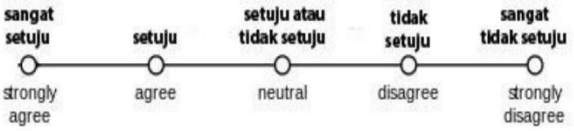
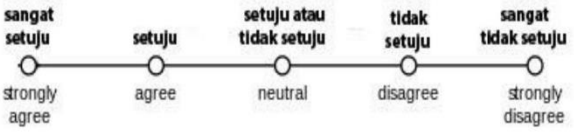
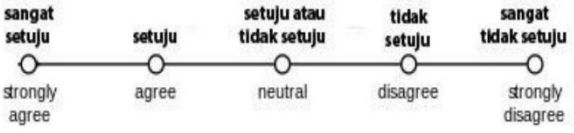
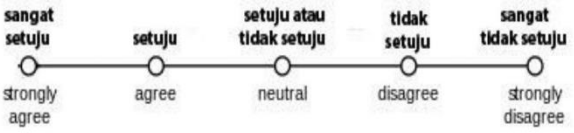
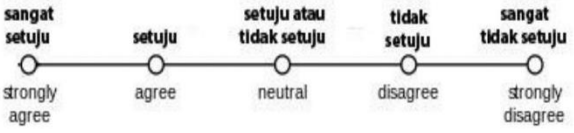
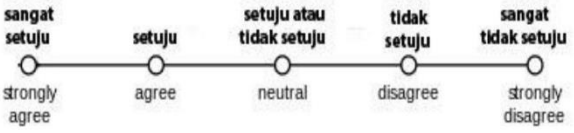
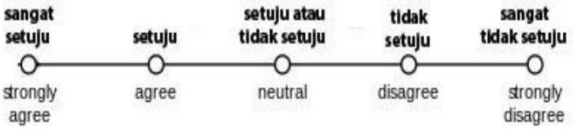
**(a) Adakah anda menyewa atau memiliki rumah anda?**
*Do you rent or own your home?*

**(b) Berapa banyak kenderaan yang anda miliki seisi rumah?**
*How many vehicles does your household have?*

**(c) Berapa ramaikah orang yang tinggal di rumah anda (termasuk kanak-kanak)**
*How many people are in your household? (including children)?*

**(d) Berapa lamakah anda tinggal disini?**
*How long have you lived here?*

| | | sangat setuju / strongly agree | setuju / agree | setuju atau tidak setuju / neutral | tidak setuju / disagree | sangat tidak setuju / strongly disagree |
|---|---|---|---|---|---|---|
| 1 | **Saya berpuas hati dengan flat saya**<br>*I am satisfied with my flat* | | | | | |
| 2 | **Susunatur flat ini adalah mudah**<br>*The layout of this flat is convenient* | | | | | |
| 3 | **Flat ini tidak di jaga dengan baik**<br>*The flat is poorly maintained* | | | | | |
| 4 | **Flat ini mempunyai suasana yang enak**<br>*The flat has a pleasing ambience* | | | | | |
| 5 | **Kejiranan ini mempunyai ruang hijau yang mencukupi**<br>*The neighbourhood has enough green space* | | | | | |
| 6 | **Saya berpuas hati dengan persekitaran hidup saya**<br>*I am satisfied with my living environment* | | | | | |

| | | |
|---|---|---|
| 7 | **Bangunan-bangunan di kejiranan ini adalah menarik**<br>*The buildings in this neighbourhood are attractive* |  |
| 8 | **Tinggal di kejiranan ini ialah menjengkelkan**<br>*Living in this neighbourhood is annoying* |  |
| 9 | **Saya merasa desakan untuk keluar dari kejiranan ini**<br>*I feel an urge to move out of this neighbourhood* |  |
| 10 | **Saya rasa rapat di kejiranan ini**<br>*I feel attached to this neighbourhood* |  |
| 11 | **Saya berasa seperti ada di rumah di kejiranan ini**<br>*I feel at home in this neighbourhood* |  |
| 12 | **Saya mempunyai banyak hubungan dengan jiran-jiran saya**<br>*I have a lot of contact with my neighbours* |  |
| 13 | **Saya mempunyai banyak hubungan dengan penduduk lain di kawasan kejiranan saya**<br>*I have a lot of contact with other residents in my neighbourhood* |  |
| 14 | **Saya rasa sama bertanggungjawab untuk mendiami di kejiranan ini**<br>*I feel co-responsible for the liveability in this neighbourhood* |  |
| 15 | **Di kejiranan ini penduduk melayan satu sama lain mesra**<br>*In this neighbourhood residents treat each other pleasantly* |  |
| 16 | **Saya tinggal di kawasan kejiranan yang selesa dengan banyak perpaduan**<br>*I live in a cosy neighbourhood with a lot of cohesion* |  |
| 17 | **Orang di kawasan kejiranan ini tidak mengenali antara satu sama lain**<br>*People in this neighbourhood hardly know each other* |  |
| 18 | **Saya berpuas hati dengan percampuran sosial para penduduk di kejiranan ini**<br>*I am satisfied with the social mix of the neighbourhood population* |  |

## Appendix 3 Screenshot of SPSS file

1) Variable view
2) Data view

1) Variable view

All Block.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

| | Name | Type | Width | Decimals | Label | Values | Missing | Columns | Align | Measure | Role |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | AA | Numeric | 8 | 2 | Type of Block | {1.00, Block... | None | 8 | Right | Nominal | Input |
| 2 | A1 | Numeric | 8 | 2 | Level | None | 99.00 | 8 | Right | Nominal | Input |
| 3 | A2 | Numeric | 8 | 2 | Do you rent or own your home? | {1.00, rent}... | 99.00 | 8 | Right | Nominal | Input |
| 4 | A3a | Numeric | 8 | 2 | How many vehicle does your household have? (motorbike) | None | 99.00 | 8 | Right | Nominal | Input |
| 5 | A3b | Numeric | 8 | 2 | How many vehicle does your household have? (car) | None | 99.00 | 8 | Right | Nominal | Input |
| 6 | A4 | Numeric | 8 | 2 | How many people are in your household? | None | 99.00 | 8 | Right | Nominal | Input |
| 7 | A5 | Numeric | 8 | 2 | How long have you lived here? | None | 99.00 | 8 | Right | Nominal | Input |
| 8 | B1 | Numeric | 8 | 2 | I am satisfied with my flat | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 9 | B2 | Numeric | 8 | 2 | The layout of this flat is convenient | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 10 | B3 | Numeric | 8 | 2 | The flat is poorly maintained | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 11 | B4 | Numeric | 8 | 2 | The flat has a pleasing ambience | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 12 | B5 | Numeric | 8 | 2 | The neighbourhood has enough green space | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 13 | B6 | Numeric | 8 | 2 | Iam satisfied with my living environment | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 14 | B7 | Numeric | 8 | 2 | The building in this neighbourhood are attractive | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 15 | B8 | Numeric | 8 | 2 | Living in this neighbourhood is annoying | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 16 | B9 | Numeric | 8 | 2 | I feel an urge to move out of this neighbourhood | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 17 | B10 | Numeric | 8 | 2 | I feel attached to this neighbourhood | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 18 | B11 | Numeric | 8 | 2 | I feel at home in this neighbourhood | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 19 | B12 | Numeric | 8 | 2 | I have a lot of contact with my neighbours | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 20 | B13 | Numeric | 8 | 2 | I have a lot of contact with other residents in my neighbourhood | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 21 | B14 | Numeric | 8 | 2 | I feel co-responsible for the liveability in this neighbourhood | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 22 | B15 | Numeric | 8 | 2 | In this neighbourhood residents treat each other pleasantly | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 23 | B16 | Numeric | 8 | 2 | I live in a cosy neighbourhood with a lot of cohesion | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 24 | B17 | Numeric | 8 | 2 | People in this neighbourhood hardly know each other | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 25 | B18 | Numeric | 8 | 2 | I am satisfied with the social mix of the neighbourhood population | {1.00, Stron... | 99.00 | 8 | Right | Nominal | Input |
| 26 | | | | | | | | | | | |
| 27 | | | | | | | | | | | |
| 28 | | | | | | | | | | | |
| 29 | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| 31 | | | | | | | | | | | |
| 32 | | | | | | | | | | | |
| 33 | | | | | | | | | | | |
| 34 | | | | | | | | | | | |
| 35 | | | | | | | | | | | |
| 36 | | | | | | | | | | | |
| 37 | | | | | | | | | | | |
| 38 | | | | | | | | | | | |
| 39 | | | | | | | | | | | |

Data View | Variable View

2) Data view


All Block.sav [DataSet1] - IBM SPSS Statistics Data Editor
File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help
Visible: 25 of 25 Variables
Data View
Variable View

## Appendix 4: Example screenshots of Nvivo analysis

# Construction and Materials

SUMMARY | TEXT

NVIVO

## Text




## References

| REF NO. | COVERAGE | CONTENT |
|---|---|---|
| 1 | 1.20 % | **Users:** You look at the flat. It's like a pigeonhole. Because they didn't do it properly. Not perfect. The way they did it is like take it is for granted. Look at the condition. It looks nice but try to look up there. No air ventilation. It is easy when they plaster (construct) the wall without ventilation holes. |
| 2 | 0.99 % | **Users:** I feel unsatisfied. From the outside, it looks old. But it's not that old like you think because the unit has a lot of problems. For example, the toilet. The toilets that they made. Leaking from the upper unit can reach the lower unit and it gets wet. |
| 3 | 0.16 % | . Like the building structure. It's scary. |
| 4 | 1.52 % | **Users:** The greenery... Thank God everything is beautiful at the ground level but once you go upper level it is not beautiful any more, You can go up and see the conditions, the walls, the floors, the entrance to the house, the scupper drain drainage flow is definitely not beautiful, if you look at upper most floors there is water leakage externally at the lobby, no one is going to clean it up. |
| 5 | 0.96 % | **Users:** The condition of the verandah itself, if you can go up to level 9 and you see from that side it is worrying, is it going to fall, can you fall down, is the building condition itself strong enough. That worries us – the building is not level. |
| 6 | 1.00 % | **Users:** If you observe the water pipes, cables ... like mine at level 14 there is cable like this (electrical), water leakage can get into the cable, until now it has turn to stalactites, there is no action from City Hall, I am worried something bad can happen. |



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# Construction and Materials

SUMMARY | TEXT

## Overview

| | |
|---|---|
| NODE TYPE | Free Node |
| DESCRIPTION | data on the quality of materials and workmanship and signs of degradation. |

## Content

### Text

| FILE & LOCATION | REFERENCES | COVERAGE | |
|---|---|---|---|
| Internals\Focus Groups\Focus Group 1 | 5 | 2.79 % | view details |
| Internals\Focus Groups\Focus Group 3 | 6 | 5.82 % | view details |
| Internals\Focus Groups\Focus Group 4 | 3 | 4.67 % | view details |
| Internals\Focus Groups\Focus Group 5 | 1 | 1.32 % | view details |
| Internals\Expert Interviews\Expert_interview_3 | 2 | 2.75 % | view details |
| Internals\Expert Interviews\Expert_interview_4 | 2 | 3.38 % | view details |
| Internals\Observation Notes\OBSERVATION PPR KAMPUNG LIMAU.Edited.1 (1) | 1 | 4.89 % | view details |
| Internals\Observation Notes\OBSERVATION PPR PANTAI PERMAI 2 BLOCK A.Edited.1 | 2 | 13.66 % | view details |
| Internals\Observation Notes\OBSERVATION PPR PANTAI PERMAI 2 BLOCK CD.Edited.1 | 2 | 11.55 % | view details |
| Internals\Observation Notes\OBSERVATION PPR PANTAI RIA JLN KAMPUNG PASIR.Edited.1 | 2 | 13.39 % | view details |
| Internals\Observation Notes\OBSERVATION PPR Seri Pantai Block 102.Edited.1 | 2 | 9.65 % | view details |

## Links

### Linked Memo

Memos\Well built or not

QSR International

# Gangsterism

SUMMARY | TEXT

## Overview

| | |
|---|---|
| NODE TYPE | Free Node |
| DESCRIPTION | references to gangs and organised rime |

## Content

### Text

| FILE & LOCATION | REFERENCES | COVERAGE | |
|---|---|---|---|
| Internals\Focus Groups\Focus Group 1 | 1 | 1.25 % | view details |
| Internals\Focus Groups\Focus Group 2 | 1 | 0.89 % | view details |
| Internals\Focus Groups\Focus Group 4 | 1 | 0.90 % | view details |
| Internals\Observation Notes\OBSERVATION PPR PANTAI PERMAI 2 BLOCK A.Edited.1 | 1 | 6.01 % | view details |
| Internals\Observation Notes\OBSERVATION PPR PANTAI RIA JLN KAMPUNG PASIR.Edited.1 | 1 | 3.38 % | view details |

## Links

### Linked Memo

Memos\Gangs

QSR International

# Gangsterism

SUMMARY | TEXT

NVIVO

## Text


Focus Group 1
1 of 5


Focus Group 2
2 of 5


Focus Group 4
3 of 5


OBSERVATION PPR PANTAI PERMAI 2 BLOCK A.Edited.1
4 of 5


OBSERVATION PPR PANTAI RIA JLN KAMPUNG PASIR.Edited.1
5 of 5

## References

| REF NO. | COVERAGE | CONTENT |
|---|---|---|
| 1 | 3.38 % | |

| | |
|---|---|
| 1. Crime and social problems | Some residents used public spaces for setting up stalls and food outlets. It is not well taken care of and no sign of authorities clamping down illegal hawkers. Vandalism and markings can be seen on the ground floor especially the stair case. Resident (who wanted to remain anonymous) mentioned that some of the signage as gangsterism related, marking territorial or sign of their group. |





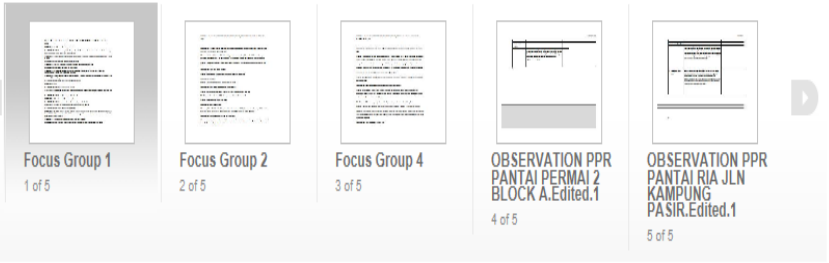
QSR International

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# Gangsterism

SUMMARY | TEXT

## Text




## References

| REF NO. | COVERAGE | CONTENT |
|---|---|---|
| 1 | 1.25 % | USERS: The kids here they gang up.<br>FACILITATOR : Gang up?<br>USERS : Yes. Like the Malays gang up here, there.<br>FACILITATOR : On political party lines or not?<br>USERS : The just form gangs.<br>USERS: Gangsterism is all over the place. Now they are recruiting gangsters.<br>USERS : Not only males but also females. |

QSR International

## Text




## References

| REF NO. | COVERAGE | CONTENT |
|---|---|---|
| 1 | 1.17 % | ARCHITECT 3: This project finished in 2002. Until now they're well maintained.<br><br>RESEARCHER: Oh.. well maintained!<br><br>ARCHITECT 3: Yes. The colour of the building....<br><br>RESEARCHER: Who did the maintenance?<br><br>ARCHITECT 3: DBKL. I didn't see any bad condition compared to Abdullah Hukum |
| 2 | 1.58 % | RESEARCHER: When you supervise the project, how do you find the workmanship?<br><br>ARCHITECT 3: Err.. not up to my standard. Below standard.<br><br>RESEARCHER: Was there a lot of leaking?<br><br>ARCHITECT 3: That day at the water tank and there was a crack.<br><br>RESEARCHER: The water tank cracked?<br><br>ARCHITECT 3: Not the water tank. At the block A, a little crack. But contractor has repaired it. |

**Appendix 5: Observation photos**

Observation Photos

Observation PPR Pantai Permai 2 Block A

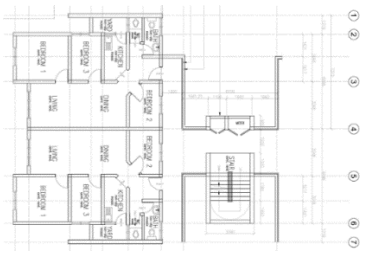
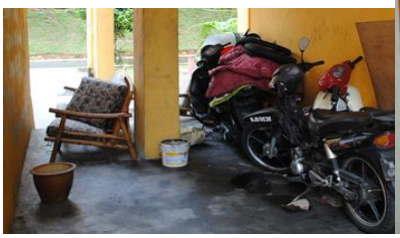
Observation PPR Pantai Permai 2 Block C,D

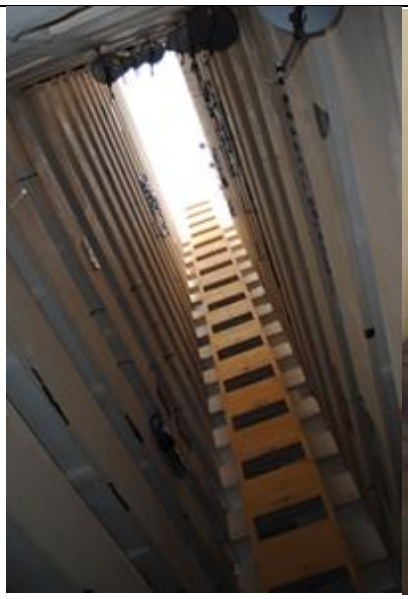
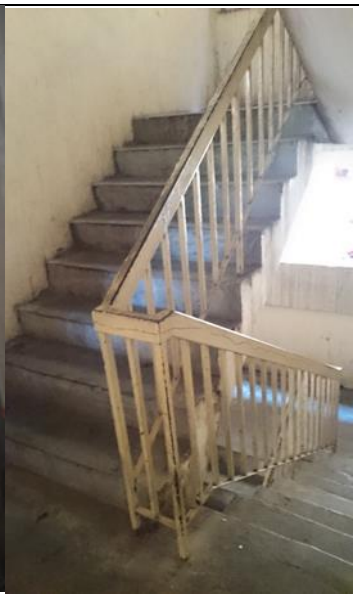
Observation PPR Kampung Limau

Observation PPR Seri Pantai Block 102

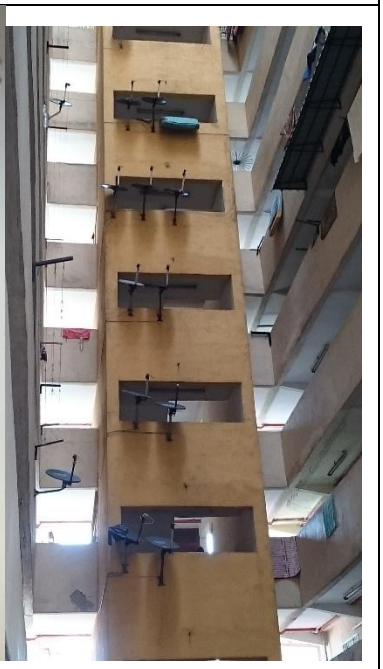
Observation PPR Pantai Ria Jalan Kampung Pasir

**OBSERVATION PPR PANTAI PERMAI 2 BLOCK A**

| | |
|---|---|
| 1. Facilities |    |
| 2. House and room sizes |   |
| 3. Family and community |   |
| 4. Crime and social problems |   |
| 5. Construction Quality |   |
| 6. Public Transport |   |

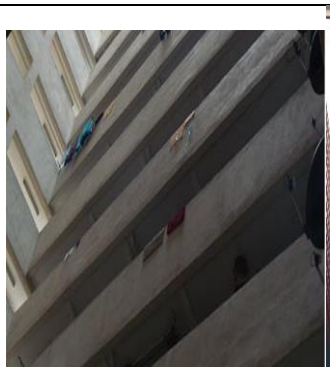
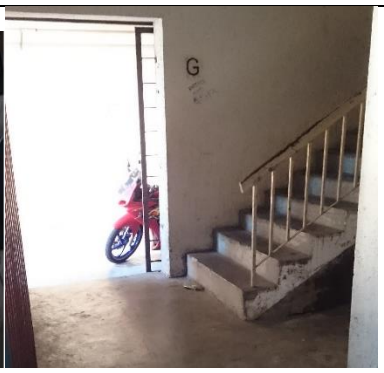
| | |
|---|---|
| 7. Safety and lighting |   |

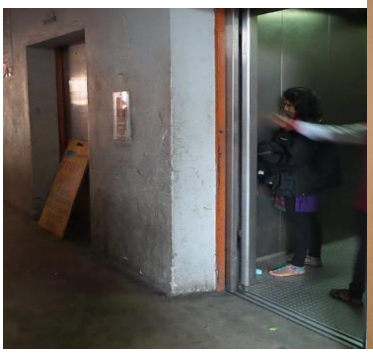
| | |
|---|---|
| 1. Maintainance |   |
| 2. Design and layout |   |
| 3. Parking |   |

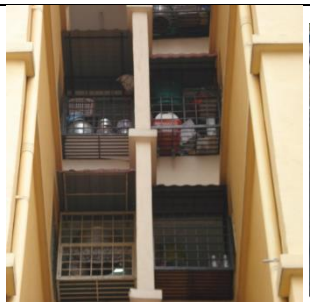
| | |
|---|---|
| 4. Cleanliness and waste |   |
| 5. Construction and materials |   |
| 6. Pollution, ventilation, and lighting |   |

| | |
|---|---|
| 7. Landscape and open spaces |  <br>  |

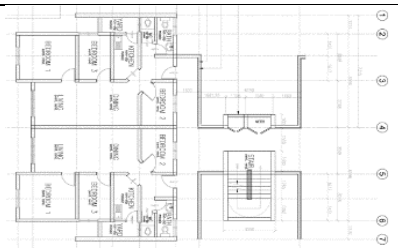
| | |
|---|---|
| 8. Facilities |   |
| 9. House and room sizes |   |
| 10. Family and community |   |
| 11. Crime and social problems |   |
| 12. Construction Quality |   |
| 13. Public Transport |  |

| | |
|---|---|
| 14. Safety and lighting |   |

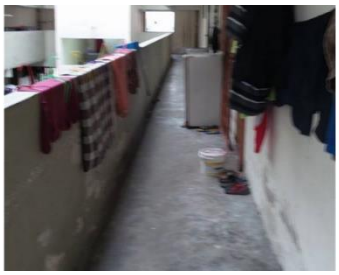
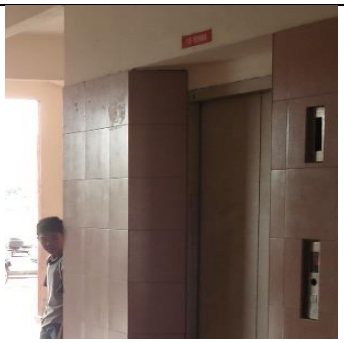
| | |
|---|---|
| 8. Maintainance |   |
| 9. Design and layout |   |
| 10. Parking |   |

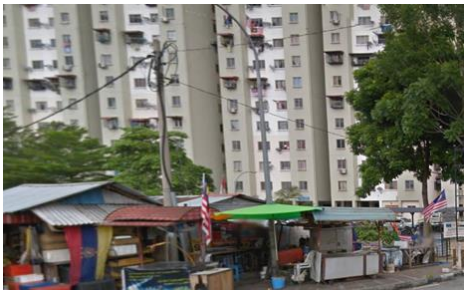
| | |
|---|---|
| 11. Cleanliness and waste |   |
| 12. Construction and materials |   |
| 13. Pollution, ventilation and lighting |   |

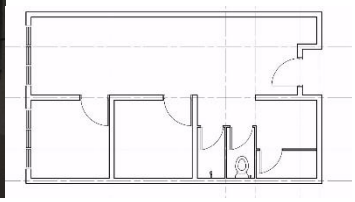
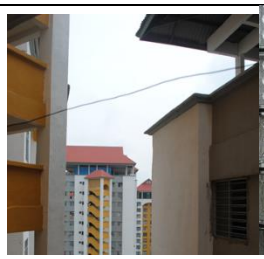
| | |
|---|---|
| 14. Landscape and open spaces |  <br>  |

| | |
|---|---|
| 15. Facilities |   |
| 16. House and room sizes |   |
| 17. Family and community |   |
| 18. Crime and social problems |   |
| 19. Construction Quality |   |
| 20. Public Transport |   |

| | |
|---|---|
| 21. Safety and lighting |   |

| | |
|---|---|
| 15. Maintenance |    |
| 16. Design and layout |   |
| 17. Parking |   |
| 18. Cleanliness and waste |   |

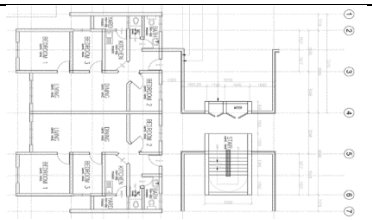
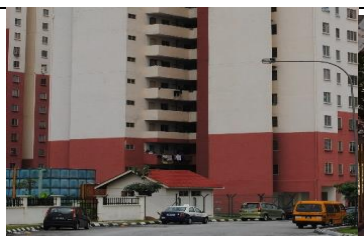
| | |
|---|---|
| 19. Construction and materials |   |
| 20. Pollution, ventilation and lighting |    |
| 21. Landscape and open spaces |   |

| | |
|---|---|
| 22. Facilities |   |
| 23. House and room sizes |   |
| 24. Family and community |   |
| 25. Crime and social problems |   |
| 26. Construction Quality |   |
| 27. Public Transport |   |

| | |
|---|---|
| 28. Safety and lighting |   |

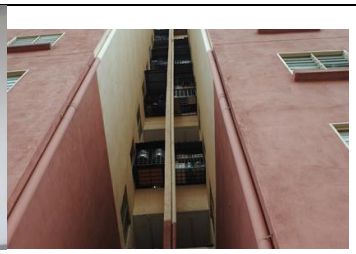
| | |
|---|---|
| 22. Maintainance |   |
| 23. Design and layout |   |
| 24. Parking |   |
| 25. Cleanliness and waste |   |
| 26. Construction and materials |   |

| | |
|---|---|
| 27. Pollution, ventilation, and lighting |    |
| 28. Landscape and open spaces |   |

| | |
|---|---|
| 29. Facilities |   |
| 30. House and room sizes |  |
| 31. Family and community |    |
| 32. Crime and social problems |   |
| 33. Construction Quality |   |
| 34. Public Transport |   |

| | |
|---|---|
| 35. Safety and lighting |   |

| | |
|---|---|
| **Environmental** | |
| 29. Maintainance |   |
| 30. Design and layout |   |
| 31. Parking |   |
| 32. Cleanliness and waste |   |

| | |
|---|---|
| 33. Construction and materials |   |
| 34. Pollution, ventilation and lighting |   |
| 35. Landscape and open spaces |   |

**Appendix 6 : Findings**

Topic 1. Observation study of Low Cost

Topic 2. Residents Views and The Sustainability Performance of Low Cost High Rise Housing

Topic 3. Providers Views and The Sustainability Performance of Low Cost housing

## TOPIC 1: OBSERVATION STUDY OF LOW COST HIGH RISE HOUSING IN KUALA LUMPUR

### 1.1 Introduction

In this chapter the findings of an observation study conducted at five low cost high rise housing locations are presented. The data comprises a combination of photographic images taken by the researcher at the locations and contemporaneously written observation notes. The five locations were each constructed as part of the Malaysian government's *Program Perumahan Rakyat* or PPR and were completed between 2000 and 2009.

The observations were undertaken during daylight hours for both the safety of the researcher and photographic data collection. The observations were conducted between Jun 2012 and July 201

### 1.2 Social and People

#### 1.2.1 Facilities

Each of the developments had a basic set of facilities including car and motorcycle parking, children's play areas, rubbish collection centres. There was a wide variation in the amount of space given over to the children's play area with **PPR PANTAI PERMAI 2** (shared by all blocks on this development) offering a particularly large well laid out area featuring grassed areas, seating areas and play equipment (fig. 1.1) such as slides. The area appeared well used and the equipment was in good condition. Unfortunately, the pathways and access to the greened area were partly blocked by residents' vehicles. **PPR SERI PANTAI BLOCK 102** also featured a well-used play area (fig.1.2) with adequate well-maintained equipment though featured less grassy area. This contrasted with **PPR KAMPUNG LIMAU** where only a small relatively unused play area was observed where adults were loitering.

At **PPR KAMPUNG LIMAU** a small mosque was left unlocked for all day access and also announced its availability for weddings and funerals. It was observed that during midday prayer around 15 -20 people used the small mosque.



Figure 1.1: Communal seating area at PPR Pantai Permai 2 Block A



Figure 1.2: The play area at PPR Seri Pantai Block 102



Figure 1.3: Sports court at PPR Pantai Ria Jalan Kampung Pasir Dalam



Figure 1.4: A small play area at PPR Pantai Permai 2 Block C-D



Figure 1.5: Cars dominate play area at PPR Kampung Limau

1.2.2 House and room sizes

At **PPR SERI PANTAI BLOCK 102 the units were** 69sqm and featured two bedrooms, a living/ dining area. Block 102 has only 1 toilet and one bathroom unlike the other blocks in this study. There is a kitchen area which face the internal corridor something which spread cooking odours. At each of the other four blocks in the study the units were larger as they were constructed under the 3-bedroom rule discussed in chapter 6. The units were approximately 84sqm with the aforementioned 3 bedrooms, a bathroom/toilet an additional separate toilet, a combined living/dining area and a kitchen area (see fig.1.5). Usage varies according to family size; at **PPR PANTAI PERMAI 2 BLOCK A** one resident who allowed access to the researcher to his home used the

smallest room (5.5 sqm) as a storage room, while a resident of **PPR KAMPUNG LIMAU** with a larger family had removed most of the furniture from the living and dining area to create additional space for sleeping, an example of the flexibility afforded by the design.

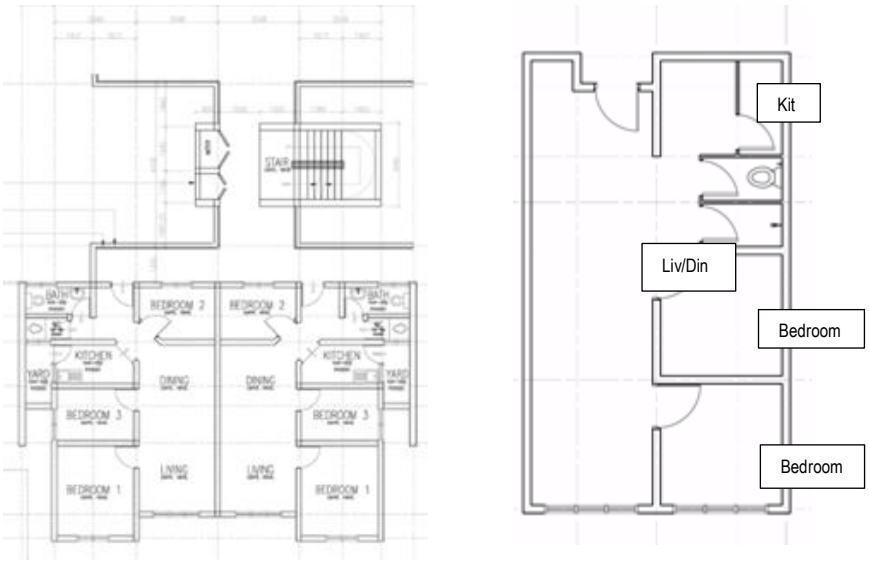



Figure 1.6: Layout of the three-bedroom unit and two-bedroom unit (for block 102)

### 1.2.3 Family and community

Across all developments it was observed that the religious background of the residents of any particular unit were easily ascertained by the display (Hindu and Bhuddist) or lack of display (Muslim) of deities visible from the outside.

Communal areas, while subjected to vandalism, were well used such as the seating area at **PPR PANTAI PERMAI 2 BLOCK C, D** (fig.1.7) they appeared popular with residents not in full-time employment such as the elderly and housewives though men tended to outnumber women and were observed relaxing and smoking.

In addition to communal areas the small shops on the developments appeared to act as points of interaction and appeared busy during the observations. They sold basic daily needs for the residents such as canned food, bottled drinks, bread, milk, and some baby products. Residents could also top up their mobile phones here (Fig.1.8). At **PPR SERI PANTAI BLOCK 102** the shop seemed to be of particular significance in terms of social interaction as not communal ground level seating area could be found, here interaction was also observed in the lift lobby area. Further interaction took place in shared corridors outside the units and ground level pathways.



Figure 1.7: A sheltered communal seating area at PPR Pantai Permai 2 Block C-D



Figure 1.8: A small sundries shop at PPR Seri Pantai Block 102. Children improvise play opportunities.



Figure 25: Shop units at PPR Kampung Limau



Figure 26: A community clinic for family health matters such as maternity/ neo-natal matters.

### 1.2.4 Crime and social problems

Evidence of low level crime and anti-social behaviour was found at all five of the developments observed, particularly vandalism and graffiti. Vacated properties were treated particularly badly and staircases were also in a poor state often smelling of urine. At **PPR SERI PANTAI BLOCK 102** the post boxes showed significant vandalism (fig.1.12) and on every floor visited the glass blocks used to improve natural lighting had been subjected to vandalism (fig.1.15).

Graffiti was everywhere to be seen and some may be related to local gangs. According to some residents at the ground floor of **PPR PANTAI PERMAI 2 BLOCK A**, some graffiti was effectively gang territory marking (fig.1.13) similar comments were made by a resident at **PPR PANTAI RIA JALAN KAMPUNG PASIR DALAM**. At **PPR PANTAI PERMAI 2 BLOCKA A and C-D** it was noted that iron grills had been fitted through the development on residential units to prevent burglary (figs.1.17 and 1.18) though these were often decorated to reduce the oppressive visual effect.

At **PPR KAMPUNG LIMAU** young boys were observed loitering on the grounds of the development during school hours (fig.1.11). Illegal hawking was noted at **PPR PANTAI RIA JALAN KAMPUNG PASIR DALAM** (fig.1.16) there was no signage prohibiting this and the area appeared disorganised and the hawkers operated unfettered and were well patronised by residents.

As the observations were undertaken during daylight hours it can only be speculated that more serious criminal behaviour may occur after dark.



Figure 1.11: Children loitering during school hours at PPR Kampung Limau



Figure 1.12: Post lockers show vandalism at PPR Seri Pantai Block 102




Figure 1.13: Apparently gang-related graffiti at PPR Pantai Permai 2 Block A



Figure 1.14: An empty unit at PPR Pantai Permai 2 Block C-D with smashed in windows



Figure 1.15: Glass blocks used to permit greater natural light were frequently targeted by vandals as here at PPR Seri Pantai Block 102



Figure 1.16: Illegal hawkers observed at PPR Pantai Ria Jalan Kampung Pasir Dalam



Figure 1.17: Iron grill to prevent burglary at PPR Pantai Permai 2 Block C-D



Figure 1.18: Iron grills also seen at PPR Pantai Permai 2 Block A

### 1.2.5 Construction Quality

Each of the developments were constructed using reinforced concrete post and beam structure with cement sand brick walls. The construction does not use any prefabricated or precast methods at any of the developments. In general terms, the buildings showed no signs of cracking but paintwork did show signs of staining and weathering. **PPR PANTAI RIA JALAN KAMPUNG PASIR DALAM,** which was completed only 5 years before the observation, showed UPVC pipes at level 6 which were not sealed properly and leaked as a result (see fig.1.21).

### 1.2.6 Public Transport

Across the five developments there was good access to public buses, shared school buses and taxis usually within a short distance of the main gate. The main issue appeared to be indiscriminate parking blocking access, or other such impediments to access such as informal stalls and makeshift huts. Bus shelters are widely provided.



Figure 1.19: PPR Kampung Limau Block 102 roofing gutter and pipes



Figure 1.20: Exterior view of PPR Pantai Permai 2



Figure 1.21: Improperly sealed UPVC pipes were observed leaking at PPR Pantai Ria Jalan Kampung Pasir Dalam



Figure 1.22: The exterior of PPR Pantai Permai 2 Block C-D



Figure 1.23: Public transport options were available just outside the development at PPR Kampung Limau



Figure 1.24: Cars block bus stop at PPR Seri Pantai Block 102



Figure 1.25: Public transport is easily accessible for residents of PPR Pantai Permai 2 Block A but again cars made access problematic



Figure 1.26: Sheltered bus stop at PPR Pantai Permai 2 Block C-D both motorbikes and cars block access

### 1.2.7 Safety and lighting

At **PPR KAMPUNG LIMAU** Safety railings alongside pathways were used to secure bicycles and motorbikes with chains and locks (fig. 1.27) typifying the sense that the developments were rather overwhelmed by motorbikes, or perhaps that there was a lack of formal parking places for them. Also at this development it was observed that the first 5 levels in particular were very poorly lit during daytime hours with little natural light and electric lighting not switched on, the same problem was recorded at **PPR PANTAI PERMAI 2 BLOCK C, D**. Better natural lighting was observed at **PPR SERI PANTAI BLOCK 102** although corridors were poorly maintained and emitted a pungent smell (fig. 1.28). At this development elevated pedestrian walkways were observed for users' safety, however, it appeared that users preferred to take their chances at street level (fig.1.31). At **PPR PANTAI PERMAI 2** (blocks A and C-D) the blocks are built around a central courtyard which does provide some ventilation and natural lighting. However, the first five floors suffered poor natural lighting with the situation improving above that (fig.1.29). As the observations were conducted during daylight hours it was not possible to assess the night time lighting around the developments.



Figure 1.27: Railings used as 'informal' motorbike parking at PPR Kampung Limau



Figure 1.28: Stained damp corridors emitted a dank unpleasant odour at PPR Seri Pantai Block 102



Figure 1.29: Lower floors at PPR Pantai Permai 2 Block A had little exposure to natural light



Figure 1.30: Proliferation of satellite tv dishes at PPR Pantai Ria Jalan Kampung Pasir Dalam



Figure 1.31: An elevated road crossing at PPR Seri Pantai Block 102

### 1.3 Environmental

#### 1.3.1 Maintenance

Observations on maintenance were inevitably dominated by the ubiquitous out-of-order lift. Two of the five locations had at least one lift that was 'under maintenance' (fig.1.32). At **PPR PANTAI PERMAI 2 BLOCK A** one lift emitted a pungent smell of urine. At **PPR PANTAI PERMAI 2 BLOCK C-D** one lift was very poorly lit and the lift interiors were covered with business sticker advertisements and the floor littered with waste; the areas in front of the lifts appeared to be cleaned daily but rubbish still accumulated rapidly as residents discarded litter at a rapid rate. No waste bins were seen in the lobby/ lift area or indeed in any communal area. At **PPR PANTAI RIA JALAN KAMPUNG PASIR DALAM** poor maintenance to rainwater outlets and grating was observed which could cause rain water to over flow during rainy days (fig.1.35

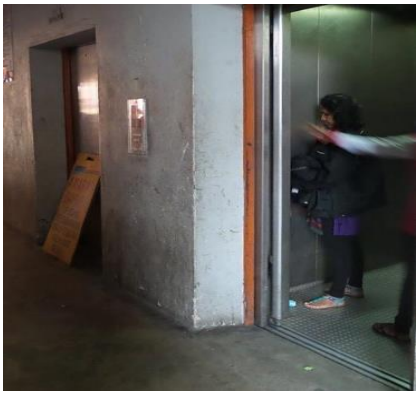


Figure 1.32: Out of order lift at PPR Pantai Permai 2 Block C-D



Figure 1.33 : Cleaning workers remove litter thrown down from above at PPR Seri Pantai Block 102



Figure 1.34: One lift at PPR Pantai Permai 2 Block A emitted a strong smell of urine



Figure 1.35 Poor maintenance to rainwater outlets and grating was observed at PPR Pantai Ria Jalan Kampung Pasir Dalam

### 1.3.2 Location and views

**PPR KAMPUNG LIMAU** is located adjacent to Klang river which runs through Kuala Lumpur city, this remains the only development which has 'river view' (fig.1.36). Another water-facing development is **PPR SERI PANTAI BLOCK 102** but this time the water in question is a sewerage plant (fig.1.37). During the observation the smell from the plant was noticeable as well the poor visual aesthetic. View above at **PPR PANTAI PERMAI 2 BLOCK A and C-D** shared the same layout but the views varied greatly with some facing more pleasant open areas while other faced busy roads or car parking (fig.1.38). However, even where the view was pleasant no balconies were included in the design to fully benefit. One notable aspect of the **PPR PANTAI RIA JALAN KAMPUNG PASIR DALAM** location was its proximity to a main Muslim prayer hall which appeared to be widely used by residents (fig.1.39).



Figure 1.36: The river view at PPR Kampung Limau



Figure 1.37: Residents at PPR Seri Pantai Block 102 overlook a sewage treatment plant



Figure 1.38: The views around PPR Pantai Permai 2



Figure 1.39: A main prayer hall is located just outside PPR Pantai Ria Jalan Kampung Pasir Dalam

### 1.3.3 Parking

Across the five locations it is clear that demand for parking for both cars and motorcycles was seriously underestimated by planners. The result of this was endemic 'informal' parking and vehicles being double parked (one vehicle blocking in another one). At **PPR KAMPUNG LIMAU** covered motorcycle parking was available (fig.1.40). Nevertheless, motorcycles were parked indiscriminately throughout the development often blocking footpaths. Cars double parked would make access to the development problematic for emergency vehicles. Shades were provided to some area of the motorcycle parking however there are a lots of motorcycle being park indiscriminately around the foot path. Double parking were occurring almost around the building this making any access to emergency vehicle such as fire engine difficult to manoeuvre. Also some people park tow truck in area not meant for such business vehicle. Walking around the building can be difficult as motorcycle and cars were park everywhere. The parking situation was also bad at **PPR SERI PANTAI BLOCK 102** where demand clearly outstripped supply with the inevitable consequences**.** At **PPR PANTAI PERMAI 2 BLOCK A** there was no shaded car parking and no covered access to the parking areas**.** However, as seen in figure 58 there was covered motorcycle parking. Here, motorbikes were also parked near the lift entrances (fig.1.44). At **PPR PANTAI PERMAI 2 BLOCK C-D** it was noted that the sheltered areas at ground level were difficult to use on foot because they were largely occupied by parked motorbikes. Similarly, at **PPR PANTAI RIA JALAN KAMPUNG PASIR DALAM** motorbikes were parked in the central shaded courtyard blocking access and double parking was seen elsewhere (fig.1.43).



Figure 1.40: Covered motorcycle parking at PPR Kampung Limau



Figure 1.41: Double parking at PPR Pantai Permai 2 Block C-D



Figure 1.42: Covered motorcycle parking at PPR Pantai Permai 2 Block A



Figure 1.43: Double parking of cars and parked motorcycles skirting grassed areas at PPR Pantai Ria Jalan Kampung Pasir Dalam.



Figure 1.44: Motorcycles parked in lift lobby entrance at PPR Pantai Permai 2 Block A

### 1.3.4 Cleanliness and waste

Speaking generally the five developments suffered from a significant waste and littering problem. Waste facilities and cleaning services appeared overwhelmed while many users clearly place a low priority on considerate behaviour regarding waste disposal. All developments showed evidence that residents discarded waste by hand from higher levels onto the surfaces below.

At **PPR KAMPUNG LIMAU** the placement of household waste including discarded household appliances was noted, which could prevent wheelchair access. Overall though the corridors were relatively litter free. At the lobby lift area, it was clear that efforts had been made to remove business stickers from the surfaces. Some users at **PPR SERI PANTAI BLOCK 102** put their household waste on the corridors outside their units causing unpleasant odours. At the time of the observation, cleaners were removing litter from the rooves of ground level shelter, the litter must have been thrown down from above (fig.1.45). Waste collection appeared inadequate and types of waste were not sorted. To the rear of this development there was a large disordered pile of household waste that appeared to have accumulated unaddressed, over time (fig. 1.46).



Fig.1.45 Block 102 resident complain of litters being thrown from above.



Figure 1.46: At the back of the development at PPR Seri Pantai Block 102 uncollected waste piled up

Broken furniture could be seen in the corridors of **PPR PANTAI PERMAI 2 BLOCK A** (fig 1.472). At **PPR PANTAI PERMAI 2 BLOCK C-D** littering was widespread including food containers, and cigarette packets and butts (fig.1.48)

There was a brighter picture at **PPR PANTAI RIA JALAN KAMPUNG PASIR DALAM** the newest of the five developments. Here there was little sign of littering and less staining of corridor walls from damp clothes.

Large waste skips at **PPR PANTAI PERMAI 2 BLOCK C-D** had either overflowed or residents had not bothered to place their waste in them, leaving them on the ground alongside them (fig.1.49). Also, Fig. 1.49 shows the waste collection area at **PPR PANTAI PERMAI 2 BLOCK A.** The problem of littering potentially causing problems for drainage was observed at **PPR SERI PANTAI BLOCK 102** (fig. 66). All the study block has problems pertaining to waste and cleanliness.



Figure 1.49: Ample waste skips at PPR Pantai Permai 2 Block C-D did not prevent waste being left on the ground.



Figure 1.50: Litter covered grassed areas at PPR Pantai Permai 2 Block C-D



Figure 1.51: Littering causing potential drainage problem at PPR Seri Pantai Block 102




Figure 1.52: Waste collection area at PPR Pantai Permai 2 Block A



Figure 1.47 Corridor outside units PPR Pantai Permai 2 Block A used as storage for unwanted items



Figure 1.48 Indiscriminate dumping was observed at PPr Pantai Block 102

### 1.3.5 Construction and materials

The developments were each made from RC frames with brick infills. They used mainly local materials, something verified from documentation obtained at the site. At **PPR KAMPUNG LIMAU** it was noted that toilet pipes and water pipes were exposed and not embedded in the wall or risers. Traditional cast iron pipes were used but all piping used UPVC pipes. The wall facing the external area at level 6 showed flaking and peeling. At **PPR SERI PANTAI BLOCK 102** The building is well-constructed using RC frame and brick infill. Uses mainly local materials. The building structure and walls had no sign of major cracks and the only problems observed were that some pipe joints show signs of leaking as there were stains visible. **PPR PANTAI RIA JALAN KAMPUNG PASIR** is a concrete framed building with brick infill with plastering-paint both sides. There is no sign of cracking or paint peeling visible. Overall quality of construction is good. **PPR PANTAI PERMAI 2 BLOCK A** has the same basic construction as does PPR **PANTAI PERMAI 2 BLOCK C-D** although here it was observed that some areas need repainting despite the building being less than 5 years old. It was also noted that there was water leakage and pump noise at the pump room.

### 1.3.6 Pollution, ventilation and lighting

At **PPR KAMPUNG LIMAU** smoke was observed from a nearby construction site and also from cooking from informal (presumably illegal) food stalls. Subsequently, the presence of rats was noted near these stalls. Corridors leading to the lift area was dimly lit although strip lighting on the staircase was on even during daylight hours (fig.1.52). Some residents had an iron grill encased area in front of the windows of their kitchen areas and had added an awning above. It was unclear from the observation whether these changes were approved or not. Similar adjustments were noted at **PPR PANTAI PERMAI 2 BLOCK A** and **C-D** and at **PPR PANTAI RIA JALAN KAMPUNG PASIR** the kitchen windows and ventilation area were used as an extension for the storage of kitchen utensils (fig.1.54).



Figure 1.53: Iron grills and awnings added to Kitched area windows at PPR Kampung Limau

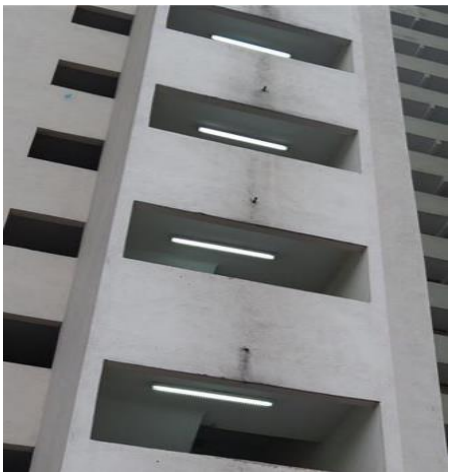


Figure 1.54: Strip lighting in daytime use on the staircase at PPR Kampung Limau

### 1.3.7 Landscape and open spaces

A general observation was that across all the developments there seemed to be two opposing 'forces' – the motor vehicle and green open space, the motor vehicle seemed to be winning in most cases. **PPR KAMPUNG LIMAU** was one development where the battle appeared to be lost as small mostly tarmacked open areas seemed little used but surrounded by vehicles (fig.1.56). As a form of resistance residents improvised their own welcome sign and had placed rows of plants around it (fig.1.58). In contrast **PPR SERI PANTAI BLOCK 102** had larger open areas but these had little landscaping/ greenery (fig. 1.59). The best example of landscaping and green open spaces was found at **PPR PANTAI PERMAI 2 (A and C-D)**; here substantial areas of green open spaces are available to residents, this includes a children's playground area with slides and other play equipment and a futsal/ basketball court. Across all developments the level of landscaping and planting was very minimal but there were some examples which were clearly being maintained (see fig. 1.55).

There are occasionally workers from the city hall maintaining the open area with grass cutters and trimming some of the shrubs and small plants. Figure 1.55: A well maintained grassed area at PPR Pantai Ria Jalan Kampung Pasir Dalam. Of all the study area housing block at Pantai Permai has the biggest open field and landscaping and in the afternoon can be observe the children using it to play football and other sport activities. Figure 72 indicates that PPR Pantai Permai 2 Block A enjoyed the largest recreational area and observed was to be utilised actively in the afternoon.



Figure 1.55 A well maintained grassed area at PPR Pantai Ria



Figure 1.56 Cars and roadside landscape area compete for space at PPR Pantai Permai 2 Block C-D



Figure 1.57:The largest recreational area observed was at PPR Pantai Permai 2



Figure 1.58: Improvised welcome sign and planted area at entrance to PPR Kampung Limau



Figure 1.59: The recreational area at PPR Seri Pantai Block 102



Figure 1.60: A small recreational area surrounded by vehicles at PPR Kampung Limau

**Part Two: Sustainability performance of high rise low cost housing in Kuala Lumpur as measured by the Green Building Index**

## 1.4 Introduction

In chapter three the Malaysian-developed Green Building Index was described in some detail. In this section the Index is used to evaluate the extent to which a high-rise low cost housing development in Kuala Lumpur can be described as 'green' by simulating a GBI assessment with a certified GBI Assessor.

Sustainability assessments are undertaken "to gather and report information for decision-making during different phases of the construction, design, and use of a building" (Bragança et al., 2010. P.2011). There have been no moves to introduce GBI evaluation to low cost housing projects and no signs that this will happen in the near future. For the purpose of this research, however, it was felt to be important to investigate the hypothetical performance of high rise low cost under GBI evaluation. In order to achieve this the researcher engaged the assistance of a registered GBI assessor who visited PPR Jalan Pantai Permai 2 Blok A (fig.1.61). and then gave his evaluation in the form of an interview. The findings from the assessment are set out below.



Figure1.61: PPR Jalan Pantai Permai 2 Blok A - the development where the GBI evaluation took place

### 1.5 Energy efficiency

Part 1 concerns use of energy and also the building's heat gain and heat loss. An OTTV (overall thermal transfer value) is measured on a sun-facing wall. Since it complies with the basics the building can have that mark. Next is EE2 Advanced Energy Efficiency Performance, the building is given is 3 out of 12 because it only achieves a bare minimum. EE3 is renewable energy; the building does not have renewable energy such as PV (photo voltaic) so the mark is 0. EE4 is external lighting and control, the building has timer for the light fitting in public area and also use energy efficiency bulb so can give 2 mark here.
EE5 is internet connectivity and there is internet connection for residents to tap into so the mark is 2. EE6 is sustainable maintenance and building manual (at the office), so I can give minimum of 1 mark only. So for this first part the building achieves an overall 8 marks out of 23.

### 1.6 Indoor environmental quality

Part 2 is Indoor environmental quality. EQ1 indoor air quality refers to the requirement of ventilation, so the overall mark that can be given is 3 because the building has a central courtyard to provide better ventilation throughout.
EQ2 is on volatile materials and the building comes under a government project so I believe no hazardous materials are used but this need to rechecked with the construction documents. So provisionally the mark is 1 of 2. EQ3 is formaldehyde minimization with which the building is in compliance therefore the mark is 1. EQ4 covers daylighting; the units themselves have reasonable daylighting but daylighting is quite poor in some public areas and walkways so I award 2 of marks out of 3. EQ5 External views - this part is limited to where the building is oriented. The building now has some reasonable views and therefore the mark is 1. EQ6 covers sound insulation. The building is

constructed using solid brick wall which offers good sound insulation, so mark is 1. EQ7 is for post-occupancy evaluation and this is not carried out. The mark is 0. This makes the total for part 2 8.

### 1.7 Sustainable planning and management

It is about sustainable site planning and management. This part has the most sections at 14. SM1 - for this section, site selection is given 1 mark as the government already designate the site within the overall city plan.
SM2 awards a mark in cases of re-habilitation of brownfield sites or re-development of existing buildings; this is not applicable for this building so 0 here. SM3 is for community connectivity; in my opinion the building has good community connectivity and can be given 3 of 4 marks (4 is reserved for excellent community connectivity). SM4 covers earthworks – construction activity pollution control; since the building is designated for housing and the site was already flat there would have been minimal earth work so it is not destructive to the surrounding; however, since this is a low cost project there was only very basic site pollution control, so overall the mark is 1. SM5 is about quality assessment; here the mark is 1 because the building is still under city hall responsibility.

SM6 refers to workers' site amenities during construction. Actual contract arrangements must have included this as this is a government project so the 1 mark available is awarded. Industrial building system is for SM7. Very minimal use of IBS. Mark is 1. SM8 is public transport access. The building has very good access to public transport with a taxi and bus stand next to the development, although these are often blocked by people parking their cars and motor bikes - so the mark is 7 of 8. SM9 awards up to two marks for the presence of a dedicated cycling network There is not one at this development so the mark is 0.

SM10 refers to storm water. A proper drainage system was observed so 2 marks are awarded. SM11 covers greenspace and water bodies. Proper green and landscaping is observed but only minimal planting is used - mark is 3 out of 5. SM12 is about hardscape; the building has proper walkways and some areas are covered so a mark of 2 is given. SM13 is for the selection of roof materials. The building uses standard approved materials so the mark is 1. SM14 composting - since the building is under city hall still it can be assumed that certified composting for the landscape is in operation – 1 mark. Overall for the sustainable planning and management section the calculated mark is 24 from a possible 33.

### 1.8 Material and resources

There are six subsections. MR1 covers reuse and selection; the building has at least minimum reusable materials such as the metal rails, roof construction etc.

so the mark is 1. Recycled content materials are covered in MR2 and the building is also in compliance so the mark is also 1. MR3 refers to regional material; the building is a government and city hall project meaning that all materials must be of local origin so the mark is 2. MR4 covers use of sustainable timber; since the project needed to use all local certified products it can be given a mark of 2. Section MR5 is on storage and collection of recyclable materials. Although a bin centre was observed which included a bin for recyclable materials it appeared not to be used or managed properly so only 1 mark can be given. MR6 is about construction waste management where 1 mark is given. The total mark for the section is 8.

### 1.9 Water efficiency

Water efficiency is divided into four parts with a potential for 12 marks. WE1 is on water harvesting; the project was found to have no system for rainwater harvesting so the mark here is 0. WE2 is assessed based on an assumption that Indah Water Corporation takes care of waste water recycling but this would require verification – so a provisional mark of 1. WE3 covers using water for landscaping; since city hall is responsible for this part, I can give 1 mark. However, once again it is necessary to verify their procedures in watering the landscape. WE4 concerns the water fittings for the building, so the mark given is 1, because the fittings only comply with the basic ISO. On site we can see some of the external water taps are broken and water seepage from the pipe is also observed. So this section had a total mark of 3 out of 12.

### 1.10 Innovation

The innovation section has 2 subsections and awards a maximum of 8 marks. IN1 covers innovation and obviously due to the nature of the project there is no innovation to be seen. For IN2 the project has not been supervised by a GBI consultant so again no marks here. So for section 6 no marks were awarded.

### 1.11 Summary

The GBI consultant who contributed to this study arrived at a score of 55 out of 100. A score between 50 and 65 is classed as ‘certified’ under GBI, the lowest classification that does not represent a fail. Significant marks were lost in areas such as energy efficiency and innovation. Although for the latter the fact that this building was part of a PPR low cost high rise housing project means room for innovation is negligible.

It should also be noted that certain subsections of the GBI tool needed to be assessed by assumption rather than actual documentary evidence. Another limitation is the fact that this assessment represents the evaluation of just one GBI consultant.

## TOPIC 2: FINDINGS: RESIDENTS VIEWS AND THE SUSTAINABILITY PERFORMANCE OF LOW COST HIGH RISE HOUSING

### 2.1 Introduction

The *Program Perumahan Rakyat (PPR) Bersepadu* translates as Integrated People Housing Programme and was introduced by the Malaysian government in 1998 as part of a policy objective of ending all squatting in Kuala Lumpur by 2005 (Sufian and Mohamad, 2009). Housing developed under the programme was thus overwhelmingly aimed at squatters with low incomes. In major cities including Kuala Lumpur the housing built under the PPR program comprised of high rise blocks of either 11-12 or 16-18 storeys. They mainly comprised of three bedroom units of at least 60 square meters (Sufian and Mohamad, 2009). The current rental rate is RM124 for unrefurbish and RM224 refurbished (http://eperumahan.dbkl.gov.my/index.php/kadar-sewa,) assessed at 1st November 2015).

Squatters did not normally move directly from their squat to housing provided under PPR. As this study learned, squatters frequently stayed for long periods (some reported 15 years or more) at transit accommodation known locally as long houses.

### 2.2 A description of the users and how they came to be in their block.

At PPR Seri Pantai Blok C/D we encountered a widow who had been at the development three years; she had with six children but only one stayed to look after her; she got her unit while staying at the long house [temporary accommodation provided by city hall for those eligible for low cost housing. http://www.dbkl.gov.my/pskl2020/english/housing/ assessed 1st November 2015] a place she described as inconvenient and prone to flooding and leaks. Another female user[1] described how she had lived there for two years with her husband, who worked, and four children. She too had previously lived at the long house and had been required to move here, although she felt her new arrangements were more comfortable. A third, also female, had a similar story, living there for three years, with five kids who worked and no husband. Again she had been relocated from the long house. She did not work herself due to ill health. The fourth user, an older female relocated from the long house and lived now with her grandchild. The fifth arrived three years ago, again from long house and now lived here with her working husband and one child.

[1] In this chapter the terms ‘user’ and ‘resident’ are used interchangeably.

The final user in this group had a large family of seven people making their accommodation ‘quite inconvenient’. Overall it appeared that their living in the block was not elective but rather the only choice available having been moved out of the long house.



Figure 2.1: PPR Pantai Permai Blok C/D

Moving to PPR Seri Pantai Blok 102 we first heard from a female user who described herself as a permanent resident of three years, with three children all at school and a husband working as a cleaner in Kuala Lumpur. The second user had 8 in her family, including six children and a husband who also worked. The next had little to say by way of introduction though did offer that they had been there 7 years and lived there with her husband, and sometimes her son. Fourth was a woman who had a family of four plus a grandchild brought to stay sometimes, her daughter were single mothers and nobody in the family worked. Finally, another user reported that she had been there eight years and lived with one child. The users arrived at the block through squatters’ relocation [long house].




Figure 2.2: PPR Seri Pantai Block 102

The focus group at PPR Jalan Pantai Permai 2 Blok A included a male resident who was part of a family of 10 who had been a resident for over two years. The second to speak had a family of just 3 having moved in just over a year before. The third user was male and had a larger family of 8, his wife and six children they had previously lived at the 'long house'. He was followed by another male resident who stayed with his wife and two children and had been there two years. The next came from a childless family and the final user was part of a six-person household. As with other groups they had been relocated from other public sector housing (long house) which was intended to be temporary but where they had spent typically 15 or 16 years.



Figure 2.3: PPR Jalan Pantai Permai 2 Blok A

The focus group from PPR Jalan Kampung Pasir Dalam included a female resident of two years who lived with her husband, who worked at the Khatijah Mosque, some of her children and one grandchild. Other children, who had married, were living elsewhere in the same development. Next was a single mother of three children who was living there with them and her brother. Third was a female resident who lived there with her husband, who worked in Melaka (100km away), and six children ranging up to 19 years of age. Next we met a full time house wife who had three male children aged from 9 to 16 years.




Figure 2.4: PPR Jalan Kampung Pasir Dalam

In the final of our five blocks, PPR Kampung Limau, we first heard from a male resident who had been living at the development for 5 years having been relocated from a squatters' site at Kampong Kerinchi. He had seven children. Next came a male resident with only 3 children and who had moved there from PPR Pantai which he had found less comfortable than her current place. Third was a male resident who lived there with his wife and five children. They had formerly been squatters and in relative terms felt more comfortable now. Another male resident introduced himself as having a family of eight, himself, his wife and 6 children, 4 boys and 2 girls. The fifth member of the group was a man with a family of four including two school-aged children. Sixth, another resident with a small family who had relocated from a squat. Finally, another ex-squatter, who lived there in a family of eight, six children.



Figure 2.5: PPR Kampung Limau

In Chapter four a sustainable community was described as “places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life” (ODPM, 2003). Hence in evaluating the sustainability of low cost high rise housing the issue of users’ perceptions is a key one.

Expectations and attitudes towards the users’ current accommodation is clearly affected by their previous circumstances. A user coming directly from a squaters would most likely have lower expectations than one who had already been moved out of their squat by the city authorities such as those who had been living in a long house [a temporary accommodation while waiting the completion of the housing block]. Similarly, the circumstances under which they were offered their unit, the amount of choice involved, is also an influencing factor that emerges from the data.

## 2.3 Social and People

### 2.3.1 Facilities

Those facilities which were provided were often seen as inadequate. While those who could use offsite kindergartens for their children often did so, the many who could not afford to complained of the lack of space, children having to sit on the floor and the need to share a kindergarten with more than one block, meaning that over 1000 units shared a single small facility.

Users made references to the lack of a multi-purpose hall with suggestions that such a facility was offered by the developers but never materialised. The consequences of the lack of such a space include the need to put up tents outside in the car park for functions which may cause a disturbance and deprive other residents of parking, or alternatively, the need to rent a hall from the DBKL which is some distance away, is expensive and needs to be booked six months in advance.

Each block has a shop though one user (PPR Jalan Kampung Pasir Dalam) complained at the lack of a sundries shop selling basic household items for the resident such as milk, sugar, flour, rice, canned food, bottle drinks etc., which meant a significant walk to buy what they needed. Hawkers are not allowed to sell their wares around the blocks although reference was made by a user from PPR Kampung Limau to a properly organised hawkers area at PPR Block A and Block C-D Well organised areas for hawkers would be welcomed according to one user.

Users reported different experiences with regard to mosques. Some blocks had a mosque, others did not and one reported a space used as a mosque which was not appropriate.

A user from PPR Pantai Permai Blok C/D commented on the lack of a clinic which meant they had to use a facility shared with other blocks and that this facility was not a true medical clinic but effectively a first aid centre with a staff nurse, medical assistant rather than a doctor. Lack of dentist facilities was also mentioned and users reported needing to take a bus journey for their dental needs or medical needs beyond the basic first aid on offer at the clinic.

There were some positive comments regarding facilities particularly concerning PPR Jalan Pantai Permai 2 Blok A where one user explained,

> *The facilities provided are good. What's good is that there's a court [fully fitted children play area], a playground. The other flats don't have this. We have a field here, futsal, a playground. That's the good thing but the building is lousy.*

The lack of facilities see residents improvising in order to create communal spaces, as figure 82 shows.



Figure 82: Improvised communal space at PPR Jalan Pantai Permai 2 Blok A

### 2.3.2 House and Room Size

From the group at PPR Seri Pantai Blok C/D the number of bedrooms (3) was seen as adequate but the rooms were so small that they were effectively filled once a bed was put in place.

> *It's because when we were offered the house, everybody liked it. Last time we were squatters at a long house. There were 3 rooms but we didn't read about the width of the house. It's true there are 3 rooms but put one bed in, we jump and were outside the room already. See how small the room is.*

Kitchens were also reported to be small and the overall lack of space in the unit meant that children spent a lot of time outside which was seen as leading to social problems.

As with many contributions, there is a heavy influence from what users had experienced before they arrived at the block they were now in. When asked whether they felt their unit was satisfactory one user commented

> *Yes for me who used to live in hardship. With 3 bedroom it's fine. I have only 5 kids.*

The comment also offers an insight into what is perceived to be a large family.

PPR Seri Pantai Blok 102 users reported that all units comprised the same number of bedrooms whatever the size of the family. Each unit had two bedrooms and with some families having many children conditions must have been very uncomfortable. The situation is further complicated when there are children of both sexes and users reported having to use the living area for sleeping.

> *I have one daughter and two sons. The two brothers sleep outside [in the living area] and my daughter sleeps in the room, their uncle will sleep in the other room, my husband works night shifts.*

Visiting relatives cannot stay overnight and friends who call during the day cannot fit in if there are too many of them. Having a single toilet brings problems and clothes drying area is inadequate. Overall life was portrayed as very difficult for families with more than one or two children.

> *If you have 1 child it is easy you won't have any problems, but if you have many kids than it is a problem.*

At PPR Jalan Pantai Permai 2 Blok A all the units had three bedrooms again irrespective of family size. Users with large families described cramped conditions.

> *The house is small. Like myself with 8 children, in a small house, staying together, everyday returning home only to sleep. The rest of the day we stay down here [at seating area on ground floor]. If everyone stays at home it becomes full and stuffy. Even the air condition doesn't work, it can't seem to cope.*

Figure 2.7 shows a standardised PPR unit layout covering 650 sq, ft. with three bedrooms.

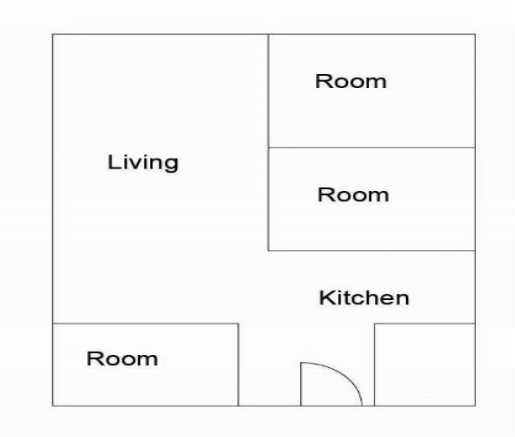



Figure 2.7: Standard PPR 3 bedroom layout

At PPR Jalan Kampung Pasir Dalam one user recounted how her unit was too small to accommodate all her family so her eldest son lived with a friend, the facilitator remarked that large families were common in the block, something to which the users agreed. While at PPR Kampung Limau, again large families featured although users appeared more positive towards the lack of space even using terms like ‘comfortable’

.

### 2.3.3 The family and community (sense of community

It was explained earlier that families with many children face a particularly challenging time living in these blocks because of the size of the units. Lack of internal space pushes children and youths to external areas where a range of social problems arise. There were undercurrents of generational conflict in the data.

High rise housing has a reputation as lacking a sense of community, something reported around the world. It is no surprise then that this also featured in the comments of users of these five high rise blocks in Kuala Lumpur.

A user at PPR Pantai Permai Blok C/D commented

> *One more thing about the community here. Sometimes people don’t even know who their next door neighbor is. Selfish. Before when we were staying at the long house, we were together in our hardship, smiling and saying hello to each other. When we encounter other people here there is no friendliness.*

There are some signs of community such as the neighbourhood watch scheme where some residents take their turn in patrolling, particularly at night. However, the lack of facilities and the inappropriateness or disrepair of those that there are, are also debilitating factors in terms of a sense of community.

There are three main ethnic/ cultural backgrounds represented in the block, Malays, Indians and Chinese. Each has their own set of cultural values and traditions as well as religious observance practices.

In one group of users an interesting insight was given into the effect of differing funeral arrangements. It concerned the difference between bereavement and funeral rituals between the Hindu Indians and the two other ethnic groups. It appeared to be a source of potential division.

> *The most sensitive issue is the need for an Indian mortuary. Indians, if they die, it takes 2-3 days until all their family has arrived. While waiting, they spray rose water. I know our neighbors cannot accept this. They will give us sour looks.*

With Muslims requiring their dead to be buried without delay the Indian process is hard to understand. As a Muslim user explained,

> *For Muslims it's different. We have masjid. We bring the body straight to the surau, pray and then bury it immediately even if it is 11 or 12 at night. I used to go. But not for Indians. The Chinese also do it more like us.*

It appears and it is certainly felt by users that the developers of these high rise blocks did not take into consideration the cultural/religious needs of the various ethnic groups.

Contrastingly, users in PPR Seri Pantai Blok 102 reported more solidarity among the residents when it came to mixing and social aspects. Ethnicity was not considered a source of division and there was regular interaction with neighbours sometimes at a 'meeting hut'.

### 2.3.4 Crime and Social Problems

The issues of crime and social problems clearly overlap. Hence they have been presented here together. It has already been stated that large families in units too small to cope drives children and young people into external areas around the blocks. Often these areas are not designed to provide activities so other less social and potentially criminal activities take place.

In and around the empty units of PPR Seri Pantai Blok C/D on the 17th floor users reported promiscuity and anti-social behaviour

> *I happened to go up to Block D, I couldn't believe it. A teenage girl putting on her panties....condoms are everywhere. Terrible.*

At PPR Seri Pantai Blok 102 more anti-social behaviour was reported with one user recalling

> *These youths socialize by the stairs and in the lift. People chase them until they dropped their underpants.*
>
> *I have a girl teenager. Isn't it worrying (safety feeling)*

It seemed that almost anything left unattended was at risk of being stolen with clothes left outside the unit to dry being a common target, even school uniforms.

> *Yes, our shoes, our clothes, our jeans even school uniforms that we are drying.*

Figure 2.8 depicts the common practice of drying clothes in the corridors, were sometimes they are stolen.



Figure 2.8 Clothes drying outside units at Jalan Pantai Permai Blok C/D

One user at PPR Seri Pantai Blok C/D referred to the theft of cars and motorbikes and unsafe parking facilities. But this was just the start of a long list of criminality that the users had heard of or experienced themselves.

*Theft, muggings. Clothes on the clothes line lost. Shirts and shoes also lost. Before we had a community guard but now no longer. But I think there are some people at night watching like a community guard. They watch but things still get stolen.*

Drug use also appeared widespread with both addicts and dealers having a presence there. These activities seemed to go on despite the nearby presence of police. Drug dealers looking like despatch riders sell their wares in the stairways.

Anti-social behaviour is widespread among the kids living in these blocks with one user tellingly reporting that kids go morally 'rotten' there very soon after moving in.

*Smoking, bikes, skipping school, sniffing glue, following bad friends*

The problem is perceived to be the lack of constructive activities and suitable facilities as alternatives to delinquency. Users expressed the perception that the developers put little thought into how day to day living would be experienced by residents. No thought beyond the physical construction of the units.

*I am a community leader of this PPR Lembah Pantai. There's no recreation place for kids. Then, only one the football field. Around here, there are many flats. Everybody wants to play. If we walk past them sometimes they show us their unhappy faces. The kids don't know what to do. They just hang around. Racing. That's become a social problem. Before they did the development, the basics should be there first. Study first then do.*

Two cases of kidnapping of children were also reported at PPR Seri Pantai Blok C/D one just two or three years old. Gangs based on ethnic background were also in evidence

*There is a lot of Gangsterism. Now they are recruiting gangsters.*

*Not only male, also female.*

In PPR Seri Pantai Blok 102 no kidnappings were reported but users referred to the rise of break ins, vandalised windows and car windscreens, and the theft of motorbikes (even if chained up) or their batteries which led to some bikes being brought up in the lift rather than leaving them in the parking area.

One user reported being too afraid to use the lift alone at night in case they get robbed and another reference was made to a break in at a unit despite it being

protected by a locked grill in from of the door. There was a belief among users that criminals were coming from outside the development to commit these robberies but that they may have accomplices among the residents who supplied them information.

Figure 2.9 shows the lift lobby at these areas raised safety worries among the users.



Figure 2.9: The lift lobby at Jalan Pantai Permai 2 Blok A

> *…the insider must have given the information, if not the robbery won't happen.*

> *The accomplice is in the block. Their gang is out there.*

Robberies were also a major problem at PPR Jalan Kampung Pasir Dalam particularly on the upper floors because they were less occupied and the robbers lacked the courage to operate on the fully occupied lower floors. Again it was believed that the perpetrators were from outside the development.

> *They can't be recognise but the majority are from outside, not from local here, mostly outside people.*

There were contrasting comments regarding users' general feelings about the place they were living in. When asked one said

> *It's peaceful to stay here. Comfortable and 'celebrative'.*

While a fellow user interjected

> *I can't stand the vandalism.*

Still at PPR Jalan Kampung Pasir Dalam muggings and motorbike thefts were reported, cars are broken into and their CD players and radios are stolen, car batteries are stolen and even fuel is siphoned off. Owners of valuable motorbikes brought them up to their unit in the lift. At PPR Kampung Limau vandalism was also a problem, made worse by the length of time things took to get fixed.

### 2.3.5 Construction Quality

Users reported poor construction quality. At PPR Seri Pantai Blok C/D the workmanship was said to be poor with walls that easily crack and chip, exposed pipes. While they are recommended to paint over the cracks, the users question whether the issue is the quality of the cement used.

Similarly at PPR Jalan Kampung Pasir Dalam a user expressed concern at the quality of construction

> *Some of the construction and quality is not that good, the walls have cracked, the pipes need repair there is water leakage, the buildings are not that old but we have these problems already.*

The concerns about why significant construction problems were arising so early in the life of the buildings were repeated for PPR Kampung Limau, with one user saying

> *To me it's strange that after 4 years we already have damages. The unit's paint is already faded, the paint is peeling off, there's leakages, and the materials are not of good quality. The materials used are not proper and not lasting.*

Expectations were modified, however, by the knowledge that this was low cost housing aimed at providing just the basics.

The deficiencies in construction were particularly felt at the extremities of tropical weather. Leaks were reported widely. A user at PPR Seri Pantai Blok C/D who felt their block had particularly poor construction pointed out that leaking water was making the walls crack more easily. A user at PPR Kampung Limau also reported water seepage when it rained. Another user, this time at PPR Jalan Pantai Permai 2 Blok A, gave an example of non-weather related water problems stating,

> *I have a problem with my house, there's water leaking from the toilet. They came to repair it but it still leaks. There are some more complaints on the same issue.*

Still in that block residents reported leaks damaging electrical cables as well as causing the formation of stalactites. At PPR Jalan Kampung Pasir Dalam users cast double on the quality of the glazing as it cannot not keep the rain out,

> *…when it's raining, the rain gets into our house. The window is not preventing the rain getting in even when we close it.*

Elsewhere the formation of mould in toilets was also reported. Others are affected by the problems of those living above them as leaks travel downward. In common areas drains do not appear to be able to cope, perhaps through blockages. Overall leaks appeared to be one of the main sources of requests for help from the local authorities.

It is not just the rain which exposes construction problems,

> *The location of this flat is in the wind ways. It happen once Last year the wind was so strong the roof was blown away.*

### 2.3.6 Public Transport

Car and motorcycle ownership appears particularly problematic for the users of these blocks. This is for two main reasons: crime and lack of parking spaces.

For users at PPR Seri Pantai Blok C/D public transport, buses or the LRT, do offer a good alternative to using their car, but often find the buses and LRT packed. Users at this block also suggested that when planning the development, the authorities had not properly assessed the impact of the thousands of new residents on traffic volumes in the area around the blocks.

> *They knew all of us from the long house will (be) transfer here. How many thousands of us? (big number of commuters form the housing blocks in the morning) Will the existing roads be fine (current traffic jam) It would have been ok if they had developed the road before we got here but they did it the other way round. Move us in first and then develop the road, there'll be no space any more.*

At PPR Seri Pantai Blok 102 users reported improvements to transport and access compared to earlier in their tenancies. The development was now included on additional bus routes and a footbridge had been constructed. However, more buses were requested and it was also pointed out that the footbridge was difficult to use for older residents.

At PPR Jalan Pantai Permai 2 Blok A users recognised the benefits of their convenient location and good transport connections.

*It's easy to go anywhere. To north, to south it's really good. So that is one of the reasons, I personally said that this is a strategic place. This is one of the reasons I like about this area.*

Similar value was placed on the location of PPR Kampung Limau by one user who had invited his German employer to the development,

*I brought my employer from Germany, he was excited and he said it is beautiful and maybe the price was more than $100,000 but I dared not tell him actual price. But he praised the strategic location.*

However, at the same development parked cars were reported to be preventing a bus route from entering the development which meant residents had to walk outside the development to an alternative bus stop. There was also a conveniently located train station nearby. Figure 86 shows that 'informal' parking created by over-subscribed allocated parking interferes with the access for public transport.



Figure 86: 'Illegally' parked cars block bus access at PPR Seri Pantai Blok 102

2.3.7 Safety and Lighting

Crime and anti-social behaviour, which was discussed above, is the main reason while residents at these blocks report a lack of safety that seems to affect both genders and all ages. Concern extends not only to property but to person.

*In term of safety we the occupants are responsible, we do our own patrols*

While the residents take this responsibility there were suggestions that the community watch arrangements were not deterring crime or anti-social behaviour.

A user from PPR Kampung Limau suggested that the fact that it was a public housing development with people moving in an out meant that it would always be less safe than a private development.

At PPR Jalan Pantai Permai 2 Blok A serious doubts were raised about the fire safety of the block and specifically whether it had be certified safe.

> *I mention this for all of us, we asked DBKL (City Hall) many times, does this building have a Certificate of Fitness (CF) The building that we occupied. That we bought. We stay here, we wanted to know if it is safe or not. Has a CF been issued? Until now we have no reply.*

Another user continued along this thread,

> *They have sold the house, we have paid up some cash but regarding CF, we don't know if we have it or not. I know the Fire Department has not approved the CF, so if there is no CF from the Fire Department, there is no guarantee of our safety!*
>
> *Before anybody end up dead I wanted to know where is that CF?*

Lifts were mentioned as unsafe areas and disrepair was mentioned as another source of problems. One user at PPR Kampung Limau voiced concern about the possibility of a child falling down a drain which had a broken cover and which was situated just outside the kindergarten.

Lighting, or the lack of it, was also mentioned as a concern. At PPR Seri Pantai Blok 102 a user described it as something which inhibited them going outside with a lack of lighting around the lifts and also a lack of street lights outside. Lighting was also described as intermittent or with lighting coming on in daylight hours and going off when it is dark. At PPR Jalan Pantai Permai 2 Blok A problems with lighting with lift lighting were reported raising safety concerns.

### 2.4 Environmental

#### 2.4.1 Maintenance

For the many reasons covered here and in the following chapter, maintenance was the most referred to area falling into the category of environment.

With regards to maintenance users reported that City Hall were slow to react to notifications or requests for assistance sent by them.

> *Maintenance, I'll say it's actually slow. It's failing.*

A user at PPR Seri Pantai Blok 102 commented,

> *Maintenance is done by City Hall. I mean, you know when we call them it takes such a long time for them to respond, especially when the lifts breakdown, some people have been trapped inside for hours.*

Problems with lifts were especially evident and lift breakdowns appeared routine. One user from PPR Seri Pantai Blok C/D responded when asked about the frequency of such breakdowns:

> *Mornings, sometimes evenings. If not in the evening then in the morning.*

Some of the reasons for lift breakdowns were put down to the actions of residents such as overloading the lift and pressing the buttons for too long of even burning the buttons.

The impression was given that contractors had been reluctant to work at the PPR SERI PANTAI BLOK C/D development for one reason or another as one user explained,

> *At this building, in the past there were 3 contractors. All abandoned it. The lift door was left opened for a few years like 5 or 6 years. The rain water flowed in and out. The contractors run away and abandoned this project and later it was taken over by "……". So the machine inside the lift easily got hiccups. If it kept going up and down, sometimes it suddenly stopped. So, that brand actually cannot be used.*

A user at PPR SERI PANTAI BLOK 102 experienced health problems when there were lift breakdowns due to asthma. Lack of a functioning lift appeared to confine some residents at this block to their units,

> *If there's no lift repaired, I won't go down. I'll stay at home until they repair the lift.*

Perhaps even more disturbingly another resident at PPR SERI PANTAI BLOK 102reported that a small child had got stuck a lift when it broke down and nearly died.

At PPR Jalan Pantai Permai 2 Blok A a resident also informed about the regularity of lift breakdowns.

> *Lift problems. In a month 5 or 6 times the lift breaks down or is damaged.*

At PPR Jalan Kampung Pasir Dalam an incident was reported in which during one piece of maintenance the contractors appeared to have caused the lifts to flood leaving the residents without lifts,

> *I was worried that the building might collapse. The lifts were flooded and we have to use the staircase for 2 weeks.*

Failing lighting in lifts was also reported as a safety concern and lift areas in general throughout the data were a much mentioned source of dissatisfaction. There appeared to be some resignation to the inevitability of lift breakdowns at high rise public housing developments with one resident commenting,

> *This lift thingy, I think everywhere at PPR all over Kuala Lumpur it is the same, always breaking down*

A user from PPR Kampung Limau argued that City Hall should be more pro-active and less reactive in their maintenance efforts.

> *The authority should really do checking and monitoring but they wait for reports then take action. When community makes complaints, only then they'll come. That's why it has to be checked always. For example, block 94, the lift can only reached up to level 4. It's really like having heart attack. Maintenance, I'll say it's actually slow. It's failing.*

Aside from lifts maintenance issues were reported with drains, drainage pipes, lighting and windows broken through vandalism.

### 2.4.2 Design and Layout

Residents were asked about the design and layout of their units. At PPR Jalan Pantai Permai 2 Blok A a user expressed dissatisfaction with this layout,

> *Not comfortable. Once you go inside then you can see the toilet, while you are eating, you can see the toilet. It's not comfortable.*

Another user from the same block referred to their unit as a pigeonhole because of its bad design and poor quality. At the design was criticised for the size of the rooms and throughout the five blocks in the study lack of variations and flexibility in design in terms of size and number of bedrooms appeared to be at the root of many negative perceptions, particularly among those living in large households.

The high density nature of the accommodation lessened feelings of privacy possibly increasing residents desire to withdraw into their own household. As one user at PPR Seri Pantai Blok 102 commented,

> *When there are two families, too packed in, peoples have less privacy. So, when there is less privacy, people will feel rebellious and try not to mix around. For terrace houses, there is a bit more privacy. Like here, there are people left, right, above and below. So they feel it. Does this lessen the neighbourhood spirit?*

More favourable comments were made users at PPR Kampung Limau with one user commenting,

> *I feel comfortable because the corridor is not shared. In other blocks the corridor is shared with other residents. Over here it is on its own. So other blocks are not as comfortable as this one.*

Another user from the same block added,

> *To me PPR Kampung Limau is beautiful if compared to other PPRs that are not so attractive.*

Figure 87 shows how, if the corridor area in front of the unit is not shared it can be more safely used as useful space. In this case it is showing an end/corner unit at PPR Jalan Pantai Permai Blok C/D.



Figure 2.11: The benefits of an unshared corridor shown at this end/corner unit at PPR Jalan Pantai Permai Blok C/D

### 2.4.3 Parking

Perhaps alongside lifts, parking was a topic which exercised the users of the blocks in our study. At PPR Jalan Pantai Permai Blok A a user lamented that "even parking is hard here". The theft of cars and motorbikes has already been reported above. The other aspect of parking that was commented on by the users was the inadequate supply of allocated parking and the consequences of 'informal' parking.

At PPR Seri Pantai Blok 102 one user reported how conflict can arise through inconsiderate parking, such as blocking in another car.

> *The handbrake is on, the car cannot be moved; then other people feel annoyed so they let the tyres down, not just one tyre but all of them. It's so worrying. There's no parking.*

Similarly, at PPR Jalan Pantai Permai Blok A a user commented,

> *This is my view of the outside. The outside that I can see. It is like one big car park. Sometimes there is double parking. It is really a pity if it is new car. We move it a bit; it might knock against another car. That's the problem. Parking is really a problem.*

A resident at PPR Jalan Kampung Pasir Dalam also voiced an opinion on the parking,

> *There is some parking not enough, sometimes they double park*

At PPR Kampung Limau the lack of motorcycle parking and the perceived lack of security led some residents to bring their motorcycles up to their units in the lifts.

### 2.4.4 Cleanliness and Waste

The data portrays the PPR developments in this study as seriously lacking in cleanliness. At PPR Seri Pantai Blok 102 a user commented,

> *They don't want to throw the rubbish away; they just put it near the lift or near the end house there.*

At the same block users also reported that rubbish was also thrown from the units to the ground below with users itemising bottles, eggs, fish stomachs, soft drink cans, potato skins, stones and even bloodied sanitary pads. Rubbish stuck

to the walls and discarded cigarette ends get blown into units below, ending up on curtains. Users from this block also reported that rubbish was collected every day and that there was even a competition for the cleanest floor.

> *They run a competition for which floor is cleanest, the winners get 2 pieces soap each.*

Meanwhile at PPR Kampung Limau a user suggests that it is not a lack of cleaning that is causing problems but the actions of the residents,

> *…rubbish is not good in cleanliness. The cleaners are around in the morning. Cleaning in the morning and afternoon. By the time we come back from work, it's dirty again. The rubbish smells, there is pee in the lift.*

At PPR Jalan Kampung Pasir Dalam the rubbish situation was highlighted by one user as their main dislike. Another commented

> *Cleanliness is a problem, irresponsible occupants throw away rubbish as they like...they also throw from their flats up there and hit some of the cars.*

There appeared to be a sense of despair at the lack of personal responsibility shown by some residents.

> *Irresponsible people. We don't know what to do*

This frustration was repeated at PPR Kampung Limau,

> *The one thing I most dislike is the human behaviour, people are still loitering and throwing rubbish everywhere even though there is a proper place to dispose of rubbish. Some people just throw away their household rubbish anywhere and everywhere.*

One potential solution to the problems being caused by residents' rubbish disposal behaviour was put forward by a user at PPR Kampung Limau. They suggested a disposal chute be installed at each floor so that disposal was as easy as possible. Though installing one now, even if possible would be a lot more problematic than having designed one into the construction in the first place.

While the overall cleanliness picture portrayed by the users in our study was a grim one, here too there were signs of low expectations based on their previous living conditions. As one user said,

*It is cleaner than the long house. Compared to the dirty drains, clogged pipes, mosquitos, and rats. Here thank God there are only Mosquitos. Everything's ok. No blocked drains.*

### 2.4.6 Construction and Materials

Users from three blocks expreesed their dissapoinmnet with the qualities of the housing bloack construction.Eventhough the development are ment as a low cost housing development, it has to adhere to the minimum standard of specification under the government contract.

Block CD
I did asked that day, why only our PPR units that has cracks, leaking. Why the one which is a bit expensive doesn't have this problem? Is it the quality of the cement? Here the water leaking made the wall easily cracked.

Block Pasir Dalam
Some of the construction and quality is not that good, the wall has cracked, the pipes need repair there is water leakage, the building are not that old but we have this problem.

Block Kampung Limau
To me after 4 years already have damages. The unit paint already faded, the paint peeled off, there's leakages, and materials is not of good quality. The material used is not proper and not lasting.

Nevertheless, overall quality and standard were monitored during construction and periodic checks were conducted by the authorities.

### 2.4.7 Pollution, Ventilation and Lighting

A user at PPR Seri Pantai Blok 102 reported a serious problem of a stench borne on wind and rain and coming from an oxidation pond (a shallow pond used to treat wastewater).

*Smells terrible if it rains, certainly the smell will reach into the house. I'll have no appetite to cook or eat. Strong wind and it will also smell.*

The same problem was reported by a user at PPR Jalan Kampung Pasir Dalam (figure 88) and at PPR Kampung Limau reference was made to a sewerage plant.

*[In hot weather] we can smell stink due to the plant located nearby.*



Figure 2.12: the oxidation pond at PPR Jalan Kampung Pasir Dalam

PPR Kampung Limau is located between, on one side, a busy highway and, on the other side, the River Klang. While they have access to and from the highway it brings with it pollution problems in the form of both noise and smog which results in dust being spread into the units.

*The location of the PPR (building) is in the middle, in front is the highway. We have access but it is too noisy, lorries come and go. But we do have a better view [of the river] than other places. The environment here that I have experienced is that I always have to sweep due to dust, I stay at level 11, the air is affecting the children, it is not healthy.*

Another user confirmed the problem with dust. Although there was appreciation for the view over the Klang River which was described as 'beautiful' by one user (see figure 2.13.



Figure 2.13: The view from PPR 102

Poor ventilation appeared to be responsible for a number of problems. Smoke and smells from cooking can be intense according to a resident at PPR Seri Pantai Blok 102, because

> *Not enough fresh air gets into the house*

As well as the smell, lack of ventilation means cooking heat is trapped inside the unit.

> *If we cook the heat gets back in to the house. There is no ventilation for the heat to flow.*

Those in higher floors seem to enjoy somewhat better ventilation but the drawback is that in heavy rain the same airflows sweep the rain into the units. At PPR Kampung Limau a user referred to the satisfactory ventilation at the block.

> *The design is good. Ventilation comes in front and back. All [units] receive ventilation from front and back.*

Users at PPR Seri Pantai Blok 102 had multiple issues related to lighting or lack of it. The lift was without lighting for months and the street lighting did not work either. Similar problems were reported at PPR Jalan Kampung Pasir Dalam where users refereed to insufficient light points inside the unit, the fact they had to do their own wiring in the unit and again, lift lighting not working.

### 2.4.8 Landscaping

At PPR Jalan Pantai Permai Blok A there was high praise for the work done by City Hall in landscaping the development (see figure 90).

> *On the environment at this time is beautiful, they [City Hall] did well, they plant all the trees.*

Another user at the same block added

> *The greenery...Thank God! Everything is beautiful at ground level. Everybody can see that it is beautiful but once you go to an upper level it is not beautiful.*



Figure 2.14: The much appreciated greenery at PPR Jalan Pantai Permai 2 Blok A

The planting of trees was also appreciated at PPR Jalan Kampung Pasir Dalam.

### 2.5 Cost and Economic and Authorities

User expectations were also linked to affordability. At PPR Jalan Pantai Permai 2 Blok A a resident reported while some do buy their units if they can afford it there are still many who cannot raise the money.

> *Not all buy. If they are offered then some will buy but others cannot afford it even though it's only RM35,000. You know those who stay here are mostly old folk and sick people. With 5 or 6 children and a salary of only RM1500. So how can you afford to buy this house?*

Aspirations for better housing undoubtedly exist among some of the users of PPR housing with one user from Jalan Kampung Pasir Dalam reporting their hopes of buying a house in the private sector but feeling unable to because of private sector house prices.

> *If we can, we would like to find a house where is comfortable for us to live in and suitable with our income. If the house is comfortable but the price is higher than we can afford then it will not work. We have to stick within what we can afford. We can afford for around RM100,000 and below. But if it is nearly RM200,000, how can we live(afford). There would not enough money to eat. We could not even afford to pay the parking.*

There is little perceived property security among the residents who reported burglaries, car and motorcycle theft and even the theft of clothes left out to dry.

### 2.5.2 Authorities

The users in our study have had a longstanding relationship with City Hall at least in regard to their housing. Having been squatters first and then residents at a transit house for a long time before being placed in their current homes under the PPR program, City Hall has effectively been their landlord for a long time. With City Hall directly responsible for maintenance and property management the existence of dissatisfaction and conflict is perhaps inevitable. The overwhelming impression left by the data is one of a perceived lack of responsiveness to both the day to day issues such as broken down lifts to longer term concerns over crime, antisocial behaviour and lack of facilities. Residents would prefer a more proactive approach from City Hall rather than waiting for a problem to arise before doing something. At PPR Jalan Pantai Permai 2 Blok A a resident commented,

> *Wait until it collapses then they'll come and repair*

This was echoed by another user at the same block who had a plumbing problem,

> *Wait until the toilet collapse then they'll come.*

The theme continued at PPR Kampung Limau,

> *The authority has to do checking but they wait for reports then take action. When community make complaints, then they'll come.*

In our focus groups users quoted many occasions where they had requested help from City Hall and when they had put their views across. One user from made the point that they were not passive and accepting in the way some people may perceive,

> *…people think because we are ex-squatters, we don't have loud voice. Just give us a motorbike, and we will go around. That's what people's perception is.*

There was a perception that interest among council leaders was somewhat superficial. One user from PPR Jalan Pantai Permai 2 Blok A suggested that the major would visit at ground level, see the nicely landscaped areas with their trees and assume everything was ok. He would not actually go up to the units.

> *We asked the Mayor to come and see us. He won't come up. He'll only visit down here [ground level] only. If he sees it is nice, he'll say everything is nice.*

Also at this block there was a conflict between users and providers regarding the safety certification for the building (or more specifically the potential lack of such certification).

While there were signs of difficulties in the relationship between the users and City Hall there was also ample evidence of realism and even gratitude that their current conditions were a good deal better than what they had previously known. They did not display exaggerated expectations and appeared to understand the financial constraints on the PPR program.

## 2.6 Summary and Key Findings

Of course each of the five blocks in this study had its own issues and variations but having said this an analysis of the data shows very clear common themes in terms of the perceptions and experiences of the users of public sector low cost high rise housing. These have been presented in this chapter. How this type of housing is experienced is also influenced by the individual circumstances of the residents including the size of their family, their age and health, and their expectations based on their previous living arrangements and their current financial situation. In particular, perceptions of comfort either negative or positive ones were firmly rooted in family size and previous accommodation meaning they were at least in part relative rather than absolute.

Beyond this the picture painted by the users of life in public sector low cost high rise housing was a grim one despite their modest expectations. Crime and anti-social behaviour was rife, maintenance was seen as inadequate and cleanliness far below an acceptable standard. There were clear tensions between user and City Hall which was responsible for maintenance and management of the developments. Such tensions are not unusual in landlord-tenant relationships but as the relationship is central to the way users experience their life in low cost high rise housing it should not be ignored. A series of points of conflicts in relations between users also emerged from the data, crime, anti-social behaviour, lack of consideration for others regarding waste disposal and other types of behaviour all featured. Both these sets of relations are important if a community is to be sustainable.

Overall there was no direct indication in the data that low cost high rise public housing was seen as unsustainable as a format and a solution by the focus group participants who were users of such housing. To an extent this may reflect the low expectations and former, harsher living conditions the participants had experienced.

Individual aspects of living in such housing were often described negatively and many of these comments were supported by the photographic and field notes data collected by the researcher during site visits. Whether the aggregation of the problems describe amount to low cost high rise housing being unsustainable will be considered in chapter nine when all the findings are evaluated.

In the next chapter, the perceptions of those representing the providers of the five blocks in our study add their voices to the study in order to add another important dimensi

## TOPIC 3: FINDINGS: PROVIDERS VIEWS AND THE SUSTAINABILITY PERFORMANCE OF LOW COST HIGH RISE HOUSING

### 3.1 Introduction

This chapter presents the findings from the data collected from the 'providers' group. As with the previous chapter data from photographic evidence and field observation notes are also included to support, contrast or illustrate the data collected from the interviews with four providers. Unlike the users who attended focus groups, in the case of providers the data was collected using semi-structured one-to-one interviews. Four such in depth interviews were conducted, three with architects familiar with high rise low cost housing in Kuala Lumpur and another with a local MP in whose constituency some of the PPR developments in our study are found. Again, as was the case with the previous chapter the findings are presented in line with the themes and sub themes identified using the NVivo program. First, however, the profiles of the four providers are described.

**Part One**

### 3.2 Profiles of the provider informants

The first provider (**P1**) worked as an architect for a small firm and had done so since 1995. Before then he had been a civil servant since 1983. He had had a lot of experience on low cost housing projects, including high rise and long house projects. The second provider (**P2**) was also an architect who had been in private practice for many years. His company worked across a range of projects from PPR to PLUS (a public-private partnership) and private sector resorts. The firm employs 14 people in all and was set up in 1993. The provider was responsible for designing everything at I've been involved with Kampung Kerinchi PPR.

The third provider (**P3**) worked for AsSaffa Design Practice having joined specifically to resolve any issues related to the Certificate of Fitness (CF) for a high rise low cost housing project at one of the sites in this study.

The final contributor on the providers' side was local MP YB Nurul Izzah Anwar Ibrahim. She is the daughter of former Deputy Prime Minister of Malaysia Anwar Ibrahim, currently leader of the opposition and imprisoned. She represents the constituency of Lembah Pantai in which the five sites in this study are located. She is also vice president of vice President Parti Keadilan Rakyat (PKR). Parti Keadilan Rakyat are the dominant political force in Kuala Lumpur in terms of MPs having been victorious in nine out of the eleven seats but due to the way the appointment of local councillors is controlled by state government, the party does not have a single representative on Kuala Lumpur City Council.

### 3.3 Social and People

#### 3.3.1 Facilities

While recognising that the starting point for architects of low cost high rise developments is the need to fit a certain number of units into the development site, he argued that the second design consideration should be steps to maximise the space available for facilities.

> *You need to fix certain numbers of units in that particular site, right.. Then of course, that'll be the first criteria. Then no. 2, ask yourself whether you can provide better facilities*

As a specific suggestion **P1** argued that if a separate car park building were constructed then more space would be available at ground level for facilities and landscaping. As an architect involved in low cost projects he recognised that as far as the units themselves were concerned there was little flexibility but at ground level and in communal areas designers can make an impact. While little had changed on unit design or size since the start of the PPR program, **P1** was hopeful that any new developments would play much more attention to the provision of facilities, which had hitherto been neglected.

While both **P1**'s priorities for facilities related to children he rated the provision of a kindergarten/ nursery as the most important. In his own architecture practice there was a kindergarten so the benefits were clear to see and would provide a major benefit to parents who could drop their children there before they went to work.

Secondly, **P1** felt strongly that recreational areas were required, either courts for badminton or kick volleyball or simply grassed areas.

> *We must have more badminton court or kick volleyball court. More green. Actually sometimes you don't need court, you know. You just need green. Grass only so that children can run. More like a park within your own compound.*

In figure 91 the games court and playground included at PPR Jalan Pantai Permai 2 Blok A is shown. These facilities are missing at some developments but viewed as essential by providers and their absence was also commented on by residents.

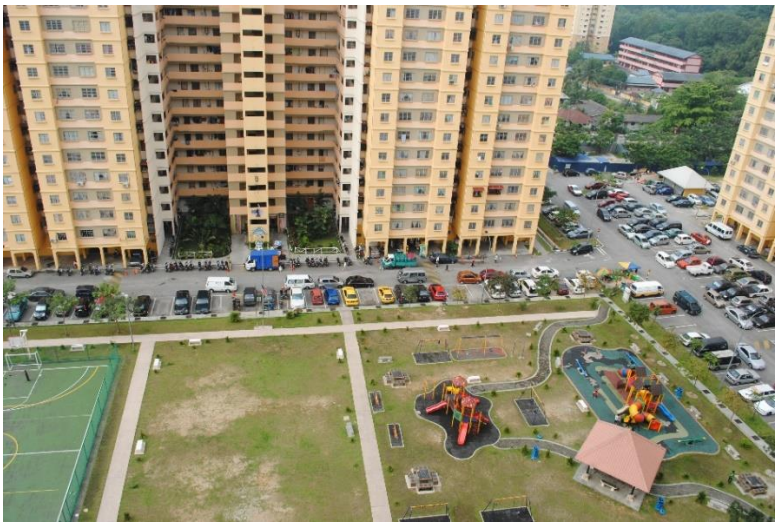


Figure 3.1: The games court and playground at PPR Jalan Pantai Permai 2

Clearly **P1** sees a key route to a sustainable community is one where children and youth have the facilities necessary to engage in worthwhile activities such as sport. In their absence, he saw children drifting off to gather at shopping malls doing nothing of value. He contrasted the needs of those with low incomes with better off people.

> *For those rich people, they drive their car and go play golf. Where (are they) today? In Penang? Melaka? Just no problem. Just drive. But for people who are low income earners of cause there're money. Petrol is money. Even riding a motorbike. If they want to play in Shah Alam. It's time and money. So we try to provide which is close by for them.*

Hence the availability of facilities in the near vicinity is particularly important for those on low incomes.

At **P3**s project there was a small mosque, a kindergarten, and a multi-purpose hall, which he felt was adequate for a low cost development. Their appeared to be no plans to add to the current facilities and no requests had been made to do so by the client (head of the PPR). The main difference between **P3**s project and most others was the emptiness of the ground floor level mainly because it was not used for parking. This allowed for more landscaping, something which **P1** had argued was highly desirable.

A combination of more green landscaping and more facilities was, according to **P1**, offered protection against the site turning into a new kind of city slum.

The local MP echoed the comments of users in the previous chapter regarding facilities, stating,

> *…most depressing is the fact that they don't have allocated space for their children to play in some there is no clear thinking of allocating the facilities, basic infrastructure to make it worthwhile to live in.*

She continued, suggesting that there were social risks associated with providing inadequate facilities with be possibility of anger being cultivated and the certainty of quality of life being undermined.

Where the architects build additional facilities into their plans it seems that sometimes they are struck off by the authorities. **P3** informs that a small mosque and food court had been deleted in this way from.

3.3.2 Parking and car ownership

Parking was highlighted as a significant problem by the users in the previous chapters. The issue is also apparent to the providers. **P2** describes how the problem arises,

> *Families frequently have two maybe three cars. You cannot get the correct numbers of car park spaces. This is why cars are parked all over the place. It's not that you are not provided with a car parking space. There is insufficient parking because the spaces are over-subscribed. So this is the scenario and the problem of our housing.*

**P2** discusses how playground areas become overspill parking areas, one starts parking there and then others follow refusing to move until everyone is made to move, but there is no enforcement. This 'if he does it so can I' attitude takes the overall level of behaviour and personal responsibility down to the lowest point.

The number of storeys is another disincentive to use ground level communal spaces as play areas. Instead children appear to use corridors and the spaces around lifts. As **P3** explains, this is partly because they are too lazy to go down to ground level and partly, for the younger ones, because they can still be supervised.

The problems in car parking and the level of 'unauthorised' parking seems to stem from a design stricture. As the MP explains,

> *…for every four units of public housing they only allocated one parking lot.*

In a country where car ownership is encouraged and affordable this limitation is inevitably problematic and even manifests itself in criminal behaviour. The MP illustrated this, recalling a case where motorbikes were set on fire by motorists angry that they had nowhere to park. Furthermore, the MP suggests that there needs to be a review of public transport provision as part of the effort to find a solution.

As figure 92 shows the parking of both cars and motorcycles is a source of a whole range of problems and is something overlooked or mishandled at the design stage.



Figure 3.2 Parked cars and motorcycles at PPR Jalan Pantai Permai 2 Blok A

### 3.3.3 Unit and Room Size

With policymakers dictating the size of the units and the number of bedrooms, architects are limited to considerations of how to divide the space up. **P1** commented,

> *There's nothing much you can change about the room. You(authorities) say 650 square ft, however you shift it around, you know, bigger room, smaller hall, bigger hall, the room becomes smaller, you know. 650 is your limit, right? ..*

As we have seen in the previous chapter there are wide variations of family size and large families are commonplace and yet all the units in a block have the same number of bedrooms. **P2** suggested a greater level of flexibility in unit offerings to avoid under- or over-occupation.

> *You provide it all. Within a block you can have may be 50% 3 bedrooms, 2 bedrooms, 1 bedroom. For newlyweds, why do you need 2 bedrooms(for)? I'm going to have a child. OK go have a child. After 2 years then you are eligible to move in there. Then you can apply.*

A further matter was raised considering the appropriateness of square feet limited pre-determined floor plans being drawn up on an unfurnished basis.

Issues arose from the interior layout once furniture was brought in to the unit, with cramped spaces being created or in some cases insufficient room to walk around or open doors. The facilitator suggested and **P2** agreed that anthropometric design techniques which took furniture placement into consideration would result in better layouts. In the previous chapter a user referred how much they liked their unit when they first saw it unfurnished and how they realised how small the rooms were when they tried to fit a bed in. **P3** also confirmed the merits of thinking in terms furnished space rather than unfurnished.

It was recognised that the size of the unit (650 sq.ft.) was a function of the density requirements in urban areas. For example, while this size may be considered small compared to some developed countries, in those where density is exceptionally high 650 sq.ft. may seem generous.

> *But if you talk to people in Hong Kong, 650 is very lavish. Because you when you have 300-400sqft in Hong Kong it is considered as a comfortable house already. You sleep in the living room at night. But that's Hong Kong. If we were in a developed country maybe 1000 sq ft is still considered low cost. Ours .. it is all 650 sq ft. now.*

**P3** recognised that low cost housing units were rather small but that all parties had to be realistic of what could be achieved for low cost public sector housing. Nevertheless, this architect believed that the kind of low cost high rise housing being built under the PPR program is too high density.

Furthermore, **P3** believed that the three bedrooms, standard was based on an assumption of a family consisting of two adults and three children while in reality many families in PPR were much larger.

> *With 3 bedrooms, I don't know how they [families with many children] live. I think the government does 3 bedrooms for 3 children. One for parents, one for boys and one for girls.*

The issue of family size was also highlighted by the MP.

> *the space allocated to each family is usually not sufficient because of the number of children*

While the size of the units is dictated by the Ministry of Housing another factor is behind the requirement for three bedrooms.

> *Muslims must have 3 bedrooms. Parents in one room. Daughters in one room and sons in one room. They cannot put both daughters and sons in one room. Two bedrooms in this country is not allowed because of Islamic influence.*

*Islamic value system. You must have 3 bedrooms. But then people cannot afford it. It's ok. According to fatwa or hadith, sons are being separated and all this. This is the thing. We are complicated by our own doing but we are not firm.*

As found in the previous chapter, many families living in PPR developments have a lot of children. This causes cramped living conditions. **P2** raises the issue of family size from another perspective,

*So I like to suggest, if you complain "I have only small house. Do they think we are pigeons?" They complain it's too small. They don't blame themselves. They say, "Don't they know that I have 5 children. My family has 7 people. They gave only 3 rooms. How is that enough?" You see. They never ask themselves, why do they have 9 children? And you live in a squatters' area. Please measure your capability.*

3.3.4 Architects limited role in PPR Design

Under the PPR program the role of the contracted architect is a restricted one. Cost limitations are clearly set down in advance and standardised designs are used across multiple PPR developments. **P1** explains,

*And also with that [PPR] project, the design is quite standard. They want it fast tracked so we just take it [the design], put it into the site and submit this to the authorities. Then we get approval and they tender out to get contractors. That's how it starts off.*

As well as cost, speed appeared to be a key driver behind the PPR process.

*That time one of the reasons was to be fast. So, that's why speed is the main criteria.*

**P1** explains that the housing department running the PPR program has a preference for staying with previously used designs where they have experience that they can be delivered quickly, with cost limits and have been satisfactorily received by users. **P1** also refers to more than 10 sites in Kuala Lumpur all using the same design. However, at a particular site the basic designs maybe slightly modified, for example, to respond to the input made by City Hall.

Another architect, **P3**, also referred to the limited role architect firms had in the design of PPR projects. Talking specifically about PPR Kampung Limau he explains that a standard floor plan had already been prepared for them and was left to them just to propose the position of the two blocks in relation to each other and some ground level options.

### 3.3.5 Crime and Anti-Social Behaviour

While the residents at the five blocks had a good deal to say about crime and anti-social behaviour, having experienced it first hand, the providers made fewer references to this aspect. The MP did, however, recognise the problems arising where units in the blocks were left unoccupied creating “a new place for drug addicts”. As mentioned before, according to the MP, where the provision of facilities was inadequate there was a greater risk of social problems. **P2** was also aware of the drugs problem arising at high rise blocks built under the PPR programme. He points to poor enforcement which sees drug dealers picked up by police only to be released without charge and reappear within a couple of days.

Rukun Tetangga (RT) (modelled on the UK’s neighbourhood watch schemes) is a voluntary program under which residents work together to improve community safety, for example, through patrols. **P1** argues that RT or a management company needs to be given sufficient enforcement capabilities and sanctions to effectively tackle crime and anti-social behaviour.

### 3.3.6 Community (sense of community)

**P2** argues that a sense of community cannot emerge in a block with 300 families. There are simply too many people to get to know in order to appear friendly. He concludes that low cost housing needs to be more spread out. As people don’t know each other they don’t know who is a resident and who has “come to rob”.

The sites with their multiple identical –looking blocks which are so indistinguishable that newspaper reports recalled by **P2** covered a story where a young boy could not find his way home and went missing for days, despite being in the neighbourhood.

> *That is why the case one boy was playing there and suddenly lost 2 -3 days. Why? Because they are all look alike. He didn’t know how to get back to his house. It’s late evening. When it’s dark, the whole environment changed. So he’s not sure where his house is.*

According to **P2**, community spirit is derived from knowing your neighbours and in smaller developments, such as the 60 house site he was working on at the time of the interview.

> *…the smaller the number of people, the smaller the number of risks and the better the sense of community. That’s why our people talk about community.*

In high density high rise developments, despite having a balloting system, the post-ballot actions of those successful in the ballot lead to ethnic clustering which is detrimental to the overall sense of community. **P2** describes how, in theory, the balloting system should produce a mixed integrated set of residents. However, the process seems to be open to ethnic clustering with Malays on one floor, Indians on another and Chinese on another.

**P3** had direct experience of living in a low cost high rise block and had concluded that beyond 10 storeys it was not possible to maintain any sense of community. He reported how some taller blocks had been split in two with one community facility for each of the two halves.

### 3.4 Environment

#### 3.4.1 Maintenance

Users had a good deal to say about maintenance and the providers offer a chance to see another perspective. There seems to be a downward spiral occurring on this matter. Residents withhold maintenance fees citing problems with maintenance; a deficit arises as a result; there are insufficient funds to sustain sufficient visits to address all the issues; so more residents withhold their payments.

> *They want a condominium lifestyle but contribution to maintenance they do not want to pay. They default. So there's no maintenance. That's why you got all these complaints about the common facilities like lift jammed, broken and not repaired. The repair man cannot afford to come every day. Even though they have signed the contract once a week, once a month should be normal but it is everyday repair.*

This phenomenon of service charge non-payment was also known to the MP. Who quantified it thus,

> *So I would say only 60%-70% pay maintenance fees...they feel why should I have to pay the maintenance fee when you don't get proper servicing…*

There were reports of developments that were being well-maintained. **P3** reported that, in his opinion, but this was mainly based on the appearance of the exterior paintwork. Drainage problems were reported at one site (Abdullah Hukum) by **P3**, noting that when it rained water would form stagnant puddles along the corridors rather than run off.

Overall the users in the previous chapter appear to blame lack of maintenance effort for problems such as lifts breaking down and blocked drains. The providers are able to refer to a counterargument that many of the problems arise from the actions of the residents themselves, such as using the lifts for inappropriate loads. The MP recalls City Hall's argument,

> *[According to City Hall] they [residents] do not take good care the facilities provided, sometimes bringing motorcycles into the lifts so on and so forth, so I think there are clear problems with the issues of housing and you cannot blame to one particular party but we need to analyze and come up with a more 'out of the box' kind of solution.*

One of the participants (**P1**) suggested that in Kuala Lumpur there seemed to be a general 'maintenance' problem.

> *The lift is something mechanical which can only last for a few years. Then of course, you have to change or replace them. Again, maintenance plays a very important role. We have a problem [in Kuala Lumpur] with maintenance. Installed nicely, everything working perfectly. After that there's no one to look after it. In a week's time or a month, it's broken down. Just like a car. You cannot keep on driving. You've to replace the oil, sent it for servicing. Even a Rolls Royce will breakdown. Servicing is very important.*

That maintenance blind spot can even be seen in government buildings.

> *… even in government buildings, you can see it. One visit you see something new and then when you go back after 6 months, what is this? Taps missing, cannot close the door properly, there's no sense that this has to be repaired, to make it look good. They don't have that.*

### 3.4.2 Safety and Lighting

Our third provider, also an architect, had been retained to sort out issues related to the Certificate of Fitness (CF) for Block A. We read in the previous chapter how residents at PPR Jalan Pantai Permai 2 Block A were in dispute with City Hall about the CF for their development. The MP was also aware of the controversy regarding CFs. She commented that City Hall always deny any absence of such certification by saying that a temporary certificate is always in place even if the final certification has not been granted. However, the existence of such temporary certificates is in conflict with the comments of **P3** who reported neither a temporary nor a permanent certificate had been issued for the project he was working on for many years.

One barrier to certification and a cause of concern for safety is that at least at some of the developments access is impossible for fire service vehicles in the event of a fire, presumably due to inappropriately parked car. In other words, the same thing that users reported was blocking bus route access. Another barrier mentioned by **P3** was not a safety issue in itself but rather parties involved in the process were either reluctant to sign, in liquidation, or both.

**P3** reported a safety issue from things being thrown out of the blocks and possibly hitting those at ground level. This was also much commented on by users in the previous chapter. **P3** suggested that the corridors may be better inside rather that open to the outside.

The MP raised an issue of child safety on the higher floors of the blocks based on personal observation.

> *…it is not safe for children if you live on the 13th floor for example. Small children just can take a walk from the block to the stairs and can easily fall through the gaps between the stairs, there is no child protection mechanism in place...nothing.*

The MP also referred to a case where two of the developments in our study, PPR Jalan Kampung Pasir Dalam and PPR Jalan Pantai Permai 2 Blok A had suffered light damage from a low magnitude earthquake in Sumatra suggesting that a more serious earthquake could have severe consequences due to the poor quality construction of the blocks.

### 3.4.3 Design and Layout

As already indicated, architects on PPR projects work within tight constraints on cost, time and design. When invited to speculate on what they would do given a blank piece of paper some interesting and practical ideas arose.

One related to the site's parking facilities,

> *… maybe by having a car parking building rather than on the ground parking. All the cars would be concentrated in the parking building, then you'll have more green. If all cars are parked on the ground, then your green is reduced. Isn't that right? So, you can concentrate all cars in parking building, then from the parking building, residents can access their unit. First, there's shelter for the car, roofed tiered parking. Second there is easier access to the building, you do not get wet if it's raining when getting out from the car. Third, you*

*have more green. From there you can create more parks, more facilities.*

However, architects desire to increase the amount of green space seems to be frustrated by the authorities,

*Even when you do provide a green area the authority asks for just 10%. That'll be just a little corner.*

Another issue which is also reflected in the views of residents in the previous chapter concerns the activity of street food sellers. While they are well used by residents there are normally no formal facilities for the sellers. Instead what little green space there is occupied by sellers for a substantial part of the day. **P1** recommends a dedicated area with sufficient space to put up tables and chairs as the residents of low cost housing can often not afford to go and eat in restaurants. This, he argues, would show a consideration for the socio-cultural aspects of life.

*I think it is important to study the social aspect, the Malaysian style, right?*

A further weakness of the PPR process and the use of standardised design is that they do not permit consideration of the specific weather, ventilation and lighting needs at the site. Ventilation is of particular importance as the residents will not benefit from air conditioning as it cannot fit within cost constraints. **P1** believes that design can introduce the right materials for insulation and can also provide optimum lighting. However, when being awarded the project there was no mention of these issues from the Housing Department, presumably because the design was already fixed.

For **P1** low cost does not necessarily mean low quality and many improvements can be made through clever design and applying elements which experience has shown have been valued at other sites. Another suggestion was to allow those who had purchased their unit to contribute financially so that, for example, laminated timber flooring could be added, or additional lighting. Although, conversely **P2** would later argue that all public housing should be rented which would mean such adaptations would be impossible.

**P3** referred to [development at Pantai Permai] where the intention had been to arrange the blocks so that a courtyard could be created in the middle of them. This had had the result that little light flowed into the blocks and an overall darkness prevailed. gure 93 shows how the high density layouts of PPR blocks can create a lack of natural light.

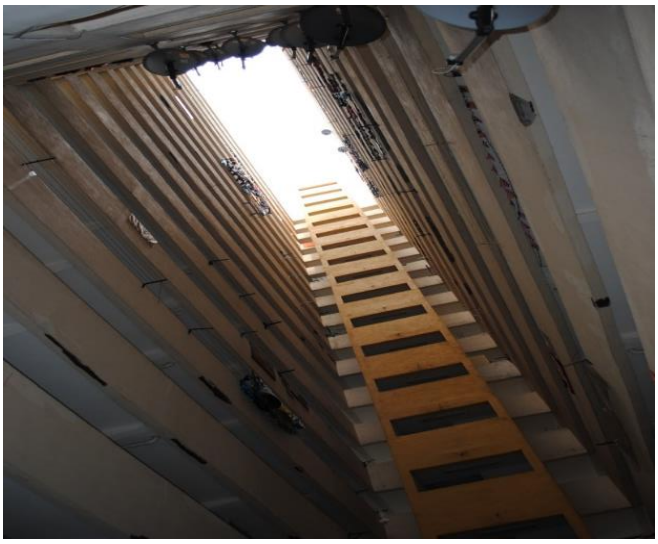


Figure 3.3. Absence of natural light at PPR Jalan Pantai Permai 2 Blok A

### 3.4.4 Cleanliness and Waste

**P3** highlighted that when a user wanted to dispose of rubbish they had to take it down in a passenger lift where the contents could spill onto the lift floor making the lift smelly and attracting insects. **P3** suggested a service lift though an alternative – a disposal chute was put forward by **P2.**

With some residents unwilling to make the effort to take their waste to the ground floor household rubbish can be found in corridors and near lifts as seen in figure 3.3.



Figure.3.3. Household waste in corridor at PPR Seri Pantai Blok C/D

### 3.5 Sustainability, cost and economics

Low cost high rise housing is a high density solution to housing needs which brings with it questions over its sustainability. Under certain circumstances (for example, city states like Hong Kong and Singapore) high rise building is inevitable. In developed Western Europe many high rise public housing blocks are being demolished and replaced with low rise. **P1** explains,

> *..the low cost high rise housing in Europe is being taken down. People demolishing it because they found it's not conducive to a satisfactory quality of life. It's not suitable enough. People who have been living above 7th or 8th storey will find it very difficult. So they spread it out, low rise. But here it is the other way round.*

Asked for his opinion of the Green Building Index, **P2** responded,

> *I'm not an advocate of the Green Building Index. Because I'm an advocate of logical, sensible architecture. This quality of green building index and its criteria is part of basic architecture training. It's already there, only now people have repackage it and Green Building Index has become champion of it.*

Explaining his cynicism for the GBI, **P2** suggested that it was not worth the time spent on all the paperwork. Furthermore, developers were only seeking GBI certification for financial reasons rather than any benevolence towards environmental issues.

**P1** had a more positive view of the GBI than his colleague but still saw issues affecting its implementations, principally cost. These costs were mainly the more expensive materials required to achieve the points needed to gain GBI certification but importantly other cost increases were indirect. For example, **P1** explains one innovation at a development he had worked on,

> *I've done one low cost project whereby we collect rain water. The rain water is used, for example, to water the plants. Then you need to have a storage tank, the piping and then the circulation pipe. Then somebody to take care of it. If not, there would be vandalism….all these things. So of course if you want something better, you must spend.*

Returning to the materials required for sustainable construction **P1** lists heat reflective paint to replace standard paint; energy efficient glass (*e-glass)* to

replace normal glass; and brick walls in place of those comprised of aeriated blocks. Each choice has a financial consequence but a benefit in terms of sustainability.

**P1** also talks about the Green Building Index highlighting how much of it concerns Mechanical and Electrical components and how architectural design has only a minority role to play. He also feels that the passive building design that responds to climate is very logical, including the idea of natural lighting (and ventilation).

> *On the project I'm doing now we are going for GBI. Of course we have to tell the client. You want to have this, these are the things that you need. Under GBI more than 50% is on M&E [Mechanical and Electrical] works. Architecture is only certain portion. It isn't a lot. Roofing whether your roof is built a heat insulation. Your windows, whether you use more on natural lighting. Natural ventilation. It's all just common sense.*

The use of the industrialised building system (IBS) is one potential solution to bridging the gap between sustainability aspirations and the constraints of low cost housing. **P1** reported that he was involved in using IBS, including for mass housing, for which he argued it was particularly suited,

> *For mass housing, system form work is most efficient. Either it be cast in situ or precast. It is suitable.*

While IBS can lead to mundane designs this may be unavoidable in the case of low cost public housing.

Apart from the considerations of those users who may wish to buy their unit, users were mainly interested in their monthly rent and service charges. Providers, however, expressed views on a wide range of cost related issues for low cost high rise housing.

### 3.5.1 Private sector

At the highest level there is the role of the private sector, particularly development companies and their willingness, or lack of it, to participate and co-operate with government in meeting policy objectives.

**P2** highlighted the reluctance of developers to get involved in low cost housing projects as they were seen as offering no profit margin. He referred to developers offering to build such low cost projects to secure government land and then subsequently build only middle and high end housing.

*So after being granted the state land on condition that they must do low cost housing. But they did not do it. They did the middle-cost and when they generate income, of course, there's profit. So he needs the profit to share with other investors and all this kind of thing. But at the same time they overlooked their obligations.*

The MP also commented that private sector developers were often building on land simply because it was available rather than assessing whether there was demand for that particular type of housing at that particular location. The result being the Kuala Lumpur has a large amount of abandoned housing stock, which of course undermines the government policy objective of zero-squatting.

### 3.5.2 Financial viability

Regarding the financial aspects of the PPR developments, the Housing Department sets a cap on the cost per unit[2] though despite the repeated raising of this cap it still does not attract developers nor according to **P2** does the cap reflect the actual cost.

*Then we have the Ministry of Housing capping the cost of these houses. Last time it was RM 25,000 then RM 30,000 then RM 35,000, RM 40,000. They keep on changing. But all the changes are still below the actual cost.*

**P1** also reflects that the cap of RM 35,000 on a 650 sq. ft. high rise unit is unworkable.

Another aspect of the economics of low cost housing and the PPR program is the payment of rent and service charges by residents Rent collection enforcement, utilities charges and service/ maintenance fees collection is reported to be poor. Though **P2** understands the social and emotional issues involved with, for example, cutting off electricity supply to units who have not paid their bills. Eviction of people who used to be squatters also seems no solution. However, large scale write offs mean that the PPR is inevitably heavily subsidised rather than being self-sustaining in economic terms. As **P2** comments,

*….the low cost housing has to be subsidized most of the time rather than be self-sustaining.*

*The lax attitudes to paying rent and charges arises, according to **P2**, from a combination of a culture of subsidy, relaxed*

[2] Subsequently, in 2014, the caps on low cost housing have risen to RM38,000 for two-bedroom units and RM44,000 for three-bedroom units.

*attitudes to enforcement and as a symptom of political patronage.*

*Purchase ok, they'll buy. Rent also ok, they'll rent. But they didn't pay the rent. Then they convert it to a purchase. But they didn't pay for that either. Because our society is like that, unfortunately. It's their mentality plus we don't enforce things. They don't bother. They'll just go to their political master, to their branch, area and all that.*

He continues,

*And I blame it on the society. Our society has a subsidized mentality. The entire society.*

The MP outlines how the financing of maintenance is also failing to work properly and leading to subsidies. The regular incidence of events such as a lift breaking down and not being repaired gives the tenants a reason to withhold their service fee payments. This creates a financial shortfall which in turn makes it more difficult to meet maintenance requirements which leads to more people withholding their payments.

There also appears to be an issue with speculation where PPR housing is purchased by people who have no intention of living in the unit themselves but instead rent them out or leave them empty and empty units attract crime. **P2** also referred to one development (Kampung Pandan) where the developer has gone into receivership, the site has been abandoned and illegal immigrants from Indonesia have effectively taken over renting out rooms and running their own enterprise.

The evidence from the providers raised questions as to whether the public housing programme was actually targeting those in need. One of the principal indicators that those taking up residence in low cost high rise units were not truly in need was car ownership. Cars which in some cases exceeded the value of the housing units.

*They are actually rich people. Some people own luxury cars. Occupants of one unit sometimes have 2 – 3 cars. They are not ordinary people, not unresourced people. There are people who are actually have little financial means how many of them are actually in this category. They can save a lot if they stay there. If we observe, these former squatters can afford to install paid satellite TV, cars, big houses, inside all complete.*

### 3.6 The Authorities and Politics

In Kuala Lumpur housing is politics. **P3** brings this into sharp focus, commenting,

> *Politically the politicians want their supporters to live in the same area. The government will do something when they think they can gain something in return. They won't do anything for nothing.*

Complaining residents react by switching their political support. **P2** explains he hears the following kind of comments from PPR residents,

> *'that's why I don't want to pay the service charge. I complained about this and that's why I don't want to pay the [rental or purchase] instalment. That's why I didn't support Barisan Nasional. I will go for the opposition. See what happens at the next election. I'll vote for the opposition'*

Malaysia's ethnicity-based politics is perceived to be reflected in housing provision with different ethnic groups receiving different treatment. **P2** recalls an event concerning the rehousing of squatters,

> *There was one part in Lembah Pantai which the squatters occupied a private land and then there's Malay squatters & non-Malay squatters. The Malay squatters on that private land get to be transferred to PPR but the non-Malay squatters on the same private land are not being transferred. Obviously this is political.*

The MP recalls a related situation regarding empty units. In the previous chapter users reported problems arising from break-ins at units that had been left unoccupied. On this matter the MP argues that having empty units may have political motives.

> *…because of DBKL policy there are still empty units these place where drug addicts hang out, because the units can easily be broken in to. You leave them to rot for so long, so they [DBKL] can at their whim and fancy decide who can move in who can move out at different places at different times. So there is a problem.*

The PPR low cost housing program was aimed at solving Kuala Lumpur's squatter problem. Yet even the treatment of squatters is, according to the MP,

a matter of ethnicity and hence politics. She recounts how ethnic groups are treated differently when it comes to rehousing squatters. Squatters on private land at Bukit Bangsar Kerinchi [where mainly the users in this study area comes from] were majority Malay and were rehoused whereas majority Chinese squatters at Sri Sentosa have been left there for 30 years.

### 3.6.1 The role of public housing

Public housing provision in Kuala Lumpur is a relatively new policy with the first public housing being built in 1958 named Sulaiman Court, **P2** had been a long standing advocate of public housing and as long ago as the 1980s was urging government to introduce a building programme. His approaches were rejected at the time as the government was looking to the private sector for its housing provision.

> *They wanted entrepreneurs. Entrepreneurship as opposed to public housing. But my attitude is this - they said if we give the job to entrepreneurs, they are driven by profit and so they will deliver. But not all developers are morally sound to me. What you should do is public housing.*

There is also a debate as to whether it is appropriate to sell public housing or to rent it. **P2** has no doubt that “Public housing is for rental”. This is partly due to the practical implications which include the fact that while deposits may be paid the instalments are often not paid. Another point made was that if freeholds are sold it would be virtually impossible to redevelop the site in the future.

### 3.6.2 Tenant Selection

The balloting system should produce a mixed integrated set of residents. However, the process seems to be open to ethnic clustering with Malays on one floor of a block, Indians on another and Chinese on another.

Another issue raised was the failure of the process, or lack of a process, to ensure that the elderly and infirm are given units on the lower floors so that they can still leave their units when the lifts are not working, this was also mentioned by the users in the previous chapter.

## 3.7 Summary and main findings

In some respects, among the three architects and one politician there was a good level of awareness of the issues that the users had raised in the previous chapter. Unsurprisingly, they also had a lot of additional points to make on the role of developers, the politics of the PPR program, public-private issues and so

forth which were less prominent among the residents. As with the findings in the previous chapter, while there was evidence that some examples of low cost high rise housing developments were better than others, the overall impression emerging from the data was that this type of housing at such high density was highly problematical. Some references to improvements being introduced to more recent projects were evident but not of such a magnitude that they changed the general picture.

**Main findings**

High density low cost high rise housing was not viewed as sustainable by the providers in our study.

This lack of sustainability arose from multiple factors including; lack of flexibility in the provision in terms of number of bedrooms/ overall size of units; the financial basis of the PPR programme including non-payment of rent, finance repayment instalments and service charges; the inadequate provision of facilities; the crime and anti-social behaviour consequences of such high density living; and a number of other contributory factors.

## Appendix 7 : Green Building Index

Green Building Index Assessment Criteria For RNC

(Residential New Construction)

# ASSESSMENT CRITERIA
## MAXIMUM ACHIEVABLE POINTS

| PART | ITEM | MAXIMUM POINTS | SCORE |
|---|---|---|---|
| 1 | Energy Efficiency (EE) | 23 | |
| 2 | Indoor Environmental Quality (EQ) | 12 | |
| 3 | Sustainable Site Planning & Management (SM) | 33 | |
| 4 | Material & Resources (MR) | 12 | |
| 5 | Water Efficiency (WE) | 12 | |
| 6 | Innovation (IN) | 8 | |
| | TOTAL SCORE | 100 | |

# CATEGORIES OF GREEN BUILDING INDEX RATING

| POINTS | GBI RATING |
|---|---|
| 86+ points | Platinum |
| 76 to 85 points | Gold |
| 66 to 75 points | Silver |
| 50 to 65 points | Certified |

# DEFINITIONS OF LANDED, LOW-RISE AND HIGH-RISE

**Landed** : Single Owner (Townhouse is included in this category)
**Low-rise** : Strata Building in which the topmost floor is ≤ 18.3m above ground level
**High-rise**: Strata Building in which the topmost floor is > 18.3m above ground level

# SUMMARY OF ASSESSMENT
## CRITERIA AND POINTS

| PART | CRITERIA | ASSESSMENT CRITERIA | POINTS | TOTAL |
|---|---|---|---|---|
| 1 | EE | ENERGY EFFICIENCY | | |
| | Design | | | 23 |
| | EE1 | Minimum EE Performance (Mandatory Compliance) | 1 | |
| | EE2 | Advanced EE Performance | 12 | |
| | EE3 | Renewable Energy | 5 | |
| | Energy Efficiency | | | |
| | EE4 | External Lighting and Control | 2 | |
| | EE5 | Internet Connectivity | 1 | |
| | Maintenance | | | |
| | EE6 | Sustainable Maintenance and Building User Manual (BUM) | 2 | |
| 2 | EQ | INDOOR ENVIRONMENTAL QUALITY | | |
| | Air Quality | | | 12 |
| | EQ1 | Minimum Indoor Air Quality Performance | 3 | |
| | EQ2 | Volatile Organic Compounds Minimisation | 2 | |
| | EQ3 | Formaldehyde Minimisation | 1 | |
| | Lighting, Visual and Acoustic Comfort | | | |
| | EQ4 | Daylighting | 3 | |
| | EQ5 | External Views | 1 | |
| | EQ6 | Sound Insulation | 1 | |
| | Evaluation | | | |
| | EQ7 | Post Occupancy Evaluation | 1 | |
| 3 | SM | SUSTAINABLE SITE PLANNING & MANAGEMENT | | |
| | Site Planning | | | 33 |
| | SM1 | Site Selection & Planning | 1 | |
| | SM2 | Re-habilitation of Brownfield Sites *OR* Re-development of Existing Buildings | 1 | |
| | SM3 | Community Connectivity | 4 | |
| | Construction Management | | | |
| | SM4 | Earthworks – Construction Activity Pollution Control | 1 | |
| | SM5 | QLASSIC – Quality Assessment System For Building Construction Work | 1 | |
| | SM6 | Workers' Site Amenities | 1 | |
| | SM7 | IBS – Industrialised Building System | 2 | |
| | Transportation | | | |
| | SM8 | Public Transportation Access | 8 | |
| | SM9 | Dedicated Cycling Network | 2 | |
| | Design | | | |
| | SM10 | Stormwater Design – Quantity and Quality Control | 3 | |
| | SM11 | Heat Island Effect – Greenscape and Water Bodies | 5 | |
| | SM12 | Heat Island Effect – Hardscape | 2 | |
| | SM13 | Heat Island Effect – Roof | 1 | |
| | SM14 | Composting | 1 | |

| PART | CRITERIA | ASSESSMENT CRITERIA | POINTS | TOTAL |
|---|---|---|---|---|
| 4 | MR | MATERIALS & RESOURCES | | |
| | Reused & Recycled Materials | | | 12 |
| | MR1 | Materials Reuse And Selection | 2 | |
| | MR2 | Recycled Content Materials | 2 | |
| | Sustainable Resources | | | |
| | MR3 | Regional Materials | 2 | |
| | MR4 | Sustainable Timber | 2 | |
| | Waste Management | | | |
| | MR5 | Storage and Collection of Recyclables | 2 | |
| | MR6 | Construction Waste Management | 2 | |
| 5 | WE | WATER EFFICIENCY | | |
| | Water Harvesting & Recycling | | | 12 |
| | WE1 | Rainwater Harvesting | 4 | |
| | WE2 | Waste Water Recycling | 2 | |
| | Increased Efficiency | | | |
| | WE3 | Water Efficient Irrigation and Landscaping | 2 | |
| | WE4 | Water Efficient Fittings | 4 | |
| 6 | IN | INNOVATION | | |
| | IN1 | Innovation in Design and Environmental Design Initiatives | 7 | 8 |
| | IN2 | Green Building Index Facilitator (GIBF) | 1 | |
| | | | TOTAL POINTS | 100 |

## Appendix 8 Paper presented

1. Can vertical living work for the low end?

   Architecture Malaysia, December 2015 pg. 64-66
2. Low-cost, high-rise urban housing in Kuala Lumpur, Malaysia: avoiding the risk of future slums
3. The Applicability of Established Environmental Tools (EAT) for Low Cost High-Rise Housing in Malaysia
4. Design Approach to Low Cost High-Rise Urban Housing in Malaysia
5. Are Low Cost High Rise Housing in Kuala Lumpur Sustainable Development for Communities? A Resident-centric Study

# Can vertical living work for the low end?

*By*
*Aminuddin A*
*Sulaiman. N*

*Kuala Lumpur, home to one of the world's most famous tall buildings, the Petronas Towers, is also a city where urbanisation, population growth and widespread squatting led to the creation of a major low cost, high rise housing programme. This research talks to the residents to explore what low cost vertical living is like in Malaysia's capital.*

**Western countries emergence of high rise living and its fall.**

Architectural impetus for high vertical structures other than 'towers' of the traditional form originated with the American skyscraper movement of the 1880s and 90s led by the pioneers of the Chicago School. Its debut was as a ten-story building in Chicago in 1885. At this time the invention of the electric elevator was crucial to making the skyscraper a practical possibility (Korom, 2008).

It was the Second World War, or perhaps more accurately, post War reconstruction that saw high rise residential buildings assume centre stage in the urban built environment of the whole of the continent of Europe. According to Turkington et al. (2004, p.1) the high rise tower block was "the most visible and uniform product of post-war urban planning." It was a truly pan-European phenomenon with high rise housing developments that had little to distinguish them from one country to another.

Architects working under the modernist banner understood and promoted the role of mass housing constructing in providing better quality housing to the working class and in so doing creating a more egalitarian society (Turkington et al., 2004). While modernism in architecture can be traced to the 1920s and 1930s it was in the 1960s that western and northern Europe saw mass construction of residential tower blocks. Such tower blocks were viewed as the best means to achieve modernist egalitarian goals: "The free-standing high-rise

block was promoted as the only means of achieving modernist building principles" (Turkington et al., 2004, p.6).

The high rise building boom of the 1960s was driven by the political desire to solve the major problem of urban housing shortages. These shortages grew out of rapidly rising urban populations whereby general population growth, widespread internal migration from rural to urban areas, and international migration, particularly to colonial countries such as France and the United Kingdom, combined to create a vast shortfall between supply and demand (Turkington et al., 2004). With urban populations set to continue to grow for the foreseeable future and other innovative forms of housing development such as the garden cities perceived as too little and too slow the urban tower block became the leading solution because it was seen as quick, cheap and efficient (Turkington et al., 2004).

Turkington et al., (2004) identify seven drivers behind the move to high rise residential construction as the preferred solution for 1960s architects, planners and policymakers in Europe. Firstly, was the already mentioned housing shortage; second was technological developments; third the modernist architecture project's desire for an egalitarian society; fourth, the aim of protecting rural areas from development; fifth, the people's demand for better living conditions; six, inter-authority competition to produce the most 'modern' housing; finally, national governments' acceptance of and support for radical solutions to meet their policy objectives.

One thing that seems is not a driver is consumer choice (or perhaps user preference is a better term). According to evidence gathered by a polling organisation and reported by Evans and Unsworth (2012) when asked what type of housing they would prefer to live in just 1% selected the high rise flat option. The lower the density of housing the more preferred the type of housing was reported to be when cost was not a factor. From a different angle another survey asked residents to state which type of new housing development they would prefer to have built in their neighbourhood, again multi-storey flats were the least preferred. They also reported the results of surveys of (private sector) high rise city centre residents themselves (in this case in the city of Leeds in the North of England). Despite being expensive, residents reported

dissatisfaction with the amount of living space, the lack of green spaces, expensive parking and its lack of suitability for children (Evans and Unsworth, 2012).

Technological innovations, including the use of concrete instead of bricks, made the construction process far faster and logistically simpler. Prefabrication was the principle innovation under which large components of the building were made offsite and brought to the site at the point they were required. Turkington et al., (2004) cite examples where the time to build a home was shrunk by as much as 70% between 1950 and 1960. This was happening at a time when there was a widespread belief the technology held they key to solving all society challenges. Jacobs et al. (2007, p.610) sum up the optimistic vision, "The high-rise ... was intended to be a pragmatic, technically driven housing solution that would radically restructure the patterns and quality of domestic life."

**Coup De Grace for high rise living in the West**

The light crisp concrete of newly built tower block turned dirty dark grey through pollution and weathering and the faults caused by hasty construction were exposed for all to see sometimes with catastrophic consequences such as the partial collapse of Ronan Point in east London in 1968 (Delatte, 2009). Pruitt Igoe in St. Louis, USA, was a large development of high rise housing built in 1954, meant to be the answer for the future of high rise living. The building was designed by Minoru Yamasaki who also design the World Trade Centre in New York City in 1964. Slightly a decade later the city of St. Louis decided that the development has to be demolished citing as a manifestation of failed high rise development for the community to live and grow. The issues were both technical and social and they surfaced within a decade of the first wave of mass high rise building in Western Europe (Jacobs et al., 2007). Dunleavy (1981) even referred to high rise housing as, "One of the most widely proclaimed (if unstudied) 'failures' of public policy."



Pruitt Igoe, St. Louis, Missouri, USA (picture source: The Guardian UK: The second stage of demolition of the Pruitt-Igoe complex in April 1972. Photograph: Lee Balterman/Time & Life Pictures/Getty Image)

As the 1970s arrived the era of high rise building drew to a close in many western countries though it continued in Eastern Europe and much of Asia (Lawrence, 1996). The optimism of modernist architecture and its promise of a more equal society being created through the built environment now became the 'small is beautiful' era as typified by Schumacher's famous book (Schumacher, 1973). In countries such as the UK, Denmark and Poland those with the means to do so were starting to leave their high-rise homes to replace by those who could not exercise such choice (Turkington et al., 2004).

**An overview in Kuala Lumpur high rise living**

The low cost high rise housing programme started even before Malaysia's independence in 1957. For the last three decades high rise blocks of up to 18 storeys have been built with the main objective of ending squatting in the city, something it has been largely successful in doing. Successive Malaysian National Plans have targeted the building of more and more housing for low income groups and the low cost high rise solution has been dominant for most

of this time. The policy objectives may have been laudable but how has it worked out for those who live in one of these projects?



High rise housing, PPR Development in Lembah Pantai area.

*The case studies*

An occupant named Nuri is angry; her son's school uniform disappeared from the clothes line the morning I spoke to her, and it is not the first time. She painted a picture of rife petty crime and absence of prevention. *"Theft, muggings. Clothes on the clothes line lost. Shirts and shoes also lost. Before we had a community guard but now no longer."* Teenage promiscuity, vandalism and substance abuse were commonplace as the youth living in the tower blocks struggled to find anything meaningful to occupy their time and instead just 'hung around' with some drifting into adult gangs. These adult gangs, which often included outsiders, engaged in more serious criminal behaviour, car theft, drug dealing and as one resident told me, even kidnapping.

*Breaking down*

Second only to anti-social behaviour, the residents refer repeatedly to maintenance. Kuala Lumpur's city authorities, it seems, do not really do maintenance check. The capacity for lifts to breakdown is renowned around the world but rarely have I heard the issue discussed with such agitation and frustration as I did here. Asked how often the lifts breakdown, Atini told me *"Mornings, sometimes evenings. If not in the evening then in the morning*."

Kasim added "... *when the lifts breakdown, some people have been trapped inside for hours."* Lifts faulty and can remain out of action for weeks on end. For elderly residents on higher floors this can mean being effectively trapped in your flat, or facing a distressing time negotiating the stairways.

*Sense of community*

As with the absence of society to tackle crime and anti-social behaviour, the lack of proper resident cantered property management and maintenance, has left the residents feeling abandoned not to mention seriously inconvenienced. While I felt some signs of residents coming together in the face of adversity, the lack of sense of community, so often associated with high rise living was even more strongly perceptible. Siti, a married mother of four told me *"Sometimes people don't even know who their next door neighbour is. When we encounter other people here there is no friendliness."* Many of these residents were former squatters and had been allocated flats after living in government "long houses" which on the face of it were far less amenable than their current accommodation, yet in the long houses Bakar remembers, *" ... we were together in our hardship, smiling and saying hello to each other."*

As someone with a particular interest in sustainable housing, and also someone who believes that for housing to be sustainable people have to want to live there, I found myself continually asking the question — Is there something inherently wrong with the low cost high rise model? Is there an inevitability that mixing high density housing with low income groups will generate the kind of problems I was being told about? Evidence from countries such as the UK, where the low cost high rise approach to housing urban lower income groups has long been abandoned, is not encouraging.

High rise housing around the world is now increasingly associated with high end urban living with luxury apartment buildings occupying some of the most high valued real estate in the world's major cities. They are closed spaces normally with dedicated security arrangements. It is tempting to conclude that high rise only works at the high end but I think this is a too simplistic view.

*Designed to fail*

There is one other potential explanation for the largely negative feedback I received from residents — that the developments were simply badly designed and since completion have been badly managed and maintained. During my many visits I saw overcrowding with large families living in the same sized units as small families, the lack of natural light for many of the units, the absence of green and recreational areas, as well as signs of poor construction quality. Cars and motorbikes overflowed from the allocated spaces blocking up access roads and covering precious recreational areas. Not only had the authorities misjudged the number of children residents had but also how many cars and motorbikes.

I could see the mistakes made in design and planning but I also saw how this had been further degraded by some of the residents themselves, the graffiti, the vandalism, and fly tipping, from my enquiries mostly the younger generation. Overall it did not fill my heart with hope. Architects involved in the projects have told me that politicians were primarily interested in speed of completion and that professional input was very limited as they worked to templated

floor plans. From what I saw this certainly seemed to be the case. These same architects are convinced that the initial low cost high rise housing projects in Kuala Lumpur were unwittingly designed to fail and that living conditions for residents could be improved if more design input was sought and applied. They urged for more green spaces and a wider range of facilities, and multi-storey car parking to free up ground floor space for such facilities. Concerning the sense of community, architect, Ali Ahmad, told me that by clustering so many towers so close together in a project nobody knew who was a resident and who was not, so making and effort to get to know people seemed futile.

There are signs that lessons have been learned and the planners of newer developments have taken some steps to improve things with increased unit size, enhanced facilities, more green space and more attention paid to the elements (rain, light, air) but the many tower blocks already housing thousands of Kuala Lumpur's lowest income citizens cannot simply be torn down and

rebuilt, so for these residents the main hope is improved maintenance, a greater presence of 'authority' to tackle crime and their own efforts to develop a greater sense of community.

*Making the right call*

Sustainable housing is not only a matter of the environment and ecology but extends to social cohesion, citizen participation. Sustainable communities are those in which people want to live not just have to live. There is enough evidence from around the world, including Malaysia, which the first call that a policy maker should make when deciding on a low-cost high rise programme should be to an architect, and preferably one with a track record in sustainability. If not the poor reputation attached to this kind of housing seems set to remain. The lesson form ***Pruitt Igoe*** nightmare and recently the demolition of ***Red Road Housing*** in Glasgow, UK, certainly has not being learned properly.

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# Low-cost, high-rise urban housing in Kuala Lumpur, Malaysia: avoiding the risk of future slums

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Keywords: urban housing, low cost high rise, sustainability, environmental assessment

**Abstract**

The developments of low cost high-rise housing have been perceived as the best possible answer to provide immediate, affordable housing for urban residents in Malaysia. In Kuala Lumpur 32, 400 units of low cost were planned to be constructed between the year 2006-10 and mostly in clusters of blocks within the urban area. With the vast number of units proposed, lay the risk of little attention or consideration given to future impacts, both socially and environmentally, this demonstrate little or no commitment of a high quality public realm. This paper will review the current development of low-cost high-rise residential buildings in the Malaysia capital city of Kuala Lumpur. It will explore the theoretical aspects of building low-cost high-rise housing exploring the relationship between theory and practice. Whilst the need to build a large number of affordable housing units remain. This paper will suggest that the design and planning to address this need may require different approaches as Kuala Lumpur develops in the 21st century and beyond. Thus the paper will address a proposal and strategic approach to this provision related policy.

## Introduction

Housing is a basic social need that is fundamentally important to all urban and rural areas. With rapid expansion of the economy and urbanization, housing needs become top priority for the government to deal with and has been integral in its economic agenda. The prolong process of urbanization throughout the 50year of the city development since gaining independence has resulted in an increase of urban

population expansion which covers the inner and city suburbs. The city of Kuala Lumpur provided attractive economic prospect appealing people from rural areas to migrate into the city regardless the availability of appropriate accommodation and housing. The rapid increase of population created rapid growth of housing demand especially in the inner city areas. The rural urban migration created immediate housing shortages. The differential of income structure against the living cost, led city dwellers to build and live in an improvised self made housing creating pocket of squatters within the city.

The sign of poverty generally indicate with the inability to have appropriate accommodation. This becomes more apparent to the lower income group who mainly reside in the pocket of squatters. The continuous build up of squatters go in parallel with the rapid expansion and economic growth of the city giving an unsightly landscape to the city profile. The escalation of squatters from 1970 to the 80's further added to the social, health and environmental problem to the city hall (Zakiyah, 2005). Immediate respond were needed urgently and the local government had opted to the idea of mass high rise housing affordable to low income group by means of renting and lower purchasing price.

The Malaysia government has establishes a programme called Hard-Core Poor Development Programme (Program Perumahan Rakyat Termiskin - PPRT) to deal with the low cost housing woes. The main objective of the scheme is to reduce the squatters in the urban area that had created prolong social, health and environmental problems (Ministry of Housing 2000). The development programme was briefly halted during the Asian economic crisis in 1997-99 and was vigorously pursued thereafter to ensure that the target to provide more than 32,000 units of low housing by year 2010 achievable in the city of Kuala Lumpur. In retrospective to the current objective, city hall has put up a target to eradicate completely squatters by the year 2020 (DBKL, 2006) parallel to the nation aspiration to be a developed country. Although strategies and plan has been taken into consideration pertaining to housing demand, the low cost housing needs will likely to continue beyond the year 2020 of which Malaysia intend to declare squatters free year. In a bigger perspective, the continuous economic growth within all Asean countries put up a pressure to housing needs not only typical to Malaysia but around the Asean region,

**Housing development**

In 1984 the Kuala Lumpur Structure Plan was prepared at ensuring that sufficient housing would be provided for all income groups in the city and planned to cover the city economic needs in order to provide immediate answers to problems of squatters (DBKL, 1988). At national level, National Economic Policy was formulated to provide continuous effort to house in proper housing scheme within the city and also

sub urban areas. The Policy additionally function to eradicate poverty as well as providing equal economic opportunities and wealth distribution among three ethnic group comprise largely the Malay(52%) followed by Chinese(40%) and Indian (8%). The NEP as it is commonly named is revised every 5 years to ensure it effectiveness and achievement (9th Malaysian Plan).

Based on the typology of housing in the Third World Nation, housing supply is divided into two areas; conventional and unconventional. The diagram below indicates the typology of housing supply in the Third World.

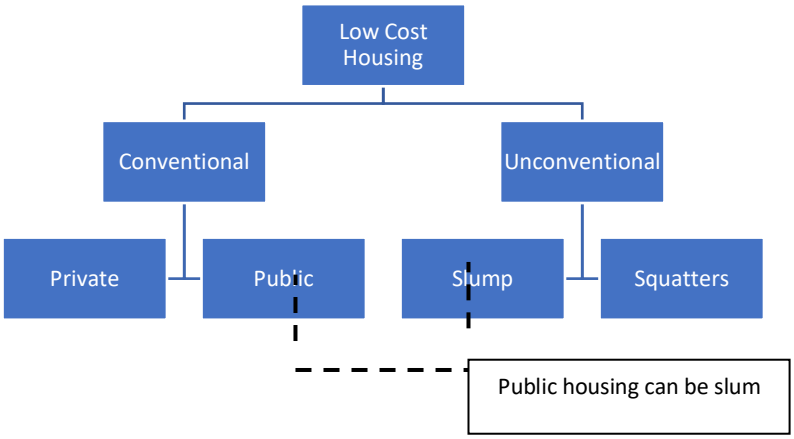



*Diagram 1. Low cost housing provision in the Third World –David Drakakis-Smith 1979*

The diagram indicates, there are two typypolgies, Conventional and Non Conventional forming the basic typology for low cost housing in the Third World (David Drakakis-Smith 2000). Retrospectively, Unconventional housing represent housing that was unplanned, undesign and informal in its setup. However there are some arguments and contradicting overview that slum only perceived as temporary structure and absence or inadequate basic services (Chattopadhyay, 2009).Within the definition of the UN Agency, slum housing represent area that is unmanaged, substandard and dilapidated in its condition.

The conventional housing refer to as housing that is built conforming to set a of standards with the involvement of relevant institution associated with the build environment such as consultants, planning authorities, regulators, real estate managers, developers and contractors. Conventional housing also defined as housing that employed paid labor, has capital investment and relative use of technology. However the unconventional housing that includes slums and squatters were not confirming to the parameter describe in the conventional housing definition and relatively not build according to the normal procedure. The unconventional housing primarily constructed outside of building industry norm and regulation and it is the most noticeable type housing built by the low income city dwellers. Squatters mainly reside in an area not legally own and usually being described as illegal occupiers which

the land owners usually find very difficult to resolve even within the law (Drakakis, 1979).

The definition of slum housing usually associated with rundown, unmanaged housing area, with deplorable living condition that put health risk to the occupier (Habitat, 2006). United Nation estimate one billion people are living in slum area and the problem more apparent in the Third World countries of which one third is in the commonwealth countries. In major cities like Kula Lumpur, the slums are always been associated with unemployment, poverty and crime, with this predicaments the government strife vigorously in trying to implement affordable housing by means of mass, high density, high rise housing scheme in the urban area particularly the city center.

The definition of affordable housing is an expression to explain a housing scheme relatively affordable to the lower income group but not necessarily to the most poor. The term often used to explain the housing scheme provided to the low income group by means of housing rental rather than housing purchase. Within the Malaysian context affordable housing initially meant for those who has average wage below RM1000 (USD 285) but has since been raised to RM1500 (USD 345taking account current exchange rate), this taking into account current purchasing power and country GDP index ( Zakiyah, 2004). In order to buy or rent 'affordable houses" under the government initiatives, potential buyer or occupier need to register and prove their household income or rather economic inadequacy. The condition not necessarily apply to potential tenant or buyer with family, unmarried applicants or single parents were allowed to apply provided the house income criteria can be justified according to the set of rules and conditions. On this area the local government needs to put up tight monitoring to avoid abuse or misuse.

**Affordable / low cost high rise housing**

The demand of labor and the continuous economic improvement in the city has resulting to an immediate surge of housing demand. In order to solve the critical shortages of low cost houses Chan (1979) reported that 70% of low cost houses built in the city of Kuala Lumpur primarily comprise of high rise buildings. The building to a stall during the 1997economic recession and low cost high rise housing become the recommended design in the urban area. They were comprised of a standard 14 to 18 storey heights with number of units comprising between 16-20 units, depending on its layout.

Due to the limitation of available public land within the city area and the increasing pressure of completion date, high rise low cost housing were built giving priority to the number of unit that can be built in a year rather than its overall design impact. Tan (1983) put it that the gross density in the high rise, high density area usually exceeds 100 units per acre and in many urban areas the average height of high

rise housing is between 17 and 20 storey high. The available public land becomes a plate for the standard high rise housing to be cast and mould into.

Findings pertaining to the design and use of spaces had been researched in a pilot study, where the circulation area and lift lobbies were inadequate in providing safety and comfort of feeling secured by the occupants (Aminuddin, 2008). Although the economic factors and the immediate policies to house low income group in order to provide some answers to problems of squatters, approaches and space planning does not differ very much for the last decade. Spaces were planned almost the same with minor adjustment to suit site condition and planning requirements. As a matter of fact some adjustment to increase density and maximizing cost had provided insecurities to users and occupiers, in the case of corridor and lift lobbies for the newly built Pantai Dalam development. Public or semi public spaces in any high rise housing development are facilities of equal importance and should be plan meticulously to ensure communal and environmental sustainability's. The importance of such spaces go beyond of providing enjoyable spaces, it can also help avoid anti-social behaviours.

Drakakis (2000) explained that the squatters and slum housing can be categorized as popular housing regardless of its condition and its lack of basic amenities. On the other hand, the description of slum not necessarily denotes lack of neither public amenities nor an area unplanned, but rather can be described as under manage, dilapidated with overall poor living condition after prolong used. The idea of construction massive numbers of typical high rise low cost housing with very high density has not taking into account the future impact of under management, dilapidation issues and overall living comfort. These factors are crucial to ensure the sustainability of the low cost high rise housing scheme envisage by the authorities in answering housing needs.

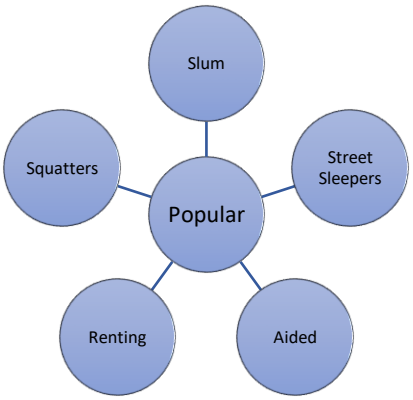



*Diagram 2. Typology of low cost housing supply-David Drakakis-Smith 1979*

**Low cost high rise urban housing development**

Low cost housing is dwelling where the total housing costs are affordable to those of low income group in that housing unit. Low cost housing is mainly designated

to accommodate low income families. Malaysia started to build low cost houses for lower income groups during the first five year plan staring from 1956 to 1960 in order to provide basic social and community needs. The various urban low-cost housing approaches are characterised in term of their physical environment that reflect the house and building design, circulation area, communal facilities and the open spaces.

*"In Malaysia, conventional low cost housing is provided by the public and private sectors. Low cost housing is generally defined as the appropriate housing units of which the construction is in accordance with identified minimum standard complying with a code of practice specially created for low cost house."* – Morshidi Sirat, (1999).

Under the Ninth Malaysian Plan (9MP) the immediate strategies to housing shortages within the urban area were to carry out as many housing projects as possible within a standard code of practices or design. Although the standard was formulated as early as the initial Malaysian Plan, studies of its impact and limitation has not been carried in detail and scrutinize appropriately. For this reason there has been a series of grievances to demolished or refurbish existing high rise accommodation due to its non appropriateness and lack of maintenance. Although the call for improvement has been voiced to the authorities, the priority to build quickly and with the shortest period of time was more of importance. The speed of building up low cost high rise housing within the city were encourage with further incentives the government introduced for first time house buyers.





*Picture 1 and 2: show existing high rise housing in its current state, without adequate lighting and proper ventilation in Pantai Dalam housing*

The pictures have illustrate the internal and external conditions for low cost high rise houses that has been build for the last ten years. The condition approaches and space planning does not differ very much for the last decade. Spaces were planned almost the same with minor adjustment to suit site condition and planning requirements. As a matter of fact some adjustment carried out to increase density and maximizing profit, had provided insecurities to users, in the case of corridor and lift lobbies for the newly built Pantai Dalam development as in the picture above.



*Picture 3: show vegetation growth on the façade without proper maintenance*

**Environmental assessment**

The environmental assessment has been in place and used for nearly two decades primarily by the developed countries. The widely known environmental assessment method and tools were, BREEAM (Building research Establishment Assessment Methods) in the UK. LEED (Leadership in Energy and Environmental Design) in the USA and GBtools (Green Building) within a number of European countries. Although Malaysia has no method of assessment tools for building construction projects it is vital that consideration to implement and use any form or type of environmental assessment tools to be part of the building project, especially that of high density housing.

Although none of the environmental assessment models covers all criteria within the scope of the built environment, the environmental assessment has provided consultants and the relevant authorities to cover the sustainable issues. Primarily the Environmental Assessment method has several criteria comprise of the following; (CRC, 2001)

1. Resource consumption – Energy, land, water and materials
2. Environmental loading – Air, solid, water and others
3. Indoor environmental quality- Air, thermal, visual and noise
4. Economics – Life cycle and operations

The local architectural association of Malaysia has taken its initial steps in getting the authorities and government bodies to consider issues of sustainability's and Environmental Assessment method (PAM Forum 2009). The four criteria can be modified to conform to the local context and issues for effective utilization to ensure sustainable built environment in the housing project especially that of high rise high density development in city center of Kuala Lumpur.

**Sustainability issues in the housing development**

The idea of sustainable architecture will be to deal with local climate and context at micro perspective. That sort of architecture can call as 'green architecture'. Nonetheless, green architecture is reducing the non-renewable energies indirectly. It also concerns more on the space planning and comfort in overall design. However, sustainable design is much wider. In the *Strategies for Sustainable Architecture,* Sassi. P. (2006) mentioned that sustainable architecture has two parts which hardware and software. The hard part will be the material, construction or ecology foot print. The soft part will be the appropriate contribution to the social environment human inhabit by addressing people's practical needs while enhancing their surrounding environment and their psychological and physical.

Although the Brundtland Commission Report 1987 provide a broader meaning to sustainability which encompasses the future generation, it has yet to be considered and carry out in the development of high rise high density housing in Malaysia. The definition of slums may defer in its term from one country to the other but its overall general characteristic can be deduced into several conditions.

Slums can generally be described with the following conditions;

- Sub standard housing – housing scheme that hastily built without appropriate quality check.
- Under manage – Housing that has not been managed to achieve comfortable living condition.
- Dilapidated – Housing condition deteriorated for a long period.
- Lack of security – Lack or no provision to provide appropriate security and psychological comfort.
- Unplanned – Lack or no input from the built environment expert.
- Undesign – Self built or self made housing.
- Lack of hygiene – Deplorable living condition that can become a threat to health.
- Lack basic amenities – Lack or no provision for public amenities such as water, electricity and communication

Although the current sustainable debate has just been taken seriously for the low cost high rise housing, implementation to provide overall environmental reform has yet to take place and be incorporated into the building project.

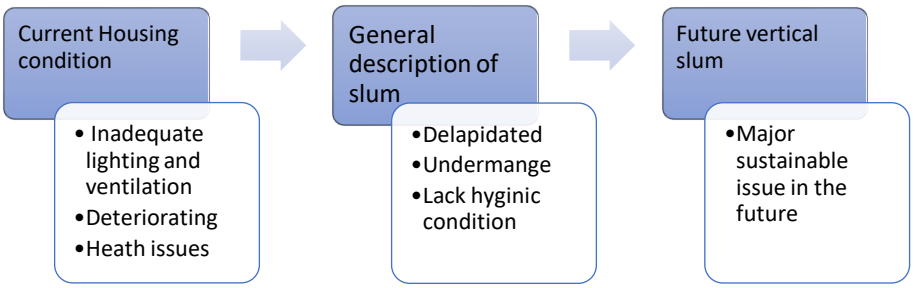



*Diagram 3. Relationship and possible future outcome for the low cost high rise housing*

The diagram above provides the relationship on the current housing condition that it's generally evident and its relationship to the general description of slum. Without appropriate steps and action, condition for the low cost high rise housing can become a major sustainable issues and problems to the future generation. The use of environmental assessment method base on the existing system can be an option for the local government and city hall to look in to in avoiding slum and improving living and working condition. UN agency Habitat (2006) has described that slum as a form of urban decay which occur through prolong negligence by occupants and authorities.

Although Drakakis (2000) has describe the structure and fundamental components for the typology of low cost housing and housing supply in the Third World, the fundamental argument that of slum and its possible 'relationship' between 'non conventional' to 'conventional' has not been examined closely.

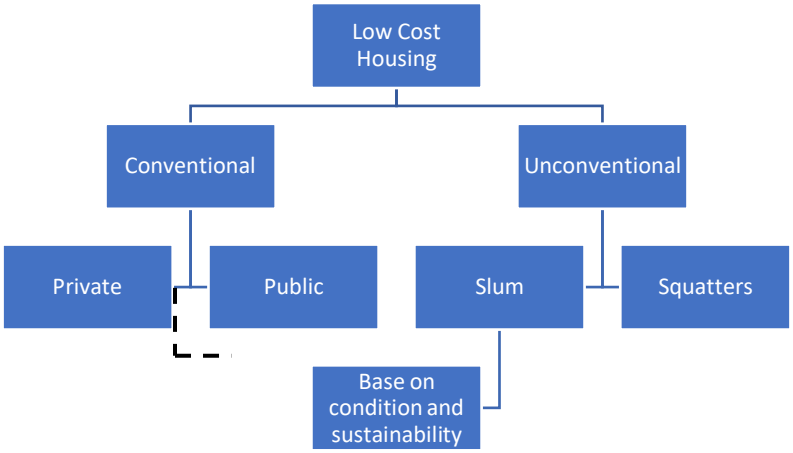



*Diagram 4. Showing possible connection between conventional and non conventional typology through public housing and slum*

Slum can be part of conventional typology of low cost high rise housing base on its condition and the sustainability of its development. Public housing relies heavily from government subsidies and local council fund. Without these, the low cost high rise housing will face serious sustainable issues in the future. It is not that crucial for the private housing sector having its own capital and manpower to carry out operation and maintenance in ensuring sustainable life cycle of their housing development. However, that does not prove that the design and its implementation is sustainable driven.

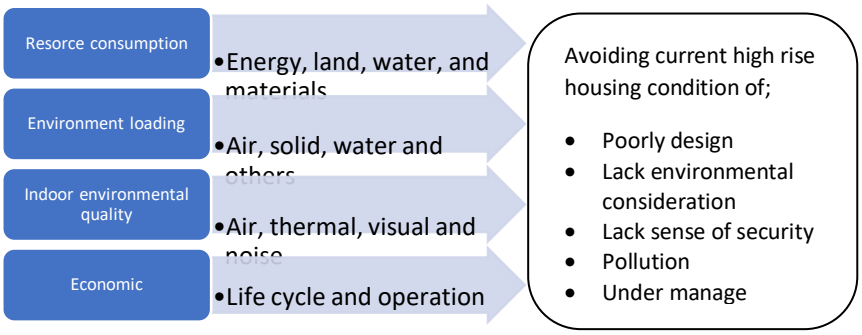



*Diagram 5. Environmental assessment criteria and its impact area*

The above diagram illustrates the use of Environmental assessment criteria to avoid future slum for the high rise housing within the condition high rise housing facing. Some of the environmental assessment criteria will be more important than the others such as the *Resource Consumption* that comprise of the initial design works from site selection, building utilization and the choice of building materials. However other aspect that might bare almost the same importance is the *Economic* criteria that comprise of the building management, building operation and maintenance. Depend on funding ability of the city hall, economic criteria could be the undoing of high rise housing development. Therefore architects and planners must strive to design building with minimal operation cost and better life cycle values.

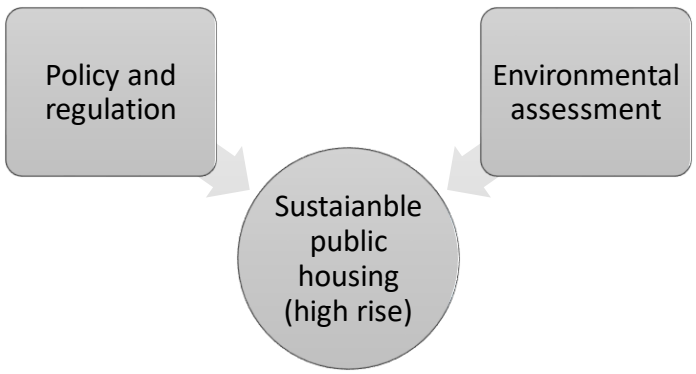



Diagram 6. Factors contributing to sustainable public housing.

**Conclusion**

The paper attempted to highlight the current condition of low cost high rise housing and its future buildability. Housing problems in Malaysia for certain will continue beyond the year 2020 and its suitability must meet both present and future urban habitant. It is within the context of suitability and sustainability that the present and future consultants and government bodies need to address tactfully. Diagram 6 demonstrate that the environmental assessment require the collective contribution of government policies and building regulation in order to have better chance to succeed.

Over the years high rise construction and development for housing were driven by the number of unit built per year and the urgency to house the squatters. Design revisions take little changes and some were more of minor modification. Lacking sustainable factors can be detrimental socially and environmentally to the city. The first few steps needed simply by learning the lesson from other cities and development across the world before eagerly trying to implement any act and regulation.

There are several recommendations that can be considered;

1. Review the design and building typology for urban housing.
2. Encourage development that incorporates sustainable values.
3. Provide a platform to develop environmental assessment.
4. Encourage users and occupants to engage in the overall planning.
5. Provide R&D funding for research to sustainable housing schem

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# THE APPLICABILITY OF ESTABLISHED ENVIRONMENTAL TOOLS (EAT) FOR LOW COST HIGH-RISE HOUSING IN MALAYSIA

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## ABSTRACT

Low cost high rise housing has emerged as a defmitive answer to the Malaysian government to house squatters and relocation of poorer planned housing. The paper will explore the applicability or otherwise of the established Environmental Assessment Tools (EAT)-as a possible tool to be used in the design and construction of high rise, low cost urban housing in Malaysian cities. At present, there are no firmly established methods for assessing the environmental performance of residential buildings in Malaysia. The paper will provide a review of existing Environmental Assessment Tools (EAT) from a number of countries and will suggest ways in which these might have relevance to the Malaysian context generally and to low cost high rise buildings specifically. The paper will evaluate the possibilities of adapting or adjusting existing Environmental Assessment Tools (EAT) and the extent to which certain environmental assessment criteria might have greater relevance in Malaysia and other tropical countries.

## INTRODUCTION

High rise public housing is a distinctive form of public housing in Kuala Lumpur. In the inner city where housing prices and rents have continue to rise, high rise public housing plays a key role in providing affordable housing for low income families. The current and future of low cost high rise housing will remain part of long term planning for the local government strategy and policies for the housing problems in the cities. However it is clear that the availability and affordability of this high rise low cost housing does not equate with the availability of better and appropriate housing to the families in need of basic accommodation. Building may not design and build to the standard of conforming to social and environmental standard and needs. Improvements are required to provide better quality for the housing occupants to achieve long term sustainable communities.

### Definition of affordable high rise housing

The defmition of affordable housing is an expression to explain a housing scheme relatively affordable to the lower income group but not necessarily to the most housing scheme provided to the low-income group by means of housing rental rather than housing purchase. Within the Malaysian context affordable housing initially meant for those who has average wage below **RM1000** (USD 285) but has since been raised to RM1500 (USD 345) taking account current exchange rate), this taking into account current purchasing power and country **GDP** index ( Zakiyah, 2004). In order to buy or rent 'affordable houses'' under the government initiatives, potential buyer or occupier need to register and prove their household income or rather economic inadequacy. The condition not necessarily apply to potential tenant or buyer with family, unmarried applicants or single parents were allowed to apply provided the house income criteria can be justified according to the set of rules and conditions. On this area the local government needs to put up tight monitoring to avoid abuse or misuse.

### Development and Issues on low cost high rise housing

In 1984, the Kuala Lumpur Structure Plan was prepared at ensuring that sufficient housing would be provided for all income groups in the city and planned to cover the city economic needs in order to provide immediate answers to problems of squatters (DBKL, 1988). At national level, National Economic Policy was formulated to provide continuous effort to house in proper housing scheme within the city and also sub urban areas. The Policy additionally function to eradicate poverty as well as providing equal economic opportunities and wealth distribution among three ethnic group comprise largely the Malay(52%) followed by Chinese(40%) and Indian (8%). The NEP as it is commonly named and is revised every 5 years to ensure it effectiveness and achievement (9th Malaysian Plan).

### Brief background of the Environmental Assessment tools

Currently there are approximately fourteen environmental assessment tools used worldwide in relation to the environmental assessment of buildings. The first Building Research Establishment Assessment Methods (BREEAM) launched and operated by the Building Research Establishment (BRE) in UK came into operation in 1990 and it is revised in the 1993 and 1998. The current BREEAM

version is noted as BREEAM 2004. It covers a range of building type comprises of industrial building, institutional building etc. It is currently seen as the most popular assessment where other countries has used it for the development their own scheme. The scheme award various categories from pass, good, very good, excellent and presently introduced the outstanding category.

The US Department of Energy started the development of energy conscious measures through Leadership in Energy and Environmental Design and initial version was adapted for use in 1998. Two years later LEED version 2.0 was established and used in year 2000 through out until the version 3.0 was introduced in 2009. LEED is an internationally

recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, $CO_2$ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. LEED provide four systems rating of certified, silver, gold and platinum.

GB Tools is software developed by the Green Building Challenge, which comprise of an association of more than twenty mainly developed countries. Green Building Challenge is an international collaborative effort to develop a building environmental assessment tool that exposes and addresses controversial aspects of building performance and from which the participating countries can selectively draw ideas to either incorporate into or modify their own tools. The criteria and sub criteria in these performance issues are scored using the rating from -2 to +5 of the assessment scale.

**Type and comparison of the Assessment tools**

**Assessment tools comparison**

Although there are more than 10 type of environmental assessment tools the choice of taking BREEAM, LEED and GB Tools were based on its recognition and length of used. The tools were compared because of its assessment criteria and the area of which there are being utilised

| BREEAM | LEED | GB Tools (GBC) |
|---|---|---|
| Pass, good, very good, excellent and out standing | Certified, silver, gold and platinum | -2, -1, 0,+1, +2, +3, +4 and +5 |
| Criteria | Criteria | Criteria |
| Management, Energy use, health and well being, pollution, transport, land use, ecology, materials, water | Sustainable sites, energy & atmosphere, materials & resources and indoor environmental quality | Base on the level of buildi performance and best practices include the use of energy & water |

*Diagram 1. Rating and criteria*

The environmental assessment tools typically the BREEAM and LEED comprise of various category and factors that form as a lengthy checklist. The checklist cover building site, materials, some form of energy use and the consumption of water. However, the GB tools utilized flexible methods of assessment and the methods or criterion can be adaptable to suit to the conditions of which the building is built

The environmental assessment tools differ from one and the other in certain category or area quite significantly. There is no common measurement or `legal tender' that can be used to compare the various environmental assessment tools. Each tool can be utilized to evaluate building materials, products, building used, existing building and new building. There several categories of building and building typology that can be covered and used by these assessment tools. Some tools maybe more fitting to assess an certain type of building or products. However, the environmental assessment tools had not cover the effect of occupants prior and after the building completion. Assessments were carried out immediately before full utilization of the building without evaluating the impact of post occupancy periods. Aesthetical aspect of a building and user feedbacks throughout the building use were not included as part of the assessment. The use of cost control and measuring the financial constraint in achieving sustainable building is not built-in to the environmental assessment tools even though cost as well as time and specifications are essential to any projects.

**Current critical environmental issues in Malaysia**

By the year 2020 Malaysia is expected to reach industrialized nation status. Today the country is characterised by rapid urbanization and industrial activities mainly in the urban cities, these will increasingly have an impact on the environment that serves both as the source of raw materials for

development and act as the green lung. Great difficulties are face in planning to utilize the natural resources around the country.

In the case of Kuala Lumpur, the most crucial natural resource is the land where urbanization poses a major concern. The rapid development of urban Kuala Lumpur itself is imposing significant pressure on the natural resources and the capacity of the overall environment. It is within such city that the consumption and waste production is comparatively high compared with the rural environment. That trend will ultimately have serious adverse effects on the life support system, including land, water and air, on which humans depend for survival, and aesthetic values such as green parcels of land, natural terrain and ecosystems that can enhance the quality of life and mental health of its inhabitants.

Apart from depleting renewable and non-renewable natural resources, development also promotes environmental degradation in the form of flash floods, landslides, mud flows, soil erosion, siltation and sedimentation of rivers, unmanageable waste production and water scarcity. It is therefore imperative for a fast-developing country such as Malaysia to protect, conserve and utilize its natural resources in a sustainable manner for the sake of future generations.

Environmental awareness is building up in Malaysia and with the 9th Malaysia Plan 2006-2010 the Malaysian government has placed further emphasis on preventive measures to mitigate and minimise negative environmental effects at source, to intensify conservation efforts and to ensure a sustainable development of both the exhaustible and the renewable energy resources.

The past decade of rapid economic growth and industrialization has caused serious environmental challenges in Malaysia. The most prominent at the moment are considered to be solid waste management, ensuring long-term sustainability of the water supply and sewerage services industry and overall improvements of energy efficiency to reestablish a clean Malaysia and good management of the natural resources.

1. **Solid Waste Management**
   Due to growing population and increasing consumption, Malaysia generates waste at 19,100 tons per day. In Kuala Lumpur waste generation is about 3,000 tons a day and forecasts shows that this will increase each year.

2. **Water and Wastewater**
   The domestic and industrial water demand in Malaysia is expected to triple over the next 50 years and based on estimated doubling of the per capita water consumption by 2020 it is predicted that water shortages will occur within the next 5 years. Currently more than 95% of the urban and 85% of the rural population are served by piped water.

3. **Energy**
   The use of energy from commercial and domestic significantly increased for the last ten years and therefore it is a major concern especially with the raising cost of oil. The overall energy demand is expected to increase at an average rate of 6.3 percent per annum, during the period of the Government's 9th Malaysia Plan to Implementation of energy efficiency programmes focusing on energy saving features in the commercial and industrial sectors are supported by current government policies.

4. **Natural resources**
   The country had a vast natural resources comprising timber, mineral, oil and gas. However with the steep increase in demand had put a strain in the harvesting and controlling of these natural resources.

5. **Air pollution**
   There are no ambient air quality standards in Malaysia. The Malaysian government, however, established ambient air quality guidelines in 1988. Pollutants addressed in the guidelines include ozone, carbon monoxide, nitrogen dioxide, sulphur dioxide, total suspended particles, particulate matter fewer than 10 microns, lead and dust. Haze almost occurs during the dry season result from the neighbouring country forest burning had cost substantial environmental health other than the industry and carbon emission.

**Adaptation and the Malaysia context**

The Malaysian needs of the environmental assessment tools was addressed by the Malaysia Institute of Architects in the year 2008 by the forming of a building sustainable committees overlooking the requirement and objectives of in achieving a green and sustainable building. The basic objectives should cover five areas;

1. To save energy and resources, recycle materials and minimise the emission of toxic substances throughout its life cycle.

2. To harmonise with the local climate, traditions, culture and the surrounding environment.

3. To sustain and improve the quality of human life whilst maintaining the capacity of the ecosystem at local and global levels.

4. To the betterment of building resources, significant operational savings, and increased workplace productivity.

5. To sends the right message about a company or organization, that it is well run, responsible, and committed to the future.

The focus area should provide criteria such as;

- Critical issues in general
- Critical issues specific (housing)
- Factors required in the establishment of assessment tools
- The required frame work to established assessment tools

**Affordable / low cost high rise housing**

The demand of labour and the continuous economic improvement in the city has resulting to an immediate surge of housing demand. In order to solve the critical shortages of low cost houses Chan (1979) reported that 70% of low cost houses built in the city of Kuala Lumpur primarily comprise of high rise buildings. The building to a stall during the 1997economic recession and low cost high rise housing become the recommended design in the urban area. They were comprised of a standard 14 to 18 storey heights with number of units comprising between 16-20 units, depending on its layout.

Due to the limitation of available public land within the city area and the increasing pressure of completion date, high rise low cost housing were built giving priority to the number of unit that can be built in a year rather than its overall design impact. Tan (1983) put it that the gross density in the high rise, high density area usually exceeds 100 units per acre and in many urban areas the average height of high rise housing is between 17 and 20 storey high. The available public land becomes a plate for the standard high rise housing to be cast and mould into.

Findings pertaining to the design and use of spaces had been researched in a pilot study, where the circulation area and lift lobbies were inadequate in providing safety and comfort of feeling secured by the occupants (Aminuddin, 2008). Although the economic factors and the immediate policies to house low income group in order to provide some answers to problems of squatters, approaches and space planning does not differ very much for the last decade. Spaces were planned almost the same with minor adjustment to suit site condition and planning requirements. As a matter of fact some adjustment to increase density and maximizing cost had provided insecurities to users and occupiers, in the case of corridor and lift lobbies for the newly built *Pantai Dalam Development.* Public or semi public spaces in any high rise housing development are facilities of equal importance and should be plan meticulously to ensure communal and environmental sustainability's. The importance of such spaces go beyond of providing enjoyable spaces, it can also help avoid anti-social behaviours.

Drakakis (2000) explained that the squatters and slum housing can be categorized as popular housing regardless of its condition and its lack of basic amenities. On the other hand, the description of slum not necessarily denotes lack of neither public amenities nor an area unplanned, but rather can be described as under manage, dilapidated with overall poor living condition after prolong used. The idea of construction massive numbers of typical high rise low cost housing with very high density has not taking into account the future impact of under management, dilapidation issues and overall living comfort. These factors are crucial to ensure the sustainability of the low cost high rise housing scheme envisage by the authorities in answering housing needs.

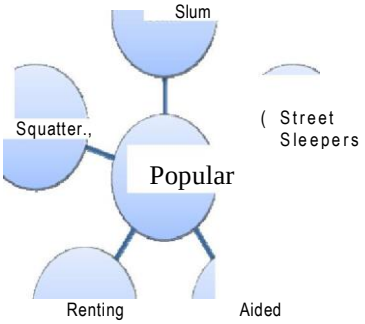



*Diagram 2. Typology of low cost housing supply- David Drakakis-Smith 1979*

**Low cost high rise urban housing development**

Low cost housing is dwelling where the total housing costs are affordable to those of low income group in that housing unit. Low cost housing is mainly designated to accommodate low income families Malaysia started to build low cost houses for lower income groups during the first five-year plan staring from 1956 to 1960 in order to provide basic social and community needs. The various urban low-cost housing approaches are characterised in term of their physical environment that reflect the house and building design, circulation area, communal facilities and the open spaces.

*"In Malaysia, conventional low cost housing is provided by the public and private sectors. Low cost*

*housing is generally defined as the appropriate housing units of which the construction is in accordance with identified minimum standard complying with a code of practice specially created for low cost house." —* Morshidi Sirat, (1999).

Under the Ninth Malaysian Plan (9MP) the immediate strategies to housing shortages within the urban area were to carry out as many housing projects as possible within a standard code of practices or design. Although the standard was formulated as early as the initial Malaysian Plan, studies of its impact and limitation has not been carried in detail and scrutinize appropriately. For this reason there has been a series of grievances to demolished or refurbish existing high rise accommodation due to its non appropriateness and lack of maintenance. Although the call for improvement has been voiced to the authorities, the priority to build quickly and with the shortest period of time was more of importance. The speed of building up low cost high rise housing within the city were encourage with further incentives the government introduced for first time house buyers.



*Picture 1 and 2: show existing high rise housing in its current state, without adequate lighting and proper ventilation in Pantai Dalam housing*

The pictures have illustrate the internal and external conditions for low cost high rise houses that has been build for the last ten years. The condition approaches and space planning does not differ very much for the last decade. Spaces were planned almost the same with minor adjustment to suit site condition and planning requirements. In fact, some adjustment carried out to increase density and maximizing profit, had provided insecurities to users, in the case of corridor and lift lobbies for the newly built Pantai Dalam development as in the picture above.



*Picture 3: show vegetation growth on the facade without proper maintenance*

**Environmental assessment**

The environmental assessment has been in place and used for nearly two decades primarily by the developed countries. The widely known environmental assessment method and tools were, BREEAM (Building research Establishment Assessment Methods) in the UK. LEED (Leadership in Energy and Environmental Design) in the USA and GBtools (Green Building) within a number of European countries. Although Malaysia has no method of assessment tools for building construction projects it is vital that consideration to implement and use any form or type of environmental assessment tools to be part of the building project, especially that of high density housing.

Although none of the environmental assessment models covers all criteria within the scope of the built environment, the environmental assessment has provided consultants and the relevant authorities to cover the sustainable issues. Primarily the Environmental Assessment method has several criteria comprise of the following; (CRC, 2001)

1. Resource consumption — Energy, land, water and materials
2. Environmental loading — Air, solid, water and others
3. Indoor environmental quality- Air, thermal, visual and noise
4. Economics — Life cycle and operations

The local architectural association of Malaysia has taken its initial steps in getting the authorities and government bodies to consider issues of sustainability's and Environmental Assessment method (PAM Forum 2009). The four criteria can be modified to conform to the local context and issues for effective utilization to ensure sustainable built environment in the housing project especially that of high rise high density development in city center of

**Sustainability issues in the housing development**

The idea of sustainable architecture will be to deal with local climate and context at micro perspective. That sort of architecture can call as 'green architecture'. Nonetheless, green architecture is reducing the non-renewable energies indirectly. It also concerns more on the space planning and comfort in overall design. However, sustainable design is much wider. In the *Strategies for Sustainable Architecture,* Sassi. **P.** (2006) mentioned that sustainable architecture has two parts which hardware and software. The hard part will be the material, construction or ecology foot print. The soft part will be the appropriate contribution to the social environment human inhabit by addressing people's practical needs while enhancing their surrounding environment and their psychological and physical.

Although the Brundtland Commission Report 1987 provide a broader meaning to sustainability which encompasses the future generation, it has yet to be considered and carry out in the development of high rise high density housing in Malaysia. The definition of slums may defer in its term from one country to the other but its overall general characteristic can be deduced into several conditions.

Slums can generally be described with the following conditions;

- Sub standard housing — housing scheme that hastily built without appropriate quality check.
- Under manage — Housing that has not been managed to achieve comfortable living condition.
- Dilapidated — Housing condition deteriorated for a long period.
- Lack of security — Lack or no provision to provide appropriate security and psychological comfort.
- Unplanned — Lack or no input from the built environment expert.
- Undesign — Self built or self made housing.
- Lack of hygiene — Deplorable living condition that can become a threat to health.
- Lack basic amenities — Lack or no provision for public amenities such as water, electricity and communication

Although the current sustainable debate has just been taken seriously for the low cost high rise housing, implementation to provide overall environmental reform has yet to take place and be incorporated into the building project.

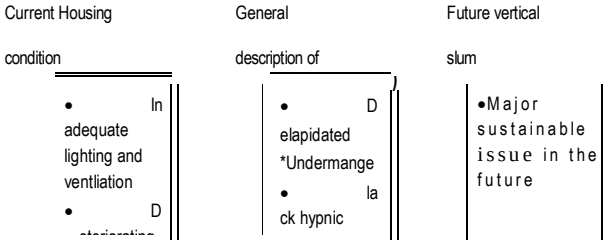



*Diagram 3 : Stage offuture vertical slum*

**Recommendation**

The environmental assessment tools had been utilized for more than a decade notable in the developed countries. The assessment tools objectives do not run from the focus of sustainability, ecological sensitivity, and green issues. However the breakdown of criteria within the assessment and its weightage differ from each other and each type of tools. On the other hand the tools were used as a 'one size fits all' in order to determining the building sustainability.

Each area for project site varies from one and the other although the project may have the same requirements. It is these local factors that require to be integrated and addressed coherently in ensuring effective use of the tools in meeting its objectives. Local climate and environment is a fundamental issue that should be an integral part of the tools which has not been adopted effectively. Climatic conditions differ from one area and the other and certain countries may experience this significant difference. The dynamic condition of the climate can certainly have a bearing on the building before, during construction and throughout its occupancy.

Designing and constructing a sustainable building need certain amount of fmancial commitment and cost bear a significant factor. Nevertheless cost issues have not been a factor in any of the tools studied. It is relatively easy to design and construct the most sustainable building without having to have the constraint of cost and long term commitment, throughout its building use during the post occupancy period. Specification, time and cost are essential for project success and therefore cost is a prime tangible element that should be part of the assessment tool. Other factor, which has not been part of the assessment tool, is the social impact of the project. Having a building without occupants is as good having a building without any use. Although the social issues are rather dynamic and difficult to comprehend, even so must not be neglected at all.

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**Design approach to low cost high rise urban housing in Malaysia**

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## ABSTRACT

Low cost high rise urban housing projects were mostly initiated by the government through the eradication of squatter's project. It can be defined as residential built with heavy financial assistance from the government to house the low-income urban families. The design of low cost high-rise urban housing in Malaysia is mostly to fulfil the standard design provided by the National Housing Department as mean to ease design requirements. The design parameters and guidelines were basic in its form and contents. It is formulated to expedite purely practical needs to house the low-income people and the squatters. Construction and building of this low cost high rise urban housing began in earnest to fulfil its intended new economic policy and also as a mean to show government seriousness to provide housing needs. It is the objectives of the government on that day and steps taken to provide adequate and yet good standard of housing. The paper will focus on the strategic design approach in its design of low cost high-rise urban housing as a mean to improve the quality of the high rise housing project. A comparative analysis of high-rise low cost urban housing will be provided in order to identify the design trend to low cost high-rise urban housing. The research will focus on several low cost high-rise urban housings in Kuala Lumpur.

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## introduction

Low cost housing is dwelling where the total housing costs are affordable to those of low income group in that housing unit. Almost in all the major cities in Asian countries, residential buildings are characterized with high-rise and high density. Therefore, the sustainable strategies in communal space used for low cost high rise housing development play an important concern and is the main focus of this paper. The research will cover the 'soft part' of the sustainable architecture which is socio-environment of the communities On the macro view, sustainable communities are communities planned, built, or modified to promote sustainable living. In the *Strategies for Sustainable Architecture,* Sassi. P. mentioned that sustainable architecture has two parts which hardware and software. The hard part will be the material, construction or ecology foot print. The soft part will be the appropriate contribution to the social environment human inhabit by addressing people's practical needs while enhancing their surrounding environment and their psychological and physical. Therefore, the sustainable community can consider as soft part.

Most of the time concern were on areas pertaining to heat lost and gain but in retrospectively to focus on the other environmental issues of sustainability (including intra personnel development and well being) and economic of sustaining moderate living. As stated by Sassi P. *"Sustainable urban and communities design connects these natural elements so that the community works together as an organism, creating interdependent patterns that sustain each other."* The idea of sustainable architecture will be to deal

with local climate and context at micro perspective. That sort of architecture can call as 'green architecture'. Nonetheless, green architecture is reducing the non-renewable energies indirectly. It also concerns more on the space planning and comfort in overall design. However, sustainable design is much wider.

On the other hand, Barton H.(2000) explained ;*"Desirable sustainable community with a place that engenders a feeling of belonging, an attractive and healthy place within a convivial community, a safe place that is pollution free, uncongested, planted, less frenetic and offers more locally based life with balance of privacy and community interaction."* In the micro scale, sustainable communities offer people the opportunity to enjoy better standard of living, while housing minimal negative impact on the environment and the economic and social structure. Communities and local government in the United Kingdom has a standard that how the sustainable should offers to public.

- A sense of community identity and belonging
- Tolerance, respect and engagement with people from different cultures, background and beliefs
- Friendly, co-operative and helpful behaviour in neighbourhoods
- Opportunities for cultural, leisure, community, sport and other activities, including for children and young people
- Low levels of crime, drugs and antisocial behaviour with visible, effective and community-friendly policing
- Social inclusion and good life chances for all.

## 2 The Communal Spaces

"*In any organisation, extreme compartmentalisation and dissociation of internal elements is the first sign of destruction. In a society, disassociation is anarchy. In a person, disassociation is the mark of schizophrenia and impending suicide*."- Christopher Alexander (1965), A City Is Not Tree. The concepts of communal space, community space, social space, defensible space, or transitory space carry out the same function in the realm of public housing. They act as platform for meetings and interactions between the residents living there. The importance of these spaces is inherently acknowledged in any traditional community. In the principles sociopetal of Edward Krupat who as Psychologist (1985, pg.158) that the five ways that then built environment relates to people;

- Physical — As end product being actual physical structure that encompasses and compartmentalise space
- Functional — Space that accomplishes certain purpose
- Cognitive — Provide cues for behaviour
- Affective — Arousing emotion, perceived and evaluated against cultural norm as being beautiful or provides safety and security

- Social — A lose setting to allow people to interact and meet others

In terms of functional satisfaction for users, the Krupat felt that the designers should beyond that which provides more cues to fulfil the human needs for social interaction privacy and identity. Likewise mentioned on how the centralize space can work better to provide a highly interaction space for human. The space function would influence the space usage as well for him.

Beside that, Tay Kheng Soon's discourse on 'The Tropical City' (1986) believed transitional zones to mitigate the suffering experienced by people living and working in cities of rapidly developing countries. Tay remarked that when people are in a hurry, they tend to cast aside the simple courtesies of demeanour and speech. However, since hospitality and informality are the hallmarks of our tropical life, therefore Tay reminded us that our city should be build and plan for them. Through the theory of the communal space, the parameter for the communal space can be formed by size, visual accessibility, physical accessibility, safety and comfort as well. Based on this criteria, the success or sustaianability achivement of the spaces can be identified easily. That it will be a encourage factor for users to come to interact and have communication as well. Therefore, the sustainable community can be formed easily.

## 3 Low Cost High Rise Housing in Kuala Lumpur

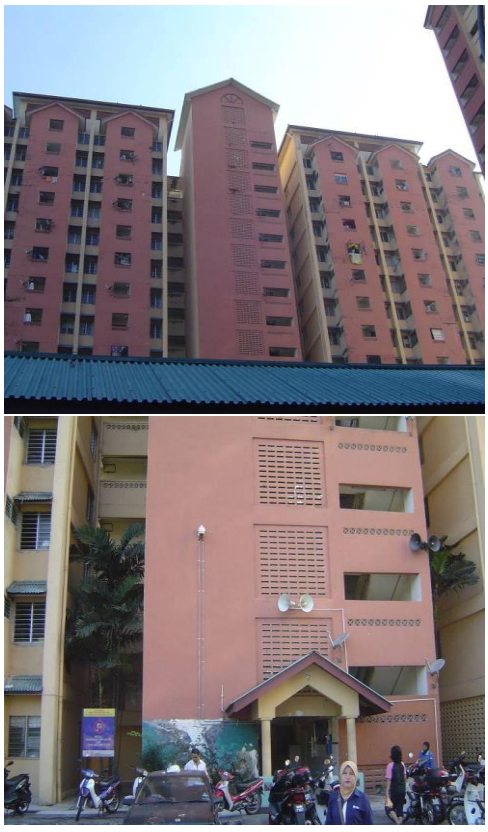
*"The quantity of housing that is required to provide accommodation of an agreed minimum standard and above for a population given its size, household composition, age distribution, etc without taking into account the individual household's ability to pay for the housing assigned to it."* – Housing Economics & Public Policy, London, Robinson, (1979, p55).

*"In Malaysia, conventional low cost housing is provided by the public and private sectors. Low cost housing is generally defined as the appropriate housing units of which the construction is in accordance with identified minimum standard complying with a code of practice specially created for low cost house."* – Morshidi Sirat, (1999).

On the above, the statement gives the general explanation for the low cost housing. Basically, low cost housing is providing for certain range of incomer particular low income that they can afford a house in our country. Low cost housing is established based on certain minimum standard of construction and planning to ensure the comfort of the residents.



Picture 1: Pantai Dalam Development, Kuala Lumpur



Picture 2: Jelatek Development, Kuala Lumpur

In Malaysia, government has establishes a programme called Hard-Core Poor Development Programme (Program Perumahan rakyat Termiskin - PPRT) to deal with the low cost housing. The one of the purpose of the low cost housing is to reduce the squatters in the urban area that created a lot of problem to environment. On the relocation of squatters, the government has considered the community spirit within the squatters. Thus, they usually replace into a same low cost housing development to extend the community spirit into new environment.

Living in multi-racial hospitality and informality is part of our culture and heritage. Communal space and communal activities are a norm in our traditional society. Yet in our quest for providing conducive high density living, we often look outward and elsewhere for clues and methods of providing safe, secure and harmonious living conditions. Both knowledge and practice founded by the academics and our culture should be synthesised and implemented in planning for high-density living.

## 4 Scope of study and methodology

The objectives of this paper are to investigate the design and use of spaces for the low cost high rise urban housing particularly in Kuala Lumpur. The paper shall also focus on space planning issues and approaches that would enable to look at the sustainability of communal spaces in urban housing areas. The scope of study covers the sustainable social aspect for communal space planning in the selected low cost high rise housings. For the fundamental social space in the housing can define into general community area such as recreation area, community hall, and sub communal space such as corridor, and lift lobby.

From that, the recreation space is where the leisure activities can be used by the youth and elders. Therefore, the space consist the facilities of leisure activities such as ball court, playground, and jogging track that can be considered as recreation area. The community hall is a building used for community activities, it is a building used for a range of community activities in housing scheme can be justified as community hall.

*'A corridor is a path or guided way (usually referring to an interior passageway in modern buildings). A corridor is fundamentally a relatively large space enclosed by a roof and walls. In the Iron Age, a mead hall was such a simple building and was the residence of a lord and his retainers. Later, rooms were partitioned from it, so that today the corridor of a house is the space inside the front door from which the rooms are reached.'* - Newman, D. "Building Identity: Socialization"

This is the definition of the corridor that the selected case studies will be based on same criteria. In this paper the study will focuses on Kuala Lumpur which is an urban state and consist a lot of high rise residential buildings which were built to accommodate government policies to house the low income group.

The research methodologies are divided into several parts as shown below:

- Case Studies
  Pantai Dalam had highest number of squatters in Federal Territory of Kuala Lumpur. The area has the highest number of PPRT flats with 5000 units in 5 housing schemes. Basically, Pantai Dalam is divided into 5 areas that are Kg. Limau, Kg. Selamat, Kg. Pasir, Kg. Pantai Dalam, and Pantai Hill Park. The 2 sampling will be selected within Pantai Dalam low cost high rise housing. The housing development at Jelatek shall also be included in the research. The observation and survey will be conducted and will be analysis accordingly.

- Collection of data (questionnaires)
  The field study is carried out through series of questionnaires which than be analysis statistically in providing some findings. (By using Likert Scale with 1 as least appropriate/suitable and 5 being most appropriate/suitable).

## 5 Findings and discussion

Low cost high rise housing in Jelatek which approximately 3 kilometers from the city center was chosen completed in the mid 1990's. The other low cost high rise in Pantai Dalam was just completed almost 2 years located approximately 10 kilometers and shall provide a contrasting research study. The questionnaires had been devided into five sections; 1. General information, 2. Recreation spaces, 3. Lift lobby and corridors(circulation area), 4. Community Hall, 5. Overall and open ended question.

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