INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT

URBANIZATION AND EMERGING POPULATION ISSUES
WORKING PAPER 12

Housing density and housing preference in Bangkok's low-income settlements

by NATTAWUT USAVAGOVITWONG, AIM-ON PRUKSURIYA, WANIDA SUPAPORN, CHAIWAT RAK-U, DIANE ARCHER and GORDON McGRANAHAN

SEPTEMBER 2013

iied
HUMAN SETTLEMENTS GROUP

iied

International
Institute for
Environment and
Development

Housing density and housing preference in Bangkok's low-income settlements

Nattawut Usavagovitwong, Aim-on Pruksuriya, Wanida Supaporn,

Chaiwat Rak-U, Diane Archer and Gordon McGranahan

September 2013

ABOUT THE AUTHORS

Nattawut Usavagovitwong
Lecturer, Department of Architecture, School of Architecture,
Sripatum University, 61 Paholyothin Rd., Jatujak, Bangkok, 10900
E-mail: nattawut.us@spu.ac.th

Aim-on Prueksuriya and Wanida Supaporn
Plan and Policy Analysts, Spatial Development Planning and Strategy Office
Office of Economic and Social Development Board

Chaiwat Rak-U
Architect, Community Organization Development Institute (CODI)

Diane Archer
Researcher, Human Settlements Group, IIED
E-mail: Diane.Archer@iied.org

Gordon McGranahan
Principal Researcher, Human Settlements Group, IIED
E-mail: Gordon.McGranahan@iied.org

Acknowledgements
The authors are grateful to Community Organization Development Institute (CODI) and National Housing Authority (NHA) for allowing us to access into some data insights. This working paper has been funded entirely by UK aid from the UK Government.

Human Settlements Group
International Institute for Environment and Development (IIED)
80-86 Gray's Inn Road
London WC1X 8NH, UK
Tel: 44 20 3463 7399 Fax: 44 20 3514 9055

ISBN: 978-1-84369-956-9

This paper can be downloaded free of charge from
http://www.iied.org/pubs/display.php?o=10631IIED

CONTENTS

Acronyms and abbreviations

BMA Bangkok Metropolitan Administration
BMR Bangkok Metropolitan Region
CODI Community Organisations Development Institute
NHA National Housing Authority

1 Introduction

1.1 Background

Decent, affordable and accessible housing for all city dwellers is surely a desirable goal. However, in a large city like Bangkok (official population: eight million in 2010) ensuring adequate and affordable housing for all can be difficult. There are multiple competing pressures for land, and private commercial developers play a big part in shaping both land and housing markets. One approach to maximising land usage is through high-rise construction ("densification"). However, few private developers cater to the lower income bracket; low-income households have historically moved into informal settlements in the city, where neither household nor settlement density may conform to official standards. Official policies for low-income groups in Thailand have ranged from provision of public housing in the form of flats, to "sites-and-services" upgrading[1] (Giles, 2003).However, the main obstacle to providing public housing has been the availability of affordable land on which to build. More recently, in 2003, Thailand adopted a two-pronged approach to housing: demand-driven, through the innovative Baan Mankong participatory slum upgrading programme (Boonyabancha, 2005); and supply-driven, through the public housing approach of Baan Ua-Arthorn (see Box 1). Only Baan Mankong continues to be implemented today.

This study sets out to understand the housing preferences of low and lower-middle-income communities, and whether these preferences are met by the different levels of population and housing density across three different types of low-income housing. The traditional view of a low-income, informal settlement is of an overcrowded space that has both a high population density within its land area and within each unit. This paper seeks to investigate whether this high density (at the level of both the housing unit and the settlement or community) is observed in practice, and whether it is perpetuated in both community-driven and public housing projects. In this study Baan Mankong represents the community-driven housing, while flats built by the National Housing Authority (NHA) represent public housing projects. We also examine what the implications of varying densities are for the project residents' levels of satisfaction with their neighbourhood.

We examine the population density to see the relationship between density levels. This allows us to see the relationship between density levels and socio-economic conditions; and satisfaction levels across the three housing types. In turn, this provides a basis for exploring the role of existing building regulations in shaping housing form and density; ongoing government housing programmes and policies; and the wider implications for the processes of densification, land use change, and value in a rapidly developing urban area.

While bearing in mind that the study is based on a small number of settlements – which may not be representative of all settlements of each type – it is possible to draw some preliminary conclusions on the relationship between satisfaction and density from the results presented in this study. Both NHA settlements have the highest levels of density at the settlement scale, despite having the largest proportion of open space. Meanwhile, the non-upgraded

[1] Sites-and-services is an approach to bring shelter within the economic reach of the poor where partial basic shelter structures and services are provided, to be developed incrementally by the home-owner.

Wat Phrayakrai settlement (as opposed to the part of Wat Phrayakrai that was upgraded following a fire) is the least dense – thus suggesting that not all "slums" conform to the stereotype of over-crowded and densely built-up spaces. However, at the level of individual homes, the Wat Phrayakrai slum homes are the most densely inhabited. When it comes to satisfaction, the three Baan Mankong upgraded communities demonstrate the highest average levels of total satisfaction and neighbourliness, and it is possible that this is due to the community-driven and participatory process of the settlements' design. Satisfaction levels across the different types also appear to be related to density levels across these settlements.

These results suggest that housing approaches offering the most satisfactory and affordable living conditions to low and lower-middle-income communities are those which allow residents' input into house and settlement design. Consequently, government-supported housing programmes should allow for this.

1.2 Standards for housing density: Anoverview

There are three levels of housing population density to consider. First, there is the density of a particular dwelling, the "in-home density", which provides a measure of overcrowding. Second, there is the settlement density of the built-up area: that is, the population density relative to the combined area of the building (or buildings') footprints, not including open space. Third, there is the settlement density for the whole site which includes buildings and shared open spaces. Each of these densities can be measured in terms of population per square kilometre or square metre, but different disciplines tend to express this in different units (such as population per hectare), inverted (such as space per capita), or through related measures (such as housing units per unit of area).

Table 1 compares the household spatial standards from four countries in Asia as set out in building codes. Since many building and housing standards refer specifically to space per capita, this "inverse of density" is what is presented in the table. The data demonstrate that Thailand has relatively high standards for space per person compared to other countries in the region, though it also has the smallest minimum bedroom size.

Table 1. Standards for housing density in four Asian countries

	Singapore	Hong Kong	Malaysia	Thailand
Minimum floorspace per capita	6.97m^2/cap	3.20m^2/cap	4.50m^2/cap	**6.8m^2/cap**
Bedroom minimum size	11.7m^2	11.0m^2	10.8m^2	**8.64m^2**
Dwelling unit minimum size	32.76m^2	11-60m^2	49-54m^2	**34m^2**

Source: based on DOLA, 2006.

Box 1: Key actors and programmes

The **Community Organisations Development Institute (CODI)** is a public organisation under the Ministry of Social Welfare and Human Development. CODI was established in 2000 through the merger of the Urban Community Development Office (UCDO) and a rural development fund. CODI is the organisation charged with facilitating the **Baan Mankong** ("secure housing") national slum upgrading programme, initiated in 2003 with government funding. Baan Mankong promotes community-driven approaches to housing, by providing collective loans for land and housing construction, and subsidies for infrastructure, to organised low-income groups. The **Baan Ua-Arthorn** ("caring housing") programme was launched at the same time, with a supply-driven approach to government construction of affordable houses and flats, aimed at lower-middle-income groups such as government workers. The implementation of the Baan Ua-Arthorn programme was facilitated by the **National Housing Authority** (NHA), which is also under the Ministry of Social Welfare and Human Development.

Official guidelines on settlement density usually refer to the number of housing units per unit of area rather than to population density, which is harder to ascertain; and this is the measure used by Thai government authorities to define a settlement as a "slum". For the Bangkok Metropolitan Administration (BMA) a slum is "an overcrowded, non-orderly and dilapidated community with unample [sic] environment which can be harmful to health and lives and with a minimum of 15 housing units per *rai*,"[2] while the NHA's definition requires a minimum of 30 houses per *rai* (UN HABITAT 2006:202). As such, the standards of the BMA are stricter than those of the NHA. Assuming five people per household, these standards are the equivalent to 47,000 persons per square kilometre for the BMA and 94,000 for the NHA.

By comparison, the average proportion of open space among middle-income housing projects is 30 per cent[3] which, based on the average house size of these projects, means that one *rai* could contain ten homes. This equates to a lower density than either the BMA or NHA standards for houses per *rai* in low-income settlements. At the dwelling unit level, the average floor space per capita in housing developed by the private sector is 20 to 30square metresper person.[4] This suggests that low-income housing is therefore three to four times more crowded than middle-income housing units on average.

Box 2: A note on terminology

The English word "slum" is frequently used in Thai with reference to low-income communities. Alternative phrases are *chumchon ae-ad* which literally translates as "crowded community", or *chumchon bukruk*, which means "squatter community". The NHA's 2001 figures counted 1604 poor and informal communities in Bangkok, comprising 283,566 households (CODI, 2005:6).

[2] One *rai* is equivalent to 1600 square metres.
[3] Based on the author's analysis of several private housing projects in Bangkok.
[4] Based on the analysis of several private housing projects in Bangkok (Pinijvarasin and Ramasoot, 2010).

1.3 Setting the context: Low-income housing supply in Bangkok[5]

Housing development is shaped by urban development market trends and actors, and land use policies set by the government. Urban morphological studies on "smart growth" and the "compact city"(Bullard, 2007; Jenks *et al*.,1996; Jenks and Burgess, 2000) have championed modern urban planning that promotes compact, well-serviced settlements with mixed urban land uses. Unfortunately, this approach often fails to take account of the economic circumstances of the urban poor, and effectively excludes them from urban centres by increasing land prices. Forcing them to the city outskirts, this market-driven process of land development makes things difficult for those on low incomes and the lower-middle classes. These groups may lose a convenient housing location as well as facing higher costs of living resulting from longer travel distances, fewer livelihood opportunities, and even educational expenses.

Bangkok's affordable housing policies and programmes have had a stop-start history. Giles (2003) provides a comprehensive history of the Thai government's response to urban housing problems between 1940, when the first Housing Division was formed, and the mid-1990s. He highlights the government's reluctance to use community-driven approaches over this period. Giles concludes that the Thai government "consistently failed to act in ways that were cost effective, instead preferring approaches that offered political visibility" (2003:228). Between the 1950s and 1970s, the focus was on public housing and slum clearance, with apartments built for those displaced by urban renewal. In the 1970s an increase in activity in the housing arena led to the formation of the NHA in 1972, with a remit to "conduct urban community development, clear slums and resettle inhabitants; provide dwellings for rent, sale and hire-purchase; and subsidise and guarantee tenants and buyers" (Giles, 2003:236). The NHA's plans and projects were sporadic, with ambitious plans halted by funding issues. The 1976 five-year plan targeted three income groups at 20,000 units a year, but the government cancelled the plan in 1977 due to lack of funds. A second plan in 1978 took a "sites-and-services" approach, but again funds were lacking, the state preferring to build more politically visible flats in Bangkok.

By the 1980s there was a shift towards an "enabling strategy": to encourage the private sector and communities to develop housing in the Sixth National Plan (1987-91). The provision of low-cost housing by the private sector in Thailand has been described as a "success story" (Yap, 1996:316), facilitated by the availability of housing finance. In 1980, only 15 per cent of Bangkok's households could afford the cheapest private sector housing on the market; by 1994, this had risen to between 70 and 80 per cent (Yap, 1996:317). Though the NHA continued to build flats, these were mostly targeted at the lower-middle class population, such as government employees. Thailand's economic growth helped to reduce poverty through the trickle-down effect, but it also meant that many slum dwellers were being evicted from central areas as demand for land grew. However, land-sharing projects provided a solution in certain cases: some squatter communities came to an agreement with the landowner to remain on part of the land, allowing the rest of the site to be developed.

[5] This section draws from Archer, 2010.

The 1997 economic crisis led to a shift in national policy towards self-sufficiency and decentralisation, and the growth of community-based organisations (CBOs).In the housing field, these CBOs began operating their own housing projects. In 2000, the Community Organisations Development Institute (CODI) was established. CODI's role is to strategically link communities to encourage collective action on poverty reduction, land, housing, welfare services and community enterprises. It also benefits from its status as a public organisation, making it a key institution that bridges government and civil society groups, and can function as an "instrument of inclusion" (World Bank, 2001). It is semi-autonomous, with representatives from government and citizen organisations, including communities on the board. While the NHA's focus is on supply, through projects such as Baan Ua-Arthorn, CODI takes a demand-driven approach, with the Baan Mankong participatory slum upgrading programme. Both CODI and the NHA report to the Ministry of Social Development and Human Security (MSDHS).

CODI has emphasised the role of community and local partnerships in housing development, with community organisations and networks being the core actors in the process. Community participation can be used to build the managerial capacities of community groups, and the communities can receive technical assistance. CODI also tries to link local housing development plans with other city developments, so that housing is seen as part of a citywide development process. Baan Mankong aids the integration of slum-dwellers into society at large by giving them power to make decisions through "horizontal power delivery", creating horizontal networks between urban poor groups in the city (Boonyabancha, 2005).

Many of the housing projects under both the Baan Mankong and Baan Ua-Arthorn programmes failed to comply with the spatial requirements of the Building Control Act of 1979 and of the Comprehensive Plan Act 1992. Given the financial constraints of the urban poor and the high cost of land, the prescribed standards were found to be too strict. Consequently, the NHA and CODI together proposed that the laws be relaxed for both housing programmes, and this proposal was accepted by the Ministry of Interior Affairs for constructing housing units (Usavagovitwong, 2012). For example, projects were allowed to reduce the minimum distance between houses; waive regulations for on-site sanitation systems if part of the NHA's New Town project; and override the Comprehensive Plan's land-use controls.

Some scholars have raised questions regarding housing sustainability including socio-economic and social sustainability (Brown and Bhatti, 2003); the political platform in making housing policy (Giles 2003); and the social return from housing as an asset rather than its mere property value (Gruis, 2005). These scholars depict a new frontier in sustainable housing, as the conventional housing standard has long penalised the lower-income groups and has segregated them into a quasi-illegal underclass.

1.4 Research objectives

In order to examine the trade-offs between population density and socio-economic satisfaction in Bangkok's low-income housing forms, this study examines three urban housing types: existing squatter settlements, community-driven slum upgrading projects (under the Baan Mankong scheme), and NHA-built low-income apartment blocks in Bangkok. The study documents the physical form of the existing settlements and the dwellings within them, and carries out socio-economic surveys through observation, questionnaires and semi-structured interviews. The study seeks to identify the trade-offs that lead low-income groups to choose to live in the supposedly "sub-standard" environments of slums instead of affordable, low-income housing settlements. It also examines the common assumption that low-rise, low-income accommodation (such as in slums or Baan Mankong housing projects) is an inefficient use of scarce urban land, compared to high-rise flats, in the case of Bangkok.

This study:

- examines levels of population density at three different levels (in-home, built-up area, and whole settlement) across three types of low-income housing in Bangkok
- examines the trade-offs between population density in housing projects and socio-economic opportunities
- re-examines the relationship between community preferences, socio-economic satisfaction, and population density, against a backdrop of different approaches to housing provision and competing pressures for urban land;
- reconsiders whether high-rise housing is the most appropriate option for providing affordable housing to low-income groups.

The study focuses on low-income settlements in the highly urbanised areas of central Bangkok. The study examines density-related issues in three key dimensions of settlement quality: spatial features, socio-economic conditions, and social situations. The research represents the current living condition of low and lower-middle-income groups, through the analysis of three communities varying in size between 70 and 1100 households.

1.5 Research framework

The study has two parts: 1) the research process, focusing on variables and physical features indicative of good housing quality; and 2) analysis of the case studies and sample surveys to examine the factors which may influence density in low-income housing.

The levels of analysis for each of the key dimensions of settlement quality are:

Spatial analyses at two levels:

- **Individual homes:** Data on the "spatial occupancy" of a household, such as average area per person, and functional design.
- **Community:** Data on the spatial occupancy of the whole site, such as communal space ratio, open space ratio, public space and usability.

Population density analyses at three levels:

- **In-home density**: Residents per square metre of home floor space. This is calculated approximately by the average number of people in a household divided by the average size of the dwelling unit.
- **Building density**: Residents per square metre of built-up area, or "building footprint". This is calculated by the total settlement population divided by the total settlement size, excluding open (or non built-up) spaces.
- **Settlement density**: People per square metre of ground area in the whole settlement, estimated as the total settlement population[6] divided by the settlement plot area (including built-up and non built-up space).

In addition to this, factors such as open space per household will be examined to complement the density analysis.

Socio-economic analyses look for connections between socio-economic and financial conditions, and other dimensions of settlement quality:

- **Household socio-economic conditions:** assessed on the basis of number of household residents, household income/expenses, and number of householders working.
- **Financial conditions:** assessed on the basis of indicators such as job mobility, job location, housing and infrastructure maintenance cost, public facility services cost.

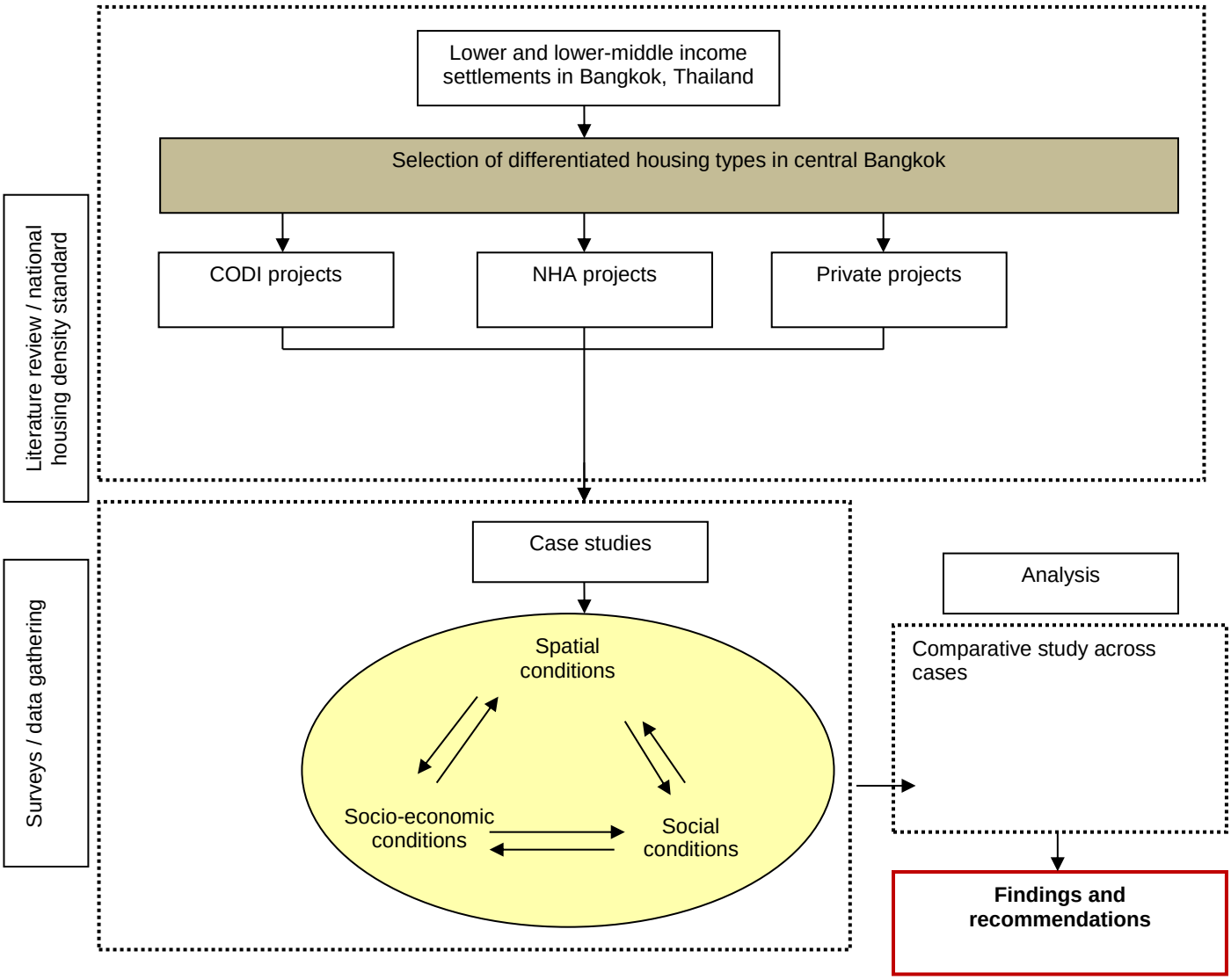
Social analyses relating the following positive community characteristics to other dimensions of settlement quality:

- **Sense of community:** the degree of social closeness such as level of "neighbourliness", degree of group strength, and "social capital" (the idea that social networks have value).
- **Organisational ability:** the community managerial ability including community networks, the community welfare system, and organisational resource management systems such as the cooperative.

The research focuses particularly on identifying ways in which high population density may be compensated for by favourable socio-economic conditions. The basic hypothesis is that residents prefer inner-city lower-income settlements – despite the lack of space compared to settlements outside the centre –because they provide better economic opportunities, as well as other social and socio-economic factors.

[6] It is important to note here that total settlement population used in this case is an estimate based on average household size and number of households. Thus, while it is an estimation, it reflects the fact that populations may fluctuate as household members come and go.

Figure 1: Research framework and approach



1.6 Expected outcomes

- To understand the typical population density of three types of low-income housing settlements in the city centre, both at the household and community scale.
- To understand socio-economic and societal housing qualities as features shaping spatial settlements. This will allow us to re-examine what factors may be taken into account in developing low-income housing options beyond physical standards alone.
- To evaluate whether density has a bearing on residents" satisfaction levels in the three settlement types, and the role of other factors such as social capital and economic opportunities.

2 Methodology and case study profiles

2.1 Research methodology

This study assesses the different levels of population density for three urban housing types and examines how and whether these differences are related to the satisfaction levels of low and lower-middle-income communities. Case study analyses were conducted in a selection of sites representing different urban low-income settlement types: public housing supplied by the state (Baan Ua-Arthorn and other NHA-supplied public housing); community-built housing through state support (Baan Mankong); and a non-upgraded "slum" settlement.

2.1.1 Case study selection and sampling

The case study sites were selected as representative of low-income housing settlements, meeting the following criteria:

1) they display **urban characteristics** based on population and socio-economic factors
2) the sites manifest problems arising from urban development, and physical, financial and social **disparities and inequalities** typical of urban areas
3) they represent **low and lower-middle-income** Bangkok populations.

These criteria are looked at in more detail below.

2.1.2 Criteria of case studies

a) Urban characteristics

Highly centralised development policies have drawn large populations to urban areas, with Bangkok being Thailand's prime location. The city therefore becomes a contested space for urban development, with land a prized asset. This favours the construction of high density dwellings in various forms. For low-income groups, this has led to low-rise, high density forms of housing, which conventionally are in poor condition and beneath housing standards in various ways, though frequently located on prime urban land. Informal settlements or slums are referred to as "dense" settlements in the terminology of the NHA. Public housing construction programmes have focused on high-rise residential construction as a way to maximise land usage (that is, to increase density as much as possible).

b) Urban disparities and inequities

Low and lower-middle-income urban settlements are frequently in inner urban areas, and are therefore prime sites for commercial development, but with poor physical conditions and infrastructure. Thus they are often situated near more affluent developments, resulting in local disparities, inequities and segregation.

c) The low and lower-middle-income communities

The researchers identified two important types of settlement within this category: first, organically formed, informal settlements in the inner cities that absorb those who do not have access to the standard or formal housing system. Many of these have not been affected by direct development policies and are usually referred to as "slums". Second, the settlements developed under state-led housing policies as represented by two national housing programmes: the Baan Mankong programme, facilitated by CODI, and the Baan Ua-Arthorn programme, operated by the NHA, including previous NHA public housing construction programmes (see Box 1).

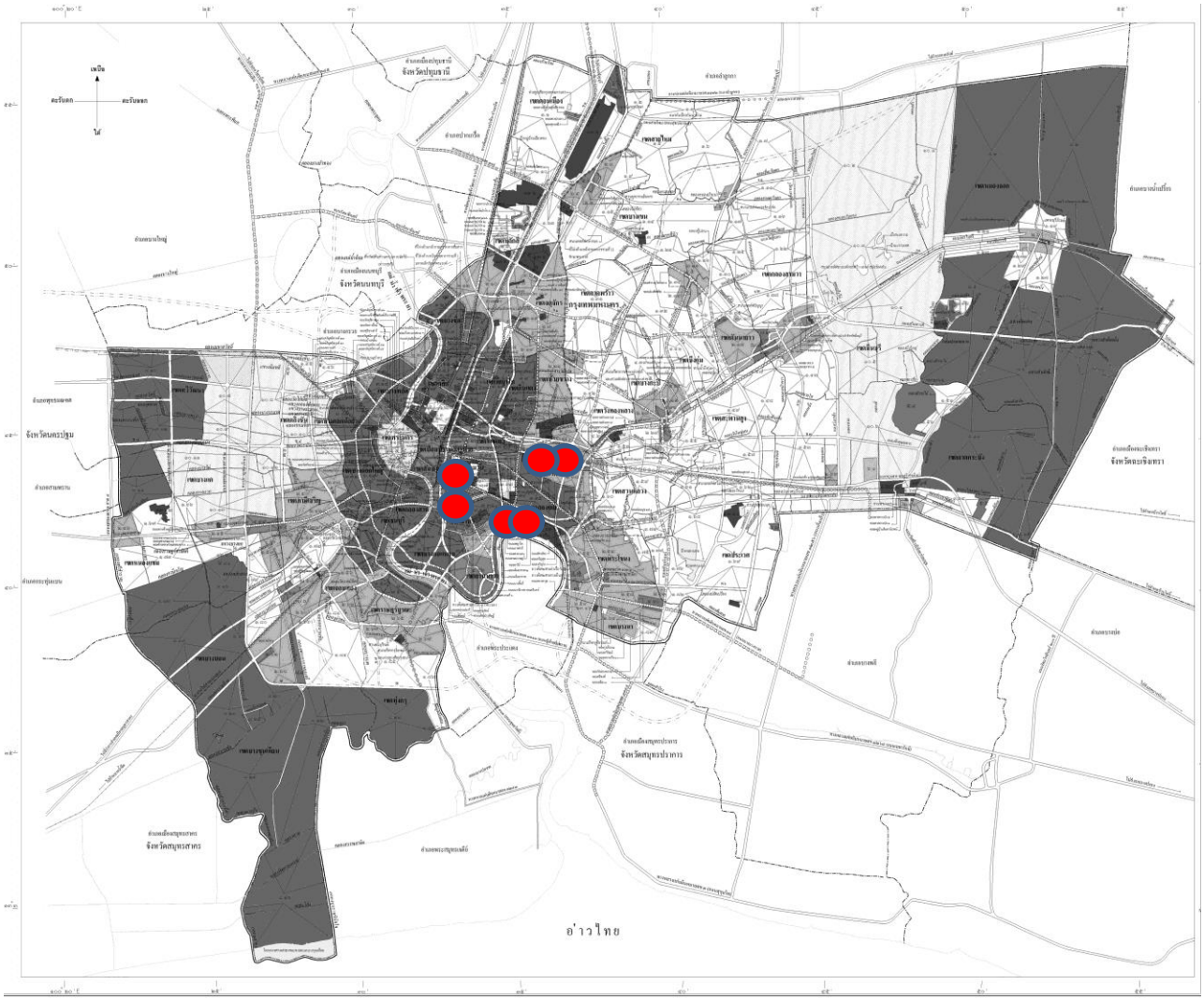
From these criteria, the researchers narrowed the target to the Bangkok Metropolitan Region (BMR) and selected six communities across three sites. Each of the three sites is an example of two types of housing system, such as community self-upgraded housing, or

government-built housing, or informal housing. The six communities sampled are identified in Table 2 and mapped in Figure 2.

Table 2.Selected communities by area and type

	Community-driven upgraded housing with state support	Public housing supplied by the state	Non-upgraded settlement
Bon Kai area	Baan Mankong Bon Kai	NHA Bon Kai	
Suan Phlu area	Baan Mankong Suan Phlu	NHA Suan Phlu (Baan UaArthorn)	
Wat Phrayakrai area	Baan Mankong Wat Pharyakrai		Non-upgraded Wat Phrayakrai[7]

Figure 2. The location of the six case study sites in Bangkok



Source: edited from http://thai.siammap.info/bangkok/

[7] As the non-upgraded portion of Wat Phrayakrai community is nevertheless an officially registered community with the local district office, the term "informal settlement" would not be appropriate here. Residents may themselves refer to their community as a "slum".

2.1.3 Data collection

Data collection focused on two sources: a questionnaire survey, and in-depth interviews of key respondents. The researchers surveyed 344 respondents and focused on the household level as a unit of analysis (see Appendix 1 for the questionnaire). Table 3 shows a sampling distribution in survey numbers by each community.[8] An attempt was also made to ensure a roughly representative selection of genders and ages.

Table 3. Sampling size and questionnaire distribution in each community

Communities	Size of community (dwelling units)	Number of samplings (households)
Bon Kai Baan Mankong	72	33
NHA Bon Kai flats	768[9]	81
Suan Plu Baan Mankong	249	70
NHA Suan Phlu Baan Ua-Arthorn	1120	86
Wat Phrayakrai Baan Mankong	80	28
Wat Phrayakrai slum	156	46
Total	**2445**	**344**

As well as using the questionnaire, the researchers also gathered qualitative data through in-depth interviews with key community representatives, to identify what properties of the housing and settlements were either significantly valued or disliked by residents. The interviews focused on socio-economic conditions, social relations and community participation, and reasons for choosing to live in these settlements. The researchers classified the key respondents into four different groups: 1) the representatives of community committees or organised groups; 2) the independent occupational group or informal occupation group representatives, such as housewives' groups; 3) the elderly group representatives and 4) representatives of large families.

Box 3. The meaning of "community"

Low-income settlements in Bangkok are organised into "communities", each with their own internal management structure in the form of a committee. The Bangkok Metropolitan Administration's Regulations of Community Committees of 1991 categorizes communities as "dense communities, suburban communities, NHA communities, housing estates, and communities in Bangkok which the BMA has defined as such" (BMA, 1991, Article 1 clause 5). When a community is legally recognised by the local district office, community elections need to be held according to the rules decreed in the 1991 Regulations. Houses need to be registered with the district to benefit from access to utilities, local public schools and voting rights.

[8] The researchers had difficulties accessing interviewees as the survey period coincided with a period of political unrest in Thailand.

[9] There are 14 apartment buildings (3272 units) within the whole NHA Bon Kai area – however, this study focused on three of these buildings (768 units).

As well as interviews, there were focus group discussions to identify organisational and social factors – such as social capital and community philanthropy – which could affect people's satisfaction with the living conditions.

In order to frame the analysis of the data collected, relevant key variables and parameters were identified with regard to population density, spatial, socio-economic and social dimensions as outlined in Table 4. These variables and parameters relate specifically to housing for low and lower-middle-income groups in Thailand.

Table 4. Dimensions and variables used in the analysis

Dimensions	Parameters	Variables
Population density	Dwelling scale	People per square metre of floor space
	Building scale	People per square metre of built-up ground area
	Settlement scale	People per square metre of ground area, including open space
Spatial	Dwelling scale	Dwelling size
		Activities and space requirements
	Community scale	Open space
		Communal facilities
		Infrastructure and services
Socio-economic	Household scale	Income and expenditure
		Access to jobs and resources
		Home enterprise
Social	Community scale	Levels of social capital
		Levels of neighbourliness

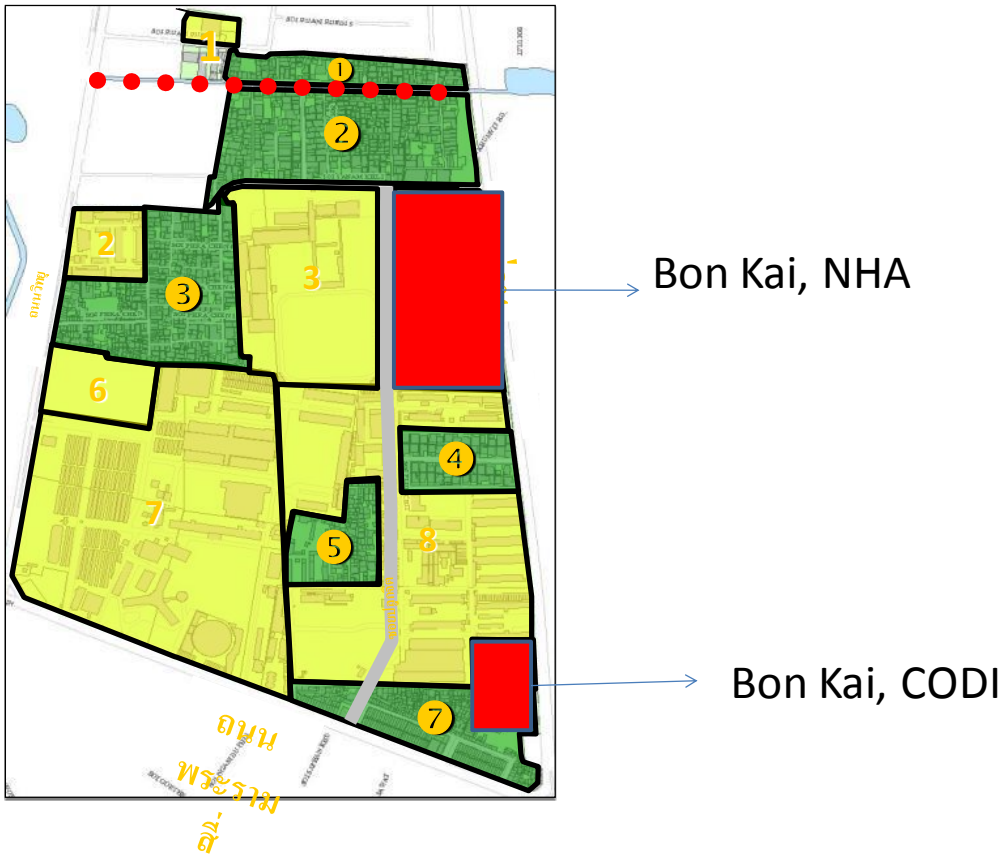
2.2 Case study site outlines

This section provides a brief introduction to the history and form of each of the case study sites.

2.2.1 Bon Kai area

The Bon Kai area is located in central Bangkok, and includes an active fresh market, a mix of NHA-built housing, Baan Mankong upgraded housing, and "slum" housing. The site is on a busy road, Rama IV, which makes it prime property, and is not far from the Bangkok Port.

Figure 3. Location of Baan Mankong Bon Kai and Bon Kai NHA (in red)



Source: The Crown Property Bureau

NHA Bon Kai community

NHA Bon Kai community is one of the oldest communities developed by the NHA under its public housing scheme. Construction on the site began in 1973 and was completed in 1985. There are 14 blocks of flats within the site, each four storeys high. The floor space of each flat is 32.75 square metres, and in total the site contains 3272 flats. In this study, the sample population was drawn from six buildings within the whole site.

Figure 4. NHA Bon Kai Community

Source: The authors

Baan Mankong Bon Kai

Pattana Bon Kai Community (referred to from here on as "Baan Mankong Bon Kai") was one of the Baan Mankong pilot projects. The programme was initiated after two fires destroyed 159 houses in the original slum in 2001 and served as the impetus for community reconstruction plans. While 43 households were unaffected by the fire, they were included in reconstruction plans. This coincided with the government's introduction of the Baan Mankong programme in 2003, and therefore the community was designated one of 10 pilot projects in Thailand. The land on which the community is located belongs to the Crown Property Bureau, and the community was the first community cooperative to be granted a long-term lease, in order to facilitate upgrading. In 2003 the construction of two-and-a-half storeys row houses[10] began in three phases. The community is adjoined by an area of non-upgraded settlement which was not affected by the fire, also on Crown Property Bureau land, and by blocks of NHA-built flats dating from the 1970s (see below). The majority of the residents of Bon Kai Baan Mankong community work in the informal economy as street vendors, hawkers, taxi-drivers, and in other self-employed jobs. The community is organised with elected representatives and a cooperative, which manages the monthly household repayments of the collective 15-year loan provided by CODI for upgrading.

Figure 5. Baan Mankong Bon Kai Community

Source: The authors

2.2.2 Suan Phlu area

Suan Phlu community began as a large slum located on Treasury Department land. In 2004, a fire ravaged the entire community. The community opted for two different approaches to reconstruction: some of the residents chose to wait for NHA-built flats to be developed under the Baan Ua-Arthorn scheme, while the remaining residents chose to undertake community-driven reconstruction under the Baan Mankong scheme, with CODI support. Both are case studies in this research.

NHA Suan Phlu community

After the devastating fire of 2004, the Cabinet assigned the NHA to build housing units for a portion of the households affected by the fire, under the Baan Ua-Arthorn program. These were built in the form of 14 apartment blocks of 80 apartments each, with a floor space of 37.4 square metres. In total, 1120 homes were constructed, starting in 2005, with the

[10]Row or terraced houses are built in rows with shared side walls.

residents moving into the flats in 2010. During construction, the residents lived in temporary shelters nearby or rented rooms elsewhere.

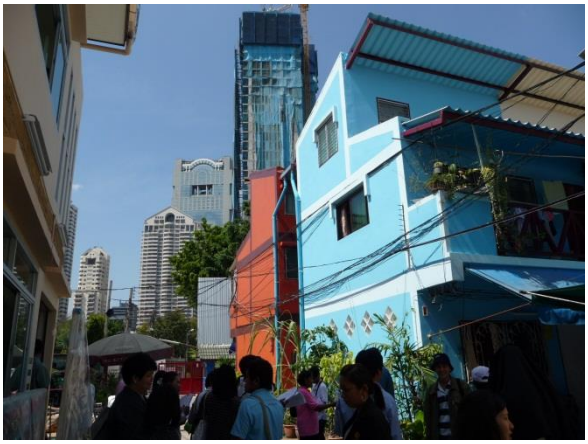
Figure 6. NHA Suan Phlu Community

Source: The authors

Baan Mankong Suan Phlu Community

For those residents of the Suan Phlu slum who opted for a community-driven approach to reconstruction, a long-term lease over the land was negotiated from the Treasury Department, and a collective, 15-year loan obtained from CODI for housing reconstruction. In total, 330 households participated in the Baan Mankong scheme to rebuild their homes. Four different housing types were made available as agreed by community members, depending on family size and ability to pay. The four housing types were: two-storey row houses; two-and-a-half storey row houses (with a mezzanine level); three-storey row houses; and a low-rise apartment building, catering primarily to those who had previously been renting rooms in the former slum community, rather than home-owners.

Figure 7. Baan Mankong Suan Phlu Community



Source: The authors

2.2.3 Wat Phrayakrai area

Non-upgraded WatPhrayakrai Community

The non-upgraded Wat Phrayakrai Community is an old settlement located on Crown Property Bureau land since 1957. It was registered officially as a community in 1983, at which time the surrounding area was not heavily developed. Since then, the area has seen

many development projects and infrastructure construction, and the area is being considered a special priority area for development. There are approximately 900 residents on the 1.48 hectare site, with a mix of one to three-storey shelters around a network of inner walkways one-and-a half metres wide.

Baan Mankong Wat Phrayakrai community

In 2005 a fire damaged part of the Wat Phrayakrai settlement and left 80 households homeless. These households negotiated a 30-year lease for a section of the site from the Crown Property Bureau and reconstruction was undertaken by the Baan Mankong programme. It was rebuilt as two four-storey apartment buildings, each apartment with a floor space of 41.25 square metres. These households make up the Baan Mankong Wat Phrayakrai community in this study.

Figure 8. The location of Wat Phrayakrai and Baan Mankong Wat Phrayakrai Communities

Source: Google 2009

Figure 9. Baan Mankong Wat Phrayakrai Community

Source: The authors

Table 5. Comparative densities across case study settlements

	NHA Suan Phlu		Baan Mankong Suan Phlu		NHA Bon Kai		Baan Mankong Bon Kai		Wat Phrayakrai non-upgraded settlement		Baan Mankong Wat Phrayakrai	
Average size	Unit size m^2	Household size	Unit size m^2	Household size	Unit size m^2	Household size	Unit size m^2	Household size	Unit size m^2	Household size	Unit size m^2	Household size
	35.75	4.31	61.25	4.71	32	4.19	35	5	32.63	4.8	41.25	3
Total settlement size m^2; number of units	13,600	1,120	10,762	249	60,800	3,272	8,808	202	14,800	156	2,400	80
Built up area m^2	9248		8610		44384		7046		13616		1968	
Percentage of open space	32		20		27		20		8		18	
Area of open space m^2	4352		2152		16416		1762		1184		432	
Estimated total settlement population	4827.2		1172.79		13,709.68		1010		748.8		240	
Dwelling unit population density, people/m^2 (Average household size/ average unit size)	0.121		0.077		0.131		0.143		0.147		0.073	
Built up area population density, people/m^2 (total estimated settlement population/by total built up area) (excludes open space)	0.522		0.136		0.309		0.143		0.055		0.122	
Total settlement population density, people/m^2 (Total estimated settlement population/by total settlement area)	0.355		0.109		0.225		0.115		0.051		0.100	
Household living space per capita (m^2/cap) within the dwelling	8.295		13.004		7.637		7.000		6.798		13.750	
Footprint per shelter unit, m^2/unit, includes open space	12.143		43.221		18.582		43.604		94.872		30	
Footprint per shelter unit, m^2/unit, excluding open space	8.257		34.577		13.565		34.883		87.282		24.600	
Plot footprint per capita (m^2) (excluding open space)	1.916		7.341		3.237		6.977		18.184		8.200	
Open/common space per household (m^2/unit)	3.886		8.644		5.017		8.721		7.590		5.4	
Open space per capita (m^2/cap)	0.902		1.835		1.197		1.744		1.581		1.800	
Open space density (household size/open space per household) = people/m^2	1.109		0.545		0.835		0.573		0.632		0.556	

3 Density analysis at the household and settlement scale

3.1 Shelter Analysis

This analysis looks at individual homes, including rooms, and the configuration of spaces within the home. Spatial analysis focuses on the architectural appearance and living units. The official minimum standard for living space is set by the NHA at 34 square metres per home for five persons (6.8m^2 per capita). This standard figure must be used with care, recognising that the same density may be experienced very differently across households depending on how the space is used.

3.1.1 Baan Ua-Arthorn Suan Phlu and Baan Mankong Suan Phlu

Baan Ua-Arthorn Suan Phlu and Baan Mankong Suan Phlu are projects initiated by the NHA and CODI respectively in Bangkok's central business district. Baan Ua-Arthorn Suan Phlu (Figure 10) comprises 14 buildings of the five-storey apartment type; 1120 units on a plot size of 1.36 hectares. It has similar features to the typical public housing schemes built by the NHA over the last few decades. One third of the site is open space for car parking and communal gardens. Space is provided between each building for neighbourhood interactions in common areas. Each building houses 80 flats, and each floor of the five-storey buildings presents a central double-loaded corridor off which are housed 16 flats. A staircase is located at both ends. Inside, the typical apartment design consists of a living space, a bedroom, a toilet, a kitchen, and a balcony. The surveys found that at NHA Suan Phlu, there is only one apartment type, with 35.75 square metres of floor space. The average household size is approximately 4.31 persons per household. Therefore, living space per capita is 8.29m^2, which is better than the national standard.

By contrast, Baan Mankong Suan Phlu (Figure 10) contains a variety of housing designs, from row housing of two to three storeys, to low-rise flats. The majority of the units are two-storey row houses. The settlement includes a 30-unit four-storey rental building for the residents of the community who were tenants in the slum community before the fire. There is also a neighbourhood activity plaza, and a day care centre. The community adjoins NHA Suan Phlu and covers 1.08 hectares. Because of its low-rise format, the Baan Mankong Suan Phlu settlement houses only a quarter of the neighbouring Baan Ua-Arthorn project's households, despite having almost 80 per cent of the land area. However, as the Baan Mankong Suan Phlu community was a community-driven reconstruction project, it was configured to meet the needs of the residents; for example, providing public space for storing vending equipment outside homes. The inner community road, four metres wide, is closed to motor vehicles, allowing children to play in the streets.

Each of the two-storey houses measures three-and-a-half metres across the front and seven metres in depth. The ground floor comprises a living space, a kitchen, and a toilet, with a bedroom and a balcony on the upper floor. At Baan Mankong Suan Phlu, the typical unit area is 61.25 square metres of floor space per home and the average household size is 4.71 persons. Therefore, the living space per capita is about 13m^2, which is significantly better than the minimum standard, and the most living space per capita of all the state-funded housing projects considered in this paper.

Figure 10. Housing characteristics of Baan Mankong Suan Phlu and Baan Ua-Arthorn Suan Phlu

Baan Ua-Arthorn Suan Phlu (NHA) Baan Mankong Suan Phlu (CODI)

Source: The authors

3.1.2 Bon Kai NHA flats and Baan Mankong Bon Kai community

Bon Kai NHA flats are a public housing project comprising 3272 living units, located on 6.08 hectares. This site is designed so that each building is in a communal, modular layout, comprised of parking space at the front and an indoor multi-purpose space at ground level. There are central facilities (post office, cooperative office, youth centre) shared by the entire community. The former communal facilities at NHA Bon Kai, such as playgrounds, the community centre, and a neighbourhood park, have gradually disappeared with the rapid urbanisation of the surrounding area. These public facilities have been replaced by revenue-generating facilities such as car parks and neighbourhood markets.

The groups of apartment buildings are arranged as eight four-storey buildings and eight six-storey buildings. Each floor has a double-loaded corridor design, with a staircase at both ends. Each home has a floor space of 32 square metres. From the surveys, the average size of households in NHA Bon Kai is 4.19 people per household; therefore the floor space per capita is 7.64m^2, which exceeds the NHA's standard of 6.8m^2 . Photos in Figure 11 show that the homes' characteristics and housing modifications are significantly different to the original buildings, such as balcony extensions. Based on a four-by-eight-metre rectangular plan, each dwelling unit consists of a living room, a bedroom, a toilet, a kitchen and a balcony – with north-south ventilation and daylight openings.

Baan Mankong Bon Kai community presents a different style of home, with two-and-a-half storey rowhouses. On a site of 0.88 hectares, the 202 housing units are arranged into two rows, winged symmetrically east and west with the main road in the middle – the only road allowing motorised vehicles in the neighbourhood (Figure 11, lower right). Each side is loaded by a double street corridor and the street is used as a public space onto which houses open directly, while the backs of the houses share the drainage system. Inside, the ground floor includes a living space, a kitchen, a toilet and a balcony. The upper floor includes two bedrooms and a mezzanine. The typical floor space totals 35 square metres (Figure 11 upper right), for a two-storey rowhouse.

With an average household size of five persons per household, the living space per person is seven square metres, which is slightly more space than the national standard. For public amenities, the neighbourhood has a communal multi-purpose meeting centre and a day-care centre. There is open space in front of the houses for storing resident street vendors' mobile kiosks, and these open spaces are also used for socialising, cooking and communal activities, as well as storing washing machines and other equipment.

Figure 11.Housing characteristics of Baan Makong Bon Kai and Bon Kai NHA

NHA Bon Kai	Baan Mankong Bon Kai

Source: The authors

Therefore, NHA Bon Kai flats and Baan Mankong Bon Kai are significantly different in spatial organisation and functional arrangement, both inside and outside the homes.

3.1.3 Baan Mankong Wat Phrayakrai

Following a devastating fire at Wat Phrayakrai slum in 2005, a group of the victims collectively enrolled in the state-sponsored community-driven Baan Mankong upgrading program. Baan Mankong Wat Phrayakrai Community is the only mid-rise scheme supported by the Baan Mankong program. Its character is similar to conventional social housing schemes but the typical home is larger than any other, at 51 square metres of floor space

per dwelling. Within a site of 0.24 hectares, the neighbourhood consists of two buildings – the north and south buildings. The north building contains 32 flats, eight on each floor, accessed by a double-loaded corridor which also serves as the neighbourhood common interior space. At three metres wide, the corridor is wider than a typical corridor in any public housing project. The south building contains 48 apartments designed in the same manner, separated into 12 on each floor. Both buildings are accessed by a six-metre inner road, with a playground at the easternmost corner of the project plot. The data from the researchers' survey show that the household size in this neighbourhood is about three persons per household, thus the living space is the most generous of all the case study sites, at 17 square metres per person, which almost equals that of a middle-class apartment. Figure 12 illustrates the housing environment (upper left and right) and the living unit plan (lower) comprising four rooms: a bedroom, a semi-open plan kitchen, a toilet, and a communal space.

Figure 12. Housing characteristics of Baan Makong Wat Phrayakrai

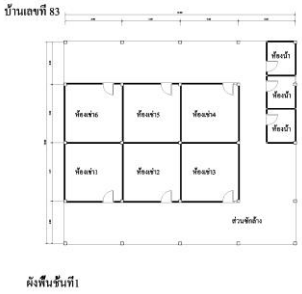
Source: The authors

3.1.4 Non-upgraded Wat Phrayakrai Community

Sections of Wat Phrayakrai Community were not damaged by the fire and have therefore not been upgraded since they were originally settled. The various types of housing here arise from the community's long history and gradual development without intervention by the state urban development policy. Located on land belonging to the Crown Property Bureau, the housing units have incrementally expanded and cater also to tenants, who may rent individual rooms from homeowners. The slum community is located on a 1.48 hectare site. There are various types of housing in the community, from one to three-storey houses connected by small inner walkways one-and-a-half metre wide, accessible only to pedestrians, bicycles, and motorcycles. Figures 13 to 15 illustrate the varied housing in terms of type and size of plot, ranging in use from residential and commercial to rental.

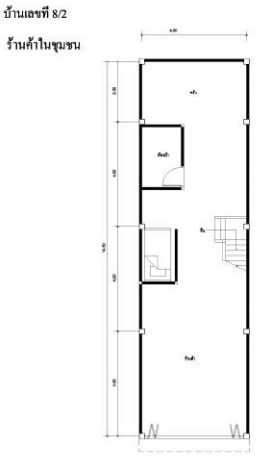
Figure 13 illustrates some rental homes within a plot, rented by one person who sub-leases rooms by modifying a simple temporary shelter. The figure illustrates rental rooms with communal toilets.

Figure 13. Rental houses of non-upgraded Wat Phrayakrai Community

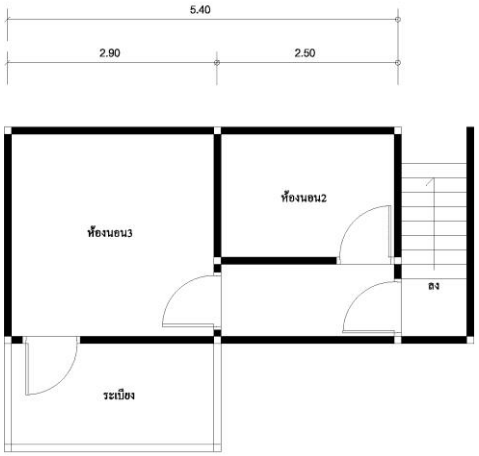


Source: The authors

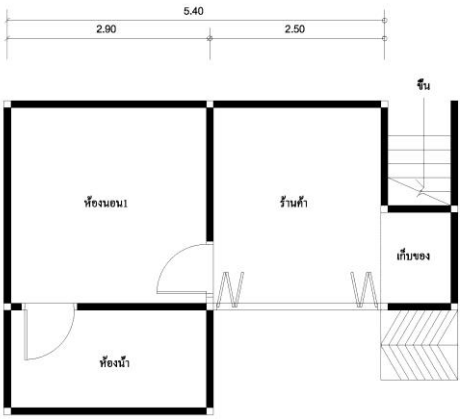
Figure 14."Shop-houses" in WatPhrayakrai community



ร้านค้าในชุมชน



ผังพื้นชั้นที2

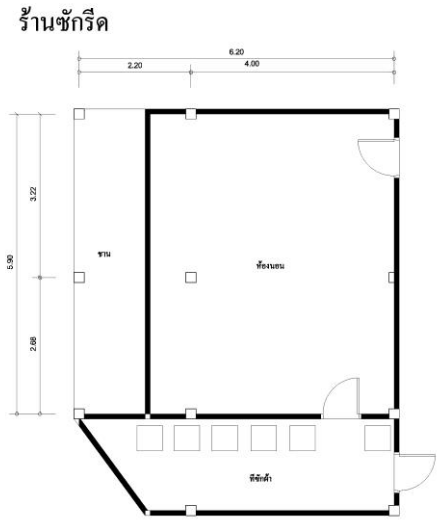


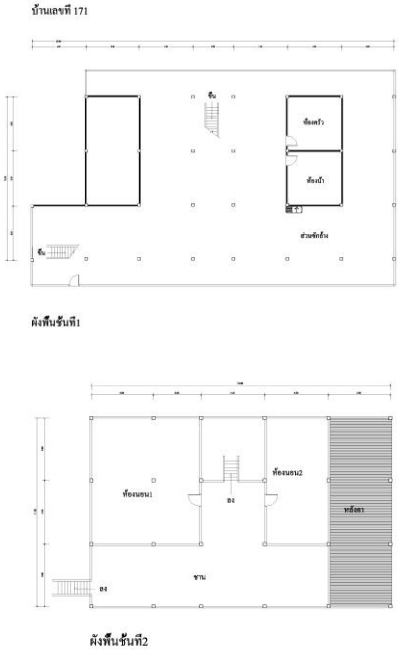
ผังพื้นชั้นที1

Source: The authors

A "shophouse" is a house modified to operate as a home-based business. The shopkeeper has used most of the ground floor space for shelves for consumer products, while the upper floor is residential.

Figure 15. Laundry in Wat Phrayakrai Community





Source: The authors

Some of the original tenants were able to occupy large plots. Tenants like these who were among the first to settle on the site have been able to generate some extensive home-based activities for their own benefit, such as renting out rooms or setting up laundry businesses at home (figure 15). In these cases, the surroundings and shelters could be considered "middle class", with a total house floor area of more than 200 square metres..

In the non-upgraded Wat Phrayakrai Community, the survey results reveal the average living unit to be 32.6 square metres. The average size of household is 4.80 persons per

household. Therefore, this neighbourhood has the least floor space per resident at 6.8 square metres per person, though it still meets the national standard.

3.1.5 In-home population density

The case study outlines above have illustrated the differences in housing form and usage across the six sites. There are similarities across the two NHA public housing projects at Bon Kai and Suan Phlu, in terms of the high-rise form and small unit size. Meanwhile, among the three Baan Mankong projects, at Bon Kai, Suan Phlu, and Wat Phrayakai, the latter stands out for being mid-rise rather than row housing, while still allowing more space per home than either Bon Kai or Suan Phlu. However, the row-house form of Baan Mankong at Suan Phlu and Bon Kai enables residents to make use of the space outside their homes for socialising, cooking, and storing their commercial equipment. This urban form is most similar to that of a traditional "slum" as presented by the non-upgraded Wat Phrayakai community, where each individual plot has multiple uses, from commerce to supplying further rental units.

Space per capita within the home is summarised in Table 6. Baan Mankong Wat Phrayakai is the most generous at 17 square metres per person, compared to the non-upgraded Wat Phrayakai community, which just meets the national standard of 6.8m^2 per person and offers the least space per capita within the dwelling.[11] The two NHA projects offer similar household levels of space per person, and perform better than Baan Mankong Bon Kai with regard to floor space.

Table 6. Household floor space per capita

Case study sites	Household floor space (m^2/capita)	Household size (average persons per home)	Conformity to minimum standards (6.8m^2/capita)
SuanPhlu (NHA)	8.29	4.2	Yes
Suan Phlu (Baan Mankong)	13.00	5.0	Yes
Bon Kai (NHA)	7.64	4.3	Yes
Bon Kai (Baan Mankong)	7.00	4.7	Yes
Wat Phrayakrai (non-upgraded)	6.80	4.8	Yes (just)
Wat Phrayakrai (Baan Mankong)	17.00	3.0	Yes
National standard	6.80	3.0 (Building Control Act 1979)	

[11] It should be noted that Baan Mankong Wat Phrayakai also has the smallest average household size across the case studies, at only three persons per household, whereas all the others have at least four persons per household.

3.2 Density of settlements

At the settlement scale, the analysis looks at two levels of density: population density for the built-up area, based on building footprints, excluding all open spaces; and population density for the whole settlement, based on its area including open spaces. This allows an analysis of how space is used across the three urban low-income housing types; often a prime consideration for urban housing developers, who seek to maximise land usage.

3.2.1 Population density based on building footprints

We compared population densities in terms of total built-up space at the six case study sites, by examining building footprints relative to the provision of open space. In densely built-up urban areas such as Bangkok's central business district, open spaces serve multiple uses: socialising, children's play, commercial activities such as vending, parking for cars, motorcycles and vending equipment, and gardening.

Figures for open space provision per household (Table 5) show that the two NHA projects perform the least well, with only 3.9 square metres of open space per household at NHA Suan Phlu, and 5m^2 at NHA Bon Kai. This is due to the high-rise form of the projects, which can accommodate a large number of families vertically, while not making similar allowances at ground level for common or open space. The Baan Mankong project which provides the least open space per household is Baan Mankong Wat Phrayakai, which adopts a mid-rise form, and thus has a similar situation to the NHA projects. However, the Baan Mankong Wat Phrayakai mid-rise buildings attempt to compensate for this by providing extra-large three-metre wide corridors within the buildings, which can serve as storage and socialisation space, compensating for the lack of open space at ground level. By comparison, the two other Baan Mankong projects at Suan Phlu and Bon Kai see the most open space per household, at 8.6m^2 and 8.7m^2 per household respectively, which is almost three times the amount of NHA Suan Phlu. Meanwhile, the non-upgraded Wat Phrayakai community also sees relatively high open space per household, at 7.6m^2, though the form of this open space would be in narrow lanes, rather than the wider thoroughfares found in the Baan Mankong projects.

At per capita level, NHA Suan Phlu once again sees the least provision of open space per person, at 0.9square metres, while Baan Mankong Suan Phlu has the most, at 1.8m^2, though the other two Baan Mankong projects have similarly high figures. Wat Phrayakai community sees a reasonable amount per capita as well, at 1.5m^2. Thus, despite the two NHA projects having the largest percentage of open space as a proportion of the whole settlement (at 30 per cent and 27 per cent for Suan Phlu and Bon Kai) because of the larger number of units sharing this open space, provision per capita and per household suffers. By comparison, only eight per cent of the non-upgraded Wat Phrayakai community site is open, common space (though some houses may have private courtyards or yards), while the Baan Mankong sites range from 18 to 20 per cent open space.

It is also possible to compare the size of built-up area per home, both including and excluding open space. In both cases, the non-upgraded Wat Phrayakai community provides the most space per unit, with an average of 94.9 square metres (including open space), which is comparable to a middle class housing unit. This would not be considered feasible for any contemporary low-income housing project in the city centre, thus reflecting the long-

standing nature of the community. The NHA units are the least generous, both with and without considering open space, at 12.1m^2 per unit for NHA Suan Phlu and 18.6m^2 for NHA Bon Kai (on average, including open space). The three Baan Mankong projects offer a middle ground of around 43m^2 for Baan Mankong Suan Phlu and Bon Kai, and 30m^2 for Wat Phrayakai (average for housing footprints including open space). Open space plays an important role for many households, as it serves as storage for equipment used in generating income, such as vending carts or tools. Alternatively, some households with home industries or shops may use this space for commercial purposes. Open space at the front of the housing is therefore an important feature which high-rise buildings cannot provide.

The footprint per shelter unit can be used to calculate population density per building footprint, based on average household size. Once again, NHA Suan Phlu displays the highest density for built-up areas, at 0.52 people per square metre, with Bon Kai NHA at 0.31 people per square metre – these figures reflect the high Floor Area Ratio[12] of these housing projects. The three Baan Mankong projects display similar population densities for built-up areas, from 0.14 to 0.12 people per square metre. The non-upgraded Wat Phrayakai community, meanwhile, is the least dense, with only 0.05 people per square metre.

3.2.2 Total settlement density

Looking at population density at the level of the whole settlement, Table 5 shows that the settlement with the highest population density is NHA Suan Phlu, in line with its high building footprint density. Population density for NHA Suan Phlu is 0.35 people per square metre, and for NHA Bon Kai it is 0.23 people per square metre, whilst the settlement with the lowest population density is the non-upgraded Wat Phrayakai community, at 0.05 people per square metre. The Baan Mankong sites once again see similar population density figures to each other, between 0.10 and 0.12 people per square metre. Thus, the NHA style housing projects can achieve densities that are more than three times higher than those of the Baan Mankong community-driven low-rise upgrading projects.

It is interesting to note that the traditional "slum" community, Wat Phrayakai, is the settlement with the lowest population density, despite the stereotype that a slum is a highly dense area. It is important to note that Wat Phrayakai may be more spacious than an average settlement, given the large average unit plot size of 94 square metres. Other typical inner-city "slum" settlements in Bangkok may not be so spacious and thus may see higher population densities. Nevertheless, in the context of this study, the "slum" settlement represents the least space-efficient use of land.

In terms of spatial efficiency (total settlement density), the NHA housing programme emerges as the most effective approach to dealing with limited land, while the Baan Mankong programme reflects a middle ground in comparison to the size of the "slum". If comparing the most and least efficient uses of land, an NHA-type approach could accommodate almost six Wat Phrayakai slums per project within the same settlement land area.

[12] The Floor-Area Ratio, or FAR, is the total floor area (including all levels and all buildings) divided by the area of the plot.

3.3 Summary

This chapter has examined the physical characteristics of the six case study sites, representing three different types of low-income housing in an inner-city area. The findings show that all case studies either meet or exceed the national standard set in the Thailand Building Code Act of 1979 for minimum floor space per capita at the dwelling level (Table 6), thus demonstrating that low-income housing need not be sub-standard in this regard. The Code sets out that the living spaces must be more than nine square metres per room, or in the case of a whole dwelling, it must be larger than 34m^2 per home for five persons, equating to 6.8m^2 per capita. The non-upgraded Wat Phrayakrai community provides the least floor space per capita, of only 6.8m^2, which is equal to the minimum standard, and the Baan Mankong Wat Phrayakai community has more than doubled this floor space through the upgraded housing, at 17m^2 per capita. Thus, new housing projects can help to reduce overcrowding at the household level while improving infrastructure, the physical environment and building quality.

It also appears that the average household size of lower-middle-income housing unit is 20 to 30 per cent higher than the original designs planned to accommodate, especially in the case of older settlements. It can be said that one of the root causes of low floor space per capita is the increasing prevalence of extended families sharing the same dwelling.

Looking more widely to the settlement scale, there is a converse relationship between open space per household and the ground-level footprint per home. Housing projects which accommodate people vertically provide lower levels of open space per capita, despite the proportion of the site that is open space being larger. The NHA projects, as conventional high-rise approaches to low-income housing, have double the amount of open space as a proportion of the site than people-driven housing schemes. Even so, the people-driven housing schemes such as the non-upgraded Wat Phrayakai community or the Baan Mankong projects see more open space available per household, in accordance with their commercial and social needs. The Baan Mankong projects at the same time can also achieve a reasonable level of population density – around 0.1 persons per square metre – without compromising on open space. This highlights the need to consider the trade-off between achieving higher population densities by building vertically, and meeting the particular needs of urban low-income groups, which relate to their livelihoods. These socio-economic considerations will be explored in more depth in the following chapter.

4 Socio-economic analysis

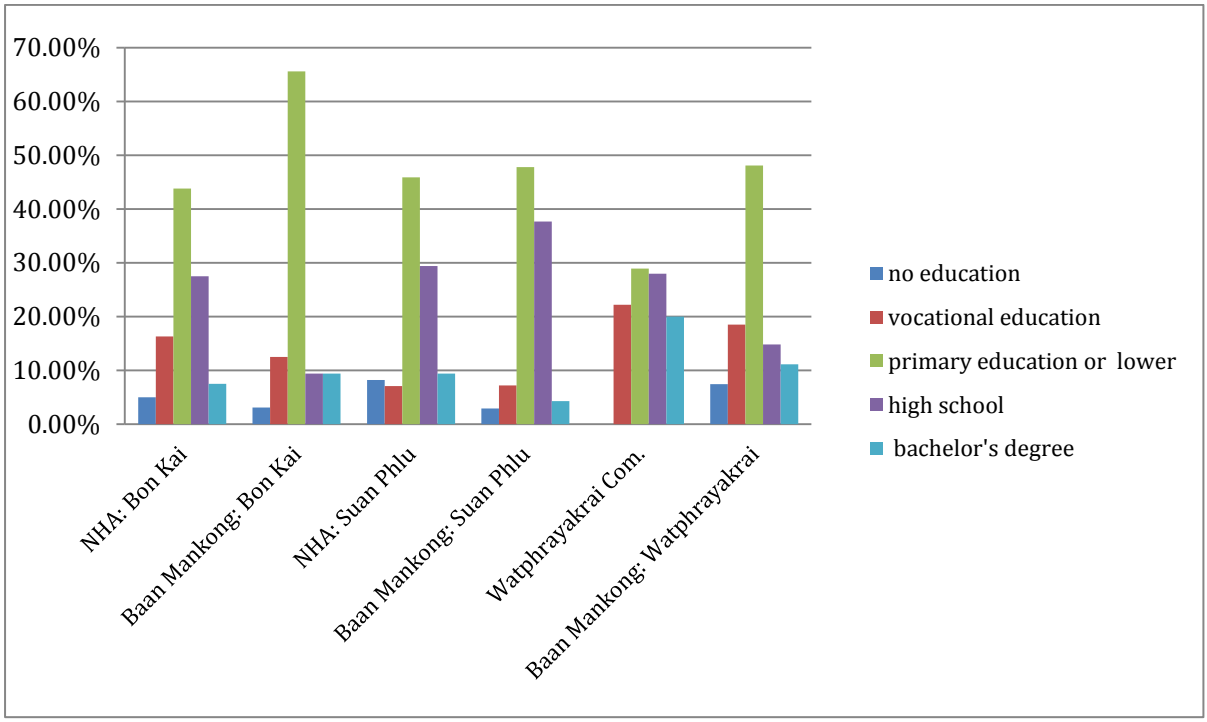
4.1 Household socio-economic milieus

This section looks at socio-economic conditions at the household level. It addresses two aspects: 1) overall socio-economic conditions at the household level, and 2) level of residents' satisfaction with their living conditions and other aspects of their lives. This can provide insights into the trade-offs which households may make between housing location and housing size and spaciousness. As residents of low-income housing projects often work in the informal sector, their residences may serve a vital function for their livelihoods, for which particular housing forms may be more or less conducive. The survey on residents' satisfaction focused on social relations, community organisation and management in the context of inner-city living, as certain housing and settlement forms are more conducive than others to the formation and maintenance of social capital and collective activities at the community level. The analysis of these two parameters can provide insights in to the interaction between physical and socio-economic elements at the household and neighbourhood scale.

Socio-economic conditions
338 sample surveys were completed in the six communities. 227 respondents are female (67.2 per cent) and 111 are male (32.8 per cent), with an average age of 44.7. Across the six neighbourhoods, 68 per cent of respondents are married. The average size of household is 4.4 persons per household: 2.4 males and 2.2 females per household. In terms of neighbourhood relations, 91.1 per cent of respondents indicate that their household members are family or relatives; meanwhile only 4.7 per cent of respondents report that they live with friends or others.

The educational background is shown in Figure 16and indicates that 65.6 per cent of respondents graduated from primary and high school; though most of these are at the lower end of the educational scale. Most respondents are educated to primary level (45.6 per cent); the highest proportion of these are in Baan Mankong Bon Kai (65.6 per cent) and the lowest proportion in Wat Phrayakrai (28.9 per cent). These lower educational levels inform respondents' choice to live in the inner city, where there are more opportunities to earn a living regardless of education. This is why residents originally moved into urban slum settlements, such as the original Bon Kai and Suan Phlu slums (before they were burnt down and reconstructed under Baan Mankong) and the Wat Phrayakai community, as the poorer living conditions in those settlements (such as sanitation) were compensated by improved access to jobs, income, education for children, and health and transport services. Nevertheless, the data from Chapter 3 demonstrate that floor space per person at the dwelling level meets and usually exceeds national building code standards, whether the housing is in the form of apartments, row housing or detached homes (Wat Phrayakai), and upgrading projects mean that the original slum conditions are increasingly being superseded.

Figure 16. The educational background of residents in six neighbourhoods



The average monthly household income across the six neighbourhoods is 25,970 Thai Baht (THB; approximately US$815).[13] NHA Bon Kai community sees the highest average income, while Baan Mankong Wat Phrayakrai has the lowest average income. On average, only 2.2 people per household are income earners, which suggests that the settlements are family-based rather than work-based. Table 7 presents both average incomes and expenditures and the gap between them for each of the six neighbourhoods. These figures imply that the highest savings are in Bon Kai NHA (US$273 per month), while the lowest are in Baan Mankong Bon Kai (US$67 per month). Residents of Baan Mankong projects in all three sites would be making monthly repayments of the original housing construction loan, and residents of Baan Ua-Arthorn flats would also be making monthly repayments on their homes.

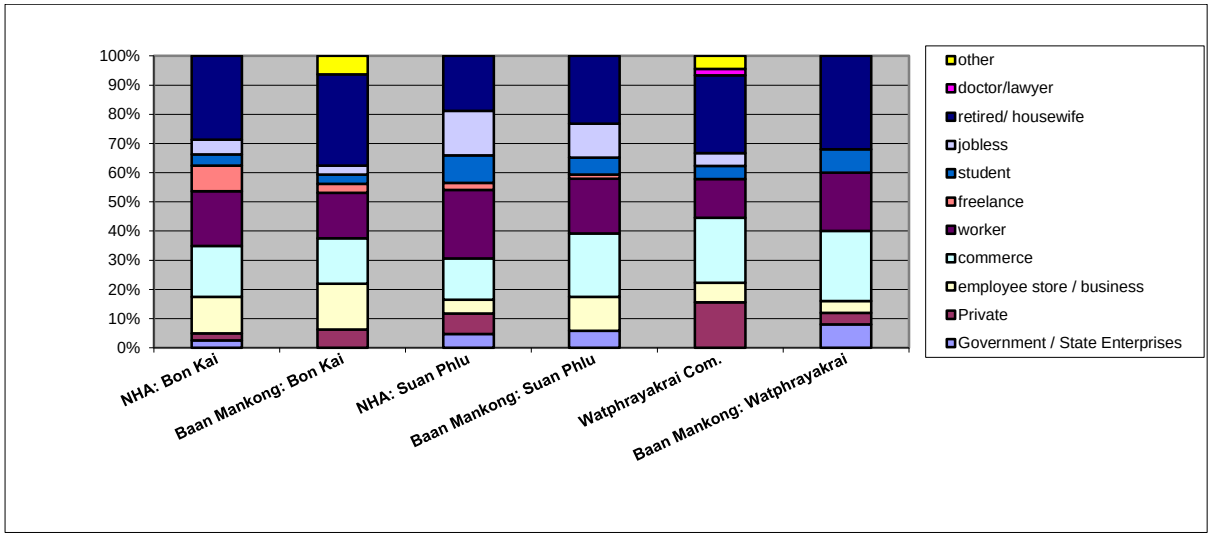
Table 7. Socio-economic surveys across the case study sites

	NHA: Bon Kai		**Baan Mankong: Bon Kai**		**NHA: Suan Phlu**		**Baan Mankong: Suan Phlu**		**Wat Phrayakrai community**		**Baan Mankong: Wat Phrayakrai**	
Sample	81 (14.3%)		33 (45%)		86 (7.6%)		70 (29.5%)		46 (34%)		28 (31.8%)	
Gender of respondent	M	F	M	F	M	F	M	F	M	F	M	F
	37.5 %	62.5 %	37.5 %	62.5 %	35.3 %	64.7 %	26.1 %	73.9 %	31.1 %	68.9 %	25.9 %	74.1 %
Average number people per household	4.2		5.0		4.3		4.7		4.8		3.0	
Average household monthly income (THB)	25,970		20,406		22,545		20,515		19,659		16,700	

[13] US$1 is equivalent to approximately 31 Thai Baht (THB).

Average household monthly expenditure (THB)	17,275	18,267	15,841	14,770	13,515	10,033
Income gap (THB)	8,696	2,140	6,704	5,745	6,144	6,667
Residence period(year)	24.4	23.3	9.2	11.2	36.6	12.3

Figure 17. Residents' occupations



Most respondents gave their job status as "housewife" or "retired", at 25.1 per cent (though this may reflect the demographic present in the sites during the daytime, when the surveys were carried out). The majority of these were in Baan Mankong Bon Kai (31.1 per cent) and the minority were in Baan Ua-Arthorn Suan Plu (18.8 per cent). Self-employment (18.9 per cent) and home-based commerce (18.3 per cent) were the second and the third most common sources of income respectively.

The survey of all six neighbourhoods showed that 52.7 per cent of respondents were debt-free. Of the total debt, 34.3 per cent was from financial institutions; 17.5 per cent was from CODI for the Baan Mankong program, while some 16.8 per cent had loans from loan sharks. The majority was found in Bon Kai NHA at 34.8 per cent; Baan Ua-Arthorn Suan Phlu had 23.5 per cent, Baan Mankong Bon Kai 20 per cent, and Baan Mankong Suan Phlu 8.8 per cent. During in-depth interviews, respondents clarified that most debts were mortgages and for personal expenses, with a very high interest rate (20 per cent per month or even 20 per cent per day).

> "Most people here have debts, especially from the loan sharks. The interest is 20 per cent (per month), but we have no other options for a mortgage.[14] I don't know how long I can continue. If I cannot continue, I will have to sell my house."

[14] For those in Baan Mankong programs, loans for housing construction are made available through CODI, and are managed by the community cooperative on a collective basis. Therefore, there is no need to obtain a mortgage, formal or otherwise, although certain residents may have obtained additional loans for home improvements or for furnishings.

Anonymous respondent, Building 4, 8th floor, NHA Suan Phlu

> "Shark loans? There are these loans in almost every family. I see the lenders come every day. Most loans are for money flow and urgent cases. Some have to pay 20 per cent interest rate daily. In other cases, one repays THB100 [about US$3.2) in a single day for only THB2000 [about US$64] loans."
>
> Ms. Nhong, Baan Mankong Suan Phlu

4.1.1 Resident satisfaction

Overall, the satisfaction levels of respondents in the six neighbourhoods seemed quite high. This seems linked to the settlements' advantageous location and their sense of neighbourliness. A community member highlights this satisfaction:

"It's an upgrade, since we've moved from the slums into the building."

Uncle Lhong
A member of Baan Mankong Bon Kai Community

Another member adds:

> "We've always previously been on the ground level. Although we now have to live at a higher level, we are proud of it. It's cleaner and more proper. Previously, we were frightened about fire. However, we're worried about monthly instalment payments instead."
>
> Uncle Pairoj
> A member of Baan Mankong Wat Phrayakrai Community

Respondents also described problems affecting their overall sense of satisfaction: that the available space did not meet family requirements, and the sense of isolation within dwellings.

They elaborate:

> "Some complain that the space is not enough and it's too crowded. There are only two rooms. In the former houses, at least, there were two storeys. I had 13 family members in the previous house, but now all members must separate into smaller units. Finally, they could not stay here."
>
> Ms. Tipparat
> A member of Bon Kai NHA Community

> "It's too silent. You close the door and it's silent. There is no friendship. Previously, one could chat informally with neighbours, but today one cannot since a door is a barrier. Some people have already sold their rooms because the construction tooktoo long."
>
> Mr. Pratueng, NHA Suan Phlu Community

Another resident in Baan Mankong Suan Phlu adds:

"I want to live here throughout the future. In other places, I don't know where to go out and I know nobody, but here I know the neighbours and we can help each other."

Mr. Wallop from Baan Mankong Wat Phrayakrai contributed that:

"If my house wasn't burnt in the fire and I had to stay in an apartment, I would not accept it. But if someone builds it for free, then I might."

"We had absolutely agreed at the beginning that we'd prefer low-rise to a high-rise scheme. But low-rise would not accommodate all our members. We thought about excluding the previous renters [in the slum before it was hit by fire], but they insisted on staying here. So, it had to be a mid-rise scheme."

"One outsider shared that he would not join the mid-rise scheme because it ties you for 30 years. What if he is 80 years old? How can he climb up to the 4th floor? I can't help it; this is our only choice. Perhaps, I will stay here a while and then have to find somewhere else."

"I guarantee that I love this place, but would prefer to be in a low-rise scheme. In this type, we cannot modify it to our own preference because of the regulations: no paint, it's monotone. Anyhow, the important thing is we created it together."

In the same way, Mr. Tanasarn of Baan Mankong Wat Phrayakrai said:

"If you ask do I want to stay here, I'd say YES. All around me are those whom I am accustomed to live with. However, if there is a chance, I'd move out. A house is different to apartments."

Since the construction of Baan Mankong Wat Phrayakrai finished in 2009, around 20 per cent of former residents have left the scheme to settle elsewhere. Four of the members who were interviewed wanted to sell their home and six wanted to rent it out. In these cases, the community cooperative re-allocates the entitlement to a property by enabling other community members to purchase the house or flat from the seller – the Baan Mankong scheme is only open to newcomers if they get approval from the cooperative.

Another perspective from a member of the non-upgraded Wat Phrayakrai:

"Living here is very convenient; the neighbours are good. It's very different to [middle and high income] gated communities in that the residents look after each other. The landowner once did a survey and asked about development because they'd perceived that we are in slum conditions. Or, they asked us which type of houses we would prefer, if there were a renovation. But I refused. I'm 50 years old now. I don't want to have any further debts. I cannot maintain the instalment payments for 20 to 30 years.

> If the landowner demands a mid-rise re-development, I would disagree because no one is accustomed to it. Some have to manage things for their occupation. A flat is too small to do a small business, too cramped."

These comments and quotes illustrate the importance ascribed to housing form and settlement layout, which need to be balanced against affordability, and possibilities offered for home-level enterprise. There appears to be a clear preference for low-rise and rowhouse type housing over apartments, though those who are living in flats have accepted these as the only option available to them.

4.2 Neighbourhood and social milieus

This section considers social relations and neighbourliness at the settlement level, by exploring social capital, community organisations and management structures. Such collective activities may be influenced, facilitated or hampered by the physical form of the housing project; or, in the case of Baan Mankong projects, may have arisen in order to enable the production of housing in the form desired and chosen by residents.

Neighbourhood ties and social capital

The researchers explored the level of social relations through the degree of neighbourhood ties and social capital, which was evaluated by 11 indicators: 1) tone of neighbourhood relations; 2) security; 3) frequency of involvement in community activities; 4) frequency of visits from neighbours; 5) willingness to entrust home to neighbours during absence; 6) willingness to entrust children to neighbours; 7-8) willingness to lend and borrow household items and utensils from neighbours; 9-10) willingness to lend and borrow money from neighbours; and 11) overall satisfaction as a resident in the settlement. Table 8 illustrates the findings from these questions relating to neighbourliness (on a scale of 1 to 5).

Table 8. Level of relationships with neighbours

Relation	average					
	NHA Bon Kai	Baan Mankong: BonKai	NHA Suan Plu	Baan Mankong Suan Plu	Wat Phrayakrai Community	Baan Mankong Wat Phrayakrai
1) Neighbourhood relations	3.8	4.1	3.6	4.0	4.0	3.9
2) Security	3.3	4.1	3.2	3.4	3.0	3.7
3) Community activity	3.0	4.1	3.0	3.8	2.7	3.5
4) Neighbour visiting	3.2	3.9	3.4	3.7	3.2	3.0
5)Entrusting house to neighbours	2.4	3.7	2.4	3.1	2.6	2.2
6) Entrusting children to neighbours	1.7	3.3	2.0	2.8	1.9	1.9
7) Lending utensils	2.1	3.1	1.9	2.3	2.2	1.8
8) Borrowing utensils	2.1	3.0	1.8	2.2	1.9	1.5
9) Lending money (no interest)	1.9	2.7	1.6	1.8	1.9	1.6
10) Borrowing money (no interest)	1.6	2.5	1.6	1.6	1.6	2.0
11) Overall satisfaction as a resident	3.7	4.3	3.8	4.0	3.4	4.1
Average	2.62	3.53	2.57	2.97	2.58	2.65

Level of relationship

Low	Fair	Upper moderate	High
1.0-2.0	**2.1-3.0**	**3.1-4.0**	**4.1-5.0**

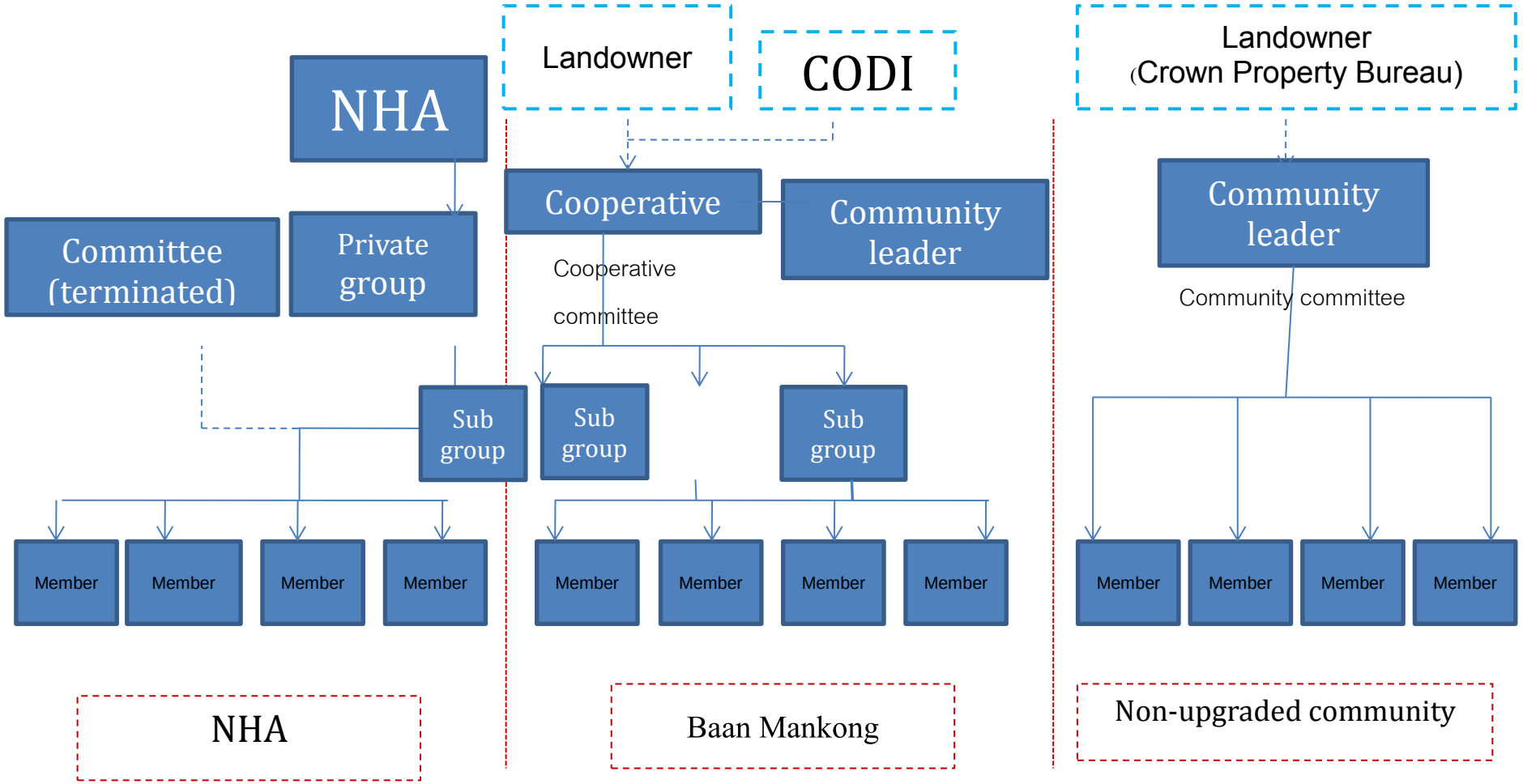
Table 7 indicates that social capital in all neighbourhoods is moderately high. Results range from low to high with regards the strength of neighbourhood relationships. Significantly, Baan Mankong Bon Kai presents the highest levels of neighbourhood relationship, while Baan Mankong Wat Phrayakrai has the second highest levels. When looking at average results, the three Baan Mankong communities display the highest figures, perhaps arising out of the collective processes required for the housing to be constructed. The lowest rate in terms of overall satisfaction is NHA Suan Phlu, where the social bond is at "fair". Most respondents reflect that they feel safe in the communities and can depend on neighbours.

The respondents gave upper to moderate level scores to general neighbourhood relationships, security, community activity, neighbourhood familiarity, and overall satisfaction; while neighbourhood trust was seemingly at lower moderate level. It seems that having an underlying participatory process – as in the Baan Mankong housing programme – can enhance levels of trust from "low" to "fair", especially trust in material and monetary exchange. This reflects the fact that social ties are interwoven within a neighbourhood, but can be strengthened by a course of people-centred development programmes like Baan Mankong's participatory processes, and community organisational structures – which will be considered in the next section.

4.2.1 Community organisation and management

This section explores the varieties of community organisation and management systems across the NHA and Baan Mankong housing programmes, and informal settlements. From the neighbourhood surveys, half of the respondents (50 per cent) depend on state agencies for resources and finance for community services and activities. These agencies include the district (municipal) office (24 per cent), the National Housing Authority (11.2 per cent), the district representatives (10.1 per cent), and CODI (7.4 per cent). Most of these agencies can address issues of environmental improvement, infrastructure upgrading, and health services. Figure 19 illustrates the different community organisational structures across the three housing projects.

Figure 19. Comparison of community organisation and management systems



NHA housing project: As a public housing concept, NHA housing programmes aim to deliver affordable homes subsidised by the state through a top-down delivery system. After the homes are built, the NHA is mandated with two roles: to sell them, and to operate and monitor the occupancy period. This is managed first by the building corporation and then regulated under the NHA's area-based office. Initially, there may be no prior community structure or ties between residents. This is particularly true when the flats are for sale to the general public; however in the case of Suan Phlu, the flats were for victims of the Suan Phlu slum community fire. The building corporation is therefore established by the NHA, not by community election. The NHA's project office acts exclusively in a legal capacity to look after the infrastructure and services, although in some cases the community group has formed its own legal body to manage the project (Figure 19 on the left). The NHA's only involvement is therefore collecting housing payments. So the NHA public housing programme does little to promote community capacity building or social interaction among residents, in spite of having created brand new settlements and neighbourhoods. Accordingly, the emergence of community groups has been spontaneous rather than seeded intentionally. The case studies show that community groups in both Baan Ua-Arthorn Suan Phlu and NHA Bon Kai are organised on an administrative and local authority basis rather than for philanthropic motives. However, the residents of Baan Ua-Arthorn Suan Phlu would already be known to each other, as residents of the former slum community on the same site.

Baan Mankong housing projects: The aim of the Baan Mankong upgrading programme is to create a participatory, community-driven process. Therefore, it starts with the establishment of community saving group schemes. Community members select their own representatives for both a community committee and a self-managing cooperative, which administers the housing loan repayments for the upgrading project. By operating a housing cooperative, community members will gain experience in managing community-level conflicts, develop mutual trust, and gain skills in monetary management. Each sub-savings group will have a representative who liaises with the cooperative. The sub-savings groups play a crucial role as an intermediary agent between community committees and savings members. Underpinned by the community members, the community organisations therefore can work equally and closely with the landowners – whether the Treasury Department, the Crown Property Bureau, or others. The case studies at Baan Mankong Wat Phrayakrai, Baan Mankong Bon Kai and Baan Mankong Suan Phlu show that the cooperatives generate a communal financial platform among residents based on trust, something which the programme has long emphasised.

The non-upgraded settlement: Case study respondents in the selected non-upgraded settlement gave similar results to previous research (Rabibhadana, 1999); that is, that the neighbourhood has close ties with external agents, particularly the district office and local politicians. The community mostly depends on these representatives for bridging and accessing external support such as infrastructure and services, and occasionally medical and social welfare support. However, as a registered community, there is still a community-level organisational structure, with an elected leader.

In the interviews with community representatives, some local and neighbourhood political issues were highlighted, as some community committees are involved in local politics:

> "Residents praise us whenever they demand something, but it doesn't last. After they've got something, the praise dies down."

Mr. Pratueng, Community representative in Baan Ua-Arthorn Suan Phlu

The relationship with the local municipal authority is also illustrated:

> "The district office has not allowed us to set up a community cooperative since its structure duplicates the current community committee. They would co-exist which could bring on community conflict. Also we don't have any political status now, because the housing cooperatives haven't been activated yet. Currently, the building is maintained by the building corporation, a business unit – not a community-based corporation… This system distances us from one another because the corporation maintains all equipment, infrastructure, and services. Among community members, they have been disconnected – the living procedures are set without community involvement."
>
> Mr. Pratueng, Community representative in Baan Ua-Arthorn Suan Phlu

The experience of Baan Mankong Suan Phlu demonstrates the power of the landowner over the community organisation and management configuration. A community leader reports that the community does indeed depend on the landowner: the Crown Property Bureau. Residents' rules and regulations – physical and procedural – are bound up with the right to rent. Additionally, community residents coordinate with the district office, CODI, the district representatives, and local politicians.

> "The community began after the former [slum] community was destroyed by a fire. There were two options for rebuilding: the Baan Ua-Arthorn programme by NHA and the Baan Mankong programme by CODI. One group of residents selected the Baan Mankong programme, because it allows informal groups to obtain housing micro-credit. In comparison, the NHA [Baan Ua-Arthorn] programme demands a formal guarantee such as salary slip or bank statement to ensure our ability to pay, which we could not provide. At that time, we had two alternatives: either Baan Mankong programme or invade a new land. Finally, we joined the former. However, the Treasury Department, the landowner, set some strict rules for housing right entitlements [to participate in the Baan Mankong upgrading process]: the original dwellers, their extended families, and the sub-rental dwellers, in that order. [Finally, some residents opted to join the Baan Ua-Arthorn programme for mid-rise apartments]. We later agreed that the elderly should stay on ground floor and the former sub-renters stay on fourth floor. The shop-houses are also located on the ground floor, regulated by the landowner. The landowner also required us to set up a cooperative, and they define the housing regulations, the procedure of debt instalments, etc. They participated with us at almost every meeting, twice a month,until we felt uncomfortable. This was because they expected this upgraded neighbourhood to be a successful case of mid-rise housing. Otherwise, external lights and street furniture are supported by the district representatives."
>
> Mr. Rawee, head of Baan Mankong Suan Phlu cooperative

Mr. Wallop, the cooperative chief of Baan Mankong Wat Phrayakrai, described how the group started after the fire:

> "Initially, there were less than 100 people joining in the community meetings. We held an election for a chair and established sub-savings groups. There were about 8 to 10 savings groups at that time. After establishing the cooperative, some groups are still continuing. At this moment, only ten people remain, totalling THB60,000 to 70,000 in savings [about US$2000].
>
> Sub-group decisions were divided into colours: red, yellow, green, white, and blue. This was to infill the physical form. Each sub-group comprises tenants and sub-tenants. After organising groups according to space, residents on each floor select a representative who is responsible for general cleanliness, and as a communication channel. Each floor representative is a volunteer and re-elected every two years. We have to maintain the public facilities together, corridor lights (THB5000 per month), litter collection (THB500 per month), and gardening. These fees are collected from each house, THB100 per month per unit [about US$3].
>
> A few regulations are enforced, such as the prohibition of smoking, keeping pets, etc. These are to be expected since we are all in the one building. However we gain communal spaces as compensation and people like this a lot."

Baan Mankong Wat Phrayakrai Community has managed to maintain building services and fees. There is a general meeting of the cooperative twice a year and a sub-committee meeting every month. Normally, 50 to 60 persons participate at every meeting.

Conversely, a community member at the non-upgraded Wat Phrayakrai Community says that:

> "The landowner did nothing for community development, except collect rent for the land. Previously, in my grandfather's time, we paid THB18 monthly for the rent. After his death, the landlord did a survey and charged the successors a transformation fee – to upgrade from wooden houses to brick houses. We paid THB12,000 [US$388]. Moreover, the rent was raised from THB18 month to THB36 per month. This is for transferring the rights within the family; otherwise [if rights are transferred outside the family] it costs THB100,000 [US$3200].
> This plot is rented land. We cannot sell or even extend or renovate without permission from landowner otherwise we will be charged extra or sued. The landowner is very strict."
>
> Ms. Pimlada, community member in Wat Phrayakrai Community

In summary, this section portrays a range of community organisation and management platforms used by national housing programmes and a conventional, non-upgraded settlement. The anecdotal evidence gives some insight into the interplay between community trust building and structured community organisations. This evidence calls for a re-conceptualisation of housing management.

4.2.2 Levels of resident satisfaction

Levels of resident satisfaction are made up of various factors. The researchers analysed five indicators: satisfaction with neighbours; satisfaction with the local environment; satisfaction with safety; satisfaction with the environment for children; and satisfaction with work and job opportunities, in order to assess the wider sense of satisfaction at each site.

Table 9. Residents' satisfaction with their living environment

Items	Average satisfaction					
	NHA Bon Kai	Baan Mankong Bon Kai	NHA SuanPlu	Baan MankongSuanPlu	WatPhrayakrai non-upgraded	Baan MankongWatPhrayakrai
Satisfaction with neighbours	3.9	4.2	3.7	4.1	4.0	4.1
Satisfaction with local environment	3.7	3.9	3.6	3.9	3.7	4.2
Satisfaction with safety	3.5	4.0	3.3	3.6	3.1	4.2
Satisfaction with child environment	3.4	4.0	3.3	3.7	3.2	4.3
Satisfaction with work opportunities	4.2	4.3	4.0	4.4	4.0	4.3

	Low	Fair	Upper-moderate	High
Scale of satisfaction	1-2.0	2.1-3.0	3.1-4.0	4.1-5.0

Figure 20. Residents' satisfaction with their living environment in six neighbourhoods: A comparison

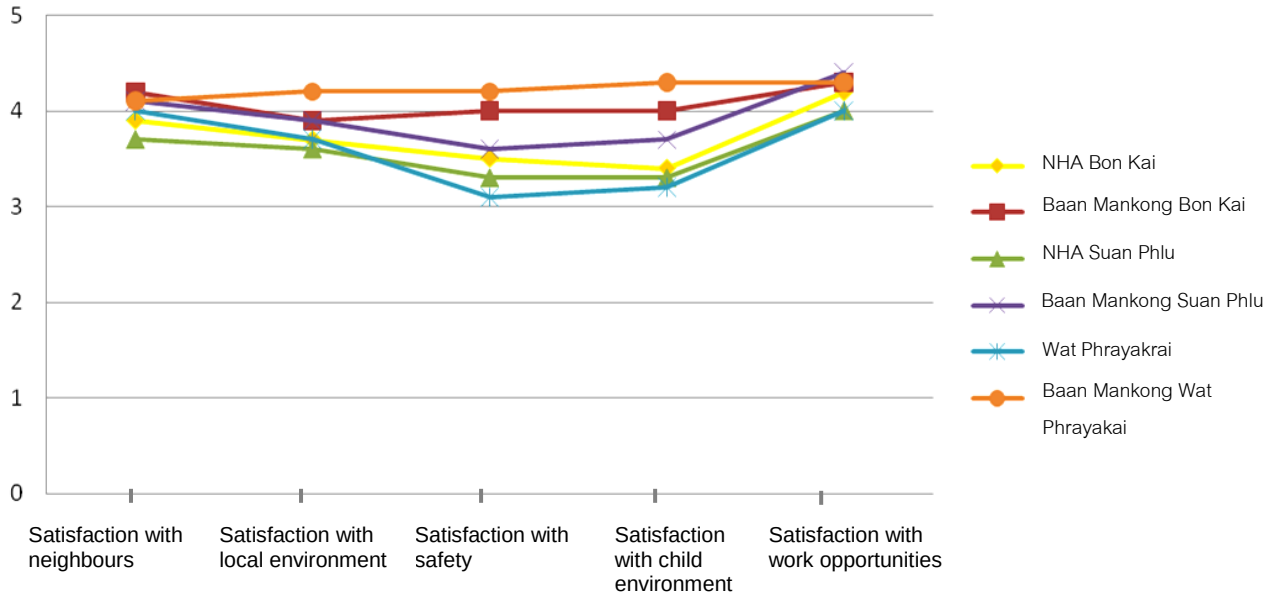


Figure 20 shows that the communities with the highest levels of overall satisfaction are the three Baan Mankong projects. The non-upgraded Wat Phrayakrai and NHA projects have lower levels of overall satisfaction, though these are counterbalanced with job opportunity

satisfaction. This suggests that people are willing to accept living in less satisfactory forms of housing if this means access to earning opportunities, and have therefore chosen to remain onsite. This satisfaction with job opportunities extends to the Baan Mankong projects, and across all cases it would seem that the locations' job opportunities are a major factor.

4.3 Socio-economic and physical conditions

This section seeks to analyse average levels of density in the settlement with regard to satisfaction levels and socio-economic considerations.

4.3.1 Opportunities for home-based industry

Table 10 shows the relationship between average size of an individual home, and the prevalence of home-based commercial units such as corner shops, laundry facilities, home-based industry and rental housing. The non-upgraded Wat Phrayakai settlement, with the largest average housing unit size, lends itself to home-based commercial opportunities. There are more than 35 combined commercial and residential units in this community. This may also account for Wat Phrayakai houses having the least floor space per person (6.8 square metres), as space is prioritised for commercial over residential use. The Baan Mankong communities of Suan Phlu and Bon Kai also see a higher proportion of commercial use than the NHA apartments, due to the rowhouse form of housing in Baan Mankong which facilitates shop-houses. Baan Mankong Wat Phrayakai is an exception due to its mid-rise format.

Table 10. Relationship between average unit size and commercial opportunities

Neighbourhoods	Average footprint per unit (m^2/unit)	Average household floor space per capita (m^2)	Number of combined residential and commercial units	Commercial units as a % of total settlement area
NHA SuanPlu	12.14	8.29	21	1.82%
Baan Mankong Suan Plu	43.22	13.00	12	4.82%
NHA Bon Kai	18.58	7.64	31	0.95%
Baan Mankong Bon Kai	43.60	7.00	6	2.97%
Non-upgraded Wat Phraya-krai	94.87	6.79	> 35[15]	12.18%
Baan Mankong Wat Phrayakrai	30	17.00	0[16]	0%

The public housing programmes of the NHA and Baan Mankong have also imposed restrictions on building use which may cause nuisance to neighbours or disadvantage the

[15] Since Wat Phayakrai community is a non-upgraded settlement, the researchers were not able to explore all of it thoroughly, limiting the data available here.
[16] The Crown Property Bureau, the landowner, prohibits any household from adapting homes for commercial purposes.

community, such as sub-letting rooms or using homes for garbage collection or recycling. These programmes may therefore discourage home-based economic activity, particularly the NHA's housing regulations. The one-bedroom format of the apartment units also restricts the available space for commercial activities. The Baan Mankong programme allows more flexibility for residents to modify their homes for some industry, such as the open space immediately outside a home. This arose from the community dialogue process, to ensure home and community design met residents' needs. However, the landowner may also have power to impose controls on the types of on-site activities and physical modifications made to the buildings, which could impede commercial activities.

4.3.2 Relationship between settlement density and neighbourhood ties

The non-upgraded settlement, such as the Wat Phrayakrai community, is the most extreme form of horizontal spatial occupancy. This type of housing privileges private space over public space[17] (however, it is only one example of a non-upgraded settlement - others may be higher in density). This community has a converse relationship between settlement density and degree of neighbourliness, with lower settlement density linked to less satisfaction with neighbours; this could be due to the ratio of public to private space in the settlement. This contrasts with the communities formed through public housing programmes. The pressure from land value, building standards, and construction management and techniques has steered the NHA towards a conventional housing delivery scheme that advocates an economic view of housing, maximising land usage at the expense of horizontal relationships. However, some architectural and housing studies have suggested limits to the number of flats or apartments in a housing scheme in order to maximise neighbourhood and social relations (Latané *et al.,* 1995;Kearns *et al.* 2012; Peterson and Minnery, 2013).

The survey material presented in this study suggests that Baan Mankong Suan Phlu and Bon Kai have the highest levels of social capital and trust, which could be related to the collective action required for the Baan Mankong programme design. Thus, while Baan Mankong achieves lower settlement density than neighbouring NHA flats, it does exhibit stronger social bonds in the community. Compared to the non-upgraded Wat Phrayakai, the Baan Mankong projects perform better both in terms of an effective household level of density, and enhanced social qualities. However, across all six sites, it can be said that levels of trust are still at the higher end of the range.

4.3.3 Relationship between settlement density, mobility and economic necessity

The questionnaires highlight that access to work opportunities is a significant reason for residents living where they do. 86.9 per cent of respondents ranked their satisfaction with urban mobility from "upper-moderate" to "high"; 80.7 per cent of respondents gave the same score to accessing jobs and economic opportunities. This supports the hypothesis that the settlement's location is crucial to residents' socio-economic well-being, so that residents are willing to trade more crowded, or lower quality, living conditions for access to jobs. Urban mobility and economic necessity are directly related to the cost of living, which is critical for the low-income group.

[17]This conventional slum has the least communal space even though it has the highest home size per person.

4.4 Summary

We saw in Chapter 3 that NHA projects offer the highest levels of population density at the settlement scale, while the non-upgraded Wat Phrayakai settlement is the least dense, and the Baan Mankong projects generally present mid-range results. At the settlement scale, the analysis illustrates how spatial density relates to social factors. In summary, this chapter suggests that socio-economic considerations are an important motivating factor in residents' decisions to live where they do, particularly to access jobs and economic opportunities. Social capital and trust are also important factors in residents' satisfaction with where they live, and this social capital will be influenced by the degree of community-level collective activity.

Looking at the form of urban settlements, there is a trade-off between achieving higher settlement densities through high-rise construction, and strengthening neighbourhood relations. This also depends on how the construction came about – a supply-driven housing programme like the NHA does not create opportunities for community collective action and hence for strengthening social ties, unlike the demand-driven Baan Mankong approach. When community members are allowed to decide on the shape of their community, their preference is for a low-rise, rowhouse style of housing; and building codes and construction techniques also require a minimum size per unit. It is therefore not possible to achieve the same level of density as in high-rise apartment buildings –but high-rise buildings allow less space for household economic activity and informal social interaction.

After upgrading or construction, the housing's spatial characteristics and residential ordinance scan forbid some activities, such as home-based industry. This is especially true in the case of the NHA's residential style: vertical housing that discourages a versatile use of space. Thus the NHA apartments see the least home-based industry as a percentage of total units.

Unlike in a typical slum, upgraded communities' housing is critically limited in terms of space and the freedom to make modifications. For the most part, these buildings take the form of rowhousing or apartments, with little scope for modification. By comparison, the unregulated nature of a typical slum is much more versatile and in most cases allows for modifications,.

The surveys on social trust and satisfaction presented in this chapter suggest that the participatory approaches of housing provision in the Baan Mankong projects contribute to higher levels of trust and satisfaction than are found in the government-supplied housing projects. This suggests that social-based housing programmes can compensate for the lower levels of settlement density achieved in the Baan Mankong projects through stronger neighbourhood ties and social capital. By contrast, NHA affordable housing schemes perform well in terms of spatial efficiency, but do not promote social ties, and in many cases reduce opportunities for home-based economic activities. Meanwhile, findings suggest that the layout of the traditional "slum" form offers benefits in terms of job and livelihood opportunities. The next chapter will go on to explore whether there is a relationship between satisfaction and density, and to look in more detail at the policy implications of these findings.

5 Analysis and conclusions

5.1 Density, settlement type and resident satisfaction

In conclusion, this section asks: are high densities consistent with high levels of resident satisfaction? Is satisfaction influenced by the way "densification" and upgrading are achieved? In other words, how does the Baan Mankong community-driven programme compare with the traditional NHA public housing? Assuming the communities selected for this study are typical, the results suggest that despite their greater density, the upgraded settlements provide higher average levels of satisfaction than unimproved slum communities. The Baan Mankong settlements have the highest average levels of satisfaction; followed by the NHA settlements; and finally the unimproved settlement. However, as already indicated above, the Baan Mankong settlements also have lower levels of density than the NHA settlements.

Comparing the three types of settlements in a multivariate analysis, the Baan Mankong settlements have significantly higher levels of satisfaction than either of the other settlement types. However, a focus on settlement density suggests that the low density of the unimproved settlement prevents satisfaction levels dropping further, while the especially high density of the NHA settlements could explain residents' lower satisfaction compared to the Baan Mankong settlements. The lower density levels in the Baan Mankong settlements may well reflect community preferences expressed during the housing and site design process, when the community was consulted with support from CODI's architects. As a result, there is scope to ensure that homes are of an adequate size to house all residents, and arranged in a way that facilitates neighbourly interaction while also allowing for household needs, such as outdoor storage space. However, the site's constraints such as small plot sizes, may limit the choice of settlement layout or style of housing, which will also be dependent on residents' financial means.

There are numerous other factors that could influence the respondents' levels of satisfaction. Some possible factors, such as income per capita, were found to be neither statistically significant nor to result in any appreciable changes to other findings, and so were not included in the results presented. The scope for comparison is limited, however, with a sample of only 338 respondents spread across six settlements of three different types, in three different areas of the city. As such, this analysis should be seen as provisional, and the conclusions as suggestions only.

5.1.1 Resident satisfaction and neighbourliness in the six settlements

In Chapter 4, residents' socio-economic satisfaction and neighbourliness were explored in order to assess levels of social capital. We constructed a summary measure of satisfaction based on responses to a series of questions on satisfaction with physical, social and economic aspects of the settlement (using a five-point scale). We also developed a summary measure of neighbourliness from the answers to another set of questions on neighbourhood sharing, visiting and safety.

Figure 21 illustrates the (total) satisfaction results graphically with a "box plot" of all of the responses, grouped by the type of settlement, and colour-coded to illustrate the area the

respondent was from. This graphic indicates that the median level of satisfaction in the Baan Mankong settlements was slightly less than four, the unimproved settlement was just over 3.5, and that of the NHA settlements was about halfway between, at 3.75. These tendencies are confirmed with the mean levels presented in Table 11, which also show that all of the Baan Mankong settlements have higher mean levels of satisfaction than any of the NHA or unimproved settlements.

Figure 21. Box plot showing levels of (total) satisfaction

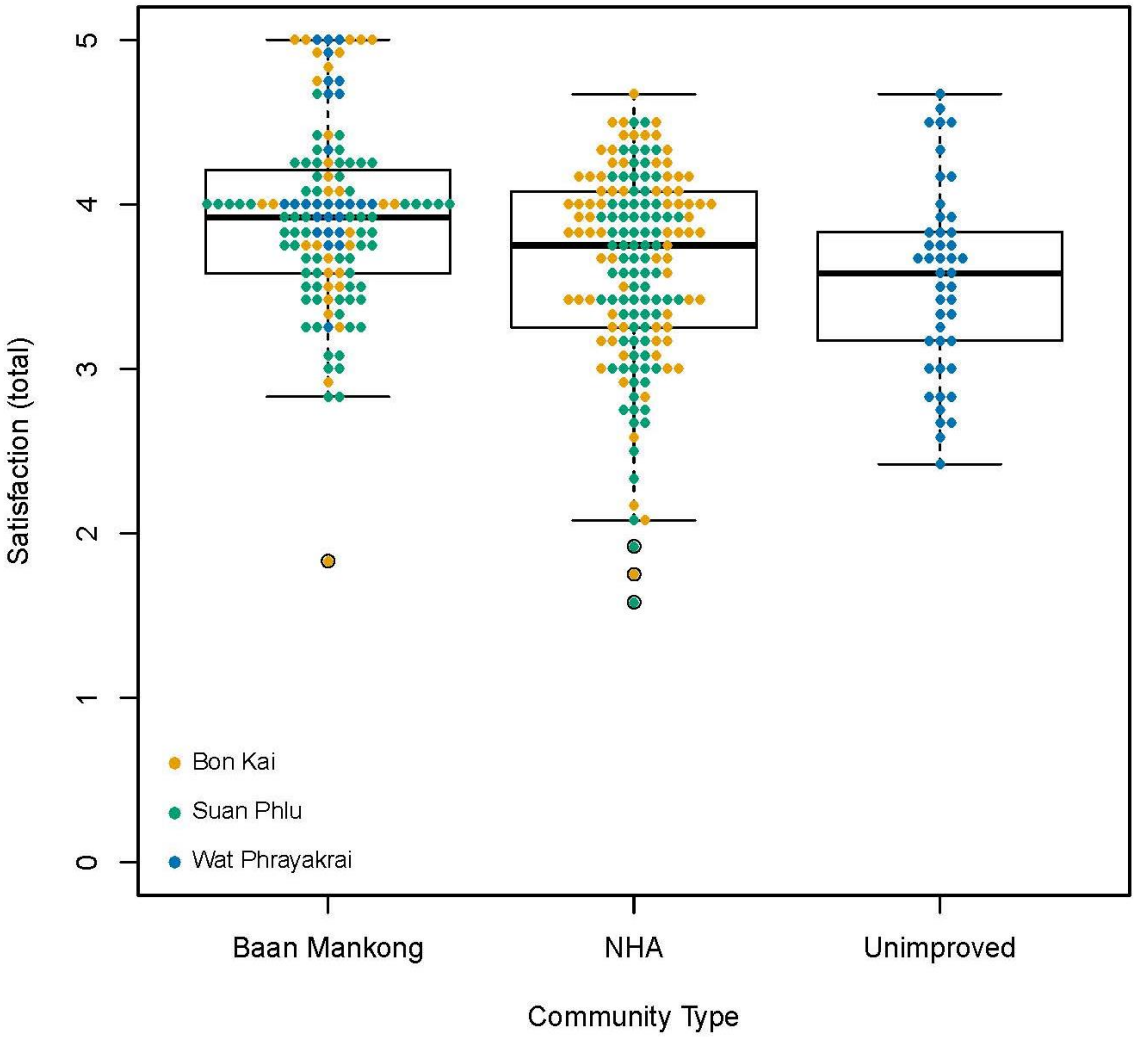


Table 11. Mean levels of (total) satisfaction by area and settlement type			
	Baan Mankong (CODI)	NHA	Unimproved
Bon Kai	4.03	3.73	
Suan Phlu	3.78	3.52	
Wat Phrayakrai	4.19		3.54
Combined	**3.93**	**3.62**	**3.54**

Fairly similar results emerge from the neighbourliness estimates, illustrated in Figure 21, with the means presented in Table 12 (the average levels are lower in the case of neighbourliness than with satisfaction, but the measures are not sufficiently comparable to

draw any conclusions from this). There is also the somewhat anomalous result that nine respondents from the Baan Mankong settlement in Bon Kai indicated high levels of neighbourliness (scoring five) on all of its dimensions, while no other respondents averaged more than four. Again, however, the mean level of neighbourliness in all of the Baan Mankong settlements was found to be higher than in any of the other settlements. Given the slight anomaly in the neighbourliness index, combined with its general similarity to the satisfaction index, only the satisfaction index is included in the following discussions.

Figure 22: Box plot showing neighbourliness by community type

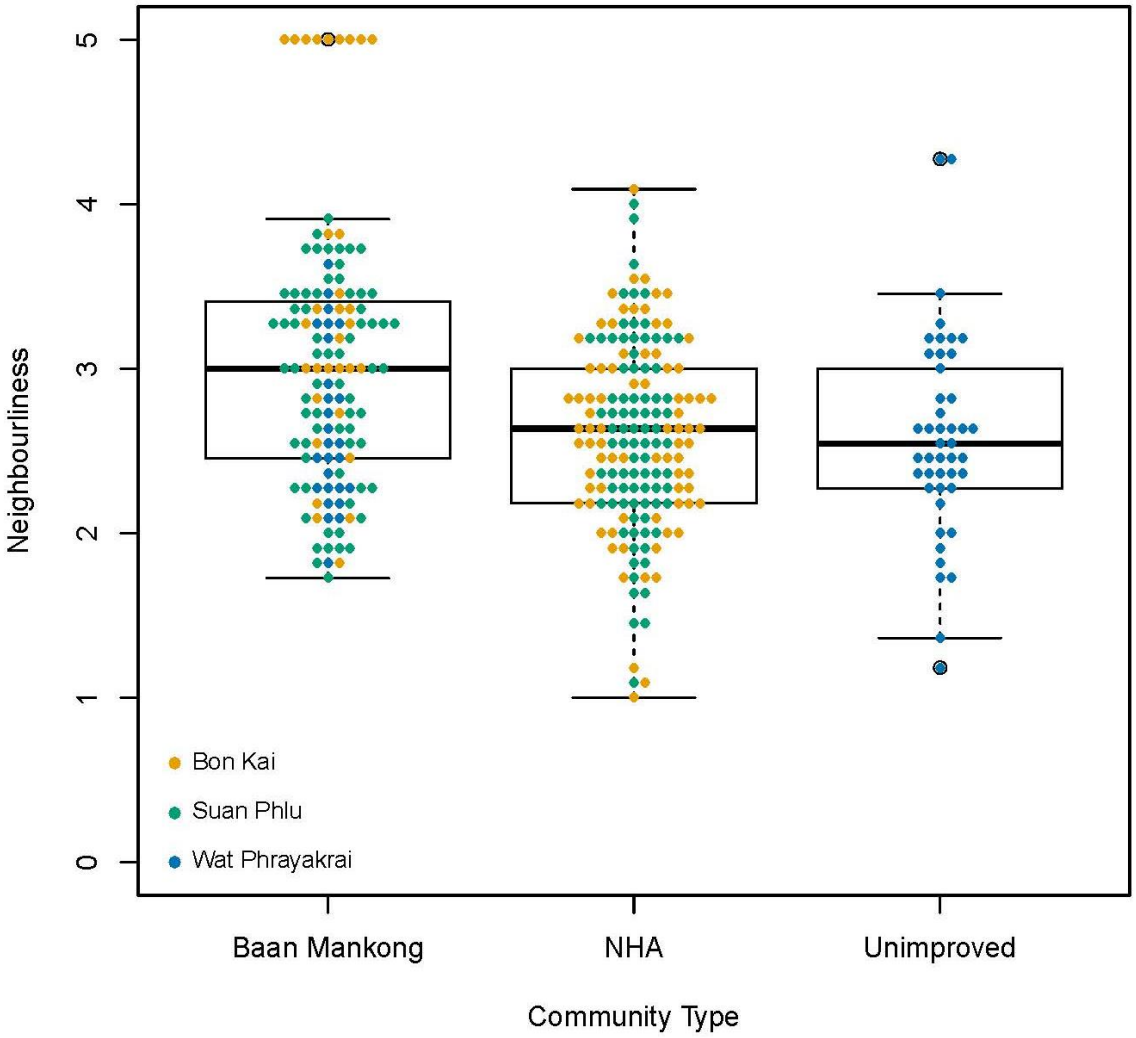


Table 12. Average levels of (total) neighbourliness by area and settlement type			
	Baan Mankong (CODI)	NHA	Unimproved
Bon Kai	3.51	2.61	
Suan Phlu	2.92	2.58	
Wat Phrayakrai	2.65		2.59
Combined	**3.01**	**2.59**	**2.59**

5.1.2 Preliminary analysis of density and satisfaction

As discussed in previous sections of this working paper, the NHA settlements are denser than the Baan Mankong settlements, which are in turn denser than the unimproved slum settlement. Given that the respondents in the least dense unimproved settlement and those in the most dense NHA settlements both tend to be less satisfied (and less neighbourly) than those in the Baan Mankong settlements with their intermediate density, it is evident that factors other than density are at work. It is possible, however, that the low density of the slum settlement makes it more satisfactory than it might otherwise be, while the high density of the NHA settlements may help explain their lower levels of satisfaction. Moreover, the preceding analysis only included settlement density, and did not include built-up density (in this analysis the number of people living in the settlement divided by the total area in the settlement in residential plots) or in-home density (household members divided by floor area). There might be reasons for these densities to relate differently to satisfaction, as in-home density is more directly linked to crowding, and built-up density excludes the influence of variations in open space.

5.2 Satisfaction across density types, and types of settlement

Looking beyond in-home density, this section seeks to understand which type of density is most likely to explain satisfaction. Table 13 presents the correlations between each of the three density measures and the three satisfaction indices and the "total" satisfaction index, which is calculated as the average of the three other indices. As indicated, the in-home density is not significantly correlated to any of the satisfaction indices. In contrast, the other density measures are both significantly correlated with all of the satisfaction indices, though the correlation coefficients are all under 0.2.

Table 13. Correlations between population density at three scales and (total) satisfaction index

Satisfaction indices	Density 1: In-home (household members per m^2 of home's floor area)		Density 2: Built-up[a] (residents per m^2 of land in residential plots)		Density 3: In settlement[a] (residents per m^2 of settlement land)	
	Correlation	p value	Correlation	p value	Correlation	p value
Physical	-0.077	0.157	-0.128	0.019**	-0.123	0.024**
Social	0.001	0.984	-0.167	0.002***	-0.164	0.003***
Economic	-0.047	0.387	-0.169	0.002***	-0.164	0.002***
Total	-0.054	0.326	-0.179	0.001***	-0.173	0.001***

[a] These variables are averages of each of the six settlements which are then applied to all households in those settlements.
** significant at 95% confidence; *** significant at 99% confidence.

It is perhaps not surprising that the in-home density does not correlate significantly with the satisfaction indices, as almost all of the questions used to build up the satisfaction indices involve settlement characteristics. The exception is a question on satisfaction with physical aspects, referring to shelter size. Answers to this specific question are negatively correlated with in-home density (-0.130), as one would expect, and are statistically significant with more than 95 per cent confidence (p=0.016). This is, however, not enough to make the overall index correlate significantly, although as indicated in Table 5.3 the physical index has a higher correlation with in home density than the other indices.

According to table 13, both plot and settlement densities do correlate significantly with all of the satisfaction indices, and most closely with total satisfaction index. This suggests that a more careful look at whether their different densities are influencing the satisfaction with the different community types, discussed above. The following sub-section uses linear regression analysis to explore this possibility.

5.2.1 A multivariate analysis of satisfaction, settlement type and settlement density

In this section we consider how the relationship between settlement type and density is influenced by settlement density. The results are summarized in Table 14.

Table 14. Regression results for (total) satisfaction – six specifications with settlement types and settlement density as dependent variables

	Dependent variable is satisfaction – total (p values in brackets below coefficients)							
Independent variables	Comparing Baan Mankong with others		Comparing NHA with others		Comparing Unimproved with others		Combined analysis	
	Spec 1	*Spec 2*	*Spec 3*	*Spec 4*	*Spec 5*	*Spec 6*	*Spec 7*	*Spec 8*
Constant	3.605	3.643 (0.000)	3.829 (0.000)	3.873 (0.000)	3.757 (0.000)	4.109 (0.000)	3.930 (0.000)	4.106 (0.000)
Baan Mankong	0.325 (0.000)	0.304 (0.000)						
NHA			-0.206 (0.001)	-0.111 (0.440)			-0.307 (0.000)	-0.010 (0.941)
Unimproved					-0.216 (0.023)	-0.483 (0.000)	-0.389 (0.000)	-0.482 (0.000)
Settlement density (pers/m^2)		-0.160 (0.644)		-0.479 (0.463)		-1.663 (0.000)		-1.619 (0.018)
Adjusted R^2	0.068	0.066	0.027	0.026	0.012	0.083	0.067	0.080
p value of F statistic	0.000	0.000	0.001	0.004	0.023	0.000	0.000	0.000
Sample size	338	338	338	338	338	338	338	338

The first specification includes only a constant and a dummy variable for households in Baan Mankong settlements. The Baan Mankong variable is highly significant, and the coefficient estimates that Baan Mankong settlements are associated with a satisfaction level 0.32 higher than the other settlements (combined). When settlement density is added to the equation, it takes a negative sign (implying higher density is associated with lower satisfaction), but this coefficient is not significant, and the coefficient for Baan Mankong remains significant though it falls to 0.30. Taken alone, this might seem to suggest that the Baan Mankong settlements are associated with higher satisfaction, and the evidence does not show that this is explained by density differences.

The second specification is analogous, but takes the NHA settlements as the comparator. In this case the NHA coefficient is negative (-0.21) and highly significant when entered on its

own, but when density is also entered neither coefficient is significant, though both take the expected signs (NHA is associated with a lower level of satisfaction, as is higher density).
For specifications 5 and 6, with the unimproved settlement as the comparator, the coefficient on the unimproved dummy is negative (-0.22) when entered on its own, and the coefficient only marginally significant. When settlement density is entered, however, the coefficient identifying the unimproved settlement became even more negative (-0.48) and more significant, and the coefficient on density was negative and statistically significant.

The final two specifications include dummies for NHA and improved, and in the first (specification 7) both take negative and highly significant coefficients (-0.31 for NHA settlements and -0.39 for the unimproved settlement), as expected. However, when density is also entered, the coefficient on NHA becomes small and statistically insignificant, while that on the informal settlement becomes even more negative. The coefficient on density is also negative and statistically significant.

The simplest interpretation of these results is that the Baan Mankong settlements are more satisfying to their residents than the NHA settlements or the unimproved settlement, but that the differences between the settlement types are themselves related to density differences. Thus, the low density of the unimproved settlement probably prevents it from being associated with even lower satisfactions, whereas it is likely that the density differences account for some and perhaps all of the differences in satisfaction between the Baan Mankong and NHA settlements.

It is important not to over-interpret these results. They are based on a very small number of Baan Mankong and NHA settlements, and only one unimproved settlement. They would seem to suggest that higher densities can be achieved in low-income housing upgrading projects without sacrificing resident satisfaction, but this finding depends on the low satisfaction levels in the one unimproved settlement selected. The results are consistent with the hypothesis that Baan Mankong settlements, whose form is driven in large part by the community members themselves, provide for higher satisfaction than the public housing provided through NHA. They also suggest that the higher levels of satisfaction in these Baan Mankong settlements may be linked to their lower settlement density. Again, however, other Baan Mankong and NHA settlements may not conform to this pattern, and it is unclear for example, what form a high density Baan Mankong settlement, or a lower density NHA settlement, would take.

5.3 Recommendations and conclusions

This chapter has sought to understand what determines household satisfaction in different settlement types, in order to ascertain whether density (of homes and of whole settlements) plays a role. This should be considered alongside the social capital in communities and social organisation explored in Chapter 4, as well as the settlement form and in-home density outlined in Chapter 3. This may offer insights for setting housing standards, to ensure that housing is of sufficient quality from a resident's point of view. What emerges is that physical housing regulations tend to overlook the social, economic and cultural aspects of life in urban settlements.

Some key findings of relevance for housing policy are:

- The respondents in all the settlements are living in housing which meets standards for floor space per capita, but may not meet other regulations such as minimum room size, provision of facilities, and general quality of the surrounding environment.
- Baan Mankong homes exceed the standards by a greater degree than NHA homes. The non-upgraded Wat Phrayakrai settlement offers the least space per capita, but still meets the 6.8 square metre per capita requirement.
- The NHA settlements have the highest levels of total settlement population density, while the non-upgraded Wat Phrayakrai settlement has the lowest total settlement density. The three Baan Mankong settlements' total density levels fall in between the other two types.
- Baan Mankong settlements have the highest levels of neighbourliness and there is reason to believe that this arises from the participatory process required in financing, designing and building the homes and community.
- While the NHA high-rise housing offers the highest proportion of open space relative to the built-up area, they offer the least open space per capita. However, open space is considered an important feature for residents who may use it to store equipment, carts, washing machines, or to socialise.
- Job and income-earning opportunities available in or near a particular settlement are a significant factor determining residents' willingness to live in a settlement which may be more dense or offer lower standards of housing, as in the non-upgraded settlement.

These findings allow us to offer some recommendations for national housing standards, as well as for urban planning policies. The research outcomes suggest that the existing Building Code may be based on unrealistic assumptions of household size, and this may need to be differentiated on the basis of income levels. According to the Building Control Act of 1979, the minimum permissible dwelling unit is 20 square metres per unit (Department of Local Administration, 2004). The Building Code is set on the basis of three persons per unit. The findings in this research show that the actual average family size is approximately 4.3-5.0 persons per household.[18] It means currently that the actual shelter space provision is around 4.65 to5 square metres per capita. Hence, this suggests that the national standard should be focused on space per capita, rather than unit size. . Alternatively, the minimum allowable housing unit size should be increased to reflect the reality of household sizes.

At the same time, the state housing programs of the NHA and CODI should actively ensure that low-income housing projects include common spaces to allow community interaction and promote neighbourliness and social capital across the settlement. There should be provision for building community organisations and participation as practiced by Baan Mankong.

Housing programmes should also make the provision of community-based organisations a compulsory condition for construction which may not meet current spatial regulations. For example, CODI and the NHA can endorse Baan Mankong and Baan Ua-Arthorn projects, on the basis of in-home space per capita which may otherwise not meet the conditions stated in building regulations, as long as certain other conditions are met; such as setting up and

[18]Except for Baan Mankong Wat Phrayakrai.

running community organisations. This would also recognise the difficulties presented by limited land availability, which may require unit sizes below permissible levels, or making use of land normally reserved for setbacks.

In the Thai context, low-income settlements – especially in inner city areas – help support a number of urban functions, particularly the provision of food through street-vending, motorbike and taxi services, and other services in the informal economy. The findings show that the income-generating activities of the low-income groups often take place in the home, or depend on homes being available at low cost – either through state-subsidised programs or by (initially) squatting on land (although the non-upgraded Wat Phrayakrai community pays ground rent). Affordable housing helps to maintain lower costs of living, and also lower costs of goods and services, in the inner city. Therefore, enabling the lower-income groups to live in the inner city area is essential to the functioning of the urban economy, especially in the absence of affordable and efficient transport options which urban development policies have long overlooked.

Thus, urban planning programmes should encourage the provision of affordable, high-standard housing in central areas of Bangkok. This study has shown that high-rise forms of housing, as in conventional NHA programs, leads to conditions of high settlement density, at the cost of low provision of open space per capita. However, the least dense settlement form– that of a non-upgraded slum settlement – provides the least communal open space, though individual households may have large courtyards or gardens, and the low settlement density means that open space per capita is still relatively high. This suggests the merits of a planned settlement form to ensure common open spaces are safeguarded and provided. The three Baan Mankong settlements are between 18 and 20 per cent open space, and have relatively high levels of open space per capita. Combined with the fact that the Baan Mankong communities see the highest levels of satisfaction and neighbourliness, this suggests that a participatory and community-driven approach to state-subsidised housing can achieve a satisfactory middle ground to ensuring affordable, low-income housing in central Bangkok. If a low-rise approach is not feasible due to space constraints, a mid-rise form as employed in Baan Mankong Wat Phrayakrai offers a level of compromise and still strives to provide communal space within the corridors of the buildings.

Such low or mid-rise building forms could be encouraged by local government via the use of "open space credits" for developers. The idea of these credits would be to exchange them for other services supported by the local authority, such as the provision of public services, amenities, or through partial housing finance, such as construction materials or rent subsidy. The idea of turning transferable and flexible private spaces into credits might help the city regain some open spaces for the benefit of the public. However, it seems clear that community consultation as part of the housing design process can help to ensure that the housing meets residents' social and economic needs, and leads to greater resident satisfaction.

Urban planning policies and programmes should be viewed as subsidising instruments, in the same way that housing programmes can passively influence land values. At the national level of comprehensive planning control, housing policy should not only consider spatial use or housing unit cost, but extend to considerations of land use or securing zoning exemptions. For instance, vacant public land and spaces held by state authorities and agencies should be secured for affordable urban housing projects.

In conclusion, there are numerous factors to consider when building affordable low and lower-middle-income housing. While national minimum floor space standards are met, on average, across the settlements, there are various types of overcrowding across households, and in many cases the number of people per household exceeds what the home was built to accommodate. However, in-home density does not seem to have a bearing on satisfaction: this study shows that it is density at the level of the whole settlement which influences resident satisfaction. This reinforces the need to consider low-income housing beyond the housing unit itself, and to consider low-income housing projects as a whole; not just as a residence, but also a place of socio-economic importance, for both work opportunities and social relationships. Maximising land usage for housing projects in city centre areas (and elsewhere) should be balanced with the need to allow residents to participate in the design process, so that people's socio-economic needs are taken into account, rather than simply considering the minimum required building regulations.

References

Archer, D. 2010. Social capital and participatory slum upgrading in Bangkok, Thailand. PhD thesis, Cambridge University.

Boonyabancha, S. 2005. Baan Mankong: Going to scale with "slum" and squatter upgrading in Thailand. *Environment and Urbanization* 17(1) 21-46.

Brown, T.,Bhatti, M. 2003. Whatever happened to "housing and the environment"? *Housing Studies* 18(4) 505-515.

Bullard, R.D. 2007. *Growing Smarter: Achieving Livable Communities, Environmental Justice, and Regional Equity*. MIT Press, Cambridge, MA.

CODI. 2005. *Baan MankongSangsanPattana 7-12 community, (Baan Mankong Chumchon Sangsan Pattana 7-12)*, 2548 (in Thai).

Department of Local Administration, 2004. *Low-income Housing Standard.*Research report submitted to National Housing Authority, 6-4 (In Thai, *มาตรฐานที่อยู่อาศัยสำหรับผู้มีรายได้น้อย*), available from http://www.dla.go.th/work/e_book/eb1/std210550/20/20.htm

DOLA (Department of Local Administration). 2006. Population and Housing. www.nso.go.th/en/indicator/soc/soc_poph08.pdf (accessed on 2 April 2009).

Giles, C. 2003. The autonomy of Thai housing policy, 1945-1996. *Habitat International* 27(2) 227-244.

Gruis, V. 2005. Financial and social returns in housing asset management: Theory and Dutch housing associations' practice. *Urban Studies* 48: 1503-1527.

Jenks, M, and Burgess. R. 2000.*Compact Cities: Sustainable Urban Forms for Developing Countries.* E & F.N. Spon, London.

Jenks, M., Burton, E., Williams, K. 1996. *The Compact City: A Sustainable Urban Form?* E. & F.N. Spon, London.

Kearns, A., Whitley, E., Mason, P., and Bond, L.2012. "Living the high life?" Residential, social and psychosocial outcomes for high-rise occupants in a deprived context, *Housing Studies* 27(1) 101, 117-118.

Latané, B. Liu, J., Nowak, A., Bonavento, M., Zheng, L. 1995. Distance matters: Physical space and social impact. *Personality and Social Psychology Bulletin* 21(8) 795-805.

Department of Local Administration, 2004. *Low-income Housing Standard.*Research report submitted to National Housing Authority, 6-4 (In Thai, *มาตรฐานที่อยู่อาศัยสำหรับผู้มีรายได้น้อย*), available from http://www.dla.go.th/work/e_book/eb1/std210550/20/20.htm

Petersen, M., Minnery, J. 2013. Understanding daily life of older people in a residential complex: The contribution of LeFebvre"s social space, *Housing Studies,*

Pinijvarasin, W., Ramasoot, S. 2010. Requirements of middle income families in the greater Bangkok area for single house characteristics. *Najua: Architecture, Design, and Built Environment* 25, 365-387.

Rabibhadana, Akin,1999. Crowded community: Knowledge and reality (*ชุมชนแออัด: องค์ความรู้กับความเป็นจริง)* Bangkok: Thailand Research Fund.

UN HABITAT 2006. *State of the World's Cities 2006/7*. Earthscan, London.

Usavagovitwong, N. 2012. Successful approaches to national slum upgrading and prevention, Thailand.Working Paper Series 7. CISR (Center for Integrated Socio-Spatial Research), Sripatum University, Thailand.

The World Bank, 2001. *Thailand Social Monitor: Poverty and Public Policy*, The World Bank, available from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2002/01/17/000094946_01120704070143/Rendered/PDF/multi0page.pdf

Yap, K. S. 1996. Low-income housing in a rapidly expanding urban economy, Bangkok 1985-1994. *Third World Planning Review* 18(3) 307-323.

Appendix 1. Sample survey questionnaire

Name of surveyor..... Date.....
Name of respondent..... Position.....
Address……
……..

Demographical data
Population and household characteristics
Please cross "X" in the black bracket ( )
1. Gender ( ) Male ( ) Female
2. Age..... years
3. Status ( ) Single ( ) Married ( ) Others
4. Educational level
( ) Primary school or lower ( ) Secondary school ( ) Professional school
( ) Bachelor degree ( ) Master degree ( ) Doctorate degree
( ) Non-education

5. Career
( ) Civil servant ( ) Private employee
( ) Professional career ie. physician, lawyer
( ) Business owner ( ) Merchant ( ) Freelancer
( ) Self-employed ( ) Student ( ) Unemployed
( ) Retired / Housewife ( ) Others, please identify.....

6. Are you the family leader or spouse?
( ) Yes ( ) No

7. How many members in your family (including yourself) ..... persons
Please answer the following questions.
7.1 Number of female.....persons male.....persons
7.2 Age of family member
Less than or equal to 15 years old.....persons
16-30 years old.....persons
31-45 years old.....persons
46-60 years old.....persons
More than 60 years old.....persons
7.3 Number of working family members.....persons
7.4 Relationship to persons in the dwelling unit
( ) as family ( ) as friend ( ) Others.....

Economic data
8. Average household incomes.....THB / month
9. Average household expenses .....THB / month
10. Does your family generate household loans or debts?
( )No (switch to12)
Yes (1 choice)
( ) House mortgage..... ( ) Educational loan
( ) Car loan..... ( ) Business loan.....
( ) Electrical device..... ( ) Land loan

( ) Others.....

11. Sources of household loan/debt

( ) Bank / Financial institute ( ) Shark loan
( ) Friends ( ) Relatives / cousins
( ) Others .....

12. Does your family have savings?

( ) Yes ( ) No

Social data

13. How long have you and your family been living here? .....years

14. Have you or your family members engage in any social group / association? (more than one)

( ) Neighbourhood committee ( ) Savings group ( ) Cooperatives
( ) Career group, please indicate.....
( ) Sport and leisure group ( ) Housewife / women group
( ) Festivity group ( ) Youth group
( ) Religion group ( ) Other group.....
( ) Not involve

15. How does your neighbourhood members communicate?

( ) Announcement board ( ) Radio ( ) Newsletter
( ) Rumour ( ) Others_____

16. Please cross "X" to express your opinions over the following items

	High	Fairly high	Fair	Little	Very little or never
Level of neighbour relationship inside your neighbourhood					
Quarrel with your neighbours					
Frequency of lending (things)					
Frequency of borrowing (things)					
Frequency of lending (money)					
Frequency of borrowing (money)					
Visiting between you and neighbours					
Passing your home to neighbours					
Passing your children to neighbours					
Community activity involvement					
How safe do you think your neighbourhood is?					
Overall preference of your living environments in the neighbourhood					

Physical and Housing data

17. Where is your original place? (Please indicate province)

( ) Bangkok and periphery.....
( ) Central / Eastern region.....

( ) Northern region.....
( ) Northeastern region.....
( ) Southern region.....

18. Do you have any other residence?
( ) Yes, please indicate..... ( ) No

19. What are the other purposes in your home utilization?
( ) For being residence only ( ) For being residence and home-based occupation
( ) For being residence and rental ( ) For being rent only
( ) Others_____

20. Plot size .....Sq. Wah
21. Unit area .....sq.m.
22. Tenure characteristics
( ) Owned and occupied ( ) Occupied without rent
( ) Private rent ..... THB/month
( ) Public rent (please identify the agency) .....THB/month
( ) Others.....

Health data

23. How much do you and your family members pay for health and medicine expenses?.....THB/month
24. How often do you and your family members have a medical service?
( ) Never ( ) 1-2 times/year ( ) 1-2 times/month ( ) more than 1 time per month
25. Since living in the neighbourhood, have you paid more expenses for medical services?
( ) Yes ( ) No
26. If yes, what do you think the cause is?
( ) More expensive than the former residence
( ) More illness
( ) The medical service centre is remote
27 Normally, where do you have sport or exercise?
( ) Normally, I have never play sport and exercise
( ) Use the neighbourhood facilities
( ) Use somewhere outside the neighbourhood

Governmental relationship data

28. Do you and your family members have contact with any government agency? (able to answer more than one)
( ) Not at all
( ) District office ( ) BMA / District council member ( ) Member of Parliament
( ) National Housing Authority ( ) Community Organization Development Institute
( ) Others .....

29. How often have you ever demand for government agency?
( ) Every week ( ) A few times per month ( ) Once a month
( ) Once every few months ( ) Once in 4-6 months ( ) Once a year
( ) Never

30. In which items have you ever supported from government agency?
.....
.....
.....

Preference data

31. Please cross "X" according to your opinion on the following questions

	High	Fairly high	Moderate	Little	Very little
Physical aspect					
Preference on plot and shelter size					
Preference on living environments					
Preference on public spaces					
Preference on infrastructure and services					
Preference on sanitation					
Preference on waste collection					
Social aspect					
Preference to neighbours					
Preference to social condition and neighbourhood					
Preference to community and property safety					
Preference to childhood environments					
Economic aspect					
Preference on transportation and communication					
Preference on job opportunities and working environments					

Thank you very much

Recent publications by IIED's Human Settlements Group

WORKING PAPER SERIES

All working papers can be downloaded at no charge. For a complete list, see http://pubs.iied.org/search.php?s=HSWP

URBAN POVERTY

Getting the Engagement of Local Institutions in the UN Development Agenda Post-2015 - David Satterthwaite, Sheridan Bartlett, Yves Cabannes and Donald Brown (2013)

A future that low-income urban dwellers want, and can help secure - *David Satterthwaite and Diana Mitlin (2013)*

Urban poverty, food security and climate change - *Cecilia Tacoli with Budoor Bukhari and Susannah Fisher (2013)*

Urbanization, gender and urban poverty: paid work and unpaid carework in the city – Cecilia Tacoli (2012)

Engaging with the urban poor and their organizations for poverty reduction and urban governance: An issues paper for the United Nations Development Programme - David Satterthwaite, Diana Mitlin and Sheela Patel (2011)

Appropriateness of the Sri Lanka poverty line for measuring urban poverty: The case of Colombo - Kulasabanathan Romeshun and Geetha Mayadunne (2011)

Capital, capacities and collaboration: the multiple roles of community savings in addressing urban poverty – Diana Mitlin, David Satterthwaite and Sheridan Bartlett (2011)

Understanding pro-poor housing finance in Malawi - Mtafu A.Z. Manda, Siku Nkhoma and Diana Mitlin (2011)

Interrogating Urban Poverty Lines – the Case of Zambia - Miniva Chibuye (2011)

Assessing the Scale and Nature of Urban Poverty in Buenos Aires – Jorgelina Hardoy with Florencia Almansi (2011)

Urban Poor Funds; Development by the People for the People – Diana Mitlin (2008)

Catalysing Pro-Poor Development; the Role of Savings and Savings Organizations: Key Issues arising from an International Workshop on Housing Finance and Poverty – Diana Mitlin (2005)

The Under-estimation of Urban Poverty in Low- and Middle-income Nations – David Satterthwaite (2004)

RURAL–URBAN

Urban poverty, food security and climate change - *Cecilia Tacoli with Budoor Bukhari and Susannah Fisher (2013)*

International migration and over-indebtedness: the case of Filipino workers in Italy - Charito Basa, Violeta De Guzman and Sabrina Marchetti (2012)

Climate change, adaptation strategies and mobility: evidence from four settlements in Senegal / *Changements climatiques, stratégies d'adaptation et mobilités. Evidence à partir de quatre sites au Sénégal*- Mohamadou Sall, Al Assane Samb, Serigne Mansour Tall and Aly Tandian (2011)

Rural migration in Bolivia: the impact of climate change, economic crisis and state policy - Carlos Balderrama Mariscal, Nico Tassi, Ana Rubena Miranda, Lucía Aramayo Canedo, Iván Cazorla (2011)

Not only climate change: mobility, vulnerability and socio-economic transformations in environmentally fragile areas in Bolivia, Senegal and Tanzania – Cecilia Tacoli (2011)

International Migration, Social Change and Local Governance in Ourossogui and Louga, Two Small Urban Centres in Senegal – Mohamadou Sall, Serigne Mansour Tall, Aly Tandian, Al Assane Samb, Abdou Khadre Sano and Souleymane Sylla (2010)

Migration, Local Development and Governance in Small Towns: Two Examples from the Philippines – Charito Basa and Lorna Villamil with Violeta de Guzman (2009)

Migration and Small Towns in China: Power Hierarchy and Resource Allocation – Bingqin Li and Xiangsheng An (2009)

Migration and Small Towns in Pakistan – Arif Hasan and Mansoor Raza (2009)

Rural-Urban Migration in China: Policy Options for Economic Growth, Environmental Sustainability and Equity – Gordon McGranahan and Cecilia Tacoli (2006)

Livelihood Diversification and Rural–Urban Linkages in Vietnam's Red River Delta – Anh, Dang Nguyen, Hoang Xuan Thanh and Cecilia Tacoli (2005)

Rural–Urban Change, Boundary Problems and Environmental Burdens – Gordon McGranahan,
David Satterthwaite and Cecilia Tacoli (2004)

WATER AND SANITATION

Groundwater, Self-supply and Poor Urban Dwellers: A Review with Case studies of Bangalore and Lusaka – Jenny T. Gronwall, Martin Mulenga and Gordon McGranahan (2010)

Urban Water and Sanitation in Ghana: How Local Action is Making a Difference - Kanton I. Osumanu, Lukman Abdul-Rahim, Jacob Songsore and Farouk R. Braimah with Martin Mulenga (2010)

Improving Water and Sanitation Provision in Buenos Aires: What can a Research-oriented NGO do? – Florencia Almansi, Ana Hardoy and Jorgelina Hardoy (2010)

Water Service Provision for the Peri-urban Poor in Post-conflict Angola – Allan Cain and Martin Mulenga (2009)

Water and Sanitation in Urban Malawi: can the Millennium Development Goals be Met? A Study of Informal Settlements in Three Cities – Mtafu A. Zeleza Manda (2009)

Lessons from Karachi: The role of Demonstration, Documentation, Mapping and Relationship Building in Advocacy for Improved Urban Sanitation and Water Services – Arif Pervaiz, Perween Rahman and Arif Hasan (2008)

Governance and Getting the Private Sector to Provide Better Water and Sanitation Services to the Urban Poor – Gordon McGranahan and David Satterthwaite (2006)

URBAN CHANGE

Africa's Urban Transition and the Role of Regional Collaboration – Gordon McGranahan, Diana Mitlin, David Satterthwaite, Cecilia Tacoli and Ivan Turok (2009)

The Transition to a Predominantly Urban World and its Underpinnings – David Satterthwaite (2007)

Urban Environments, Wealth and Health: Shifting Burdens and Possible Responses in Low and Middle-income Nations – Gordon McGranahan (2007)

Outside the Large Cities: the Demographic Importance of Small Urban Centres and Large Villages in Africa, Asia and Latin America – David Satterthwaite (2006)

A Pro-poor Urban Agenda for Africa; Clarifying Ecological and Development Issues for Poor and Vulnerable Populations. A Report for the Ford Foundation - Joel Bolnick, Happy M Kayuni , Richard Mabala, Gordon McGranahan, Diana Mitlin, Sikhulile Nkhoma, John Oucho, Amal Sabri, Sarah Sabry, David Satterthwaite, Mark Swilling, Cecilia Tacoli, Richard I C Tambulasi and Mirjam van Donk (2006)

CLIMATE CHANGE AND CITIES

Understanding the nature and scale of urban risk in low- and middle-income countries and its implications for humanitarian preparedness, planning and response - David Dodman, Donald Brown, Katie Francis, Jorgelina Hardoy, Cassidy Johnson and David Satterthwaite (2013)

Urban poverty, food security and climate change - *Cecilia Tacoli with Budoor Bukhari and Susannah Fisher (2013)*

Climate change impacts, vulnerability and adaptation in Zimbabwe – Donald Brown, Rabecca Rance Chanakira, Kudzai Chatiza, Mutuso Dhliwayo, David Dodman, Medicine Masiiwa, Davison Muchadenyika, Prisca Mugabe and Sherpard Zvigadza (2012)

Community-driven Disaster Intervention: Experiences of the Homeless People's Federation Philippines, Incorporated (HPFPI) – Jason Christopher Rayos Co (2010)

Towards Pro-poor Adaptation to Climate Change in the Urban Centres of Low and Middle-income Countries – Caroline Moser and David Satterthwaite (2008)

Climate Change and Urban Children: Impacts and Implications for Adaptation in Low and Middle-Income Nations – Sheridan Bartlett (2008)

Adapting to Climate Change in Urban Areas: the Possibilities and Constraints in Low- and Middle-income Nations – David Satterthwaite, Saleemul Huq, Hannah Reid, Mark Pelling and Patricia Romero Lankao (2007)

URBANIZATION & EMERGING POPULATION ISSUES (Joint series with the United Nations Population Fund)
Land ownership, control and contestation in Karachi and implications for low-income housing - Arif Hasan, Noman Ahmed, Mansoor Raza, Asiya Sadiq, Saeed ud Din Ahmed and Moizza B. Sarwar (2013)

Urbanization and development: Policy lessons from the BRICS experience – Gordon McGranahan and George Martine (2012)

Russian urbanization in the soviet and post-soviet eras – Charles Becker, S Joshua Mendelsohn and Kseniya Benderskaya (2012)

Urbanisation and Development in South Africa: Economic Imperatives, Spatial Distortions and Strategic Responses – Ivan Turok (2012)

Urbanization, gender and urban poverty: paid work and unpaid carework in the city – Cecilia Tacoli (2012)

Trends and Processes of Urbanisation in India - Amitabh Kundu (2011)
China's Post-Reform Urbanization: Retrospect, Policies and Trends - Anthony G.O. Yeh, Jiang Xu and Kaizhi Liu (2011)

Brazil's Early Urban Transition: What can it Teach Urbanizing Countries? – George Martine and Gordon McGranahan (2010)

Planning for High Density in Low-income Settlements: Four Case Studies from Karachi – Arif Hasan, Asiya Sadiq and Suneela Ahmed (2010)

The Food Price Crisis and Urban Food (in)security – Marc J. Cohen and James L. Garrett (2009)

Is Urbanization Contributing to Higher Food Prices? – Jesper Stage, Jørn Stage and Gordon McGranahan (2009)

OTHER HUMAN SETTLEMENTS PUBLICATIONS
The Demography of Adaptation to Climate Change – George Martine and Daniel Schensul (2013) (a joint UNFPA-IIED and El Colegio de Mexico publication)

Assessing the Costs of Adaptation to Climate Change. A Review of the UNFCCC and Other Estimates - Martin Parry, Nigel Arnell, Pam Berry, David Dodman, Samuel Fankhauser, Chris Hope, Sari Kovats, Robert Nicholls, David Satterthwaite, Richard Tiffin and Tim Wheeler (2009)

Population Dynamics and Climate Change edited by José Miguel Guzmán, George Martine, Gordon McGranahan, Daniel Schensul and Cecilia Tacoli (2009) (A joint UNFPA-IIED publication)

BOOKS
Reducing Urban Poverty in the Global South by David Satterthwaite and Diana Mitlin (2013)

Urban Poverty in the Global South by Diana Mitlin and David Satterthwaite (2013)

Adapting Cities to Climate Change: Understanding and Addressing the Development Challenges, edited by Jane Bicknell, David Dodman and David Satterthwaite (2009)

The New Global Frontier: Urbanization, Poverty and Environment in the 21st Century, edited by George Martine, Gordon McGranahan, Mark Montgomery and Rogelio Fernández-Castilla (2008)

Scaling Urban Environmental Challenges; From Local to Global and Back, edited by Peter J Marcotullio and Gordon McGranahan (2007)

The Earthscan Reader on Rural–Urban Linkages, edited by Cecilia Tacoli (2006)

Empowering Squatter Citizen: Local Government, Civil Society and Urban Poverty Reduction, edited by Diana Mitlin and David Satterthwaite (2004)

The Citizens at Risk: From Urban Sanitation to Sustainable Cities – Gordon McGranahan, Pedro Jacobi, Jacob Songsore, Charles Surjadi and Marianne Kjellén (2001)

Environmental Problems in an Urbanizing World: Finding Solutions for Cities in Africa, Asia and Latin America – Jorge E Hardoy, Diana Mitlin and David Satterthwaite (2001)

The Earthscan Reader in Sustainable Cities, edited by David Satterthwaite (1999)

Squatter Citizen: Life in the Urban Third World – Jorge E Hardoy and David Satterthwaite (1989)

ENVIRONMENT AND URBANIZATION

A twice-yearly journal published since 1989, this is one of the most cited and widely distributed international journals on urban issues. Each issue has a special theme and includes 9–14 papers and some include a guide to the literature on that theme. It also has a special section of papers on climate change and cities (since 2007), profiles of innovative NGOs (in some issues) and Book Notes – which includes summaries of new books, research reports and newsletters and how these can be obtained (including those in Spanish, French and Portuguese).

For more details, see http://www.environmentandurbanization.org/

The online edition is at http://eandu.sagepub.com/ The full text of all papers in all issues (from the first issue in 1989) are available on-line at this site and all but the issues from the last two years are available at no charge. From this site, subscriptions and back issues can be purchased and searches made. There is also a list with the theme of each issue.

Environment and Urbanization Briefs: A five page summary of each issue of Environment and Urbanization is available in print and electronically; to receive this, e-mail Hannah.Bywaters@iied.org. All Briefs can be downloaded from http://pubs.iied.org/search.php?s=EUB

Please contact humans@iied.org for any publication queries or to request copies.

Cover design: **Smith+Bell** www.smithplusbell.com

HUMAN SETTLEMENTS GROUP

IIED is an independent, non-profit organisation promoting sustainable patterns of world development through collaborative research, policy studies, networking and knowledge dissemination. **The Human Settlements Group** works with partners to help establish better governed, more sustainable cities in low- and middle-income nations, able to offer secure shelter, access to services and reduced vulnerability to environmental hazards.

The work of the Human Settlements Group is organised under the following objectives:

- **Achieving socially and environmentally beneficial urbanisation**
- **Reducing urban poverty**
- **Adapting cities to climate change**
- **Securing rural-urban synergies**

The Group publishes the international journal *Environment and Urbanization*, Working Paper Series and books on urban environment and development issues, as well as a wide variety of articles in academic and other journals.

The Group has longstanding links with an affiliate organisation, IIED-América Latina in Buenos Aires, Argentina, as well as a number of long term partners in other cities in Asia, Africa and Latin America.

Downloadable publications as well as other communications can be accessed at **www.iied.org**

iied

International Institute for
Environment and Development (IIED)
80-86 Gray's Inn Road,
London WC1X 8NH, UK

Housing density and housing preference in Bangkok's low-income settlements