The planning of public housing sites in Bangkok

Rob den Haan / Ron van de Kuilen

Faculty of Civil Engineering
Department Planning, Design and Organization

Delft University of Technology
Part III
CHAPTER 6. CONCLUSIONS

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Preface

In almost every developing country across the globe major cities are confronted with high rates of growth and a rapidly expanding urban area. Usually, and despite strong government efforts, utilities and services lag behind. Apparently these developments are, in absence of strong regulatory instruments, taking place "autonomously". However, infrastructure investments, which are usually a government activity, appear to be of major influence on the structure and pattern of growth of cities.

Methods to appraise these investments, in addition to the scrutiny in financial and/or economical terms, also in terms of second and third order effects are still in their infancy.

This book does not aim to review the available methods, but wants to exemplify the potential use of the multi-criteria-evaluation method in planning problems in a practical situation. This qualitative appraisal method, developed in recent years, is highly suitable for assessing multi-order impact investments.

Housing is a prime consumer of a single, eventually utmost, scarce commodity: land. The use of this commodity in time and location is highly affecting the efficiency and effectiveness of infrastructure investments.

To the resident-family a house, in relation to its urban and physical environment, holds many functions.

In this book, the result of a thesis-research conducted in Bangkok for the National Housing Authority, it is attempted to incorporate both points of view in one single method of appraisal of locations for public housing.

Adapted versions could be made applicable to infrastructure provision agencies, private housing developers and real estate investors.

Prof. ir. H. Wiggerts
Acknowledgement

This study would not have been possible without the help of numerous people and institutions; hereby we would like to thank them all for their kind co-operation. Our special thanks we would like to express to the following persons:

Khun Pree Buranasiri, assistant-governor of the National Housing Authority, who invited us to take part in the study-programme of the NHA/CHHSS and for his explanations on the many aspects of providing public housing in Thailand.

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Last but not least we would like to recommend TT Guesthouse, in which we enjoyed a simple, but homely stay for six months.
Abbreviations

ADAB  Australian Development Assistance Bureau
ADB  Asian Development Bank
BMA  Bangkok Metropolitan Administration
BMR  Bangkok Metropolitan Region
BMTA  Bangkok Mass Transit Authority
CBA  Central Business Area
CHHSS  Centre for Housing and Human Settlement Studies
DTCP  Department of Town and Country Planning
DUT  Delft University of Technology
ETA  Expressway and Rapid Transit Authority
GHB  Government Housing Bank
IBRD  International Bank for Reconstruction and Development / World Bank
IHS  Institute for Housing Studies
MWWA  Metropolitan WaterWorks Authority
NESDB  National Economic and Social Development Board
NHA  National Housing Authority
NUDB  National Urban Development Board
PWWA  Provincial WaterWorks Authority
RTG  Royal Thai Government
STTR  Short Term Urban Transport Review Study
US/AID  United States Agency for International Development

Measures and equivalents

1 rai = 1600 m$^2$
1 sq. wah = 4 m$^2$
1 m$^2$ = 0.25 sq. wah
1 ha. = 6.25 rai

Currency and equivalents (as per July 1985)

<table>
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INTRODUCTION

Background of the study.
Land suitable for developing public housing is becoming increasingly scarce to obtain in Bangkok, at least at a reasonable (i.e. affordable) price. The consequent choice until now of the National Housing Authority has been to locate projects further away from the city-centre where land-prices are low(er). These locations appear to be less suitable for the target-group (i.e. low-income people) and more costly to develop.
The goal of this study was to select and evaluate locations for public housing, in relation to the priorities of the target-group, costs of land and the development of the location and urban development. During the course of the study the impact of infrastructure planning and development on the urban development and consequently on the locational possibilities for public housing appeared to be of major importance. At the same time an infrastructure study was conducted for the Bangkok Metropolitan Region (BMR). The choice of a location for developing public housing is an optimization in which previous relationships are of importance.

This resulted in a stronger emphasis on urban and infrastructure development as well as land management options. This stronger emphasis is reflected by the contents of the working papers and the BMR Housing Study reports, to which we have made some contributions.
Our original objective as stated in the preliminary report, identifying locations suitable for public housing, has consequently been worked out taking into account the findings of these reports and studies as far as appropriate.

Working method.
Following a period of familiarization with the major issues, policies and mechanisms concerning public housing and the urban planning and actual development of Bangkok, a part of our work-programme was carried out in Bangkok. The majority of the in total six months was spent at the office of the National Housing Authority / Centre for Housing and Human Settlement Studies.

To overcome the problem of limited interface between the authors and the local experts attempts were made to make optimal use of the time available. This was done in three ways:
- frequent informal discussions
- the writing of some internal working papers (see literature)
- the writing of contributions to the BMR Study (see literature).
The working papers were produced as internal memoranda, intended to discuss some issues of importance to NHA and urban development of Bangkok. These memoranda therefore form no part of this report, although parts and the results of discussions that followed were used in writing this report. The memoranda were also intended to contribute to the BMR Study.

Purpose and nature of the report.
Although we realize that this report is not easily accessible for readers from NGO-s and community organisations (let alone for low-income people), we hope they will benefit from our study since this has been our motivation for doing the study in the first place.
The purpose of this report is to summarize and discuss the relationship between urban development and public housing issues of importance to NHA. Urban development is in general restricting NHA's ability to acquire sufficient land to produce housing-units in accordance with the priorities of the targetted client-group. The main objective of this report is to contribute in some small way to NHA's immense task to house the urban poor. This is done by identifying and recommending locations for public housing development in relation to urban development and infrastructure planning and development, and implicitly by giving a method of assessment of locations.
INTRODUCTION

This report is also aimed at a wider readership, to the government departments charged with development co-ordination such as the National Economic and Social Development Board and also at the many government agencies who play a major role in the urban development process. We emphasise the need, and some possible ways, to address the urban development process and the land-use issue. The combination of comprehensive planning and land management -so urgently needed- requires the full co-operation of all agencies involved in urban development and infrastructure provision.

Four different aspects are interwoven in this report, which could have been dealt with separately:
1. urban development of Bangkok and related problems
2. the land- and housing-market, and the role of the public and private sectors
3. evaluation of the efforts of the National Housing Authority to fulfil the needs and wishes of low-income people
4. a strategy for appraisal and selection of public housing sites, by finding an optimum between suitability and costs.

The reasons for combining these aspects in one volume are, firstly to put emphasis on the interrelationships between these aspects, and secondly to publish a reference book for use by interested Dutch organisations and the Delft University of Technology in particular.

Outline of the report.

In combining the subjects of public housing and urban development in Bangkok, and in describing their relationships, our report has become somewhat complex and confused. To help the reader, we have split up the reports in three parts; furthermore we have summarized each chapter in the last section of that chapter. Only for chapter 5 however, the conclusions are described in chapter 6.

The outline of the report is as follows.

Part I: This first section of the report describes the urban development issues in relation to the BMR Study and the presently foreseen infrastructure investments (chapter 1), which also form the input for an assessment of possible low-income housing locations. Chapter 2 and 3 describe the low-income housing development issues and set the focus for the remaining part of the report.

Part II: This section of the report identifies the priorities of the targetted client-group of public housing and possibilities to reduce the costs of providing this housing (chapter 4) while chapter 5 gives an appraisal (including the method) of several possible locations.

Part III: This final section summarizes the urban development and public housing issues and contains recommendations concerning the location of new public housing projects within present land-acquisition procedures. Alternative acquisition/development procedures, which are also of importance to address the urban development process, are highlighted as important but requiring further investigation.

In conclusion it must be emphasized that the views expressed throughout this report are those of the authors alone and do not represent official policy statements.
CHAPTER 1 THE DEVELOPMENT OF BANGKOK

1.1. Introduction

Thailand's capital Bangkok, founded as such in 1782 and located in the central plain (see figure 1.1), started out as a fishing village but is nowadays a sprawling metropolis beset by serious problems -obvious to even a visitor- as traffic congestion, slums, noise, air- and water-pollution. It does not need much professional planning expertise to sense that the city suffers from tremendous development problems while its economy is moving fast, for the better or worse.

However this is a lop-sided impression; a visitor is also bound to notice the splendour of the royal traditions, the fascinating combination of an oriental and modern-cosmopolitan city, the extremely active population and its economic potential.

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Position of Bangkok within Thailand.

Bangkok with its 6 million inhabitants is an excellent example of a primate city and is about 50 times larger than the largest regional city<1>. Not only the governmental, cultural, educational and financial centres can be found here, but also the largest harbour (over 90% of the country's imports and exports pass through it<2>) and a concentration of industry and trade (38% of the industrial firms are located in the BMA and about 45% in the BMR, while 32% of the gross domestic output and about half of value added was generated in Bangkok<3>). Other indications for Bangkok's primacy are the electricity consumption, which is 5 times higher than elsewhere in Thailand, the telephone connections and the motor vehicle registrations, which are respectively 5.4 and 3.5 times the national average. As motor of the national economy Bangkok pulls investments and people, resulting in a development-pressure and relatively high growth. The standard of living in Bangkok is significantly higher (per capita incomes are about 2.5 times the national average<4>) and the opportunity to obtain a job,
especially in the informal sector, is higher than elsewhere in Thailand. The Bangkok Metropolitan Region is furthermore a large producer of agricultural products, although the share in total output is declining.

Defining the city limits and the metropolitan administration.

Statistics and reports refer to a set of areas defined as Bangkok:
- Bangkok, Krung Thep-Thonburi, or Bangkok Metropolis, as defined by the administrative boundary of the Bangkok Metropolitan Administration (BMA); the two former changwats (provinces) Phra Nakhon and Thonburi were amalgamated in 1972 to form the BMA. The area does not completely cover the built-up area of the city, while on the other hand it comprises large tracts of (semi-)rural land.
- The Greater Bangkok Area, first used in 1960 in the first comprehensive development plan, is often referred to for planning and statistical purposes. The term is used to identify the area covered by the BMA and the changwats of Nonthaburi and Samut Prakan. Because of the, more recent, large urban overspill in the north sometimes the changwat Pathum Thani is also indicated by this term.
- Bangkok Metropolitan Region (BMR) is a term which refers to an area of some 9,700 km² which consists of the BMA, Samut Prakan, Pathum Thani, Nonthaburi, Nakhon Pathom and Samut Sakhon. The area contains the metropolis, its vicinity towns and large tracts of rural land, and is mainly focussed on for regional planning purposes.

As can be noticed from the map (figure 1.2) not one single definition renders satisfactory statistical figures. Primary reason is that the definitions are based on administrative boundaries rather than functional boundaries. Figures concerning population size, etc. can at best be more or less accurate indications of the real magnitude. There is no administrative body that covers the entire metropolitan area. The area of jurisdiction of the official local government body, the BMA, is short of the actual metropolitan area.

The Bangkok Metropolitan Administration, governed by the 1975 BMA Act, has a special status and is an "Independent Agency", while the other changwats, which share parts of the metropolitan area (Nonthaburi, Pathum Thani and Samut Prakan), fall under the Ministry of Interior. Up to November 1985 the Governor of the BMA was appointed by the Minister of Interior; nowadays an elected Governor rules the affairs of the BMA. Formally the local government is taken care of by the district (amphoe or khet) councils, which are formed by elected persons and which has independent policy-making and budgetting agencies. The BMA has 24 districts (khets) which are further subdivided in sub-districts (tambons). The district offices are responsible for household registration, personal identification cards and provision of services: garbage collection and disposal and maintenance of the drainage-system. In practice the councils do not have the suggested independency, because they entirely depend on the BMA for finance and are thus in effect the implementing organs of the BMA.

1.2. Problems due to the quick and uncontrollable growth

The explosive growth of Bangkok in the fifties and sixties (see figure 1.4) and the (quick) rising industrialization have created serious capacity problems. Services, utilities and infrastructure lagged behind due to a lack of policy and money, but also due to the uncoordinated, space-squandering character of that growth of which the external costs were put on the shoulders of the public authorities.

The growth occurred along the main transportation-axes and was mainly ruled by free-market processes; the efforts of the authorities were limited to following the demand. The conversion of paddy land into urban land followed the growing network of major roads, with a marked tendency towards ribbon development resulting in a sprawling, haphazardly developed suburbia (see figure 1.3). Without hardly any government intervention (other than, indirectly, by
The development of Bangkok

opening new areas by road construction) this process takes place whenever the private owners
decide to subdivide or develop their land.\(^5\).

In the seventies growth continued unlimited, but at the same time the texture of the city
changed due to enlargement of scale and specialization in the secondary and tertiary sectors.
The original multifunctional city-structure is replaced by a segregated and devided pattern.
Department stores, offices and condominiums have replaced small shops, craft-industry and
cheap houses. The industries are located in or relocated to the urban fringe at a large
distance from the labour-quarters surrounding the centre. The higher middle class, mainly
working in the centre, lives in new monofunctional suburbs. The imbalance between living and
working place is growing worse.

In the inner city the developments and problems reinforce each other. The rise of a Central
Business Area goes hand in hand with a growing traffic congestion, resulting in a reaction of
an even higher concentration of functions. The high land-prices and speculation lead to
dowfall of the housing stock ("urban redevelopment blight\(^6\)) and eviction of the semi-legal
slum settlements. In the eighties we see the rise of condominiums and corporate sector busi­
ness, as well as the beginning of gentrification in Chinatown.

At the moment the biggest growth seems to be past; the Metropolis Bangkok is concluding a
period of explosive growth. At present the growth rate is estimated to be around 3% per annum,
largely due to natural growth of the young population.\(^7\). The Bangkok region (BMR) still has,
compared to Thailand, a high growth-rate (respectively 3% and 1.9% per annum), while the other
urban areas in the region (Samut Sakhon, Nakhon Pathom and Pathum Thani) have an estimated
growth rate of 4.8% per annum.\(^8\). Clearly a part of the growth has been taken over by these
vicinity towns.

The problems this development, in combination with its pace and scale, has caused are:

1. Traffic congestion and stagnating public transport.
The limited road network, the fast growing number of motor vehicles, the growing imbalance
between working and living place as well as the absence of a secondary road system makes
Bangkok almost a synonym for "a permanent traffic congestion". The road hierarchy is
incomplete at all levels, including missing links in the primary system, but is most severe
at the secondary, distributor and access levels. These deficiencies increase journey dis­
tances and congestion. Further public transport in Bangkok is inadequate, both in terms of
capacity and quality.

2. Environmental degradation.
As a result of the enormous traffic flows, combined with a growing industrial output, the
air pollution reaches unhealthy levels while the traffic also creates a noise level beyond
bearing. Surface water as well as the soil are polluted due to the absence of a sewerage
system and the limited effectivity of refuge collection. Surprisingly no major outbreaks,
like typhoid and cholera epedemics, have taken place.

3. Shortage of piped drinking-water.
Only 60% of the population has access to the central water-supply system. Surface water
necessary to make drinking water from is scarce (in the dry season), or strongly polluted.
A large amount of the treated water (40%) is lost in the system; losses of 25% are con­sidered to be normal.
Groundwater, abstracted by individuals, is becoming more and more brackish and/or unsafe,
while the extent of abstractions is causing high rates of land subsidence. For both reasons
many deepwells will have to be closed and/or replaced in the near future.

4. Floods.
The city extensions in the past have almost entirely taken place on low-lyin g, marshy paddy
fields. The only considerations of private developers and individuals were and are the
price of land and its accessibility.
The klongs, the drainage (and irrigation) system for long, have been filled up, or are
silted due to the absence of a sewerage system and refuge collection as well as too little
maintenance. Last but not least: the high rate of land subsidence is worsening the situ­
5. Housing. (see chapter 2.)

A serious housing shortage, in numbers, quality of the house and, more important, the environment as well as location, affects the position of a large share of the population.

Related problems.

The backlog in the several infrastructure and utilities systems require major (public) investments. The efforts of the several authorities, state enterprises and ad-hoc committees (see section 1.4 for the plans) to address these strongly interrelated problems are eroded by:

1. The lack of financial resources.

The austerity policy of the government has already resulted in the postponement of several major investments. Financial viability, cost-recovery and short-term improvements and effects are becoming increasingly important for the authorities to obtain financial resources from the central government. The BMA has little means of its own (only 15% of the total government allocations for Bangkok is spent by the BMA), due to arrears in tax payments, inadequate levies and an obsolete register of land and real property.

2. "Holes in the urban fabric" and under-utilized land; the low land-use efficiency and the absence of control.

Overlooking the built-up area of Bangkok some matters are eye-catching (see figure 1.3):
- large tracts of idle, unserviced land within the urban area
- the absence of secondary road infrastructure and the erratic development pattern
- the large number of accessible, serviced lots which remain unused.

This under-utilization of available, sometimes readily developable, land contributes to diseconomies and creates:
- social costs, especially in commuting and unbalanced public transport services.
- higher than necessary public investments in primary roads, drinking water (especially the main pipe system) and future sewerage and mass transit systems, while the inability to structure the land-use is likely to create huge extra investments in the drainage and flood protection.

Kammeier explains the cause for this under-utilization as follows:

"In summing up this brief review of major deficiencies of urban development, their common root causes appear to be fairly obvious. Most of the land, especially in the fringe areas, is privately owned, and ownership rights are sacrosanct. Thus the urban development processes are dominated by actions and reactions of the private land market. In this almost undisturbed laisser-faire situation, the enormous betterment values, typically by improvements in accessibility and other public infrastructure, accrue to the private land owners; on the other hand, the social costs of speculation and leapfrog development are passed on to the public agencies in charge of infrastructure provision and, lastly, to the taxpayer".

The problem of under-utilization, with mentioned consequences, affects approximately 350 km² of urban land, equivalent to 40% of the present urban area and capable of absorbing some 3.5 million people.

3. Lack of co-ordination and planning.

With the exception of sanitation and drainage, for which the BMA has sole responsibility, all major public services in Bangkok are either provided by both local and central government, with the latter assuming the lion's share (see figure 1.5). Many of the public services and infrastructure are provided by state enterprises, which have as a first objective to provide these services in a financially sound way. Six central government ministries (Interior, Communications, Health, Education, Industry and Justice) and a series of state enterprises (directed by appointed governors) solely provide for: fire protection, public safety, public transportation, public housing, town planning, utilities and pollution control. Major investments are primarily financially and project-wise reviewed by
figure 1.2 Administrative boundaries Bangkok Metropolitan Region

- . - Changwat (province) boundary

Built-up area

scale 1:400,000
figure 1.2 Administrative boundaries Bangkok Metropolitan Region
Figure 1.3: Examples of "holes in the urban fabric" and under-utilized land.

Aerial photo composition and partial interpretation of the Bangkapi district (northeastern suburban Bangkok)

- main road
- railroad
- klong
V larger tract of vacant land
L land subdivision occupied
L' land subdivision partly unoccupied
P private development project
S shophouse project
K klong settlement
N NHA public housing (flats)
U university
R recreational facility

Scale 1:47,000

Source: Aerial photo composition by the Royal Thai Airforce, NHA and ITC.
figure 1.4 Population figures and projections.

<table>
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<th>BMR</th>
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<td>1985</td>
<td>5604</td>
<td>6531</td>
<td>7953</td>
<td>6401</td>
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<td>1990</td>
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<tr>
<td>2000</td>
<td>7702</td>
<td>9455</td>
<td>11378</td>
<td>9109</td>
</tr>
</tbody>
</table>

projections: population ('000)
growth rate annual (%)

year | BMA | GMBA | BMR | Urban Bangkok | BMA | BMR
-----|-----|------|-----|---------------|-----|-----
1985 | 5604 | 6531 | 7953 | 6401 | 2.9**| 3.0**
1990 | 6350 | 7610 | 9060 | 7317 | 2.5**| 2.6**
1995 | 7044 | 8528 | 10169| 8209 | 2.1**| 2.3**
2000 | 7702 | 9455 | 11378| 9109 | 1.8**| 2.2**

*: Figure refers to Greater Bangkok including Pathum Thani province.
**: Average annual growth rate in five-year period.

source: Figures 1-4: CHHSS/NHA
Population projections: NESDB, BMR-Study Interim Report
the National Economic and Social Development Board (NESDB), using only financial criteria. Most major public investments in Bangkok are financed with foreign loans and it is important for the RTG to control its foreign debts. The financial criteria however do not reflect the financial impact of (land-)market reactions to these investments, which sometimes creates high second order investments. This accounts especially for transport investments (34 authorities and committees are active in this field\(^{[18]}\)); road investments antedate the need for future investments in all types of infrastructure. Underestimation of this fact has contributed to the present backlogs.

The administrative structure is highly centralised, ill-co-ordinated and slow, and bound by complicated budgetary and legal procedures\(^{[19]}\). The central government practically rules the metropolitan affairs through (in exceptional cases) direct cabinet decisions, or (routinely) through a large number of central government agencies and state enterprises (directed by governors appointed by the Cabinet). In practice the BMA activities are limited to local administration, roads, primary education, public health, garbage collection and drainage. But even in these fields the central government frequently takes the lead, as for example in the current efforts towards flood protection (see figure 1.5). Affairs concerning the planning or administration of the metropolis beyond the boundaries of the BMA are assigned to ad-hoc forms of co-ordination or agreement\(^{[20]}\).

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**Figure 1.5** Departments, agencies and fields of operation (see also appendix 1).

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<thead>
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<th>Departments:</th>
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<tr>
<td><strong>Highways</strong></td>
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<td><strong>Royal Irrigation</strong></td>
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<td><strong>Town &amp; Country Planning</strong></td>
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<td><strong>Expressways &amp; Rapid Transit</strong></td>
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<td><strong>Metropolitan Waterworks Auth.</strong></td>
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\(*x:* field of operation of agency or department.*

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### 1.3. National and urban planning practice.

We have seen that in Bangkok the powers of control by the central government are almost unlimited, while local government is virtually absent. This puts the national cabinet into the role of the policy maker in Bangkok. Planning in Bangkok must therefore be seen in the context of national policy and plans. The RTG is primarily concerned with national interests, which in the last few years has meant a shift towards rural development. In the Fifth National Plan (1981-1986) the policy goals are clearly defined and can be summarised as follows\(^{[21]}\):

- Strengthening the agricultural sector
- Regionalisation of the urbanisation
- Limiting the growth of Bangkok.

Although a necessary move in the direction of a more balanced national development, the metropolitan area still requires continuous support to address problems like traffic, flood protection, garbage disposal and housing, to name a few. This need for attention for the
economie motor of the nation has been acknowledged and has resulted in a specific Bangkok Metropolitan Region Study as a base for the Sixth National Five-Year Plan (1986-1991) (see section 1.5).

Urban planning history: BMA, DTCP and NESDB.

Although the lay-out of the old city shows the existence of some form of planning, planning in the modern sense started only 26 years ago, both in terms of national economic and comprehensive city planning. 1959 was the year the National Economic Development Board was established. This important national planning agency, preparing the national Five-Year Plans and reviewing all major expenditures (primarily economical/financial), belongs to the Office of the Prime Minister and was renamed into National Economic and Social Development Board (NESDB) in 1973.

The first masterplan for Bangkok prepared by American consultants\(^{22}\), was presented in 1960. The plan foresaw a population of 4.5 million people in 1990 on 460 km\(^2\) land and used the concept of the concentric city. The city, however, soon grew bigger and in a different pattern. The plan was never officially adopted.

In 1962 the Department of Town and Country Planning (DTCP) was established as the central planning agency under the Ministry of Interior. Ever since its establishment the DTCP has revised and updated the plans for all Thai cities. To cut a 24-year long story short: none of the plans prepared for Bangkok by the DTCP has reached the status of a legally binding document and the plans strongly tend to follow the actual physical developments. Still some progress in urban planning can be noticed, especially in terms of co-ordination and this might be of importance for the future.

The Policy and Planning Dept. of the BMA prepared the second Bangkok Metropolitan Development Plan (1982-1986). This plan, like the first, is an inventory of existing plans and policies and their budgetary implications and is in line with the Fifth National Plan of the NESDB.

The second revision of the Greater Bangkok Plan, drawn up in conjunction with the Fourth Five-Year Plan (1976-1981), showed a marked change to a polynuclear structure with mass transit corridors and expressways. Although the plan was revoked in 1978, due to massive political objections against especially the intended zoning regulations, it meant a first form of co-ordination between the DTCP, BMA (City Planning Division) and NESDB\(^{23}\).

Metropolitan Area Structure Plan.

In a somewhat revised form this plan, stipulating the multinuclear concept even stronger, appeared in the Fifth Five-Year Plan (1981-1986, see map 1.6). The Metropolitan Area Structure Plan is still largely based on zoning regulations, but has no legal status. Its importance is given by the fact that the NESDB reviews the major expenditures and investments of all other authorities and state enterprises. As such the plan has a guiding function and has finally reached the agencies who previously simply ignored it. Still many do not comply with the plan, due to its non-legal status, or because they lack the instruments or resources.

In a review of the Metropolitan Area Structure Plan for the DTCP, Edwards notes that for the implementation of the plan, or any of its successors, a set of instruments is needed\(^{24}\):
- comprehensive land-use control measures
- measures to control, stimulate and redistribute economic activity
- infrastructure rationing and supply
- seed development; industrial and residential estates (e.g. Bang Plee Bang Bo new town), universities, distribution/transportation centres (airport/harbour) and government offices
- land management.

It is not necessary that all these instruments should be vested in one authority. More important is consensus among the agencies about goals and targets of development and timing of
figure 1.6 Metropolitan Area Structure Plan.

LEGEND

- GREEN AREA RESERVED FOR AGRICULTURAL PURPOSES
- LOW DENSITY URBAN AREA
- HIGH DENSITY URBAN AREA
- SETTLEMENT OUTSIDE FLOOD PROTECTION AREA (BUND)
- EXISTING INDUSTRIAL AREA
- INDUSTRIAL ESTATE
- HIGH DENSITY CENTRE
- BUND/DITCH AND DIKE (FLOOD PROTECTION SYSTEM)
- MAJOR BRIDGES
- RAILWAY LINES
- FUTURE RAILWAY LINES
- OUTER RING ROAD
- MASS TRANSIT ROUTES
- EXPRESSWAYS
- TRUCK TERMINALS
- PAHONYOTHIN STATION
- MAIN ROADS

SOURCE: 5th NATIONAL PLAN
implementation. However, most of the forementioned instruments are either not available or ineffective, while, according to the Fifth Plan, co-ordination has been far from ideal<sup>25</sup>.

Conclusion.
Although urban planning is gaining momentum, its position is still very weak. At present a study on the Bangkok Region (see section 1.5) for the Sixth Five-Year National Development Plan is conducted, which is primarily reviewing (financially and technically) planned infrastructure investments on a short-term base. The DTCP and BMA are not involved in this study.

The most important influence on the city's structure are the market reactions to public investments and agglomeration dis-economies. As long as there are no effective measures to intervene in the land market, the only available instruments are infrastructure investments, co-ordination of these investments by the NESDB and, to a lesser extent, seed development.

1.4. Infrastructural Plans.

Bangkok is confronted with a serious set of backlogs. Most of the plans, briefly described hereafter, deal with these backlogs. Infrastructure investments, being the only governmental intervention in the city's structure so far, are of major importance for the planning of the city as well as public housing locations. Roads and transport infrastructure are of major importance, while the absence of drinking-water supply is sometimes prohibitive.

Sewerage.
At present there is no central sewerage collection and treatment system, except in some housing projects developed by NHA. In the Bangkok Sewerage System Project Masterplan<sup>26</sup> a system for sewerage is proposed to be implemented in the future. For the flexibility of implementation of the plan a zoning is proposed. This has several advantages; the implementation can be staged and adapted to future needs and the costs for a complete system can be spread. Nevertheless, the total costs are very high (36,671 million Baht at 1980 constant prices) and cost-recovery is difficult, therefore the plan is not likely to be implemented in the near future.

Large parts of the Metropolis will be unserviced for quite some time; therefore a set of Interim Measures is proposed. These measures aim at improving existing systems (such as sludge collection, dredging and cleaning of drains and klongs), on a better control (especially on private septic tanks and cesspools) and on regulations. Each housing development, either public or private, should have treatment facilities for human excreta and sullage water. Enforcement of these interim measures will have a negative impact on the housing supply of private developers, especially where small projects are concerned. At the moment however only the National Housing Authority (NHA) is complying with these regulations, while enforcement is not pursued in the private development projects.

Flood protection and drainage.
Following the severe floodings of 1983 plans were devised to tackle the flooding and drainage problems effectively as well as to relieve immediate problems<sup>27</sup> (see map 1.7):
1. The City Core Project, covering 92 km<sup>2</sup> of the core area, is the first phase of the large scale flood protection scheme. The proposed polder system will be implemented from 1986 to 1990.
2. The Samut Prakan Sea Wall Project. This project is the embankment of the sea wall and the improvement of the klongs to divert occurring storm waters. It is partially implemented but has been stopped due to lack of financial resources.
3. The Greenbelt project, nearly completed, is in essence an embankment scheme of the eastern border of the metropolis and diverts flood to the Gulf of Siam, preventing the inflow of water during the rainy season.
4. The Chao Phraya River Water Lowering Plan (1986-1994). This plan consists of diverting the river waters to the Gulf by means of a by-pass canal along the eastern or western borders of the metropolis. At the same time river bank dyking from Ayutthaya down to Bangkok will be extended.

5. Urgent plans due to the 1983 floods. The plans consist of barriers, cofferdams and pumps and have a more or less temporary status.

6. The Masterplan for Flood Protection/Drainage Project in Eastern Suburban Bangkok. This plan proposes three large polders and makes use of the existing klongs to pump the water to the Chao Phraya. 20% of the total area of 260 km² is needed for retention of water. The project is scheduled to be completed by 2000.

7. A study on flood protection for the westbank (Thonburi).

The plans mentioned under 3 and 4 aim at blocking the inflow of flood waters into the area, while the plans 1, 2, 6 and 7 aim at flood protection and drainage. The urgent plans are integrated in the Masterplan(s).

For all plans the basic issue is cost-recovery. As shown in table 1.11, the private sector is not contributing directly to the flood protection investments, although it benefits enormously. The success of indirect contribution via taxes and fees will determine the speed of implementation.

Supply of drinking-water.

In map 1.8 the present service envelope of the Metropolitan Waterworks Authority (MWWA) and the Masterplan for extension are shown. According to this masterplan the water production and distribution will grow from 1,200,000 Cubic Metres per Day (CMD) in 1978 to 5,000,000 CMD in 2000. The total plan, then serving the total metropolitan population and area, is to be implemented in stages and phases. The first phase of stage 1 is to increase production capacity with 800,000 CMD and to increase the area served. The second phase should provide an extra capacity of 400,000 CMD and increase the area served to a total of 430 km². Rehabilitation of the present system should reduce losses to 30%.

Presently MWWA is closing its deepwells and pursues supply from surface water. Main source for surface water is the Chao Phraya and the possibility to extend MWWA’s service area will be limited by the availability of new resources of suitable surface water. This extension is not only desired to provide better quality and higher quantity in the presently serviced area (only 60% of the households is connected) but also to make the numerous private deepwells (especially those from industries) redundant.

Transportation.

Investments in new roads and public transport are planned by various departments and state enterprises. To co-ordinate these investments, the Short Term Urban Transport Review (STTR) made a detailed study on the transportation problems of Bangkok and gave some suggestions for improvement. These suggestions have been calculated and assumptions have been made regarding budget allocations for the next five years. Furthermore the study paid attention to cost-recovery and privatization to ease the burden on the public budget. Two major alternatives were chosen: the basic (125%) budget level and the 200% budget level (map 1.9), with reference to the 10.5 milliard Baht invested in the past five years.

The plans are directed to solve the following problems:
- removing bottle-necks and construction of missing links, to improve traffic in the urban areas
- new links and secondary roads, to improve the road network in the outer area
- improvement of public transport, to satisfy the demand for transport
- toll-zones in the inner-city to relief congestion and manage demand for road-space
- increased expenditure on distributor and access roads, to relief the primary roads and to improve accessibility of under-utilized areas.
THE DEVELOPMENT OF BANGKOK

Figure 1.7
Flood Protection and Drainage Plans

1. King's Dyke (implemented)
   Embankment of eastern Bangkok and several temporary measures
2. City Core project
   River dyking and drainage
3. Eastern Suburban Bangkok
   River dyking and drainage
4. Samut Prakan Works
   River dyking, Sea Wall and drainage
5. Eastern bypass/flood diversion channel and short cut channel (in study)
6. Western bypass/flood diversion channel (in study)
7. Thonburi project (in study)

Alignments of plans in study are only indicative.

- King's Dyke
- River dyking
- River dyking and Sea wall
- Flood diversion channel
- Short cut channel
- Polder dyking

Built-up area 1985

Scale 1 : 250,000

North
TUE DEVELOPHENT OF BANGKOK

Drinking Water Supply Plans

Area served by Metropolitan Waterworks Authority 1985 (by central water supply system)
West Bank: 120 km²
East Bank: 366 km²
Total: 486 km²

Extension service area 1985-1990
West Bank: 140 km²
East Bank: 530 km²
Total: 670 km²

Extension service area 1990-2000
West Bank: 187 km²
East Bank: 646 km²
Total: 833 km²

Service area separate systems 1985 (by Metropolitan and Provincial Waterworks Authorities)

Extension of service area separate systems

Built-up area 1985

scale 1 : 250,000
	north
figure 1.9
Transportation Plans; Highways, roads and bridges

Short Term Urban Transport Review Study

Basic Investment Programme:
projects (not indicated):
area traffic control
local road programme
traffic management programme

A project included in basic investment programme

Recommended Investment Programme:

Basic investment programme
B additional project included in recommended investment programme

Additional Highway Investments in BMR:
C project included in highway investment programme

For public transport see figure 1.10
A project included in basic investment programme
B project included in recommended investment programme
C project included in highway investment programme
P project recommended to be privatized

% % % % % % % %
committed investment
% % % % % % % % planned investment

— national highway
— main arteries

Built-up area 1985

scale 1 : 250,000

north
GOOD DEVELOPMENT OF BANGKOK

Figure 1.10
Transportation Plans: Public Transport

Short Term Urban Transport Review
Basic Investment Programme:
E project included in basic investment programme

Recommended Investment Programme:
G project included in recommended investment programme

Vegetation or agricultural land
Highway
Main arteries
Railway

scale 1: 100,000
north
The investments for the 125% budget level are for the major part committed, especially through the primary roads by the Department of Highways. The STTR-study recommends an accelerated implementation of secondary (BMA-) roads to increase land-use efficiency and to relieve the primary network. Other more ambitious highway-plans, like the widening of the Thonburi-Pak Tho Highway and the Outer Ringroad, are to be privatized; cost-recovery is realized with tolls.

A Traffic Improvement Programme (TRIP) is proposed using the basic principles of the (in terms of exploitation successful) Expressways system: Bangkokians who benefit by smooth traffic-flow are willing to pay a small fee for this. With the fee, the 200% budget level can be realized and public transport and other roads can be improved. The congested inner-city is to become a toll-zone which will reduce (through-)traffic and thus improve traffic-flow and the busservice in the city. The money from TRIP will be used for segregated Mass Transit lines, either by bus or by rail. The Expressway and Rapid Transit Authority (ETA) and STTR have both studied the most desirable alternatives for Mass Transit Systems and they are presented in map 1.10. These ambitious plans are depending for a great deal on the enthusiasm of the private sector over the plans and their willingness to invest in them. In general Mass Transit (like roads) are regarded as a public service and a subsidy to the economy. 

In spite of these plans and the new Expressways, traffic will increase faster than road capacity and in general congestion will get worse in 2000. New roads will attract new traffic. Mass Transit is necessary to satisfy the demand for public transport and also to take its share of private transport demand since the modal split will change; however this system will not be in operation before 1995.

All forementioned plans, with the exception of committed projects, are at the moment being reviewed.

1.5. The Bangkok Metropolitan Region Study.

Scope of the study.

The BMR-study, presently conducted by the National Economic and Social Development Board (NESDB), the World Bank (IBRD), the United States of America / Agency for International Development (US/AID) and the Australian Development Assistance Bureau (ADAB), is part of the preparation of the Sixth National Five-Year Plan and reviews all infrastructural (master-) plans financially, technically and spatial within the context of foreseeable growth of the population and the economy. The importance of the study consists of:

1. The guiding function it has on one of NESDB's daily activities: reviewing projects and major expenditures to advice the Cabinet.
2. Stipulating the relationship between public investments, market reactions (thus the pattern of development) and the need for second order public investments.
3. Generating ideas and methods for: financing public services (for instance: benificiaries should pay an increasing share, stimulation of private sector investments and privateisation), co-ordination and regulations.

The terms of reference of the BMR-study, as put up by the NESDB and the World Bank, posed four major questions:

1. Over the next 5 to 15 years, what will be the magnitude and composition of the growth of the BMR in terms of population and economic activity?
2. Within the BMR, where is growth likely to occur? How will the new growth of population be distributed? How will employment in manufacturing, commerce and services be distributed? How will public and private development costs vary by location within the BMR?
3. Given the magnitude and distribution of growth, what sectoral investments should have priority, with particular reference to the urban transport, housing, water supply and flood protection network?
4. How will it be possible to pay for the priority investments and other committed projects?
How should institutions be designed to co-ordinate the investments and service provision?

The objective of the BMR-study is to come to a financially sound five year investment programme with clear priorities, which contributes to a more efficient development of the metropolis and its region. "The approach taken here emphasizes the use of public investments in infrastructure to guide development. That this is feasible is demonstrated by the recent pattern of development in the region. Nevertheless, some modest regulatory impositions may be required for the proposed plan to succeed. The regulations of groundwater abstraction and restrictions on development in certain critical flood areas are prominent examples." This approach is a marked shift away from expressing the need of control over the land-use, as done in the Metropolitan Area Structure Plan.

The concentration in the BMR-study on financing and financial review of projects and plans, necessary in view of the limited economic growth and the fact that foreign loan repayment makes up almost 20% of the annual budget, inhibits the danger of overlooking important inter-relationships. The absence of a long-term view upon the development of Bangkok—based on the strategic influence of infrastructure, the physical and technical possibilities to service areas and the costs of these efforts, economical interests of the private sector, the available and effective instruments and other the factors influencing the population-distribution and growth of Bangkok—against which the investment programme could be reflected is strengthening this concern.

**Impact of the investment programme.**

The tentative investments required during the Sixth Plan period (1986-1991) total 103,000 million Baht (see table 1.11), of which roughly 51,000 million Baht will come from public resources (foreign loans 31,000 million Baht and 20,000 million Baht from public funds). Some of the figures are probably over-estimated, especially the share of the private sector in transportation and (low-income) housing (see chapter 2). The table also shows that the sources necessary to finance the transportation sector after 1991 are not allocated. Another high estimation is the housing component of the public sector. In view of the present priorities and the austerity programme of the government, which already expressed its wish to stop subsidies for housing, the figure is likely to be too high.

**Table 1.11 BMR Investment Programme**

<table>
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<tr>
<th>sector</th>
<th>total project</th>
<th>6th plan</th>
<th>public total</th>
<th>6th plan</th>
<th>private total</th>
<th>6th plan</th>
<th>foreign total</th>
<th>6th plan</th>
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<td>Transportation</td>
<td>47135</td>
<td>40538</td>
<td>11066+7</td>
<td>11066</td>
<td>12325</td>
<td>12325</td>
<td>17167+7</td>
<td>17167+7</td>
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<td>10320</td>
<td>2680</td>
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<td>0</td>
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<td>Housing</td>
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<td>20197</td>
<td>51606</td>
<td>51606</td>
<td>43292+7</td>
<td>31097</td>
</tr>
</tbody>
</table>

(source: NESDB, BMR-Study Interim Report)

Map 1.12 shows the planned and committed investments and their spatial configuration. Especially the impact of this configuration is reason for some concern. In the recent past large areas on the west-bank of the river have been opened up by road investments (see map 1.15), while investments in service systems are not projected. As it cannot be expected that the
THE DEVELOPMENT OF BANGKOK

figure 1.12
Bangkok Metropolitan Region Study

Transportation:
- Basic investment programme of Short Term Urban Transport Review Study (see figures 1.9 and 1.10)
- Additional investments in highways
  For public transport see figure 1.10

Drinking water supply:
- Existing service area of central water supply system
- Extension service area 1986-1991

Flood protection and drainage:
- King’s Dyke (implemented)
- City Core (phase I)
- Eastern suburban Bangkok
- Western by-pass and flood diversion channel
- River dyking

Built-up area

scale 1: 250,000
north
1. Recent road investments resulting in highly improved accessibility, hence much growth. Little development and no service-system investments projected in BMR-study, therefore backlogs are likely to occur.

2. See under 1., but larger growth projected. Main problems: no piped water supply (in highly critical land-subsidence area) and partly outside flood protection area.

3. Planned investments in service-system(s) and projected growth. Due to low accessibility development is likely to be slower and growth less.

4. See under 3.. To speed up development more road investments (secondary system) are needed. On the other hand the implementation of the drainage plans (especially the retention areas) is endangered by too much (uncontrolled) growth.

5. Growth projected in BMR-study. Due to low accessibility not very realistic.

6. Growth projected in BMR-study. Large road investments, but no drinking water available (brackish groundwater); since piped water supply will not be available in the near future, growth is likely to be less.
haphazard development of this area can be stopped or controlled, inefficient land-use and new backlogs are likely to occur. Furthermore several investments do not coincide with the predicted population growth, or vice versa the population forecasts have not considered recent and committed investments in infrastructure which may influence growth.

Major investments in service systems have been implemented and are planned in the eastern suburbs. Due to the higher attractiveness of other areas and the absence of sufficient accessibility, development is likely to stagnate and thus to leave the investments under-utilized. Map 1.13 summarizes the areas and their development problems.

Basic issues.
The basic issues, next to financial ones, of the BMR-study and the development of Bangkok are according to the authors:

1. To limit the creation of new backlogs.
   Apart from population growth, two factors are of major importance:
   - the relative attractiveness of an area in terms of accessibility and travel time to the city centre which pulls development
   - the inefficiency of land-use (see section 1.2) which pushes the spread of development (during the last years counterforced by traffic congestion). This factor is also of importance for the efficiency of investments.

2. To raise the efficiency and utilization of investments (implemented, committed and planned).

To reduce the future demand for primary infrastructure it is necessary to develop strategies aiming at raising the efficiency of development at local level. This with a high priority for vacant areas within the present service envelope. The tentative investment programme shows a tendency towards promoting (by road investments) development in these areas. However, an important aspect -the landownership pattern, which is determining the lay-out- is not addressed to.

At the same time investments are projected (and some already in the implementation phase) which will reduce travel time to, and thus highly increase the relative attractiveness of, certain outer areas. These areas are not yet serviced and are likely to attract a significant share of the growth. This undermines the effectivity of promotion investments considerably.

In that respect coincidence, in time and location, of investments of various types is likely to positively affect the efficiency.

1.6. Perspective of development

The Bangkok region continues to grow in an inefficient manner; infrastructure, particularly roads, water supply, flood protection and drainage systems are deficient; mechanisms for the overall co-ordination of planning and investment programming are not in place; BMA's financial status is a limiting factor in the development process; and the central government continues to subsidize and bear the burden of infrastructure provision and the delivery of urban services.

The fundamental problem is therefore to plan for additional investment in urban development in such a way as to maximize the net economic benefits of urbanization. Major issues and constraints which will have to be addressed by the Sixth Plan include: resource constraints; economic distortions created by existing subsidies for bus transport, housing, water supply and infrastructure provision; inadequate project formulation and inefficient decision-making; and inefficient patterns of urbanization.
Uncontrolled development.
In spite of the Metropolitan Area Structure Plan development has continued along the radial axes formed by major transportation arteries which extend from the city centre and, in some cases cross the designated green belt. In the absence of strong and effective regulatory measures and government intervention in the development process, the existing (market-)forces that are shaping the region will continue. An ensuing government investment policy simply aggravates this situation; e.g. the past has shown that investments in roads (under government responsibility!), and the subsequent opening up of areas, often lead to high second order investments (i.e. water supply, flood protection, public transport and more roads), because these areas attract new development. The low land-use efficiency in the suburban areas (partly caused by the phenomenon mentioned above) reduces the already limited means -finance and instruments- to address the city’s problems.

Guided development.
However the government, in pursuing a policy of "guided development" (i.e. a concerted investment programme), can influence the direction of growth and the longer term structure of the Metropolis.
The efficiency of investments, especially the financial return on service-systems, is in our opinion calling for a twofold strategy:
1. The development of vacant and under-utilized areas within the service envelope, i.e. the area where water supply and/or flood protection are available or planned. One possibility for doing this is discussed in chapter 5 (land pooling schemes).
2. The concentration of growth (i.e. the spread of development) in a limited number of areas by means of concentrated and co-ordinated investments. The areas should be chosen on base of:
   - the physical and technical possibility to service the area
   - the costs of these efforts
   - economical interests of the private sector; i.e. market (re-)actions
   - available and effective instruments
   - the factors influencing the population distribution and growth
   - agricultural land-use value
   - the land ownership pattern.

The implementation of such a strategy requires strong co-ordination of infrastructure investments and seed development. The NESDB is the most suitable agent to play the role of co-ordinator, as it has shown with the BMR-study. The NESDB can expand its horizon from short-term financial evaluations and budget control to long term economical policy and planning, with an open eye for the impact of first order infrastructure investments on the need for second order infrastructure investments.
The necessity of a strong co-ordination has been acknowledged in the final report of the BMR-study, which proposes the set-up of the National Urban Development Board, chaired by the Prime Minister and its secretariate based at the NESDB.
NOTES CHAPTER 1

<1> H. Detlef Kammeier and Larry Sternstein, see literature
<2> NESDB: BMR-Study Interim Report
<3> see <2>
<4> see <2>
<5> H. Detlef Kammeier and Ray Archer, see literature
<6> UNCHS/HABITAT: Upgrading Inner City Slums
<7> see <2>
<8> see <2>
<9> based on Tony Edwards: The Bangkok Metropolitan Area; an appraisal of planning and development
<10> Bangkok Post May 1985 to November 1985, such as the Leam Chabang Port, the mass transit system in Bangkok and several road construction projects
<11> H. Detlef Kammeier: A review of the development and land-use problems in Bangkok
<12> Studies and projects have been started to update the land registry and to make up the arrears, e.g. Land Titling Project (ADB), Urban Land Management (ADB); see also BMA, Dept. of Policy and Planning: Profile of the BMA, 1985
<13> see <9>
<14> see <11>
<15> see <11>
<16> from 1984 aerial photographs, Royal Thai Air Force, NHA, ITC, IHS; see also <9> and Sidhijai Tanphiphat, see literature
<17> Suchitra Punyaratrabandhu: Structural Problems in the Governance of Bangkok
<18> HFA: Short Term Urban Transport Review, Principal Findings Report
<19> see <11>
<20> see <11>
<21> NESDB: Fifth National Economic and Social Development Plan (1982-1986)
<22> the Lichtfield Plan, 1960; see <1>
<23> Larry Sternstein: Portrait of Bangkok
<24> see <9>
<25> see <21>
<26> JICA: Bangkok Sewerage System Project (Masterplan)
<27> Binnie & Partners, review of the flood protection and drainage plans for the Centre of Integrated Planning and Operation (NESDB)
<29> see <18>
<30> see <10>
<31> see <2>
<32> see <2>
<33> see <2> and Bangkok Post Supplement: Economic Review Mid-Year 1985
<34> see chapter 2. and appendix 2.2
<35> Ray Archer: The possible use of urban land pooling / Readjustment for the planned development of Bangkok
<36> see <2>
<37> see <2>
2.1. Introduction

Housing, an individual affair.

To be the owner of one's own land and shelter is the prevailing goal of all Thai families, and the promotion of owner-occupancy is an explicit policy objective of the government\(^{(1)}\). Before the explosive growth in the sixties sufficient low- and middle-income housing or land to build on was available, in terms of numbers as well as in terms of location (relationship with concerned city functions). Housing supplies were arranged according to the demand for locational functions, to the availability of land (for rent) and to personal needs and limitations. The construction of shelter was mostly a private affair, either by the occupants themselves or by means of small contractors. Landowners either sold their land or rented out their land cheaply; usually on a temporary basis and by informal means (only few renters have written contracts).

The growth of Bangkok in the sixties and seventies, due to a massive migration and a considerable natural growth rate, created backlogs in infrastructure and utilities as well as development problems (see chapter 1). Housing, being the prime consumer of space, is closely related to the availability of land on the land-market. An upsurge of speculation in this market induced high rises in housing costs. Private developers entered the market; first by providing serviced plots of land in land-subdivision projects (a privately exploited type of sites and services), and later by offering complete houses. A considerable share of the urban population was and is not able to obtain and afford private housing. This low affordability is one of the major forces behind the growing number of slums.

The problems in the housing- and land-market and the increasingly visible slums were the cause for government intervention, which - in fact - started in 1973 with the establishment of the National Housing Authority (NHA).

Housing is nowadays acquired by renting or buying a complete house (rangeing from a high-income house to a squatter-dwelling), by building privately on an acquired plot (bought, rented or squatted) and by obtaining public housing.

The growth of slums.

Income earning opportunities are the prime instigator of the formation of low-income settlements\(^{(2)}\). These can therefore be found close to employment opportunities: e.g. rental apartments in the inner-city, barrack-housing provided by factories and industries, slums and squatters close to markets, the port, factories and government agencies, usually in the ring around the inner-city. Half of the number of slums is located within 6.5 kms of the Central Business Area (see figure 2.5).

For long the major component of the growth of slums and squatters was thought to be migration. A recent research by Soporn Porachokchai\(^{(3)}\) indicates that 15-20% of the Bangkok population has, ever since 1940, lived in slums, while new slum formation is mainly due to intra-migration (evicted slum dwellers who resettle and natural growth) rather than rural-urban migration. Also existing rural communities often turned into slums as the city encroached them.

Slums, the major low-income housing component, are areas comprising dense, small, irregular, owner-built temporary and semi-permanent dwellings on short-term rented land. Access and services are limited, and the quality of materials is often poor, resulting in poor living conditions and a usually unhealthy environment\(^{(4)}\). Slums legally occupy the land, but the houses are substandard and thus illegal.

Squatter-settlements are identical in their physical appearance, except for the fact that the
 occpency of the land is illegal and hence the quality of services even lower. Slums thus defined can turn into squatter-settlements as soon as the lease of the land is ended.

Slum-dwellers are considered to be "the poor". Although this might have been true, at the moment such an assumption would be misleading as recent research has indicated. About half of the slum population are poor, yet one-third has an income higher than the Bangkok average. Obviously there is a higher degree of divergence than related to income only. On the other hand it indicates that a growing number of middle-income people cannot be served in the formal housing-market, which co-incides with a growing disparity in income and the increasing inability of the private sector to serve this section of the housing market.

Due to several changes in the economic and urban structure (see chapter 1.) existing informal housing areas are confronted with evictions increasingly, while the traditional mode of access to the land market (by rent) is declining. These are also the forces behind a growing number of squatter-settlements (166, of which 60% is younger than 15 years) and the recently "discovered" phenomena of inner-city slums (rented "apartments" of 3 by 3 metres in subdivided run-down buildings), which seems to be growing.

The function of slums.

To explain the function of slums for low-income people we would like to quote Shlomo Angel from "Land for housing the poor":

"The slums of Bangkok house hundreds of thousands of people in good locations, are in close proximity to middle-income and upper-income areas, and are an integral part of the fabric of the city. People of different income groups have access to each other and can be of most use to each other. This closeness is particularly important for low-income people, who hold many occupations in the informal sector of the economy, and who can take advantage of temporary and even non-recurring economic opportunities in the city. The informal economy functions best when the mixture of income groups is allowed.

In Thailand, where the patron-client system of contacts still flourishes, this is of special significance. In this system, closeness to people of influence can mean survival. Building contacts within and outside the community is the essence of participation in the economy. Such a system of contacts thrives best in communities that have been established over a period of time, and suffers a severe blow when these communities are destroyed and evicted. The option of allowing people to remain in the same location permits them to preserve the system of social contacts they have developed over the years."

Following this quotation we conclude that a slum is more than a place with affordable, though substandard, housing for low-income people. Slums are integrated in the economical and social structures of Bangkok and even generate employment possibilities of their own. This is of course the main reason for promoting slum-upgrading, and it is also the main cause behind the problems relocated slum-dwellers are facing in the new low-income housing projects. It is therefore we want to stress the importance of locational aspects for low-income housing projects in chapters 4 and 5, next to longer established factors as affordability and the standard of facilities.

2.2. Magnitude of the housing problem

Role of the private sector.

The influence of the organised private sector on the housing- and land-market started in the late fifties, when large tracts of land were assembled for speculative purposes, and expanded ever since.

Until the late sixties the private sector has mainly been active in the land-market and hardly delivered complete houses. The activities were normal speculative transactions (also piecemeal selling of larger tracts of land, for instance for shophouses and for private houses) and land
subdivision projects, in which an area is developed and subdivided in plots. The construction of the house is the responsibility of the buyer of the plot. Plot-sizes vary from 150 to 400 m² (less frequent projects with smaller plot-sizes do occur\(^{13}\)), while the infrastructure is generally rudimentary: dirt roads, no proper drainage and water wells. Although most plots are sold, many remain vacant because of the bad accessibility and the location in peripheral areas, but also because the buyers keep it as an investment (for their children) or are waiting to accumulate enough savings to build later\(^{14}\).

A sharp contrast and an example of social segregation is formed by high-income housing projects which are fenced off, e.g. by means of barbed wire, and have a permanently guarded entrance. In the late sixties specialized developers emerged who offered complete houses in projects and estates; occasionally extra facilities like recreational terrains or lakes and schools are enclosed. Shophouses, the typical housing-type for small entrepreneurs, etc., also became popular as a development investment, especially among smaller developers. Through the years the scale of these projects showed a marked increase.

The housing developers are, in terms of output, at the moment the most important group. Land subdivision projects already experienced a major decrease in 1973, and have since 1980 almost come to a halt, while the market for shophouses has experienced a slump: in 1982 52,000 units were unoccupied of which 36,000 were unsold\(^{15}\). For the (near) future this will mean that the bulk of the units the private sector supplies will be developer built housing. Figures 2.1 and 2.2 make clear that this supply will be out of reach for the majority of Bangkok's population.

In the urban peripheries, the location for land-subdivision projects, land prices are at such a modest level that even lower-income families would be able to afford them. This in the hypothetical situation that projects with an appropriate modest level of infrastructure and services are implemented and that long-term finance, like for the higher-income families, would be available. The private sector, however, is not able to participate in the low-income housing supply due to\(^{16}\):

- Regulations such as the Land Subdivision Act and Building Codes.
- The inavailability of long-term finance, which is only available to the higher-income groups.
- The high investment costs by the construction of infrastructure.

The terms for long-term finance (30% downpayment, repayment in 10 or 15 years, a collateral and a minimum loan-amount) are already an obstacle for middle-income families and has resulted in a slump in this market-section.

Furthermore the private sector is often not interested in low- and middle-income housing development because the return on investments is considered too low. Due to saturation of the high-income housing market however, private developers show a growing interest in lower income housing development. Non-profit organizations, like housing co-operatives and the Building Together Association (which is also a community development organization), aim to address this section of the housing-market, but their output is relatively small.

Housing-supply.

A 1980 research\(^{17}\) into the standards and prices for housing on the market revealed that:

1. A rental unit in a land + house development scheme, also called a horizontal tenement, was affordable to as low as the 20th percentile. However, no new projects of this type were noted. As a possible reason the sharp increase in the price of wood is given, which makes it financially uninteresting to start such projects.

2. A plot of 120 m² in a land rental, which is a slum, with a self-built structure is affordable to the 40th percentile and up. The survey again found hardly any new projects of this type.

3. A plot of 120 m² in a land subdivision project was affordable to as low as the 50th percentile. The household would have to wait (or save in advance) several years to be able to build a house.

- 29 -
table 2.1 Income distribution in BMA in Baht per year

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>25,000</td>
<td>28,000</td>
<td>31,000</td>
<td>24</td>
</tr>
<tr>
<td>20</td>
<td>32,000</td>
<td>37,000</td>
<td>42,000</td>
<td>31</td>
</tr>
<tr>
<td>30</td>
<td>39,000</td>
<td>46,500</td>
<td>54,000</td>
<td>38</td>
</tr>
<tr>
<td>40</td>
<td>48,000</td>
<td>56,000</td>
<td>64,000</td>
<td>33</td>
</tr>
<tr>
<td>50</td>
<td>57,000</td>
<td>65,500</td>
<td>74,000</td>
<td>30</td>
</tr>
<tr>
<td>60</td>
<td>69,000</td>
<td>77,500</td>
<td>86,000</td>
<td>25</td>
</tr>
<tr>
<td>70</td>
<td>85,000</td>
<td>95,000</td>
<td>105,000</td>
<td>24</td>
</tr>
<tr>
<td>80</td>
<td>104,000</td>
<td>117,000</td>
<td>130,000</td>
<td>25</td>
</tr>
<tr>
<td>90</td>
<td>150,000</td>
<td>167,500</td>
<td>185,000</td>
<td>23</td>
</tr>
</tbody>
</table>

source: 1981: NESDB, urban poor study
1984 and 1987 distribution are 1981 distribution inflated with an average of 4% per annum, total average increase: 28%. Differences in increase according to NESDB, urban poor study.

figure 2.2 Housing supply forms, actors, types and legal status related to income distribution.

legend: illegal i client group: primary xxx
a/legal a secondary xxx
legal 1 marginal 1

source: figure adapted from Angel, Benjamin and de Goede, Towards the recognition of the people's housing effort: the low-income housing delivery system in Bangkok.
distribution of housing types by income groups is based on NHA: Present standards and prices 1980, Bangkok, 1980.
4. A house in a land + house development project was affordable for families with an income of at least the 85th percentile. With GHB-finance this option would be available to the 60th percentile and up. Similar options provided by the NHA are affordable to the 30th percentile income groups, thanks to favourable financial terms.

Since 1980 certain forms of supply (especially those serving the lower income section) have come almost to a halt while the land and construction costs have risen considerably, so that it can be assumed that the private sector, at best, is capable to provide housing or land to as low as the 50th percentile. However, the major supply, in the form of "land + house" development, is likely to fall in the 60th percentile an up category.

The combination of the inability of the private sector to supply adequate housing for low-income groups, the limitations the informal supply is confronted with, the increasing poverty and the unfulfilled demand of the middle-income groups results in a higher demand for public housing and middle-income families entering the slum housing market more and more.

Demand for housing.

As from the previous section may be understood: the housing-market in Bangkok is an example of the "housing gap". Supply and demand do not coincide in terms of affordability. Figure 2.2 shows the present modes of housing related to income, legal status and actors, while table 2.3 gives the in 1984 available housing-stock. The figure gives an impression of the various housing types provided and promoted by different actors. The table shows that the informal supply system is still of great importance. This supply does not only help in absorbing housing shortages, but also to create living areas for those who sustain city activities and living standards of high- and middle-income people.

<table>
<thead>
<tr>
<th>type of housing</th>
<th>1974</th>
<th>1984</th>
<th>1991</th>
<th>increase 85-91</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no.</td>
<td>%</td>
<td>no.</td>
<td>%</td>
</tr>
<tr>
<td>1. shophouses</td>
<td>179968</td>
<td>30.4</td>
<td>332937</td>
<td>29.7</td>
</tr>
<tr>
<td>2. developer built housing</td>
<td>24864</td>
<td>4.2</td>
<td>176029</td>
<td>14.9</td>
</tr>
<tr>
<td>3. individually built on land subdivision project</td>
<td>24864</td>
<td>4.2</td>
<td>62776</td>
<td>5.6</td>
</tr>
<tr>
<td>4. individually built</td>
<td>151552</td>
<td>25.6</td>
<td>164787</td>
<td>14.7</td>
</tr>
<tr>
<td>5. public housing</td>
<td>12432</td>
<td>2.1</td>
<td>100890</td>
<td>9.0</td>
</tr>
<tr>
<td>6. slum and squatter housing</td>
<td>139712</td>
<td>23.6</td>
<td>207385</td>
<td>18.5</td>
</tr>
<tr>
<td>7. klong houses</td>
<td>27232</td>
<td>4.6</td>
<td>29146</td>
<td>2.6</td>
</tr>
<tr>
<td>8. others</td>
<td>29600</td>
<td>5.0</td>
<td>56050</td>
<td>5.0</td>
</tr>
<tr>
<td>total housing stock</td>
<td>592000</td>
<td>100%</td>
<td>1121000</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: -1974 and 1984 NHA data based on aerial photographs interpretation.
-1991 distribution based on income distribution (see table 2.1) and affordability according to figure 2.2; see table 2.4.

The demand for housing between 1981 and 1991, as a result of natural growth, migration and a decrease in household size, is estimated to be between 390,000 and 500,000 units. Because only household formation is included, and not replacement of existing units, the high estimate will be used. Related to household income, shown in table 2.1, the demand for several types can be estimated; see table 2.4.
### Table 2.4 Housing Type Demand by Income Group

<table>
<thead>
<tr>
<th>Household Income per Month</th>
<th>Total Units</th>
<th>Shop Developer Housing</th>
<th>Individual Built</th>
<th>Public Slums</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>under 3000 (14.5%)</td>
<td>50750</td>
<td>-</td>
<td>-</td>
<td>5000</td>
<td>31750</td>
</tr>
<tr>
<td>3001 - 5000 (21.5%)</td>
<td>75250</td>
<td>-</td>
<td>-</td>
<td>10000</td>
<td>16800</td>
</tr>
<tr>
<td>5001 - 7000 (22.0%)</td>
<td>77000</td>
<td>-</td>
<td>10000</td>
<td>22500</td>
<td>7000</td>
</tr>
<tr>
<td>7001 - 9000 (13.5%)</td>
<td>47250</td>
<td>-</td>
<td>37000</td>
<td>9250</td>
<td>1000</td>
</tr>
<tr>
<td>9001 - 11000 (7.5%)</td>
<td>26250</td>
<td>1050</td>
<td>23700</td>
<td>1500</td>
<td>-</td>
</tr>
<tr>
<td>11001 - 13000 (6.0%)</td>
<td>21000</td>
<td>1400</td>
<td>18200</td>
<td>1400</td>
<td>-</td>
</tr>
<tr>
<td>13001 - 15000 (4.0%)</td>
<td>14000</td>
<td>1400</td>
<td>11900</td>
<td>700</td>
<td>-</td>
</tr>
<tr>
<td>15001 - 17000 (4.0%)</td>
<td>14000</td>
<td>1400</td>
<td>11900</td>
<td>700</td>
<td>-</td>
</tr>
<tr>
<td>17001 - 20000 (3.0%)</td>
<td>14000</td>
<td>1400</td>
<td>11900</td>
<td>700</td>
<td>-</td>
</tr>
<tr>
<td>over 20000 (3.0%)</td>
<td>10500</td>
<td>1960</td>
<td>7840</td>
<td>700</td>
<td>-</td>
</tr>
</tbody>
</table>

100% 350000 8610 132440 47450 30800 131690 17500

-Housing demand as described in text, 1981-1991 demand: 500,000 units. So for 1985 - 1991 a demand of 350,000 units is assumed.  
-Affordability of the several types of units, see figure 2.2.

Of major importance for the demand for housing will be the extent to which settlements, under threat of eviction, will actually be evicted. A high estimate would be an additional 50,000 units, mainly in the low-income section (see map 2.5). Another major component is the replacement of old units. An estimated 1% of the housing stock will have to be replaced yearly, which equals a life-span of 100 years. For slums this percentage is likely to be higher: 90% of the dwellings in these settlements is made of wood and half of the housing-stock is older than 15 years and in a bad state. 57% of the families admit they need new housing and about half of these families have savings to pay for it, the other half prefer to live in the present homes with better conditions and facilities.

During the first half of the eighties supply by private developers has stagnated, while the single public developer, the NHA, created a 3,000 to 4,000 units yearly. With the limitations the informal supply is facing it can be concluded that the demand cannot be fulfilled increasingly.

### 2.3. The answer from the government

**Public housing activities.**

Public housing activities in Thailand were started by the establishment of the Housing Welfare Division of the Public Welfare Department. In 1950 the Public Housing Office was set up in the same department, followed by the Government Housing Bank (GHB) in the Finance Ministry in 1953. The last to be established was the Slum Improvement Office (SIO) in 1960 as a section of the then Bangkok Municipality.

The general goal of the four was to solve the problem of housing shortage. The general policy was building flats and slum clearance, which was added by the SIO. During the time to 1973 they constructed 19,659 units only. At that time the housing need was estimated to have grown to 100,000 units.

In 1973 a major reshuffle took place. The National Housing Authority (NHA) was established as the housing construction agency while the GHB was transformed into a financial institute.
## Settlements under pressure of eviction within BMA per June 1984.

<table>
<thead>
<tr>
<th>District (see map)</th>
<th>No. of slum and squatter settlements</th>
<th>Number of improved settlements</th>
<th>Settlements under pressure of eviction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phra Nakhon</td>
<td>24</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Pom Prab</td>
<td>20</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Pathum Wan</td>
<td>19</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Sampangswrang</td>
<td>16</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Bang Rak</td>
<td>12</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Tanahai</td>
<td>90</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Dusit</td>
<td>97</td>
<td>31</td>
<td>16</td>
</tr>
<tr>
<td>Phaya Thai</td>
<td>51</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Nong Luang</td>
<td>59</td>
<td>3</td>
<td>29</td>
</tr>
<tr>
<td>Bang Kiew</td>
<td>63</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>Phra Samut</td>
<td>111</td>
<td>26</td>
<td>37</td>
</tr>
<tr>
<td>Bang Khep</td>
<td>33</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Klong Chok</td>
<td>3</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Makkathai</td>
<td>3</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Lat Krabang</td>
<td>2</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Thon Ruri</td>
<td>44</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Klong San</td>
<td>38</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Bangkok Noi</td>
<td>84</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Bangkok Thani</td>
<td>26</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Phasi Charoen</td>
<td>64</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Bang Khu Thani</td>
<td>34</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Taling Chan</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rat Burana</td>
<td>41</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Nong Phai</td>
<td>4</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

The 262 settlements under pressure of eviction within the BMA house 254,000 people. Of these settlements 46 were upgraded in the past and 216 were not yet upgraded. The 262 settlements consist of 129 slums and 133 squatters.

---

**Figure 2.5**
Distribution, upgrading and pressure of eviction of slum and squatter settlements within the BMA per June 1984.

Source: Sapon Pornchokchai, see literature
figure 2.6
NHA sites and services project-locations.

Implemented:
1. Rangsit
2. Tung Song Hong

Partially implemented:
3. Lad Krabang
4. Bang Plee Bang Bo new town

Advanced planning stage:
5. Samut Prakan *
6. Samut Sakhon *
7. Nakhon Pathom *

Planning stage:
8. Thonburi II, III
9. Bang Bua

* Regional project
dealing with housing finance for individuals.

There was also a change in policy. Instead of slum clearance only, the NHA started to provide highly subsidized flats for the evicted families, while the building programme of its predecessors was continued. This has been the policy, in various programmes, up to 1979.

Due to several problems with the flats, e.g. high financial burden for the government, social inappropriateness and transfer of rights (resale) to higher incomes, a major change took place<sup>24</sup>. The second programme (1976-1980) was stopped in 1978 by the government who could not sustain to provide the high subsidies necessary. The financial burden created by the implementation of the flat-building programme is still limiting the financial situation of the NHA and thus its present activities<sup>25</sup>.

In September 1983 the Cabinet approved the National Housing Policy – the first formally adopted, which provides a framework specifying the roles of the NHA, GHB, local governments and the private sector as well as specific guidelines for operation of the NHA and GHB (see appendix 2.1 for its main provisions and section 3.1 for comments). The role of the NHA as a financing agency will be taken over by the GHB in the future, enabling the NHA to focus on low-income housing development on a cost-recovery base with limited subsidy from the government. The policy furthermore expresses the need for the NHA to be able to operate on the land market (through various mechanisms) as well as the need for housing development to co-incide with overall urban development.

**National Housing Authority; policy, programme and results.**

The NHA, employing 2,400 employees in 1984 and since its establishment operating as a housing finance, production and management institute, started to experiment with different forms of housing supply in 1977, when the first sites and services project and slum upgrading scheme were initiated. The 1979-1982 programme formally established these new forms of low-income housing supply. Target was to develop 25,000 s&s units and to upgrade 26,000 units with subsidy for infrastructure for the lowest-income groups (up to 50<sup>th</sup> percentile) only. The slum upgrading programme involved various types of improvement: physical upgrading, land tenure consolidation and social-economic upgrading.

Although the NHA began to produce more units it did not meet its targets (see table 2.7). The programme was extended to 1984 and the 1982-1986 programme, aiming at a production of 42,500 s&s units and upgrading of 30,000 units, was postponed to 1984-1988 and scaled down to 25,500 s&s units and upgrading of 18,000 units.

<table>
<thead>
<tr>
<th>Year</th>
<th>Production Results</th>
<th>Slum Upgrading</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973-1975</td>
<td>10,000 units from the &quot;pipeline&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975-1979</td>
<td>19,000 units (flats) from first and second programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1979-1984</td>
<td>5,000 units (flats) from second programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13,500 units (s&amp;s) from third programme*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>26,000 units slum upgrading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1984-1988</td>
<td>25,500 units (s&amp;s) fourth programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18,000 units slum upgrading</td>
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</table>

* An extra 16,500 units are to be constructed in Bang Plee Bang Bo project

source: NHA/ADB

Since 1981, the operating deficits have changed into net surpluses thanks to reducing estate management costs, increased revenues and by converting rental units with great maintenance costs to hire-purchase units. The financial results are pressed by high interest payments and management costs from projects before 1980<sup>26</sup>, but also by high overhead/management costs due to fluctuating production levels (as a result of difficulties in obtaining land and uncertain
Figure 2.8 Samut Prakan Housing Project; lay-out and distribution of housing types

- Type A, 10-20th percentile group (highest subsidized)
- Type B, 20-35th percentile group (subsidized)
- Type C, 35-50th percentile group (moderate price)
- Types D, E and shophouses, 50-70th percentile group (market price)
- Public spaces
  1. Open space, playground
  2. Kindergarten
  3. Football field
  4. Daily market, hawkers
  5. Community centre and NHA office
  6. Square
  7. Pond and waste-water treatment
  8. Guard post and electricity substation
subsidy-levels). Although the NHA is now able to provide housing in a financially sustainable way, its ability to produce housing in targeted quantities is obstructed by the lack of a large enough revolving fund/working capital, by difficulties in purchasing land through formal bureaucratic procedures, by the financial inability to create land-holdings in advance and by the limited construction capacity available on the market.

**Project-implementation: sites and services.**

NHA’s sites and services projects consist of land acquisition and development, subdivision, on- and off-site infrastructure, building of core houses and provision of social and commercial facilities. In some cases also building material and small business/industry loans are provided. The target group in such schemes are households with an income between the 10th and 50th percentile. For the purpose of cross-subsidy, plots earmarked for the lower-income groups are sold below development cost and plots earmarked for higher-income groups are sold beyond development cost (for an example see figure 2.8). While total development cost is recovered from the beneficiaries, some 30% is allocated to higher-income groups. Government subsidies of some 10% of the development costs (usually the off-site infrastructure) are required. The projects are efficiently implemented, the internal economic rate of return is approximately 15%, which makes the units relatively cheap (compared to market prices).

Up to date four partially successful projects have been implemented in Bangkok and three more will be implemented soon in the BMR (see map 2.6).

In order to comply with the Building Codes, the NHA offers **high quality housing and high standard infrastructure and services.** In order to reduce unit-prices and to reach the necessary internal economic rate of return, the option of large-scale projects with internal cross-subsidy has been chosen. To obtain the necessary vast areas of land at a reasonable price, the projects had to be located quite far from the urban centre and job opportunities. This locational drawback, which leads to reduced income and raised expenditures for especially the lower income groups, combined with the relatively (to income) high housing expenditures made the projects less attractive to the target-group. Resale to higher-income families and under-occupancy occur frequently.

A critical phase in the implementation of sites & services projects is the acquisition of land. On basis of a set of suitability criteria (see appendix 2.2), an area is selected in which owners are invited to make a bidding. From these biddings a choice is made, usually on the base of costs. This procedure often causes delays. When the land-owner is a public agency, negotiations seldomly lead to satisfactory results (i.e. a low price for NHA). Only when the land is obtained, the planning, co-ordination and construction can advance.

**Project-implementation: slum upgrading.**

Slum upgrading projects essentially consist of minor infrastructure improvements within the slum area concerned, such as provision of walkways, drainage, water supply, garbage collection points, fire protection equipment and street lightning. NHA’s expenditures under this programme are fully subsidized by the government (see appendix 2.1) up to 8,000 Baht (1984) per household.

Due to the difficulties in the land consolidation programme the upgrading remains a temporary measure. Some upgraded slums have been evicted, while slums under eviction pressure cannot be upgraded because the landowner’s consent for upgrading is required. If security of land-tenure can not be arranged, costs can not be recovered from the beneficiaries other than by indirect means.

Forementioned problem has led to a diversification of strategies within the slum upgrading programme:

- **land-sharing:** a strategy in which the land occupied by the community is shared with the landowner. Part of the land is sold at a low price or given by means of long term lease to the community. The prime land is developed commercially by the landowner.
- **slum reconstruction**: a strategy similar to land-sharing. Part of the community is cleared and the remaining part is densified and upgraded.
- **slum reblocking**: a strategy in which the dwellers buy the land and reblock it according to affordability and a pre-agreed arrangement of plots. Upgrading of the environment is part of the strategy.
- **slum relocation**: a strategy in which the slum is moved to a piece of land made available. In case the new land is made available by the land-owner of the relocated slum the project is similar to land-sharing combined with reconstruction. In other cases the land is made available by the NHA and the project shows great similarity to clearance (only when no other option is available).

Projects do not necessarily fall into one category, mixture forms are possible; the slums are upgraded in a one-by-one approach, leaving space to adjust the project to the specific circumstances of the community.

Slum upgrading projects addressing the land issue in a structural manner (i.e. solving the problem of security of tenure) are few and far between and are highly depending on the community organisation resisting eviction. Another problem which occurs with the slum projects is that the location can be too good and the quality too high; after the project the rights are sold to higher-income groups.

### 2.4. Prospects for the future

Since its establishment the National Housing Authority embarked upon several programmes. The targets of these programs were never fully reached, both in terms of produced units as well as the composition of the client-group.

In terms of production of new units (s&s program) the major factors for the slowness are:

1. NHA's limited working capital. As soon as subsidies, grants or loans are required, and this is usually the case, a long list of project scrutiny agencies have to be involved and approval obtained. This is a time-consuming procedure while the financial limitations make that too little a number of projects can be started.
2. The limited availability of land. NHA can only obtain land through formal and time-consuming bureaucratic procedures (and not through eminent domain)<sup>29</sup>. Due to its financial situation advance acquisition of land is hardly possible.
3. The limited capacity of construction companies, able to implement large-scale projects. The NHA is, in this respect, in competition with large-scale private developers, which usually offer higher incentives to the construction companies.

The target group (20th to 50th percentile) was not reached by the s&s projects to the extent projected due to:

1. The location of the projects which is disadvantageous for the target-group (higher housing and travel expenditures and reduced income due to limited job availability).
2. High standards which make the project less affordable to the target-group and which furthermore attract a middle-income client-group. The advantageous financial terms (long-term credit) strengthen this attraction.
3. The housing-market which leaves the demand of middle-income groups unsatisfied.

The slum upgrading programme has been more successful in terms of upgraded settlements and units. However, security of tenure remains an unsolved problem in the implementation of the projects; the exceptions are few but promising.

At the moment there are a number of issues of importance for the public sector, its production capacity and the suitability of its products for the target group. From a housing-market point of view, the role of the public sector is clear-cut. An estimated 24,000 units are required annually but cannot be produced by the private sector (including individual built houses; excluding slums).
The issues determining the government's capability to address this "housing gap" concern its financial situation and need for capital, subsidies, credit facilities for house buyers, standards, co-operation with the private sector and land.

Reduction of the standards, which are presently revised, would enable the private sector to supply a wider and more affordable range of options in the housing-market, thus reducing the need for public housing. It would also help the NHA to develop appropriate levels of infrastructure and services for low-income settlements and thus to be able to serve lower-income groups. In this context the possibility of a special status for NHA is discussed at present.
NOTES CHAPTER 2

1. Sidhijai Tanphiphat in Angel, Archer, Tanphiphat & Wegelin: Land for Housing The Poor
2. Soporn Pornchokchai: A study of house renters in four Bangkok slum-housing settlements
3. Soporn Pornchokchai: 1020 Bangkok slums; evidence, analysis, critics
4. CHHSS/NHA: BMR Housing Sector Interim Report
5. CHHSS/NHA: BMR Housing Sector Interim Report
6. see 3, and confer section 4.2
7. Alain Durand Lasserre in "Land For Housing The Poor"
8. Rataya Chantien: Problems, experiences and strategies of low-income housing in urban development in Bangkok
9. see 3
10. Chantana Chanond: Bangkok Inner City Slums
11. Angel, Archer, Tanphiphat & Wegelin: Land for housing the poor
12. see 7
13. Plot-sizes as low as 50 m² do occur according to Prof. Ray Archer (AIT), who is at present conducting a research into acceptable standards for low-income housing.
14. NHA: Present Standards and Prices, see also 1
15. ESCAP: Study and review of the human settlements situation in Asia and the Pacific
16. see 8
17. NHA: Present Standards and Prices
18. see 6; A conservative estimation is that the number of urban poor (i.e. below the poverty line) would increase from 336,000 in 1981 to 446,000 in 1990. The study notes that the rapid rate of per capita income growth in BMA is accompanied by a substantial widening of disparities.
19. A.P. van Huyck in "Urban Planning in Developing Countries", 1968
20. Michael Rodel: Housing demand study, working report I & II
21. This figure represents the presently known settlements under pressure of eviction and does not include any other settlements which might come under pressure of eviction, see also 3.
22. see 4
23. CHHSS/NHA: BMR urban poor study
24. see 8
25. see 4
27. see 23 and 4
28. see 27 and Chadari Bunnag and Somsook Boonyabancha: Land-sharing in Bangkok
29. see 8
3.1. National Housing Policy Framework

Before 1973 public housing was considered as welfare and was performed by several institutions under the authority of the Department of Welfare. In 1973 these institutions were amalgated to form the National Housing Authority (NHA), a state enterprise. Up to 1983 public housing activities (construction, management and provision of long-term credits) were primarily performed by the NHA without reference to a formal (public) housing policy.

In October 1983 the National Housing Policy (see appendix 2.1 for its main provisions), the first to be formally adopted by the Cabinet, became the framework for the concerned agencies. This policy, dealing with a number of issues beyond the purview of the NHA, is largely based on NHA's experience in providing low-income housing. The objectives of the policy are:

- To increase the housing production in general, and especially in urban areas, in order to satisfy housing demand of all income groups.
- To increase formal low-income housing production (sites & services) on a cost-recovery base.
- To keep-up present low-income settlements (slumupgrading).
- To improve the capital availability for public and private housing developers.
- To improve the availability of long-term credit for house-buyers, especially the lower income groups (below the 50th percentile of the income distribution curve).
- To have housing development co-incide with the urban development policy as stated in the Fifth National Plan.

The policy also provides specifications for the operations of the two major public institutions dealing with housing: the Government Housing Bank (GHB) and NHA. With functional streamlining in view the GHB is to become the financial institution, while NHA is to concentrate on (public) housing production.

The GHB presently provides long-term credits (30% downpayment, recovery in 15 years -since 1985 20 years-) to house buyers. Due to its eligibility criteria, GHB's main client-group is formed by high-income households. In the future GHB is to provide long-term credit to all house-purchasers and especially to purchasers of NHA units and plots, thus taking over NHA's role of a financing agency (present credit terms: 10% downpayment and recovery in 20 years). Such a move would reduce management required by the NHA as well as the need for capital, because the invested capital returns quicker. Furthermore, defaults and arrears, presently undermining NHA's results, would become history.

The GHB, in the recent past not able to honour all requests of individuals for long-term credit due to limited capital-resources, expects to be able to mobilize sufficient funds to honour all requests (by individuals and NHA's clients) in the late eighties<1>.

The context of public housing.

Despite the fact that NHA embarked upon several ambitious programmes to address the housing shortage it was not able to produce sufficient units, while the demand for public housing was and is growing. This growing need for public housing is caused by:

1. The housing demand distribution; the largest share of the housing demand is generated by low-income households (see section 2.2).
2. The inability of the private sector to adequately satisfy this demand due to:
   - The limited availability of long-term credit for house buyers, resulting in a less affluent market.
   - Regulations and standards concerning plot sizes, buildings and infrastructure.
   - The high investment costs for infrastructure required to develop the accumulated but frittered land holdings.
Housing has for long been considered as a private and market affair; consequently the government has undertaken little action to promote housing development by the private sector.

Improvements in the housing-finance market, as stipulated in the National Housing Policy and reduction of standards would enhance the private sector's ability to supply housing to a larger share of the housing-market. This intervention should not only stimulate the private sector, but should also result in a stabilization of the construction industry which is highly influenced by the availability of capital for housing development.

The increasingly restricted capacity of the informal housing supply sector to absorb the housing shortages. These restrictions are due to:
- The increased number of evictions of present low-income settlements.
- The reduced availability of land for rent, which is indicated by the sharp increase in squatter-settlements.
- The sharply risen price of wood, leading to a necessity to utilize more sophisticated materials as concrete. The consequently reduced mobility and higher investment require more "security of tenure".

3. The problems: slum upgrading

Security of tenure.

Part of the present approximately 1000 slums of Bangkok are under pressure of eviction. Most of these slums and squatter settlements are in proximity of the city centre. Pressures of eviction have increased due to expansion and redevelopment of the city centre as well as infrastructure investments. Among the settlements evicted and under pressure of eviction there are several upgraded settlements.

The original NHA slum upgrading programme stated the intention to arrange security of tenure. The programme also stated that it was doubtful whether such arrangements could be made. To overcome the problem of upgrading remaining a temporary measure for which the land owner's consent is required, alternative strategies have been developed (land sharing, slum reblocking, slum reconstruction and slum relocation; see section 2.3). Slum upgrading projects addressing the issue of security of tenure are few and far between and are highly depending on the community organisation resisting eviction. Recently we have noticed a co-operation between NHA and community organizations, giving very promising results (2).

Cost recovery and resale to higher-income groups.

The slum upgrading projects not addressing the issue of security of tenure are entirely depending on subsidies from the government. Neither the land-owners nor the residents are willing to pay for the improvements. In projects where security of tenure is arranged the residents usually have to and are willing to pay for the improvements. Still modest subsidies are required. In specific cases this can lead to a high burden for the residents involved. Defaults and arrears do occur frequently in these upgraded communities.

Resale is, of course, only possible in projects were security of tenure is arranged. For a part of the residents the consequent housing costs are beyond their affordability. Especially when the accessibility is improved and the location is attractive to higher-income groups, resales occur (3). This indicates that upgrading of settlements cannot be addressed in isolation but that the urban environment and (re-)developments taking place in the surroundings must be taken into account to assess the viability of a project.

A strong community organization, in which the residents feel that the improvements are the results of their efforts, is thought to be able to counterforce pressures from higher-income groups.
3.3. The problems: sites & services

Resources.

1. The lack of a large enough revolving fund

Housing production requires large capital investments which are fixed for a relatively long time; in NHA's projects the full recovery period is 20 years (excluding time of construction) in case of 'hire-purchase' units and longer for rental units. To be able to produce the planned number of units a large revolving fund (working capital) is required. Although producing net operating surpluses since 1981, NHA does not have a sufficient revolving fund to sustain its planned production level. For the same reason NHA is not able to make advance acquisition of land (land banking).

As soon as subsidies, grants or loans are involved, and this has been the case in every project, a long list of project scrutinization agencies have to be consulted and their approval obtained. Such practices of course lead to delays. Improvements in the financing system, as stipulated in the National Housing Policy, for NHA and its clients would reduce these limitations and delays. However, to address the housing shortage a substantial enlargement of NHA's working capital would be required.

2. The limited availability of suitable land in the BMA

Physically spoken there is no shortage of land in the BMA, some 350 km\(^2\) is vacant. However, these mostly private landholdings are highly frittered and due to speculative efforts in the past rather expensive (500 – 4000 Baht/m\(^2\) and over). At the same time very few private or public developers are able to create larger united tracts of land. Consequently the developers leap-frog to outer (agricultural) areas where larger landholdings can be obtained at low(er) price. The actual problem is not the lack of land supply but the lack of practical measures to bring this land into proper use (confer section 1.2).

To determine the suitability of an area the NHA uses a set of criteria (see appendix 2.3). Due to the legal and procedural inability of NHA to acquire the land most suitable, the maximum land-price is in fact the only criterion. In order to keep a housing project affordable to the target-group (20\(^{th}\)–50\(^{th}\) percentile of the households income distribution) and at the same time comply with all regulations, land prices should not exceed 300 Baht/m\(^2\). Furthermore the project-area should be fairly large in order to justify the high infrastructure investments usually necessary and to be able to use cross-subsidy in the set up of the exploitation of the project.

NHA's land acquisition procedure, by means of advertisements to invite land-owners to offer their land, puts the NHA entirely at the whims of the land market and those operating in it.

The objective to have housing development co-incide with overall urban development is not attainable due to the fact that infrastructure investments (made by other government agencies) lead to escalations of land prices. Consequently these locations are not affordable to NHA, while NHA is financially not able to acquire these areas in advance.

The combined result is that the projects are located quite far from employment and urban centres, resulting in a reduction of income (especially when the household relies on informal sector opportunities) and an increase of expenditures (for travel, the house and the plot) for the residents.

3. The limited capacity of the construction industry

Only a limited capacity in the construction industry is available and capable to implement NHA's large-scale projects. This section of the industry is reluctant to implement NHA's projects and prefers the more profitable projects of private developers. In this respect NHA is in competition with private developers and thus depends on the conjunctural movements in the housing production market.
Underoccupancy.

Underoccupancy (i.e. the non-habitation of sold units) occurs frequently. The core-houses (see figure 3.1) are not readily habitable according to the users and the majority of those that had not moved onto the site six months after buying stated the lack of money as the main reason. The combination of the downpayment and finishing the core-house would be too great a burden to carry at once. This situation is aggravated by reduced income and increased expenditures due to the location of the projects.

The incremental approach to low cost housing in Thailand appears to warrant reconsideration. All evaluators of the Tung Song Hong sites and services project, NHA-staff and consultants, agreed that the primary obstacle preventing more people from moving on site over the initial 18 month period was a lack of access to resources considered sufficient to complete the dwelling units as desired.

Building material loans are provided by NHA, but are considered to be too low by NHA's clients. If NHA would provide higher loans, the total loan amount ('hire-purchase' of house and plot and building material minus downpayment) would exceed the value of the collateral. Defaults then could become a considerable burden for NHA.

As a solution to this problem two options are considered:
- An increase of downpayment levels to 20% and encouragement of prospective buyers (who apply 1-2 years in advance) to save in advance.
- The provision of immediately habitable core-houses, which would result in a somewhat increased monthly payment but the financial burden at one time would be avoided.

Defaults and arrears.

The move to an NHA sites & services project can put a considerable strain on a household's budget. Especially the lack of a large enough building material loan puts people in severe debts (most families borrow from other sources) unless they wait and accumulate sufficient savings. The lowest income group is not able to save and pay for two houses at one time, but they also cannot carry the burden of a decrease in income and an increase in expenditures.
They are likely to arrear their monthly payments (also due to irregular income) or will drop out (default).

The proposed adjustments in the financing system and the core houses is likely to prevent most of these problems, but will make the NHA options somewhat less affordable to the lowest income groups. The present locational drawbacks, partly also causing arrears and defaults, will remain.

Resale to higher-income groups.

The competition with higher-income groups, who are attracted by the high standards, has been neglected by the NHA in its first projects, with the result that the target-group has partly been ousted. The largest divergency between targetted and actual client-group occurs in the units earmarked for the lowest income groups. Likely is that problems mentioned in previous sections are of influence on this divergency (i.e. the costs are beyond the affordability of the residents).

In general resale is largely due to the general housing shortage and the lack of good housing-credit facilities, which leaves especially the demand of middle-income groups (50th-70th percentile of the households income distribution) unsatisfied. Furthermore NHA standards (roads, water-supply, sewerage, drainage and street lightning) are higher than the standards used by the private sector (also in this respect NHA can be considered to be competative). It could be said that the NHA standard plot size is acceptable for a household up to the 87th percentile.

In projects to be implemented in the near future, for instance in Samut Prakan, standards of road-width and plot-size have been reduced to overcome forementioned problems as well as to keep the projects affordable.

Another counterforce to resale is a strong community organization (i.e. the feeling of the residents that the project is a result of their own efforts, as in the Building Together Association's project). Stimulation of these residential organizations might reduce resale caused by pressure from the housing market, but is not likely to reduce resale which is a result of housing costs beyond the affordability of the residents.

3.4. Limitations

In the previous sections a series of limitations emerged. These affect two major components of public housing: the number of units produced and the suitability of the units for the target group. Some of these limitations are external factors which cannot be addressed by NHA. For changes/improvements regarding housing finance and legal land acquisition measures NHA has to rely on activities from other agencies and the government, while for its production it largely depends on the capacity of the construction industry.

External limitations.

Concerning housing finance major shifts are envisaged to take place in the near future (see section 3.1 and appendix 2.1). The National Housing Policy considers this to be the main strategy to address the present housing problems. Such shifts would have a twofold effect:
- Increased production of the private sector when the less affluent segment of the market (the middle-income segment) can make its demand effective.
- Reduced operational limitations for NHA regarding housing finance for its clients as well as regarding its own need for capital.

In general it can be said that operational constraints for NHA as a result of financial limitations are gradually becoming less important.

An additional advantage of a more stable housing capital flow would be the stabilization of the capacity of the construction industry.
Subsidies, which up to now have always formed a partial base of housing projects, have gradually become less. Following a Cabinet decision in 1984, to review all subsidies to be provided, no new subsidy commitments were made. Concerning new public housing it is not likely that subsidies will be provided in the future (with a possible exception for off-site infrastructure, see section 1.2, 2.3 and appendix 2.1). The effect will be that adjustments in prices are necessary and that the projects will be less affordable to the lowest income group (20-30th percentile of the household income distribution).

The possibility to address the slum problem, almost entirely depending on subsidy, is at the moment eroded by the inavailability of this type of financing. Slum upgrading strategies which offer the possibility of cost recovery (and thus necessarily deal with the land-title issue) are promising but limited in numbers. In view of these limitations we expect an increasing accent of the NHA on sites & services (including immediately habitable core houses) and in the remaining we will focus on this type of housing development.

Despite the fact that due to better housing finance the private sector must be thought to be able to supply housing to the middle income groups increasingly, the housing market in general will still require large public housing production quantities for which higher income groups will remain to compete.

NHA is entitled to use the powers of "eminent domain" (compulsory purchase) (see section 2.3). Due to non-agreed compensation codes and public opposition against such administrative intervention these powers have remained unused (see section 2.3 and also 1.3). Regarding legal land acquisition measures no improvements are envisaged for the near future.

Internal limitations.

Given the previous external limitations and the expected changes in them as well as NHA's efficient project implementation (see section 2.3 and 3.3) only a limited number of factors concerning sites and services (including immediately habitable core houses) can be influenced by NHA.

Concerning the production level these factors are: land acquisition procedure (already streamlined in the recent past) and alternative strategies to acquire and develop land, construction research and management and stimulation of the private sector (transfer of knowledge on efficiency in land development and construction).

Concerning the suitability of the produced units these factors are: the location of a project, the standards applied, cross-subsidy levels and the housing types provided. The scale of variation is limited by the affordability of the target group, building codes and other regulations.

The problem of limited availability of suitable land for NHA in the Metropolis and the inability of the private sector to develop its accumulated, but frittered, land holdings clearly calls for a closer co-operation between NHA, the private sector and GHB. Due to saturation of the high-income section of the housing-market, private developers have become aware of the advantages of addressing a less affluent segment of the market in joint venture with NHA and with appropriate financing from GHB. Such a scheme would be relatively simple in case of larger united land holdings, but where many small landowners are involved complex arrangements (such as: land pooling, land readjustment or land development) are required to develop a scheme of viable size. The NHA, as an experienced (public) large scale developer, is considering such strategies as well as land banking as alternative options to its present procedure to acquire land.

3.5. The study; a strategy for planning public housing sites

Considering the demand for public housing (i.e. the units required which the private sector cannot produce), an estimated 24,000 units are needed annually (see section 2.2), the NHA
would have to expand its production markedly. However, less ambitious production-targets were already out of NHA's reach, because its operations are obstructed by the lack of a large enough revolving fund, the limited availability of suitable land in the Metropolis and the limited capacity of the construction industry.

Other problems, partly caused by these operational limitations, are the underoccupancy of sold units, defaults and arrears as well as resale to higher-income groups.

In order to address the housing shortage, also in view of the capital available for housing and the affordability of the residents, slum-upgrading is important and at short notice more effective than building new units. But in view of forementioned financing problems, NHA is likely to concentrate on new housing projects. Due to the increasing evictions also a growing number of people will have to be rehoused. Furthermore the role of the informal housing sector in absorbing housing shortages is declining. The new demand, as a result of growth, will have to be absorbed by other sections of the housing market. Concerning the low-income groups, their demand can almost only be absorbed by new public housing.

There are two major aspects concerning new public housing: the production level and the suitability of the product for the targetted client group.

Concerning the production level NHA is limited by factors it cannot influence. Only in the field of alternative strategies to acquire and/or develop land action is possible. A special study into this subject will be conducted in 1986, with the aid of the Asian Development Bank\(^{10}\). Strategies to bring presently vacant private landholdings into urban use (development instead of acquisition) are not only important for public housing, but also to address many of the city's infrastructure development problems (i.e. increasing the efficiency of present and future infrastructure and services, see section 1.6).

The remaining part of this study is, in view of these factors, focussed on the locational aspects of public housing taking into account the variations possible regarding standards, cross-subsidy levels and housing types provided. These aspects are considered to determine the suitability of the produced units for the targetted client group taking into account their limited affordability as well as the financial viability and cost factors of a project. In this respect the development of the Metropolis and especially investments in infrastructure are of importance.

For the identification of the priorities of the target group and the consequences for public housing we used the many available research reports of low-income settlements and public housing projects. The latter were, together with technical project reports, also used to identify cost factors.

Finally these factors and priorities have been used to identify possible locations for public housing, now and in the future (by taking into account future investments in infrastructure), as well as trade-offs between costs and suitability.

Due to the limited, and probably inaccurate, data on land-prices and in order to comply with the existing land acquisition procedure not specific locations but broader areas are compared. Furthermore alternative land acquisition and/or development strategies (such as land banking) can be taken into account; for this purpose the 1985 and 2000 infrastructure situation have been chosen.
PROBLEMS AND LIMITATIONS

NOTES CHAPTER 3

1. According to Sidhipai Tanphiphat, assistant director GHB
2. e.g.: Klong Toey, Lad Bua Kao, Manangkasila and Bang Bua
   Chadsri Bunnag and Somsook Boonyabancha: Land-sharing in Bangkok
3. Rataya Chantien: Problems, experiences and strategies of low-income housing in urban
devolution in Bangkok
4. NHA: Evaluation Tung Song Hong and L.F. Salmen, see 5
5. L.F. Salmen: Participant-observer evaluation of urban projects in Thailand
6. IBRD: Project Completion Report Bangkok Sites & Services
7. see 4 and
8. NHA: Present standards and prices, 1980
9. NHA/CHISS: BMR Housing and Urban Poor Sector, Interim Report
10. Asian Development Bank: Appraisal of the shelter sector project
CHAPTER 4. PRIORITIES OF LOW-INCOME PEOPLE

4.1. Proximity to employment and services

The first priority of low-income people, defined as a household with an income below the 50th percentile of the income distribution curve (i.e. less than 5460 Baht/month, see table 4.1), is work and a shelter close to employment opportunities. Their low income is often earned with odd-jobs, informal sector merchandise and unskilled service and manual work. These labourers switch jobs often and rely on contacts in the neighbourhood for (temporary) work. They have to be prepared to move to another part of town if opportunities over there seem better. Only those with a regular occupation can afford a permanent house and greater distance between home and work. In most households, both parents are working to earn an income sufficient for the family. A diverse range of employment opportunities (formal-informal, skilled-unskilled) is needed for low-income people. Relocations of slum dwellers to NHA Sites & Services Projects have been unsatisfactory so far, due to limited job opportunities and increased housing and transport costs.

The facts.

Research in several low-income settlements supports the previous statements. Investigations of Klong Toey slum in 1971<1> and 1973<2> showed that around 22% of the labour force was occupied with port related activities (the settlement is located on land belonging to the Port Authority of Thailand) and 30% worked within 15 minutes of travelling. Questioned about the reason for staying in Klong Toey, 37% answered "close to job opportunities", while "near relations" came in second (16%) and "cheap" was mentioned by 11% of the respondents.

An interview of 96 settlers from 12 slums in 1981<3> found as reasons for moving in "near work" (66 respondents) and "low rent" (29 respondents); the reasons for leaving the previous settlement were: eviction (43), high rent (13), migration (26), "starting a family" (10) and "far from work" (4 respondents). A recent NHA-survey of 116 slums in 1985<4> shows that slum-dwellers move frequently; 23% moved into a settlement less than 5 years ago. The predominant reason to choose a certain community is its "location near employment" (32%), others are "to follow spouse" (21%) and "rented house available" (12%).

A study on house-renters in four low-income settlements in Bangkok<5> showed that "work is the most frequently mentioned reason encouraging people to move from place to place". In all four settlements the main reason for moving in was "close to workplace", second came "live close to friends and relatives", while "availability of jobs", "good accessibility" and "low rent" were mentioned frequently also. In this study it was found that newly arrived people tend to be younger and more mobile and mainly renting a house, while home-owners were on average older, lived longer in the settlement and had regular employment with a higher income per household.

Furthermore important is the fact that the average number of earning members per low-income household is 2 to 3 (see table 4.2). In general the head of the household (husband) has a more or less regular job in the formal sector, while the second member (wife) earns an additional income working at or close to home in the informal sector. This indicates that an industrial estate alone is not enough to attract and satisfy low-income people; the wages for (unskilled) labour are too low for a whole family. A combination of industrial estate and city sub-centre seems more promising.

A study on "housing arrangements for the slums evicted from canal settlements in Bangkok" in 1983<6> reveals some of the problems low-income people are faced with when they are relocated. 110 families from three settlements were moved to three NHA sites & services projects (Tung Song Hong, Lad Krabang and Bang Plee Bang Bo) and two private housing schemes. Before relocation 65% worked within 5 km of the settlement and only 10% travelled farther than 10 km. Now

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37% works within 5 km of the new settlement and 41% travels more than 10 km, since most people kept their jobs. Residents of Bang Plee Bang Bo travel as much as 35 km to their working places in the Central Business Area.

55 families (50%) experienced a substantial reduction of their savings (income minus expenditure) and have economic problems, 16 of these spend more than they earn. Only 18 households were able to improve their economic situation. The reasons for this are clear: a high increase in housing expenditure (88% had no housing expenditure at all before relocation!) and increase in travelling expense, in combination with lower incomes. Some families moved back to other settlements close to their work place and to housing with lower rent.

Public transport.
Proximity to employment and services is a relative conception, since not only location but also accessibility is an important factor as the above has made clear. Accessibility for low-income people means a good access to public transport, since this is the only affordable mode of transport.

People in the Tung Song Hong project emphasized the good accessibility of this site, because of the expressway and "several buslines". Residents of Klong Toey slum use walking (22%) or the bus (50%) as the main means of transport; in case of travel times over 30 minutes, 90% of the people used the bus<sup>7</sup>. The situation mentioned in Lad Krabang and Bang Plee Bang Bo, to where many slum-dwellers were relocated, was characterized by the lack of good and cheap transport facilities. Only recently the Bangkok Mass Transit Authority (BMTA) has opened a busterminal in Lad Krabang.

Especially the BMTA-buses provide a good service at low cost (2 Baht flat fare), the private buses and BawKawSaw long distance buses are more expensive. There are also many mini-buses (songthaews) in Bangkok which function as feeders for the BMTA-network. In the suburbs, where people live 1-3 km from the main road, these songthaews ride up and down the sois to deliver their passengers at the next BMTA busstop. Because there is no alternative, the maximum distance to a busstop is unlimited and there will always be some mode of (public) transport to facilitate the commuters. This transport is however quite expensive.

4.2. Affordable housing costs
The second priority of the people is a secure place and ample space to live, but at reasonable cost. A secure place to live implies a wide range of housing options (self-built, bought or rented), which share one basic principle: security of tenure.

The extent to which an option is attainable depends on the share of the household-income which might be used for housing.

Income distribution.
In table 4.1 the income distribution for the Bangkok Metropolitan Area is shown, based on a survey in 1981 by the National Statistics Office<sup>8</sup>. The figures for 1984 and 1987 are an estimation (see section 2.2.) with a slight correction in the lower-income brackets because of the growing disparity in the BMA and the growing number of urban poor<sup>9</sup>. Average income growth is around 4% per annum.

Furthermore it is worthwhile to note that these figures are averages; they do not reflect irregularities in the household income (especially when earned in the informal sector), nor do they reflect possible expenses necessary to obtain these earnings. In this respect the social structure of slums is of importance (see section 2.1); here opportunities for earnings are created which would normally not occur.

Previous income distributions used by NHA were based on the 1975-1976 survey, which did not account for the growing disparity and were therefore slightly optimistic. The income distribution based on the 1981 figures will serve as the base for our calculations of affordability in
PRIORITIES OF LOW-INCOME PEOPLE

NHA-projects.

table 4.1: Income distribution in the BMA in % of households.

<table>
<thead>
<tr>
<th>% of households</th>
<th>1981</th>
<th>1984</th>
<th>1987</th>
<th>affordability</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>2080</td>
<td>2330</td>
<td>2580</td>
<td>500</td>
</tr>
<tr>
<td>20%</td>
<td>2670</td>
<td>3080</td>
<td>3500</td>
<td>1000</td>
</tr>
<tr>
<td>30%</td>
<td>3250</td>
<td>3875</td>
<td>4500</td>
<td>1750</td>
</tr>
<tr>
<td>40%</td>
<td>4000</td>
<td>4670</td>
<td>5330</td>
<td>2500</td>
</tr>
<tr>
<td>50%</td>
<td>4750</td>
<td>5460</td>
<td>6170</td>
<td>3500</td>
</tr>
<tr>
<td>60%</td>
<td>5750</td>
<td>6460</td>
<td>7170</td>
<td>4750</td>
</tr>
<tr>
<td>70%</td>
<td>7100</td>
<td>7920</td>
<td>8750</td>
<td>6000</td>
</tr>
<tr>
<td>80%</td>
<td>8700</td>
<td>9750</td>
<td>10800</td>
<td>8500</td>
</tr>
<tr>
<td>90%</td>
<td>12500</td>
<td>13960</td>
<td>15400</td>
<td>12000</td>
</tr>
</tbody>
</table>

source: 1981: NESDB, urban poor study; 1984 and 1987 distribution are 1981 distribution inflated with an average of 4% per annum, total average increase: 28%. Differences in increase according to NESDB, urban poor study.

Affordability target-group.

Forementioned NHA-survey\[^{10}\] showed that one quarter of the families interviewed have a household-income below 5000 Baht per month, the average income is 5940 Baht per month. The majority of the families rent house and land for around 500 Baht/month. Housing affordability of the urban poor is more or less 20% of their household-income, approximately 800-1000 Baht per month. Given an average income of 4000 Baht, a family is able to spend 600 Baht on housing and 200 Baht for utilities (water and electricity).

In table 4.1 the affordability of the target-group is shown. The lower brackets are, according to NHA, able to spend 20-30% of their income on housing, the higher brackets can go as far as 40%. These figures are, of course, generalizations which should be used with some care as they do not reflect irregular income and other necessary expenses.

In table 4.2 we can see that the average income of families in low-income settlements is around 5000 Baht/month, which is in the 40\(^{th}\) percentile (see section 2.2). They spend from
about 14% on housing when living in slums to 30% when living in upgraded or relocated settlements. In NHA-projects low-income households that hire-purchase a dwelling spent more than 30% of their incomes on housing<11>. The Asian Development Bank considers 16-26% to be acceptable<12>. We can also see that in several slums the per capita income is less than 1000 Baht/month, which is the estimated poverty line in 1984. This is mainly due to the large household size. A study on Urban Poor by the NESDB states that low-income families are poor because of their large size and hence have many dependents<13>.

<table>
<thead>
<tr>
<th>Slums</th>
<th>Number of Households (HH)</th>
<th>Average HH-size</th>
<th>Average Workers per HH</th>
<th>Average HH-Income B/m</th>
<th>Per Capita Income B/m</th>
<th>Housing Expenditure B/m</th>
<th>% of Income</th>
<th>Rent for Land/House B/m</th>
<th>Water/Electricity B/m</th>
<th>Average Plotsize m²</th>
<th>Average Dwelling Area m²/p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 slums house-renters 1984</td>
<td>407</td>
<td>4.4</td>
<td>2.1</td>
<td>4495</td>
<td>1022</td>
<td>622</td>
<td>13.8</td>
<td>519</td>
<td>290</td>
<td>75.2</td>
<td>25.2</td>
</tr>
<tr>
<td>4 slums house-owners 1984</td>
<td>419</td>
<td>6.1</td>
<td>2.4</td>
<td>6296</td>
<td>1041</td>
<td>391</td>
<td>6.2</td>
<td>82</td>
<td>304</td>
<td>75.2</td>
<td>41.4</td>
</tr>
<tr>
<td>NHA survey 116 slums 1985</td>
<td>3483</td>
<td>4.8</td>
<td>3*</td>
<td>5942</td>
<td>1238</td>
<td>800</td>
<td>14*</td>
<td>500</td>
<td>-</td>
<td>65.0</td>
<td>45*</td>
</tr>
<tr>
<td>Manangkasila 1984 ***</td>
<td>197</td>
<td>5.1</td>
<td>-</td>
<td>4404</td>
<td>864</td>
<td>1310</td>
<td>30.7</td>
<td>804</td>
<td>-</td>
<td>27.0</td>
<td>33.3</td>
</tr>
<tr>
<td>Sengki slum 1984</td>
<td>122</td>
<td>5.3</td>
<td>2.2</td>
<td>5364</td>
<td>1012</td>
<td>645</td>
<td>12.0</td>
<td>321</td>
<td>324</td>
<td>83.6</td>
<td>43.7</td>
</tr>
<tr>
<td>Lad Buakao 1984 ***</td>
<td>67</td>
<td>6.1</td>
<td>2.6</td>
<td>4901</td>
<td>803</td>
<td>1350</td>
<td>27.6</td>
<td>530</td>
<td>-</td>
<td>40.0</td>
<td>42**</td>
</tr>
<tr>
<td>Bang Bua 1984 ***</td>
<td>77</td>
<td>6.6</td>
<td>3.0</td>
<td>4546</td>
<td>689</td>
<td>1280</td>
<td>28.2</td>
<td>670</td>
<td>-</td>
<td>60.0</td>
<td>57**</td>
</tr>
</tbody>
</table>

* Calculation authors based on NHA survey  
** only completely finished dwellings  
*** after implementation project

A survey by the NHA on prices and affordability in 1980<14> revealed that "half of the households in Bangkok can afford to buy a plot on the private market, but most of them will have to save for about another 12 years before they can build even a very modest structure on it." Converted to 1984 prices this means that below a monthly income of 5000 Baht households can, in the private market, only afford a rental unit, a walk-up apartment or slum house; this is 44% of Bangkok's population. With an income between 5000 and 6300 Baht per month a family can invest in a piece of land, but still live in slums or rental unit while saving for a house. However, not all households want to own a house. In 480 slums 26% of all households were found to be renters<15>; a share of these families are renters by choice, a high mobility is essential to them.

For the public housing delivered by NHA this implies that low-income families are able to save a considerable part of their income to buy a plot and a house. In recent NHA low-income housing projects, such as Tung Song Hong, Bang Plee Bang Bo and Lad Krabang, plots are offered in the range of 80-144 m² with or without core-houses. These plots are affordable to the 30-40th percentile income group (confer section 2.2 and 2.3).

The monthly instalments required in NHA-projects are acceptable, but other factors involved may cause defaulting and dropping out. As the study on relocation shows, eviction to new locations often results in a decrease of income. Further the initial investment for constructing and finishing the shelter is a high burden as evaluation-surveys in Tung Song Hong showed<16>. 

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Apart from this, hire-purchase of plots is not a solution for young and still mobile families; to own land is something for the future when they are settled. Security of tenure is more important than owning a piece of land\(^{17}\).

Another conclusion we can draw from the facts and figures is that slums are not inhabited only by poor people. The average income of slum-dwellers is 5000 Baht per month, which puts them in the 40\(^{th}\) percentile group; one third has an income above the Bangkok average, while half of the slum families are poor. These families are larger and have more dependents than the average Bangkok family, which means a low per capita income.

On the other hand many households in the 10-20\(^{th}\) percentile group are "one person households", which means that on a per capita base these households belong to the 50\(^{th}\) percentile and up\(^{18}\). The per capita income of slum ("low-income") families is low indeed, but the fact remains that slum and squatter settlements are populated by a fairly wide range of income groups.

Minimum standards.

The standard NHA plotsizes in \(s\&s\) projects is 80 m\(^2\) for the lowest incomes, but in recent \(s\&s\) projects supported by the Asian Development Bank\(^{19}\) the standard plotsize is minimally 48-60 m\(^2\). In relocation and land-sharing projects, plotsizes of 60 (Klong Toey, Bang Bua) or even 40 m\(^2\) (Lad Buakao, Manangkasila) were accepted to reduce costs (confer table 4.2). Two-storey row houses were built to make optimal use of the available space. Average households (5 members) were generally satisfied with the plotsizes\(^{20}\).

People prefer to build the houses themselves, according to their own standards and affordability\(^{21}\). This is the basic idea behind the sites and services concept and core-housing. Problems related to this concept and the reason for providing complete shelters have been discussed in chapter 3.

In existing slum settlements, private and public space is used intensively as playground, drying and storage space, meeting place, etc.. In new projects people want some extra space for these activities. Adequate roads, water-supply and electricity have a high priority and in general people are willing to pay for private connection of drinking water and a private toilet. Public telephone, street lighting and fire-fighting equipment are important for security\(^{22}\).

From table 4.2 we can conclude that the average household size is around 5. With a dwelling area of 7 m\(^2\) per person this would lead to a minimal standard 35 m\(^2\) floor area. NHA-cores offer about the same space, but the new residents extend these cores as soon as possible to houses twice or three times this size. Two-storey row-houses on a 60 m\(^2\) plot (as in Bang Bua) are comparable with standard NHA one-storey houses on 84-100 m\(^2\) plots, and therefore quite acceptable to even large families.

4.3. Cost reduction possibilities

The standard of infrastructure, flood protection and utilities is of major influence on the price of a serviced plot. From previous sites & services projects by NHA we can see that 70\% of the total cost can be influenced by altering the standard (see table 4.3). By lowering prices, these projects will be affordable to a larger group of people.

Another factor that can influence the costs of a project is the location of the site. About 25\% of the total costs may be influenced by choosing a different location.

From table 4.3 it can be seen that the costs can be divided into three groups with a more or less equal share.

A higher standard of infrastructure, houses and utilities will increase the costs. A lower density (= higher standard) will decrease the benefits. Complete houses, cores or just provision of building materials may influence the prices for plots considerably. Higher direct costs and construction costs will furthermore lead to increasing contingencies, since these
are a fixed percentage of the costs for building materials and labour (around 10-25%).

Proximity to the city-centre, proneness to flooding and connection with main system of infrastructure are aspects that may influence development costs. For example the NHA considers a land price over 13% of the total costs too high to be viable! The calculation in appendix 4 shows that a land-price of 250 to 300 Baht/m² is the maximum affordable by low-income groups. The suitability of the location (close to the centre) has to be balanced against the costs (a higher land-price). By lowering standards of infrastructure and with more efficient management, the total cost will be lower and the share of the land-price may go up to 20%.

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**Table 4.3: Breakdown of costs NHA s&s projects**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>land acquisition</td>
<td>7.6%</td>
<td>6.0%</td>
<td>16.8%</td>
<td>4.5%</td>
<td>9.4%</td>
<td>10.4%</td>
</tr>
<tr>
<td>flood protection</td>
<td>1.3%</td>
<td>2.4%</td>
<td>5.1%</td>
<td>4.0%</td>
<td>7.7%</td>
<td>5.6%</td>
</tr>
<tr>
<td>on-site infrastruc.</td>
<td>16.7%</td>
<td>19.9%</td>
<td>8.9%</td>
<td>17.5%</td>
<td>21.6%</td>
<td>11.8%</td>
</tr>
<tr>
<td>off-site infrastruc.</td>
<td>6.7%</td>
<td>1.3%</td>
<td>1.4%</td>
<td>2.1%</td>
<td>0%</td>
<td>2.5%</td>
</tr>
<tr>
<td>total direct cost</td>
<td>32.3%</td>
<td>29.6%</td>
<td>31.2%</td>
<td>28.1%</td>
<td>38.7%</td>
<td>30.3%</td>
</tr>
<tr>
<td>construction of houses, schools</td>
<td>33.8%</td>
<td>37.1%</td>
<td>36.9%</td>
<td>49.9%</td>
<td>33.1%</td>
<td>40.8%</td>
</tr>
<tr>
<td>overhead, interest and contingencies</td>
<td>34.0%</td>
<td>34.2%</td>
<td>31.9%</td>
<td>22.0%</td>
<td>27.1%</td>
<td>28.8%</td>
</tr>
</tbody>
</table>

*) Estimation costs per 1978, land at market value.

**) Actual costs per 1984, land was transferred to NHA on 1966 cost base. Real market value in 1979 was four times this price.

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A great distance from roads and watersupply networks will increase the cost for off-site infrastructure as the cases of Lad Krabang and Samut Prakan show. Flood protection implies high costs of infrastructure and a high degree of management in case pumping is needed. Land fill, as used in Nakhon Pathom and Samut Prakan, also proves to be quite expensive; in Lad Krabang where the danger of flooding is small the cost for flood protection is much less.

A study carried out by MIT showed that circulation/storm drainage "is clearly the most costly utility and consequently provides much more room for savings than other utilities that cost less". Cost increases from minimum to standard level of services for the basic networks are as follows:

- electricity/street lighting = insignificant
- water-supply, sewage disposal = appreciable
- circulation/storm drainage = very substantial.

There are four ways the minimize the costs of circulation and drainage:

1. rectangular plots with short access side
2. grid instead of gridiron lay-out
3. lowering the level of service
4. higher density.

The NHA already uses an optimal lay-out for its projects. The only way to reduce costs is by lowering the standards, i.e. a higher density and a lower level of service. Net densities of 20-25 units/rai are possible with an average plot size smaller than 80 m². Average gross density in NHA-projects is 12 units/rai, this might be increased up to 15 units/rai.

Since NHA has a rich experience in the field of lay-out optimization, it is sufficient to note...
that the possibilities for cost reduction by the design, apart from the ones mentioned above, and implementation of on-site infrastructure depend for a large share on the physical suitability of the site, and as such can be used as criteria when assessing locations for public housing.

4.4. Conclusions

First priority.
The first priority of low-income people is work. They need a good accessibility to a wide range of employment opportunities. The most favourable location in this respect is of course the Central Business Area; people are prepared to travel more than one hour by bus to work there.

Other opportunities with a less diverse range of employment opportunities are the several city-subcentres, where one can find services, markets, shops, small industry, etc. Industrial Estates offer a somewhat more selected range of employment, but the high concentration of jobs makes these locations interesting for labourers to live close by.

Informal sector employment is often a spin-off from formal economical activities; large concentrations of people and activities, like the three areas mentioned above, offer also informal employment opportunities and reinforce the importance of these centres for low-income people.

In the informal sector social relationships are important; slums create, due to flourishing social networks, opportunities internally (see also section 2.1).

Second priority.
The second priority of low-income people is suitable place to live (with ample space) at affordable cost. The most important aspect is land and security of tenure.

For highly mobile households renting is more important than owning, the last is usually the objective of households with stable income.

The actual house can be obtained in many ways: rented, self-built, contractor-built or bought. The choice made is depending on the household-income and the availability of finance.

Implications for public housing.

In view of the first priority of the target group the location of a project, i.e. the proximity to and linkages (transportation-possibilities) with employment centres, is important. Highly mobile households prefer to rent their housing and are even stronger depending on proximity to employment centres. Public housing nowadays is directed towards possible house owners. In order to serve the market as good as possible it might be necessary to start with rental units.

Because a share of the informal sector opportunities is created within the existing low-income settlements, with their strong social structures, the promotion of community organization might contribute to the creation of employment opportunities within public housing projects.

The present standards used by the NHA are a little high (and therefore costly) for low-income housing. A reduction of these standards is being discussed by the agencies involved. Cost reduction of NHA housing options is also a matter of location: land-price, flood protection and connections with the road- and watersupply-network influence about one quarter of the total costs.

It is possible to accommodate even the 10-30\textsuperscript{th} percentile income groups by means of internal cross-subsidy, variation in plotizes and good financial arrangements for purchase of a dwelling. Using the people's affordability as a starting point, we see in appendix 4 that a raw land-price between 250 and 300 Baht/m\textsuperscript{2} is the maximum for a viable and self-financing housing project.
People prefer dwellings according to their own standard and affordability, but often lack the money to invest in a basic shelter just after they move onto the site. The shift in the NHA policy to build immediately habitable housing units<sup>24</sup> will be advantageous to the lowest income groups.

A more elaborate overview of the requirements for low-income housing projects, which result from the priorities previously mentioned as well as NHA’s operational constraints, is given in appendix 4.2.

NOTES CHAPTER 4

<1> C. Sakorupan et.al.: Klong Toey; a social survey of a squatter slum
<2> T. Hongladaromp: Klong Toey 1973; a house to house survey of the squatter slum
<3> Joe Maier: Process of new slum formation in Bangkok
<4> CHHSS/NHA: BMR Urban Poor Study
<5> S. Pornchokchait: A study of house renters in four Bangkok slum-housing settlements
<6> P. Niyom & D. Thaitakoo: The housing arrangements for the slums evicted from canal settlements in Bangkok 1983
<7> see <2>
<9> NESDB: BMR Urban Poor Study, Interim Report
<10> see <4>
<11> USAID/NHA: Survey of house purchasers in Thailand 1982; in <12>
<12> ADB: Appraisal of the shelter sector project
<13> see <9>
<14> NHA: Present standard and prices
<15> S. Pornchokchait: House-renters in Bangkok slum & squatter settlements with reference to 480 existing settlements
<16> NHA: Final report of qualitative evaluation of the Tung Song Hong project and socio-economic survey
<17> Sopon: 1020 Bangkok slums; evidence, analysis, critics
<18> M. Rodell: Housing Demand Study, working report II & CHHSS/NHA: BMR Housing Sector study
<19> see <12>
<20> Social Research Institute: An evaluation of Lad Buskao community project of the NHA
<21> C. Bunnag & S. Boonyabancha: Land-sharing in Bangkok
<22> Social Research Institute: An evaluation of Bang Bua community project of the NHA
<23> NHA Project administrative division, Nakhon Pathom and Samut Prakan Housing Projects; Lad Krabang sites & services project; Final report Bang Plee Bang Bor New Town; see also <16>
<24> R. Goethert & H. Caminos: Urbanization Primer
<25> IBRD: project completion report Bangkok sites and services
CHAPTER 5. EVALUATION AND SELECTION OF PUBLIC HOUSING SITES

5.1. Introduction

Following chapter 3 it can be concluded that the major aspects to be addressed in the public housing delivery system are the production level and the suitability of the product for the targetted client group. Concerning the production level, limitations beyond the purview of NHA like the limited availability of finance, land and construction capacity hamper the actual results. Within these current external limitations the NHA can only address the suitability of its product. Referring to the chapters 3 and 4, this chapter will be focussing on one subject in particular: finding "suitable" locations for low-income housing. This because the location combines many aspects of suitability and costs. Due to limitations in data and time we will look only at alternatives on the medium term (until 2000).

"Suitable" stands for a number of (locational) criteria that give an indication in what measure the priorities of low-income people and the demands of the NHA are met. A number of alternatives (locations) will be selected and evaluated by means of these criteria.

As we found in chapter 4, the most important requirements a location should fulfil are proximity to employment and services and affordable housing costs. A third requirement is spatial concordance of development with governmental policies and investments, as elaborated in chapter 1. However the latter requirement is less important to NHA and the residents. We will therefore make distinctions between several viewpoints and their respective priorities in section 5.2. Here we will also take a closer look at the requirements, since this will render the criteria to evaluate the alternatives. These eleven criteria and the way they are made operational are described in detail in appendix 5.1.

The alternatives will be assessed for each criterion and the scores are evaluated seperately for each criteria set (representing the requirements mentioned above). Further an evaluation with all criteria will be made. This so-called multi-criteria evaluation will therefore not result in an unambiguous ranking of locations -as we will see in section 5.4- but it does give an insight into why certain alternatives may be considered better than others, and thus supports the policy- and decision-making process. The steps taken in the evaluation process are discussed in section 5.3.

Forementioned method or strategy to find locations has been set up in such a way that it does comply with the present land acquisition procedure of NHA. Alternative methods to acquire/develop land (such as land banking, land pooling schemes) will be investigated in section 5.5. We will give some examples of the usefulness of multi-criteria evaluation methods in this respect.

These alternative options for land development are not only important for NHA, but do also address many of the city's development problems, as discussed in section 1.6. We will illustrate this with some examples in the sections 5.4 and 5.5.

5.2. Locational criteria

Criteria sets.

In section 5.1 the requirements for a low-income housing project were presented. In order to measure the extent in which a location is suitable, forementioned three requirements had to be transformed into locational criteria. Criteria can be defined as standards of judgement, and the extent to which a location meets a particular criterion is measured with an indicator. They are described in detail in appendix 5.1. Each requirement is represented by three or four criteria, viz. the criteria sets. A set consists of a number of criteria, covering the differ-
ent aspects of the requirement (see table 5.1).

First we have proximity and accessibility to employment and services of a diverse nature, that is formal and informal, skilled and unskilled. Industrial estates, markets and city-(sub)centres are data for this requirement. The proximity is measured with travel-time by car.

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### table 5.1: Criteria sets

#### Proximity and accessibility to employment and services

1. Proximity to the Central Business Area
2. Proximity to City-subcentres of Services
3. Proximity to City-subcentres of Industry
4. Quality of Public Transport

#### Affordable housing costs

5. Land-price
6. Flood Protection Measurements
7. Off-site Infrastructure Roads
8. Off-site Infrastructure Watersupply

#### Spatial concordance of development with government policy and investments

9. Concordance with the DTCP Masterplan for Bangkok
10. Efficiency of Infrastructure
11. Potential of land for Agriculture

---

Accessibility is indicated by the level of public transport service, such as the presence of BMTA-buses\(^1,2\). Second set of criteria is affordable housing costs, which means in this context low land-prices and low development cost by looking for a suitable and dry location, nearby or within the existing service envelope. Data are land-price and existing land-use, flood protection masterplans, water-supply masterplans and the STTR-study.

Third set is the desirability of development. It should indicate whether a low-income housing project or any other urban development is desirable on that location and in concordance with policies and investments. Data are DTCP masterplan for BMA, STTR-study, flood protection and water-supply masterplans, existing land-use and potential land-use. As stated before, the importance of this requirement to NHA and its clients is little; if the projects are in concordance with the spatial plans we consider this merely as a bonus. More important are the actual tendencies in the development of Bangkok (confer section 1.6). The contradiction(s) between the first two sets and this set might contrarily be a reason to adjust the spatial urban plans!

---

Check on the criteria.

The criteria derived were specified and assessed in two ways. By evaluating previous public and private housing projects and existing slum and squatter settlements we have found indicators for basic needs and priorities of residents belonging to the lower-income groups (confer chapter 4). We have done the same with existing policies, masterplans and other (physical) data, to find indicators for the level of service (now and in the near future), availability and suitability of land and the costs of off-site infrastructure (confer chapter 1).

The second way is "trial and error"\(^3\), by putting the rough and global criteria to work on the base-maps and see from the results whether they need further refinement or whether they can not be assessed at all because of lack of data. Criteria falling in the latter category
are listed in appendix 5.3, since data necessary to use them may be available later on.

The scores of alternatives for each criterion will be represented by using "base-maps" (see appendix 5.1); Bangkok and vicinity is sub-divided in grids of 500 by 500 metres and in principle each grid stands for a locational alternative and may be assessed individually. This large number of alternatives is not very practical to evaluate and in our analysis we will make two preliminary steps to simplify the evaluation. This will be specified in the next section. Using grids and basemaps makes computerization of the criteria and scores possible. The first two steps of the evaluation were done by hand, which was a very time-consuming process.

Some of the criteria will also be used as veto-criterion, representing a major constraint. Such a criterion is useful to exclude in advance alternatives that are unsuitable, so as to limit the number of alternatives that have to be investigated (see also section 5.3).

**Viewpoints and priority sets.**

In a multi-criteria evaluation not all criteria have the same importance for each actor involved. A viewpoint is expressing the specific interests or priorities of a person, group of people or even a more abstract objective and each viewpoint could thus be labelled with the actor or objective it is representing. The necessity of taking into account different viewpoints was inspired by our wish to show the preferences of each actor and by the lacking of hard, absolute data about the priorities of the actors involved.

Here the viewpoints representing these actors or objectives can be developed by giving the more important criteria more weight, by means of a so-called weighting factor. The higher the weighting factor, the more important the criterion is. Each viewpoint is thus characterized by a set of eleven weighting factors; this set is called a priority set since the weighting factors are expressing explicitly the priorities of a certain viewpoint.

### 5.3. Method of evaluation

**Excluding unsuitable locations.**

The first step of a strategy to find and assess locations for public housing will be a rough sieve-analysis, in which unsuitable housing locations are sifted out. We will use three so-called veto-criteria to do this:

1. travel times longer than 75 minutes to CBA
2. area is already built-up
3. presence of brackish groundwater and more than 1500 metre from a drinking-water supply system.

Grids that do not fulfil one of these constraints are unsuitable. In figure 5.2 the result of this sieve-analysis is shown. It is clear that the number of potential locations for housing is much less and thus a lot of time (=money) can be saved.

**Generating potential alternatives.**

The second step is to generate more or less homogeneous alternatives (i.e. locations) by using a limited number of criteria that are considered to be essential; the so-called hierarchial cluster-analysis. The result of this step is a crude ranking of grids (500 by 500 metres) and each cluster of grids may represent an alternative.

For this step two sets of criteria were used, namely:

1. proximity and accessibility to CBA and to subcentres of employment and services
2. the price of land and the costs of flood protection and off-site infrastructure.
The sets were used in a more global way than as described in appendix 5.1, since the only goal was to get a crude ranking of the grids. Grids with a more or less equal score form a cluster and thus each alternative is represented by a cluster of grids. In figure 5.2 the clusters and their scores are shown.

Notable are the clusters with score SSC; because of their high level of service and reasonable cost of infrastructure the land-price in these areas is quite high. It is exceptional (as the five clusters with SSCC scores show) that highly accessible and well-serviced areas have a low land-price. In four of the five cases this favourable score is based on investment plans for the year 2000. Present service levels (and thus land-prices) are still low and this example may emphasize the importance of land-banking (and by the way the usefulness of this study).

24 alternative locations.

After this step we see that there are about 75 clusters of grids with more or less good scores (figure 5.2). Most interesting for the NHA are the clusters with SCC and SCCC scores and these clusters will all be taken into consideration for the third step. For low- and middle-income people the SSC clusters are interesting since they represent potential housing development with good employment opportunities, but probably too expensive for low-income people because of the high land-price. As for the clusters with SS, SC and CC scores, these are more interesting on the long term, after the year 2000, and will not be evaluated in this study.

The alternatives that will be evaluated in section 5.4 are the clusters with the SSOC, SSC and SCC scores, and one more location, Bang Plee Bang Bo New Town, where the NHA already owns land which will be developed for housing. In total we now have 24 alternatives as shown in figure 5.3. The total area to be considered is 171 km$^2$. Remarkable are the gaps in the built-up area with a low service level and therefore unsuitable, totalling around 49 km$^2$.

Multi-criteria evaluation.

The third (and final) step is the more detailed multi-criteria evaluation, to find out several sets of prime locations, each set depending on the priorities chosen beforehand.

The reason for choosing a multi-criteria evaluation, and the advantages and disadvantages of such an analysis, may best be explained by citing H. Voogd from "Multi criteria evaluation for urban and regional planning":

"Multi-criteria evaluation (mce)-methods serve to investigate a number of choice possibilities in the light of multiple criteria and conflicting priorities. An mce-method can serve to inventorize, classify, analyze and conveniently arrange the available information. The method uses a number of explicitly formulated criteria (= standards of judging) which may be measured with indicators reflecting as good as possible the nature of the criteria concerned. Another important feature of mce-methods is that they are able to take explicit account of policy priorities. The result will then be a conditional evaluation, i.e. the outcomes will depend on the viewpoints expressed."

In this regard mce-methods give an explicit account of the way in which the various aspects of the planning problem are taken into consideration in the decision making process. This way assumptions and appraisals are explicit and can be properly explained and justified.

The main reason for us to use an mce-method is that we have many choice-possibilities after the second step and many criteria; the problem is therefore rather complex. For the same reason we will make use of a computer-programme (EVAMIX), which can handle our particular case.

In appendix 5.1 the scores of the selected alternatives are presented, as derived from the assessment of the criteria in appendix 5.1. The scores for the year 2000 show best the suitability for new housing locations if we take the time to develop locations, 4 to 8 years, into consideration. To make the assessment for 2000 we used our own interpretation of the likelihood of the plans as described in chapter 1, hence the scores may differ a little from the
EVALUATION AND SELECTION OF SITES

figure 5.2
Sieve- and cluster-analysis.

Sieve-analysis results:
- area excluded by veto criteria travel time and brackish water
- area excluded by veto criterion built-up area

Cluster-analysis results:
- good services, low cost (SSC)
- good services, reasonable cost (SC)
- reasonable services, low cost (SCC)
- good services (SS)
- reasonable services and cost (SC)
- low cost (CC)
- not suitable

scale 1 : 250,000

north
The resulting 24 alternative areas.

1. Bang Plee Bang Bo New Town
2. Lad Krabang
3. Bang Kruei
4. Talat Chom I
5. Phasi Charoen I
6. Rat Burana I
7. Rat Burana II
8. Muang Samut Prakan
9. Yannawa
10. Bang Kapi Wat Kohon
11. Muang Nonthaburi I
12. Muang Nonthaburi II
13. Talat Chom II
14. Patr Charoen II
15. Samut Prakan Bang Na
16. Phra Khanong Nong Bon
17. Huai Khwang
18. Bang Kapi Huai Mark
19. Lad Krabang Klong Mae Chan
20. Minburi
21. Bang Kapi Wat Chuan Nan
22. Bang Kapi Rama Indra
23. Pathum Thani Bangsait
24. Nonthaburi Bang Salama
actual plans.
The scores for 1985 will be used in section 5.5, to distinguish between locations that can be
developed directly and alternatives that can best be developed a little later, when other
locations are used.

5.4. Evaluation of the alternatives

With the computer-programme EVAMIX we have made several runs with changing priority sets, to
get an insight into the strong and weak points of each alternative. We have made runs for each
criteria set separately, and will discuss the results below. The final runs are a compilation
of all criteria also taking into account several viewpoints. Although they are subjective and
arbitrary and not based on "hard" socio-economic data, the priorities are explicit and give an
indication of the relationship between the priority sets (or viewpoints) and the ranking
(suitability) of the alternatives.

In appendix 5.2 the outcomes from one run, which made use of what we defined as the NHA vision
or priority set, is listed with an analysis of the weak and strong points of each alternative.

Proximity and accessibility to employment and services.
We have defined the following viewpoints and priority sets for the criteria 1 to 4:

IA: Only the first criterion (proximity to CBA) is taken into consideration.
IB: This priority set emphasizes clearly the importance of the CBA and proximity and
accessibility to employment and services. It represents in our opinion the ideal set for
evaluating locations for housing.
IC: This priority set puts little emphasis on the CBA and more on secondary centres and
accessibility. It does acknowledge the fact that close to the CBA it is difficult to buy
land for (low-income) housing. IB can be labelled as the NHA viewpoint.

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>4, 7, 9, 12, 13 and 17</td>
<td>1, 2, 20</td>
</tr>
<tr>
<td>1, 2, 11, 21, 22 and 24</td>
<td>23, 24</td>
</tr>
</tbody>
</table>

Looking at the ranking for the first criteria set, proximity and accessibility to employment and
services, we can see that the alternatives 4, 7, 9, 12, 13 and 17 score well for all three
priority sets, whereas the alternatives 1, 2, 11, 21, 22 and 24 always have a low ranking.
Remarkable are the alternatives 8, 19 and 23, which are very suitable from an NHA viewpoint.
These locations are situated far from the Central Business Area (CBA), but have good public
transport accessibility and are close to secondary centres of employment and services.
Contrarily alternative 3, 5, 6 and 14 tumble to the lower regions when the NHA viewpoint is
emphasized. Especially Bang Krual (3) is situated close to the CBA, but in a rural area; relationships
with centres of employment and services are therefore poor.

Costs of development.
The following viewpoints and priority sets have been defined for the second criteria set:
EVALUATION AND SELECTION OF SITES

2A: Land-price, only the fifth criterion is taken into account.
2B: Infrastructure, with the criteria 6, 7 and 8 only.
2C: Costs I, with much emphasis on land-price.
2D: Costs II, with less emphasis on land-price.

**Table 5.5: Ranking second criteria set**

<table>
<thead>
<tr>
<th>ranking</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>land-price</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>24</td>
<td></td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>20</td>
<td>7</td>
<td>18</td>
<td>21</td>
<td>4</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>infrastruct.</td>
<td>(0, 1, 1, 1)</td>
<td>9</td>
<td>12</td>
<td>17</td>
<td>8</td>
<td>15</td>
<td>16</td>
<td>6</td>
<td>19</td>
<td>18</td>
<td>14</td>
<td>5</td>
<td>11</td>
<td>23</td>
<td>10</td>
<td>20</td>
<td>22</td>
<td>7</td>
<td>3</td>
<td>13</td>
<td>21</td>
<td>24</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>costs I</td>
<td>(7, 1, 1, 1)</td>
<td>18</td>
<td>10</td>
<td>19</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>20</td>
<td>11</td>
<td>22</td>
<td>24</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>14</td>
<td>21</td>
<td>15</td>
<td>4</td>
<td>16</td>
<td>12</td>
<td>13</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>costs II</td>
<td>(3, 1, 1, 1)</td>
<td>18</td>
<td>6</td>
<td>19</td>
<td>8</td>
<td>15</td>
<td>10</td>
<td>20</td>
<td>5</td>
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<td>16</td>
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<td>3</td>
<td>7</td>
<td>9</td>
<td>21</td>
<td>24</td>
<td>2</td>
<td>23</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 5.5 clearly shows that the land-price is related to the level of infrastructure and facilities. A good service level (infrastructure, but also proximity to CBA) is usually coupled to a high land-price and mutatis mutandis a low land-price to a low service level. The (weighted) summation of scores technique will therefore not render per se the most suitable locations for NHA (and the residents for that matter). For example Yannawa (9) is the best location for Employment & Services (see table 5.4) and has the lowest costs for infrastructure, but is with a land-price of around 5000 Baht/m² much too expensive for low-income housing.

As we found in chapter 4, the maximum land-price for NHA to be able to purchase land is 300 Baht/m². This means that the alternatives 24, 3, 1, 2, 10, 20, 7, 18 and 21 are affordable to NHA. Supposing the costs of development (off-site infrastructure, flood protection) are low, the land-price could be somewhat higher without increasing the total costs. In table 5.6, second row, we notice that the alternatives 8, 6, 19 and 11 with a land-price of 350-500 Baht/m² are locations with such a potential. With the assumed NHA priority set we can see the high ranking of these four locations. Noteworthy is also the relatively high ranking of Ram Indra (22) and the low ranking of Taling Chan I (4), which both have a reasonable land-price of 350 Baht/m².

In Bang Plee Bang Bo (1), Lad Krabang (2) and Bang Kruai (3) we can see examples of rural areas with a low land-price but high development costs.

Since detailed information about the costs of off-site infrastructure and flood protection is not known, and in fact even the prices of land are just indications (though based on "hard" data), it is very difficult to achieve the right weighting factors that will give a correct ranking for the costs in Baht/m² of each alternative. In table 4.3 we learned from previous projects that the costs of land-price and off-site infrastructure (flood protection, roads and watersupply) are in the proportion of 1.5-2 to 1. So in our assumption of the NHA priority set we have made two extremes, namely 3,1,1,1 and 7,1,1,1. Since the rankings for these two extreme weighting factors are quite similar, we are concluding that the alternatives 18, 10, 19, 6, 8, 20, 11, 22, 3, 24, 1, 2, 7 and 21 are affordable to the National Housing Authority, with Hua Mark (18) and Klong Mae Chan (19) as the two cheapest locations.

Desirability of development.

In chapter 1 we discussed the importance of the DTCP Masterplans and the current BMR-study. The Royal Thai Government (RTG) has become conscious of the impact of infrastructure investments, and the efficiency of land-use and previous investments is emphasized by the NESDB<6>. In section 1.6 we came to the conclusion however that the policies of DTCP and NESDB are not
yet consistent with each other. The alternatives 6, 15 and 19 have a high score for efficiency but according to the DTCP they should remain rural, whereas the locations 2, 4, 10, 13, 20, 21 and 23 are considered "desirable", but infrastructure is still lacking by the year 2000.

table 5.6: Ranking third criteria set

| ranking | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   | 24   |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| R      | 9,17,18,12,16,22 | 1,7 | 5,8,11,21 | 2,20,23,13,14,15,19 | 4,3 | 0,10,24 |

Looking at table 5.6 we see that the so-called "holes in the urban fabric" are ranked in the top. The relatively high ranking of Bang Plee Bang Bo New Town is due to its status as new town, which in our opinion justified a high score for efficiency.

Total evaluation with four viewpoints.

The viewpoints A, B and C are combinations of the viewpoints mentioned above. As stated before, the priority sets used for the viewpoints are subjective and arbitrary. Furthermore table 5.7 gives no real insight into the suitability of locations, since the different scores (as mentioned in the passages above) are smoothed. Nevertheless some broad trends are still visible.

In table 5.7 four viewpoints are shown with their respective priority sets. Viewpoint A could be labelled as "employment & services" (E&S), since its priority set emphasizes the criteria set with the same name. Its priority set is (5,2,2,3,1,1,1,1,1,1); the figures represent the weighting factors for each criterion.

In viewpoint D we have expressed the priority set of the private developer. His main interest...
EVALUATION AND SELECTION OF SITES

is concerned with the land-price, since the standard of infrastructure is low and therefore cheap. Proximity to employment and services is thought to be less important because the target group of the private developers is the 50th percentile income group and up; these people generally have steady jobs and their own means of transport. The priority set of viewpoint D is (1,1,1,5,1,1,1,0,0,0).

Referring to the evaluations of each criteria set, the results for the viewpoints A, B and C are no surprise. Viewpoint A gives a good indication of the prime housing locations, but except for Rat Burana II (7) these are too expensive for the NHA. Noteworthy are the low rankings of Lad Krabang (2) and Bang Plee Bang Bo New Town (1), where the NHA already owns land and is busy developing low-income housing.

If the Thai government (in casu NHA) wishes to develop profitable well-serviced high-income housing schemes (e.g. to compensate for financial losses on low-income housing projects), we can recommend the following locations: Yannawa (9), Nonthaburi II (12), Nong Bon (16), Huai Khwang (17) and Rangsit (23). Relatively well-serviced areas for low- and middle-income housing are Rat Burana I (6) and II (7), Hua Mark (18) and Klong Mae Chan (19). The prime locations are shown in figure 5.8.

Viewpoint B gives a ranking of the housing locations with an emphasis on costs. Employment and services is less important than land-price. Suitable for low-income people are therefore the locations 6, 7, 18 and 19, which corresponds with our conclusions from the preceding passage. Muang Samut Prakan (8), Wat Kubon (10), Minburi (20) and Ram Indra (22) score quite well too. Alternative 9 is not suitable due to its extremely high land-price (its favourable location is however underlined by the presence of many -illegal- low-income settlements).

In viewpoint C the alternatives with an extreme land-price (confer table 5.5) are ranked too high and they should in fact be excluded from the evaluation. Since the NHA (necessarily) puts less emphasis on the proximity to the Central Business Area, we notice that the locations of NHA housing schemes (1 and 2) suddenly have a high ranking. This is mainly due to their "New Town" or "growthpole" concept.

Here too the alternatives 7, 18 and 19 are ranked high, followed closely by 10, 20, 1, 2 and 22. The alternatives 9 and 12 are unsuitable because of their high land-price.

The results for viewpoint D illustrate where the private sector will compete with NHA, and where in the coming years private developers will try to buy or develop land. The latter might give an indication as to where growth and development will occur in the near future.

Comparing the rankings for C and D, we notice that the locations 7, 10, 18, 19 and 20 are ideal locations for both public and private developers, or in other words suitable for all income groups. Furthermore we can see that the alternatives 2, 3, 4, 10 and 24 score relatively bad on efficiency of infrastructure and desirability (tables 5.5 and 5.6), but it is quite likely that (private) development will take place within 15 years. This development will create new backlogs unless the RTG undertakes action, either by restricting such development or by providing for the necessary infrastructure and adjusting the spatial Masterplans.

Conclusion.

In the figures 5.8 and 6.1 the conclusions of the evaluation are shown. In figure 6.1 the locations with unaffordable land-prices are left out, only the best locations for low-income housing are shown. Distinctions have been made between good and medium service level and between low and moderate costs of development.

We do not pretend to give an absolute ranking of alternatives, since we are well aware of the subjectivity of the priority sets and the imperfection of our data and criteria; nevertheless we would like to give a broad ranking of the alternatives as follows:

1. Highly suitable for low-income housing are:

   Rat Burana II (7), Bang Kapi Hua Mark (18) and Lad Krabang Klong Mae Chan (19).
Prime locations for housing. Total area is 46 km².

6. Rat Burana I
7. Rat Burana II
9. Yannawa
12. Muang Nonthaburi II
16. Phra Khanong Nong Bon
17. Huai Khwang
18. Bang Kapi Huai Mark
19. Lad Krabang Klong Mae Chan
23. Pathum Thani Rangsit

scale 1:250,000
north
figure 5.9
Suitability for alternative options.

1. Bang Plee Bang Bo New Town
2. Lad Krabang
3. Bang Krung
4. Taling Chan I
5. Rat Burana I
6. Rat Burana II
7. Muang Samut Prakan
8. Yannawa
9. Bang Kapi Wat Kubon
10. Muang Nonthaburi II
11. Phra Khanong Klong Bon
12. Huai Khwang
13. Phra Khanong Klong Mark
14. Lad Krabang Klong Mae Chan
15. Minburi
16. Bang Kapi Wat Chuan Man
17. Bang Kapi Ram Indra
18. Nonthaburi Bang Saima

---

suitable for land pooling
suitable for 1986
land banking recommended

---

Built-up area 1985
scale 1 : 250,000
north
2. Relatively good locations for low-income housing are:
   - Bang Kruei (3), Taling Chan I (4), Rat Burana I (6), Muang Samut Prakan (8), Bang Kapi
     Wat Kubon (10), Minburi (20) and Bang Kapi Ram Indra (22).
3. Less suitable for low-income housing are:
   - Bang Plee Bang Bo New Town (1), Lad Krabang (2), Pasi Charoen I (5), Muang Nonthaburi I
     (11), Pasi Charoen II (14), Bang Kapi Wat Chuan Nan (21) and Nonthaburi Bang Saima (24).
4. Definitely unsuitable are:
   - Yannawa (9), Muang Nonthaburi II (12), Taling Chan II (13), Samut Prakan Bang Na (15),
     Phra Khanong Nong Bon (16), Huai Khwang (17) and Pathum Thani Rangsit (23).

5.5. **Other options to acquire/develop land for public housing**

As explained earlier, development of (public) housing is determined by the possibility to
develop land at reasonable cost. In the previous sections we have tried to find the best (i.e.
suitability versus costs) locations for housing. The strategy used to assess these locations
was based on the current NHA-procedure for acquisition and development of land, which is very
limited.

With help of the Royal Thai Government and the private sector however more options are avail­
able to the NHA to develop land for low-income housing. In this section we would like to
illustrate in what way the NHA and the private sector can co-operate to increase the low­
income housing stock, and in which locations such a co-operation is advantageous to both.
Further we will give some examples of how the RTG and the NHA can mutually benefit by insti­
gating alternative land development and management techniques.

**Land pooling schemes.**

Land pooling or land readjustment schemes carry out the unified servicing and subdividing of
separate landholdings for planned urban development, in order to expedite infrastructure
provision\(^9\). As such land pooling schemes could be used for an adequate supply of land for
housing, while contributing to an efficient development of the city.

In a land pooling scheme a group of adjoining separate landholdings is developed (e.g. by NHA)
as a single estate; the lay-out is designed efficiently, roads and utilities are provided and
the building sites aligned. The new sites are partially sold in order to recover the project­
costs, while the rest is redistributed to the owner-participants.

In case this location is suitable for low-income housing the government can induce the private
developers to earmark a part of their site for low-income housing. When the NHA is implemen­
ting and co-ordinating the project, part of the available land could be transferred directly
to NHA (as a payment for its involvement), to develop public housing.

The project benefits are thus shared by the participants, while the increase of the land value
recovers the costs. For this reason the land-owners are expected to join such schemes; their
support determines the (political) feasibility of the land development schemes.

Land pooling has high potential benefits. Especially the principle of "the beneficiary pays"
is highly attractive to the government, while at the same time a contribution is made to urban
development. The highly frittered land-holdings in many suburban areas of Bangkok clearly call
for government intervention (see section 1.6). The government (RTG or BMA) may wish to stimu­
late land development schemes in the so-called "holes in the urban fabric", and thus raise the
efficiency of land-use and infrastructure (and at the same time discourage less desirable
developments). Another example is the realization of large-scale public investments, without
having to buy the land at a high price or to use time-consuming expropriation procedures (for
example the implementation of flood retention areas).
Conditions for successful land pooling schemes.

To achieve these potential benefits land pooling has to be used selectively and each project has to be financially viable and effectively implemented. Which locations are most suitable? Land pooling will be a success only when it is profitable to both public and private developers. We have tried to develop some criteria that may indicate this mutual benefit:

1. vacant areas with a highly frittered land-ownership pattern
   The "prisoner's dilemma" (see section 1.3) and the high cost of off-site infrastructure has inhibited development so far; the potential gain can be very high for the land-owners.

2. high potential for urban development
   A high increase in the land value is needed to pay for the investments in infrastructure. A high development pressure on the scarce land available will enhance the land-price.

3. desirability of development
   The government plays (through NHA) an instigating role and has to make the initial investments, so it will only support those schemes that are in concordance with current government policy.

Unfortunately data were lacking to make the most important criterion (1) operational. Since the NHA is still doing research on this subject, an evaluation of the locations could be possible later on. (follow-up!)

Preliminary indication of viable locations.

The set-up and execution of a pilot-scheme has been recommended by the BMR-study\(^{10}\). The NHA, as the single experienced large-scale developer, could play an important role in this respect. We would therefore like to give a preliminary indication which locations may serve as pilot-projects for land pooling schemes.

In table 5.7 we found that the alternatives 4, 9, 12, 13, 16, 17 and 23 score reasonably well for employment and services, but are too expensive for NHA to buy (except for 4). Further it is very desirable, from a governmental point of view, to develop the alternatives 9, 12, 16, 17, 18 and 22 (see table 5.6). These areas are all vacant. The high potential for urban development can be indicated by the level of employment and services and also by the development pressure, based on the projections for the population growth until the year 2000\(^{11}\). At the moment the development pressure from population growth is very high in the khets (districts) Yannawa and Phra Khanong; in Bang Kapi, Nonthaburi and Huai Khwang the pressure is high too (confer appendix 5.3).

A preliminary conclusion is that the alternatives Yannawa (9), Nonthaburi II (12), Phra Khanong Nong Bon (16) and Huai Khwang (17) are too expensive for NHA to buy, but by means of land pooling the NHA may be able to realise low-income housing. Taling Chan I (4), Hua Mark (18) and Ram Indra (22) have a reasonable land-price, but the land pooling option may render good results with less involvement from (and less financial burden on) the government (see also figure 5.9).

The alternatives Pasi Charoen I (5), Nonthaburi I (11), Wat Chuan Nan (21) and Rangsit (23), which represent "holes in the urban fabric" and are all vacant, are less suitable because they have less potential for urban development (5, 11, 21) or because they are less desirable (23). Land pooling will be a success only when the vacant areas have a frittered land-ownership pattern. It is recommended to investigate the alternatives 4, 9, 12, 16, 17, 18 and 22 as soon as possible.

Application for land pooling: flood retention areas.

Noteworthy are furthermore the locations 17, 21 and 22. According to the Flood Protection Masterplan\(^{12}\) retention areas are planned in these locations. Flood retention areas serve an important purpose in mitigating the costs for the main drainage system. For the private land-owner, who wants to make the same profit other land-owners make by developing their land,
there are two alternatives: developing the land, or selling to the government (BMA) at a high price. Thus the implementation of these flood retention areas would be jeopardized and governmental control is needed. Land pooling is a technique that could satisfy all parties involved.

Land banking.

Land banking is a land management technique to secure continuity in the production of land for housing. It can also be used as an investment to gain profit by anticipating on future developments; hence land banking is closely related to land speculation. By investing in land the government can (via NHA) influence the development and (direction of) growth in Bangkok, especially when this land management is in concordance with other public investments in infrastructure. Land banking however puts a heavy burden on the public finance.

Land banking is not unfamiliar to the NHA; its larger housing schemes like Lad Krabang, Bang Plee Bang Bo and Thonburi are implemented in phases but the land was purchased at one go. Due to financial limitations the NHA has not been able to buy land recently and the present landholdings are hardly sufficient if we know that NHA is expected to produce thousands of housing units annually (see section 2.3). The Royal Thai Government or the Bangkok Metropolitan Administration will have to support NHA with loans to purchase land. In return suitable locations for low-income housing (and any other public investment) are secured for the near future and a more balanced spatial development of Bangkok could be achieved.

Indication of suitable locations for land banking.

In table 5.11 we can see that the locations 2, 7, 10, 18 and 19 are suitable for immediate development, whereas 1, 4 and 23 are more suitable later on. Their suitability relatively decreases since only little investments in infrastructure are planned in these locations. Relatively good alternatives as 3, 6, 8, 20 and 22 (confer section 5.4) are benefiting from proposed investments in the next 5 to 15 years, and land banking in these locations (land-prices are still low) is profitable and yield good locations for housing in the future (see figure 5.9).

The highly ranked alternatives 9 and 12 are too expensive for NHA, they are serviced well already.

<table>
<thead>
<tr>
<th>table 5.10: Ranking land banking</th>
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<tr>
<td>ranking</td>
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<td>N H A 1985</td>
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Land speculation can be illustrated by comparing the current situation (1985) with the rankings for the year 2000 from a private developer's point of view. The locations 3, 8 and 20 are prone to speculative activities, since their suitability increases significantly over 15 years. This could be an argument to start land banking in these locations.

Land banking can also be used to prevent undesirable development, for instance an early development of locations not yet serviced. Examples are in this respect the alternatives 3, 4, 10 and 24. Later on, when infrastructure is provided, the government can sell the land (for a good price) or develop it by itself.
5.6 Description of the alternatives

Below we will give a description of the alternatives and their weak and strong points (confer appendix 5.2). The ranking is indicating the suitability of these locations for public housing.

Further we will give an indication of the size of the locations. This size can not be related to capacity in terms of housing units—the NHA will bid for sites within the location—, but it does show the area available for development now or in the near future.

1. Rat Burana II (7); 5 km²

   This location is a so-called hole in the urban fabric, with a relatively poor connection to the road network. It will be connected with the watersupply network in the future and it is quite close to the CBA and the industrial area of Phra Pradaeng. Therefore this location is attractive to low-income people, and the land-price is estimated to be around 300 Baht/m².

   Since the NHA viewpoint puts more emphasis on accessibility, rather than proximity to the CBA, this alternative is an excellent location for NHA because of the good public transport on the adjacent roads.

2. Bang Kapi Hua Mark (18); 3 km²

   Although located quite far from the CBA, it has good connections with industry and services in Klong Chan. Further the costs of development are low after completion of the flood protection and watersupply Masterplans. In other words an ideal location for the NHA to develop and for low-income people to live in.

   In spite of its suitability to be developed by the private sector, this location is still vacant. The accessibility by road is poor and perhaps the owners of the small and frittered land-holdings are not capable of implementing the necessary infrastructure. If this is indeed the case, Hua Mark could be developed with a land pooling scheme in which the public and private sector co-operate and benefit.

3. Lad Krabang Klong Mae Chan (19); 6 km²

   This location has excellent public transport services (busses and railroad) and the connection with the city-centre will be improved dramatically with the construction of the Second Stage Expressway.

   From the NHA's point of view this location is very suitable, but its relatively great distance from the CBA makes it somewhat less good for low-income people. Remarkable is that Klong Mae Chan is indicated as agricultural zone in the DTCP Masterplan, while at the same time large infrastructure investments are planned to open up the area further.

4. Bang Kruai (3); 14.5 km²

   This location is flood-prone, has a high potential for agriculture (orchard) and is at the moment quiet and rural. Highway 914, planned for the nineties, will give a direct connection with the CBA. Hence the area has been earmarked by the DTCP as a suburban growth-pole, and urban development will make it very suitable for low-income housing.

   Land banking—buying but not developing before 2000—by the government may serve two purposes: securing this area for the future and preventing creation of new backlogs. Development is likely to start after the provision of watersupply and flood control, so not before the year 2000.

5. Taling Chan I (4); 7 km²

   This alternative, on the westbank of the Chao Phraya river, is located close to the CBA and other city-centres. Because the area is prone to flooding and accessibility by road is poor, Taling Chan I is still in use as orchard. From a government viewpoint this location should remain agricultural.

   Its potential as a low-income residential area is high, although development is expensive since flood protection, roads and watersupply are not planned before 2000. Here too land banking is necessary to prevent speculation (and thus a sharp increase in land-price) and
backlogs.

6. Rat Burana I (5); 7.5 km².
   Again a rural area, suitable for agriculture but already vacant and encroached by urban
development. The accessibility of this location, and especially its connection with the
CBA, will increase vehemently with the completion of the First Stage Expressway.
The diverse employment opportunities close by, make this location very suitable for low-income people. However the land-price is quite high and from the NHA's point of view Rat Burana I is much less suitable.

7. Muang Samut Prakan (8); 7.5 km².
   In spite of the high land-price (500 Baht/m²) and the great distance to the CBA, this
location is quite attractive from the viewpoint of low-income residents. It is very close
to the town of Samut Prakan and has good connections with the industrial centres in Phra Pradaeng.
   Its accessibility will be improved by a new primary road and provision of watersupply is
planned for 1990. Because of the high land-price the location is less suitable for NHA.

8. Bang Kapi Wat Kubon (10); 14 km².
   This alternative is situated close to the Minburi Industrial Estate and although public
transport is not very good, the accessibility of the CBA is reasonable. The location is
excellent if seen from the NHA viewpoint, but is less ideal when services are concerned.
   Competition from the private sector, in the form of high-income housing estates, is expec-
ted. Since premature development is not desirable from a government point of view, land
banking is profitable to both RTG and NHA.

9. Minburi (20); 6.5 km².
   Minburi scores very bad for proximity to the CBA, but relatively well on secondary centres
of employment and services and for public transport. Expansion of the existing deep-well
watersupply system is not possible, either development has to wait until 2010, when the
connection with the MWWA-network is completed or costly temporary deep-wells will have to
be used.
   In the DTCP Masterplan Minburi has been destined as growth-pole; on the medium term it is
a very good location for the NHA to develop in the tradition of previous sites & services
projects. A large city-subcentre can make this location also attractive to low-income
groups, without the growth-pole concept however Minburi is not likely to be successful.

10. Bang Kapi Ram Indra (22); 4 km².
    Another hole in the urban fabric where development is highly desirable. The area is still
vacant because of a poor accessibility and the presence of unserviced subdivided land. The
costs of development are moderate but the land-price is quite high. Land pooling schemes
could bring this area into efficient development.
    The suitability for low-income groups will be improved after completion of highway 913,
which will give a direct connection by bus with the CBA. This section will probably not be
completed before the year 2000.

11. Bang Plee Bang Bo (1); 4.5 km².
    The NHA already owns land in this location to implement housing and industrial estates in
three phases. This New Town has its own flood protection and watersupply systems, a centre
for services and facilities and an industrial estate.
    All this can make it a very attractive location for low-income people, but at the moment
facilities and employment opportunities (especially in the informal sector) are hardly
sufficient, because the first phase has been completed only recently (1984). Furthermore
good connections (public transport!) with Bangkok are lacking and the travel time to the
CBA is very long.
    Expansion of this New Town will be quite costly; the existing watersupply system is
already insufficient and the land is not protected against flooding.
12. Lad Krabang (2); 9 km$^2$.
Another example of a growth-pole is the NHA housing project in this location. Here too only the first phase has been realized (1985). It is located relatively far from the CBA and good connections with the road network are still lacking. The NHA is taking care of the water supply system, roads, drainage and services.
At the moment Lad Krabang is not very suitable for low-income residents since employment opportunities are few. However many high-income residential areas are being realized here, which in the future may give service work in the informal sector. Lad Krabang is therefore more attractive on the medium term, after 2000.

13/14. Pasi Charoen I (5) and II (14); respectively 9 and 10 km$^2$.
Both locations in Pasi Charoen have a lot in common. Their strong point is that they are serviced by the water supply network. The areas are under urban influence and the land-price is high.
To increase the efficiency in infrastructure it is highly desirable to develop these locations; however they are less suitable for NHA and low-income people because of the high costs of development (land-price and flood protection). Perhaps land pooling is an option to increase efficiency and realize flood control, but because of the low development pressure the viability of such a scheme is doubtful.

15. Muang Nonthaburi I (11); 4.5 km$^2$
This location has a very poor access and is situated far from the CBA. The relatively high land-price makes it unsuitable for public housing. To speed up development the government may wish to start land pooling schemes. We think however that the increase in land value (after provision of infrastructure) will not be sufficient to cover the costs of development, because the development pressure is low.

16. Samut Prakan Bang Na (15); 7 km$^2$
This location has a relatively good connection with the city-centre via the Expressway, and most infrastructure is already present or will be implemented in the next five years. From a residents viewpoint therefore the location is good, but the land-price (650 Baht/m$^2$) is too high for NHA to purchase it.

17. Bang Kapi Wat Chuan Nan (21); 8 km$^2$
This location is a very large gap in the city's built-up area, and will remain as such until 2000. The backlog in the provision of infrastructure becomes quite clear in this area; in spite of the Masterplans most of the area will not be serviced in the next 15 years. Employment opportunities and services are lacking. Furthermore large flood retention areas are planned in this waterlogged area. This and the low development pressure (which means only a small increase in land value) will not make the present land-owners enthusiastic about land pooling. Strong government intervention is needed in this location.

18. Nonthaburi Bang Saima (24); 8.5 km$^2$
This rural area has been opened up recently by a new highway crossing the Chao Phraya. It is therefore very interesting for land speculators and the private sector. Development however would create backlogs in the water supply infrastructure and is otherwise undesirable because of its high agricultural potential. Restriction of development or land banking may prevent undesired changes in land-use.

19. Yannawa (9); 3 km$^2$
This location is situated adjacent to the CBA and is under great pressure of urban (industrial) development. In the coming years the accessibility of this area will be improved dramatically. Yannawa scores high for all criteria except one: land-price. The only way to realize public housing or, also important here, to secure tenure for existing low-income settlements is by means of land sharing/pooling schemes. Serviced, buildable land has an extremely high value, which may compensate for the costs of infra-
structure and the loss of an area for utilities and low-income housing.

20. Muang Nonthaburi II (12); 3 km².
   This area close to the town of Nonthaburi was opened up recently by a new primary road and
   now has good connections with the CBA and secondary centres of services and employment.
   Watersupply will be provided within the next 15 years and urban development is highly
   desirable. As a location for public housing Nonthaburi II is impossible for the NHA to buy
   (land-price is estimated to be 2000 Baht/m²). This location seems more suitable for high-
   and middle-income groups.

21. Taling Chan II (13); 9.5 km².
   This rural area has come under the influence of urban developments due to recent invest-
   ments in roads. Further this location is serviced by commuter-trains and buses, so the
   accessibility of the city-centre is relatively good.
   Here land pooling may render positive results as an alternative for buying at a high
   price, if the government is willing to provide for flood control and supply of drinking-
   water. This is not likely to happen in the near future, only a part of the area will be
   serviced by the MWWA soon.

22. Huai Khwang (17); 9 km².
   The location is comparable with Yannawa. This large vacant (and sometimes even rural) area
   in the middle of Bangkok is ideal for low-income settlements. The present lack of infra-
   structure and the high development pressure make Huai Khwang interesting for land pooling,
   and the NHA may benefit by receiving land for public housing.
   Furthermore some flood retention areas are planned here, which is a strong argument for
   government (i.e. NHA) intervention.

23. Phra Khanong Nong Bon (16); 6 km².
   This location is surrounded by high-income residential estates and it is typical for a
   Bangkok suburb: flood prone, low density, relatively low level of services and employment
   opportunities, high land-price. In other words rather unsuitable for low-income settle-
   ments.
   The development pressure in Phra Khanong is high and new investments in infrastructure
   (watersupply and roads) are being made. Nong Bon is suitable for land pooling schemes and
   perhaps the NHA can realize some profitable middle-income housing projects here.

24. Pathum Thani Rangsit (23); 3 km².
   Rangsit is one of the growth-poles of Bangkok, where services and industry are concen-
   trated. It is located close to Don Muang Airport and has potential to grow out as a second
   centre of the Metropolis.
   It is however not included in the flood protection and watersupply Masterplans, since the
   authority of BMA and MWWA stops at the boundary with changwat Pathum Thani. The costs of
   developing land are very high and from an NHA viewpoint this location is unsuitable.
NOTES CHAPTER 5

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<11> NESDB: BMR-study Interim Report
<12> JICA: Masterplan on Flood Protection and Drainage Project in Eastern Suburban Bangkok
6.1. Summary

Urban structure, problems and strategies.

In the fifties, sixties and seventies the Metropolis Bangkok has grown explosively. Despite the efforts and successes of the government to address the problems accompanying this growth process some of them remain:
1. Traffic congestion and stagnating public transport.
2. Environmental degradation.
3. Shortage of piped drinking-water.
4. Floods and poor drainage.
5. Housing shortage, both in numbers and types.

The government is strongly pursuing solutions to address these problems but is confronted with:
1. A lack of financial resources to overcome all problems at short notice, while the continuing growth (both the process of development and the absolute number of people) is creating new backlogs and problems.
2. The urban development process, which is, after being induced by public infrastructure investments, an entire free-market operation resulting in high speculative profits and a highly inefficient development pattern of which the social costs are passed on to the public agencies in charge of infrastructure provision.
3. The lack of co-ordination concerning planning and implementation.

The Bangkok Metropolitan Region Study, co-ordinated by the important National Economic and Social Development Board, is an effort to establish a more comprehensive planning/co-ordination approach in order to set priorities for investments (to address the existing and future problems) within present and foreseeable future budgettary constraints. Next to financial ones, the basic issues are according to us:
1. To limit the creation of new backlogs due to population growth and the distribution of population as a result of market (re-)actions to public investments and agglomeration dis-economies.
2. To raise the efficiency and utilization of infrastructure and utility investments (both implemented and planned).

The most important factors that have an influence on the city's structure are the market reactions to public investments and agglomeration dis-economies. As long as there are no effective measures to intervene in the land-market, the only available instruments are: infrastructure investments, co-ordination of these investments by the National Economic and Social Development Board and, to a lesser extent, seed development (i.e. new towns, industrial estates, airport, harbour and universities).

The major determinants are the roads and transport facilities, while the absence of drinking-water supply can be prohibitive (in case of brackish groundwater).

The government, pursuing a policy of "guided development" (i.e. a concerted investment programme), can influence the direction of growth and the longer term structure of the metropolis and thus reduce the future need for infrastructure investments as opposed to uncontrolled development, the present situation.

In our opinion the efficiency of investments is calling for a twofold strategy:
1. The development of vacant and under-utilized land within the service-envelope, i.e. the area where water supply and/or flood protection are available or planned.
2. The concentration of growth (i.e. the spread of development) in a limited number of areas
by means of concentrated and co-ordinated investments. The areas should be chosen on base of:
- the physical and technical possibility to service the area
- the costs of these efforts
- the economical interests of the private sector; the market (re)actions
- the available and effective instruments
- the factors influencing the population distribution and growth
- the agricultural land-use value
- the land ownership pattern.

The National Economic and Social Development Board and the proposed National Urban Development Board seem to be the appropriate agencies to co-ordinate such a strategy.

Public housing; problems, limitations and possibilities.

Housing has for long been considered a strictly private and market affair; public housing was until 1973 a public welfare consideration. This approach towards housing is in concordance with the traditional social values concerning housing. However land- and housing-market imperfections as well as a growing number of semi-legal settlements (slums) were reasons for a different, more active, approach by the government.

The private sector produced and produces housing options not affordable to the majority of the population. Supply and demand do not coincide in terms of affordability. Slums and other forms of semi-legal settlements are the visual expressions of this "housing-gap". Due to growing restrictions in the short-term land-rental possibilities (the source of land for slums) and the growing number of evictions, a great number of squatter settlements emerged during the last decade.

The need for public housing is a function of:
1. The housing demand distribution; the largest share of the housing demand is generated by low-income households (i.e. the poorest half of the population of Bangkok).
2. The inability of the private sector to adequately satisfy this demand for low-income housing due to:
   - the limited availability of long-term credit for house buyers, resulting in a less affluent market
   - regulations and standards concerning plot sizes, buildings and infrastructure
   - the high investment costs for infrastructure required to develop the accumulated but highly frittered land holdings.
3. The increasingly restricted capacity of the informal housing supply sector to absorb housing shortages. These restrictions are due to:
   - the increased number of evictions of present low-income settlements
   - the reduced availability of land for rent, which is indicated by the sharp increase in squatter-settlements
   - the sharply risen price of wood, leading to a necessity to utilize more sophisticated materials as concrete. The consequently reduced mobility and higher investments require more "security of tenure".

Improvements in the housing-finance market (resulting in a higher effective demand), as stipulated in the National Housing Policy (the first formally adopted policy, in October 1984), and reduction of standards would enhance the private sector's ability to supply housing to a larger share of the housing market. Nevertheless an estimated annual demand of 24,000 units during 1986-1991 would have to be produced by the public and informal housing sector. In view of previously mentioned limitations the public sector should ideally produce the lion's share.

The National Housing Authority (NHA), an amalgation of the divisions of the Welfare Department previously concerned with public housing, has during its 13 years of existence pursued different types of housing development with changing success: rental walk-up apartments, slum upgrading (in several forms) and sites and services including core houses.
The rental walk-up apartments programme was abolished due to the high financial burden and social inappropriateness. Consequently a new programme was conceived establishing new forms of housing supply: slum upgrading and sites and services.

The goal of the slum upgrading programme is to keep up the existing low-income housing stock in appropriate locations. It started as a strictly physical upgrading programme, although the original intention was to deal with the "security of tenure" problem also. Only in a few cases the co-operation of the landlords could be obtained to actually achieve this. In order to address especially the "security of tenure" problem new and appropriate forms of slum-upgrading were tested and established. These new forms of slum-upgrading (e.g. landsharing), which are highly depending on the community organization resisting eviction, are far and few between but promising.

An important aspect of slum upgrading is that the economical and social networks, necessary for the functioning of the informal economy, remain intact.

Despite the importance of slum upgrading, this study has been directed to new housing production because the informal housing sector (slum- and squatter-settlements) is confronted with evictions increasingly (resulting in more people to be rehoused), while its ability to expand is limited.

For sites and services (including core houses) the two major issues are: the number of units produced and the suitability of the product for the targetted client-group (20-50th percentile of the household income distribution). At present NHA is not able to produce its targetted number of units because its operation is hampered by:

1. The lack of a large enough revolving fund/working capital. Although producing net surplusses since 1981 former projects still hamper the financial results, while for its capital for projects NHA depends on subsidies and foreign loans. Project approval is consequently needed and contributes to delays. The formerly mentioned improvements in the housing-finance market do also positively influence NHA’s financial position and the capital available to NHA.

2. The limited availability of suitable land in the metropolis. Although there is no physical shortage of land, NHA is not able to obtain these land holdings. Powers of eminent domain are in practice (as opposed to statutory) not available and NHA has to rely on advertisements and formal bureaucratic (and time-consuming) procedures. Furthermore the land is often too expensive to be able to create a financially viable project; the price-limit is approximately 300 Baht per m².

For changes concerning the land acquisition procedure NHA has to rely on the central government. Other possibilities, which need further investigation, are land banking and land pooling schemes.

Land banking is the advance acquisition of land suitable for developing public housing in the future, but presently with a low or affordable land-price.

Land pooling is a private-public joint venture to develop an area with primarily private landholdings. Especially in areas with a highly frittered ownership pattern the costs of development are extremely high for a single owner/developer. Combined efforts of the authorities (with the input of infrastructure) and the land-owners (with the input of land-titles) are expected to yield high benefits for the parties involved, while creating an efficient pattern of development.

While land banking is specifically geared towards future public housing development, land pooling is primarily concerned with increasing the supply of land for urban use. This way NHA, being the single large-scale public developer, might obtain land-holdings for public housing.

3. The limited capacity of the construction companies able to implement NHA’s large scale projects. Especially in a flourishing market this problem emerges as developers in the private sector offer higher incentives.

Until now the suitability of the product for the targetted client-group is sub-optimal; underoccupancy, defaults and arrears as well as resale to higher-income groups occur. While resale is highly stimulated by the housing-market situation, favourable credit facilities by
Figure 6.1
The best locations for low-income housing. Total area is 138 km².

1. Bang Plai Bang Bo New Town
2. Lad Krabang
3. Bang Krui
4. Taling Chan I
5. Phasi Charoen I
6. Rat Burana I
7. Rat Burana II
8. Muang Samut Prakan
10. Bang Kapi Wat Kubon
11. Muang Nonthaburi I
14. Phasi Charoen II
18. Bang Kapi Huai Mark
19. Lad Krabang Khlong Mae Chan
20. Minburi
21. Bang Kapi Wat Chuan Nan
22. Bang Kapi Ram Indra
24. Nonthaburi Bang Saima

- Good service level
- Medium service level
- Low development costs
- Moderate development costs

Built-up area 1985

Scale 1:250,000
NHA and the high standards and quality, underoccupancy and defaults and arrears seem to be the resultant of the location (leading to higher expenditures and reduced household incomes) and the investment required to make the core-house habitable.

In future projects readily habitable core-houses will be provided, thus reducing the investment-need of a family moving onto the project-site. It also means that the options are less affordable to the target-group with the lowest income (20-30<sup>th</sup> percentile of the household income distribution).

Looking at the priorities of the target-group we find that:

1. The first priority is work. In view of the way the household-income is earned a close proximity to and good accessibility of employment centres (formal and informal) is required.
2. The second priority is a suitable place to live at affordable cost. This implies land and security of tenure, but not necessarily ownership. A certain group of households, for example the young and highly mobile renter-families in slums, will prefer to rent until they have a stable job and income. This section of the market has up to now not been addressed.

For public housing this implies that the location, i.e. the proximity to and linkages (transportation possibilities) with employment centres, is important. This accounts even stronger for highly mobile households which prefer to rent their homes.

Location is at the same time a cost factor: land-price, flood protection and connections with the road and watersupply-network influence about one quarter of the total costs of a project.

It will be clear that the most suitable location is priceless and thus unaffordable. However, within the financial limitations the choice of location of public housing can be optimised. This optimization can be performed with help of the evaluation method summarized in the next passage.

**Locations for public housing.**

Finding locations for low-income housing is a matter of suitability versus costs. Suitability and costs (or affordability) are standing for a number of (locational) criteria that give an indication in what measure the priorities of low-income people and the demands of the NHA are met.

The most important requirements a location should fulfil are:

1. **proximity and accessibility to employment and services**
2. **affordable housing costs**
3. **spatial concordance of development with governmental policies and investments (desirability of development).**

We have developed 11 criteria that represent different aspects of these requirements and these criteria will be used to select and evaluate potential locations for the year 2000. The criteria are based on investment-plans and the likelihood of their implementation, priorities and needs of low-income people, evaluations of housing projects and low-income settlements and studies on land-use and land-price.

After excluding the unsuitable areas and generating homogeneous alternatives, we have 24 potential locations which are all more or less suitable for public housing with a total area of 171 km<sup>2</sup>.

To find the most optimal locations we will make use of a multi-criteria evaluation method, since this method takes explicit account of the priorities and viewpoints of the parties involved (e.g. residents, NHA, government RTG). We will use this method also to illustrate that alternative ways to acquire/develop land, such as land banking and land pooling, can be a replenishment to the existing land acquisition procedure of NHA (see section 6.2, Recommendations).
We have broadly ranked the alternatives from highly suitable to definitely unsuitable. We do not pretend to give an absolute ranking of alternatives, since we are aware of imperfections in our data and criteria and because such a ranking may differ for each viewpoint. For each party involved has its own priorities and the result is an optimization of suitability versus costs.

In figure 6.1 the seventeen best locations for low-income housing are shown, and distinctions have been made between good and medium service & employment level and between low and moderate costs of development (land-price and off-site infrastructure). The locations with unaffordable land-prices (>500 Baht/m²) are left out.

When comparing the locations with the priorities and demands of low-income people, we see that in general the distance to the Central Business Area is great. For families with jobs in the city-centre, relocation to these sites will not be attractive. On the other hand the locations found by us have good relationships with secondary centres of services and employment. For those low-income families who have a regular income, a dwelling does not have to be close to work as long as there is adequate and cheap public transport available. This is indeed the case with the first locations mentioned.

Conclusion.
The usefulness of the strategy can be characterized by the way data are used and interpreted and by the accuracy of the results. To start with the latter, the accuracy of results highly depends on the accuracy of data. We have already indicated that some criteria (e.g. development pressure and land-price) could not be used properly due to lacking or unreliable data. However we can say that our study already gives a good indication of where to look for good locations; when better data are available the usefulness of the strategy can only increase further. The way data were used and interpreted is explicitly shown in appendix 5.1; furthermore the multi-criteria evaluation method was chosen to give explicit account of assumptions and appraisals.

Whether it is likely or not that the housing situation will really improve is depending on the financial, legal and organisational (in that order) possibilities of the NHA and other government agencies to acquire the locations recommended (see maps 6.1, 6.2 and 6.3) or to stimulate the private sector to co-operate in realizing low- and middle-income housing in these locations. The purpose of this strategy is merely to make better use of these rare possibilities and identify (in an early stage) suitable areas in which to look and bid for available sites. At the moment NHA has little legal and financial power to acquire suitable locations, and is therefore depending on the willingness of landowners to sell their land at a reasonable price. Land pooling is the only alternative, but it requires some organisational adjustments. Furthermore the government has very little control over land-use and undesired developments; simply indicating low-income settlements in the masterplan will not stop private developers and speculators.

Recapitulating we can conclude that the strategy can be useful to evaluate locations for housing and decide which locations are the most suitable from a certain viewpoint. Considering the financial and legal limitations, the application of this strategy might lead to a better use of scarce means and opportunities to develop low-income housing. To really improve the low-income housing situation however, these means and opportunities should be expanded.

6.2. Recommendations

The recommendations for the NHA concern those aspects of (public) housing which can be influenced by NHA and deal primarily with locations for public housing. The recommendations for the Government concern aspects which are of influence on the location and quantity of public housing, but which are beyond the purview of NHA.
Recommendations for the National Housing Authority.

1. Immediate development of locations suitable for public housing.
Given the great need for public housing, and the ambition of the NHA to develop some thousand housing units per year, we like to recommend the following locations for immediate development (see figure 6.2): Rat Burana II (7), Hua Mark (18) and Klong Mae Chan (19). NHA will concentrate its bidding for land and may purchase several sites within the areas recommended.

2. Advance buying of locations suitable for public housing.
To overcome problems of continuity and to secure good locations, we like to recommend land banking in the following locations (see figure 6.2): Bang Kruai (3), Rat Burana I (6), Wat Kubon (10), Minburi (20) and Ram Indra (22). Here too, NHA will try to acquire several sites for future housing projects within the areas recommended.

3. Expansion of revolving fund.
A condition to make the two previous recommendations successful is an enlargement of the working capital of NHA. The Royal Thai Government and the Government Housing Bank should support the NHA in exploring ways to raise such capital from either the private or the public sector.

Given the large investments done in the Bang Plee Bang Bo and Lad Krabang projects, they should be completed as soon as possible to get full benefit from their growth-pole potential. These locations are however not (yet) suitable for housing low-income families. Only people with a steady job in the neighbourhood (e.g. at the industrial estate) will find these locations attractive.

5. Preservation and upgrading of the existing low-income housing stock.
To mitigate the need for public housing, we like to recommend slum and squatter upgrading schemes. Security of tenure is a major constraint for the success of upgrading schemes and we like to support NHA in pursuing alternative ways such as land sharing, long term leases or purchase of the land (by NHA or residents) to secure tenure for low-income people.

6. Co-operation with non-governmental and community organisations.
In order to minimize disruption of the important social network of a community involved in slum upgrading or relocation, co-operation with non-governmental or community organisations might lead to a smoother adaption to the new situation. In case of relocation it is desirable to relocate the entire community over a distance as short as possible in order to keep up the external social and economic pattern of contacts (confer the Bang Bua relocation-project of NHA).

7. Research on other factors influencing the suitability of locations for public housing.
Other aspects determining the suitability of a housing location for low-income people are:
- the standards of houses and infrastructure
- demand for housing types (distribution for each income group)
- availability of housing finance
- form of tenure (ownership, hire/purchase, rental).
Further research by NHA is recommended on these subjects to develop alternative strategies for developing and operating public low-income housing projects, successive of the location selection.

Recommendations for the Government (RTG, RHA, NESDB).
The following recommendations are a specification of the policy measures to improve the housing market efficiency, as we have described in the draft final report of the Housing & Urban Poor Sector Study. These policy measures, which can be labelled as guided development,
CONCLUSIONS

comprised of:
- the location and provision of infrastructure
  + withholding and selective supply of infrastructure
  + promotion of private investments by incentives
- the locational development concepts
  + emphasis on areas near current development
  + emphasis on a limited number of new areas which can be efficiently serviced
  + efficient locational interaction
  + promotion of areas already attractive to the private sector
  + new or growth (i.e. satellite) towns
  + corridor development
  + densification
- the land supply policy measures
  + land readjustment or pooling
  + satellite town land development schemes
  + legislation and taxation.

The last two recommendations concern the quantity of public housing needed and the financial aspect of supplying public housing.

1. Advance buying of locations suitable for urban development.
   To prevent premature development creating backlogs and to secure good locations, we like to recommend land banking in the following locations (see figure 6.3): Bang Kruai (3), Taling Chan I (4), Muang Samut Prakan (8), Wat Kubon (10), Minbouri (20) and Bang Saima (24). Land banking in combination with a selective provision of infrastructure may contribute to a more balanced development and growth of Bangkok.

2. Stimulation of desirable development.
   To increase the efficiency of existing infrastructure and to stimulate efficient development of serviced land, we like to recommend land pooling schemes, and we support the idea to start a pilot project. The causes of vacancy and underdevelopment determine the viability of land pooling. Therefore we recommend a survey on these causes in the following locations with the best potential for a successful land pooling scheme (see figure 6.3): Taling Chan I (4), Yannawa (9), Nonthaburi II (12), Nong Bon (16), Huay Khwang (17), Hua Mark (18) and Ram Indra (22). Land pooling in combination with a selective provision of infrastructure may render a more balanced use of land, utilities and infrastructure.

3. Introduction of land development taxes.
   The Bangkok Metropolitan Administration, responsible for services, utilities and infrastructure, has little revenue from the beneficiaries of these services, utilities and infrastructure. A condition to make the two previous recommendations successful is an enlargement of the working capital of the BMA. Under the motto "the beneficiary pays", we suggest to raise taxes on land where infrastructure and services are provided. To speed up development in vacant but already serviced land, taxes could be imposed on the land-owners.

4. Integration of housing locations and spatial urban plans.
   Our recommendations concerning housing development, land banking and land pooling by NHA and RTG/BMA will be more realistic when they are in concordance with the spatial urban plans for Bangkok. In the currently performed Bangkok Metropolitan Region Study more attention should be given to spatial integration of sector investments (housing, transport, watersupply, flood protection, etc.) next to financial integration. We would like to support the establishment of the National Urban Development Board, which is the most suitable agency to perform forementioned co-ordinating activities in the Bangkok Region.
   We are asking special attention for the suitable housing locations 6, 10 and 19, since these are conflicting most with the Bangkok Masterplan. On the other hand we notice that the locations 3, 4, 13 and 20 are earmarked in this plan for urban development, while the necessary infrastructure is not to be implemented in the next 15 years.
Recommendations for NHA.

1. Bang Plee Bang Bo New Town
2. Lad Krabang
3. Bang Kruai
4. Rat Burana I
5. Rat Burana II
6. Bang Kapi Wat Kubom
7. Rat Burana II
10. Lad Krabang Klong Mae Chan
18. Bang Kapi Huai Mark
19. Lad Krabang Klong Mae Chan
20. Minburi
22. Bang Kapi Ram Indra

suitable for 1986
land banking recommended
Recommendations for the government.

3. Bang Krueai
4. Taling Chan II
6. Nonthaburi II
8. Muang Samut Prakan
9. Yannawa
10. Bang Kapi Wat Kubon
12. Muang Nonthaburi II
13. Taling Chan II
16. Phra Khanong Nong Bon
17. Huai Khwang
18. Bang Kapi Huai Mark
19. Lad Krabang Klong Mae Chan
20. Minburi
21. Bang Kapi Wat Chuan Nan
22. Bang Kapi Ram Indra
24. Nonthaburi Bang Saima

- land banking recommended
- investigation viability of land pooling
- conflicting locations
- flood retention areas

Built-up area 1985

scale 1 : 250,000

north
5. Stimulation of the private sector to develop low-income housing.
   To reduce the need for public housing it is important that the private sector will take a
   larger part in the supply of low- and middle-income housing, approximately reaching the
   40th percentile income group. The production capacity is available due to a slump in the
   high-income housing and shophouse markets, but the financial risks are perceived to be too
   high. We like to recommend government stimulation by means of:
   - land development schemes (land pooling and provision of infrastructure)
   - housing finance (comparable with NHA loans through the Government Housing Bank).

6. Transfer of financial matters from NHA to GHB.
   At the moment NHA is handling all financial transactions between the residents and itself,
   including the collection of rent, downpayments and instalments next to giving building-
   loans and long term leases. As a result NHA is confronted with arrears and defaults. We
   therefore support the recommendations in the National Housing Policy about transferring
   loans, leases and the collection of installments to the Government Housing Bank. The GHB is
   geared towards such financial matters (and problems), while the NHA can concentrate on the
   development of land and the construction of houses.

6.3. Follow-up

Appraisal of locations.
   Concerning the locational choice of land acquisition for public housing within the present
   procedures this study is a first step towards a more comprehensive method of appraisal. As
   such the method is apt for improvement, mainly in the following two ways:
   1. Refinement of the criteria used by:
      - Research on the target-group priorities. The priorities identified in this study appear
        to be trivial. It is very likely that a higher divergence in priorities exists.
      - Research on the target-group affordability. The present representation of income, by
        household, does not take into account divergencies in household-size, nor in the
        methods and costs involved in earning this income. This strong generalization erodes
        the possibility to take into account divergencies concerning the share of income that
        can be spent on housing as well as possible decreases in income due to relocation.
   2. Improvement of the base-maps and data-base.
      The lack of refined data, especially concerning land-use, land availability, land-price
      and distribution of employment and services, is hampering the use of more refined appraisal
      methods. Furthermore, the use of existing data is a time-consuming process due to
      their representation. Computerization of the available data and maps would, apart from
      further study in these subjects, be highly useful. Not only for the appraisal of locations,
      but also to trace the actual and fast-moving development of the Metropolis. The
      latter is also of importance for urban and infrastructure planning by other agencies and
      departments.

Concerning the criteria which are possibly of importance, but for which data were not avail-
able or not sufficiently refined, a listing is given in appendix 5.3.

Urban land management options.
   Concerning the options of land banking and land pooling, discussed briefly in this report,
   only a rough locational indication could be given. The future use of these options will depend
   on:
   - the supply and demand factors in the land-market in Bangkok
   - the feasibility in terms of public opinion and support
   - the financial viability
   - the land-ownership pattern.

With the assistance of the Asian Development Bank a study will be started in 1986 to determine
the feasibility of these options and the criteria concerning the locational choice will be refined. Subsequently a pilot-project is likely to be started, as recommended by the BMR-study.
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Appendix 1.1: Simplified Organization Chart Royal Thai Government

<table>
<thead>
<tr>
<th>MINISTRIES</th>
<th>DEPARTMENTS</th>
<th>STATE ENTERPRISES</th>
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<tbody>
<tr>
<td><em>Independent Public Agencies</em></td>
<td>-Bangkok Metropolitan Administration</td>
<td>-Bank of Thailand</td>
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<td></td>
<td>-Auditor General</td>
<td>-Government Housing Bank</td>
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<tr>
<td>Office of the Prime Minister</td>
<td>-National Economic and Social Development Board</td>
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<td>-Bureau of Budget</td>
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<td></td>
<td>-Undersecretary of State</td>
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<td>Defence</td>
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<td>-Fiscal Policy</td>
<td>-Port Authority of Thailand</td>
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<td>-Royal Irrigation</td>
<td>-Expressways and Rapid Transit Authority</td>
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<td>-Authority of Thailand</td>
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<td>-Highways</td>
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<td>-Land Transport</td>
<td>-Port Authority of Thailand</td>
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<td>-Post and Telegraph</td>
<td>-State Railways of Thailand</td>
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<td>-Bangkok Mass Transit Authority</td>
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<td>University Affairs</td>
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source: NESDB.
Appendix 2.1 National Housing Policy (main provisions)

The original National Housing Policy was drawn up by the Housing Policy Subcommittee, under the Office of the National Economic and Social Development Board (NESDB). In October 1983 the Cabinet adopted this national housing policy.

I. Housing Development Policy

General policy.
1.1 The government will improve the quality of life through community development programmes in terms of physical, economic and social development.
1.2 The government will support public participation through community organization and will provide public services to the communities, including both social and economic aspects such as income enhancement programmes.

Construction policy.
1.3 The government will support housing construction at modest standards, neighbourhood improvement and slum upgrading programs in order to decrease the housing problems of the poor people within the urban area as a priority objective.
1.4 The government will provide housing development in conjunction with industrial development to the provincial areas away from the Bangkok Metropolis.
1.5 The government will encourage private developers to provide appropriate housing for people of every income group as required.
1.6 Building material research and appropriate technology experiments for rural housing construction will be promoted.

Financial policy.
1.7 The government will mobilize local savings for housing investments within the country through existing financial institutions and the capital market that will be established.
1.8 The Government Housing Bank will be the wholesaler of housing finance to NHA and private developers.
1.9 The government will encourage the insurance companies, the Government Provident Fund as well as their financiers to provide housing loans to the poor people through the GHB or Credit Fonciers.
1.10 The government will increase the provision of long-term credit for housing low-income families not only in the capital city but also in the provinces.
1.11 The government will encourage providing financial links between saving institutions and those that provide housing in order to increase housing loans.
1.12 The government will support and improve housing co-operatives or savings and loan institutions as instruments of housing finance for low-income families.

Organization and co-ordination.
1.13 The Subcommittee for National Housing Policy under the NESDB, established by the Cabinet, will be the linkage between housing policy formulation and implementation including solving any issues concerning financial or technical problems.
1.14 To support housing development the government will expand infrastructure and facilities networks in accordance with urban land development programmes stated in the Fifth National Economic and Social Development Plan (1982-1986).
1.15 Agencies responsible for infrastructure development, public services as well as housing, will closely and effectively co-ordinate under control of the Committee for Public Facilities and Infrastructure Co-ordination of the Ministry of Interior.

Other policy concerns.
1.16 The government will promulgate the Comprehensive Plan Act and gazette the Specific Plan for the Bangkok Metropolitan Area as a basis to implement the urban development programme, especially land-use.
1.17 The government will improve laws and regulations in order to prevent land speculation.
1.18 Within commercial and industrial areas, the government will provide adequate affordable housing for workers of every income group.
1.19 The government will encourage the development of housing in accordance with employment creation in both public and private schemes in order to solve transportation problems.
1.20 The government will promote housing and land ownership to the people, especially for low-income people.
II. Specific Policy for the National Housing Authority

Construction policy.
2.1 NHA will develop housing communities on a self-financing basis. Government subsidies will be allocated for construction of infrastructure such as main roads, water supply systems, sewerage systems, electricity systems, etc., through the NHA and other government agencies concerned<sup>(1)</sup>.

2.2 The government will fully subsidize slum improvement programmes for physical improvement and will partly subsidize economic and social improvements, including land tenure consolidation schemes through NHA<sup>(2)</sup>.

Financial policy.
2.3 Most NHA activities will be financed from local loans as well as partly from external loans.
2.4 To develop a public housing programme, NHA will determine its investments based on affordability, cross subsidization and cost recovery principles.
2.5 Rent and hire-purchase schemes should be flexible and related to economic growth.

Co-ordination and organization.
2.6 The government will encourage BMA and other local authorities to participate in implementation and maintenance of the infrastructure systems within NHA housing communities, including participation in socio-economic programmes in slum improvement schemes.
2.7 Within industrial estates, the Industrial Estate Authority of Thailand will sell part of land at original cost to NHA for developing public housing for workers.

Other policy concerns.
2.8 NHA will supply adequate land for its housing programmes in the future by using land acquisition procedures, land banking mechanisms and the power of eminent domain vested in NHA under its establishing act.
2.9 In housing communities, NHA will provide a part of the project for promotion of small business and industries programmes to enable income enhancement.
2.10 NHA will improve its management capacity to support its own programmes as well as its private partnership programmes.

III. Specific Policy for the Government Housing Bank

Fund mobilization policy.
3.1 The GHB is the principal government institution for long-term housing finance.
3.2 The government and other financial institutions will mobilize long-term loans within the country or from external sources for the GHB.
3.3 The government will encourage insurance companies and the Government Provident Fund to invest in the GHB.

Credit policy.
3.4 The GHB will provide long-term credit for housing finance.
3.5 Interest rates will be closely related to prevailing market interest rates.
3.6 The GHB will provide long-term credit to private developers, both directly and through appropriate finance institutions.
3.7 The GHB will provide long-term credit to NHA's clients to support housing development.

Other policy concerns.
3.8 The GHB will have a study made to improve its management and organization so it can expand its housing finance function.
3.9 The GHB will promote personal savings investment in GHB as a source of housing finance capital.

source: NHA summary

Appendix 2.2 Criteria for Site Selection (NHA)

The location is in proximity of employment opportunities, bearing in mind affordable costs and time, to be indicated by distance, travelling mode, time and costs involved from the site to
major employment centres.

The site is located with suitable access to trunk infrastructure.

The site is in "buildable" physical condition, including minimal flooding (allowing for reasonable amount of land fill if necessary) and suitable soil conditions and topography.

The location is such that it meets low-income housing demand.

Arrangements are worked out to provide municipal services and local administrative support.

In order to keep the project affordable the land price should not exceed 480,000 Baht/rai or 300 Baht/m² (1985 prices).

source: Policy and Planning Office, NHA

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**Appendix 4.1: Calculation of costs for sites & services projects**

1. Average gross density is 14 units/rai and higher than in NHA projects (12), this corresponds with an average plot size of 75 m². Standard land-use for housing projects is:

<table>
<thead>
<tr>
<th></th>
<th>calculation</th>
<th>NHA&lt;3&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>residential</td>
<td>65%</td>
<td>60%</td>
</tr>
<tr>
<td>infrastructure and utilities</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>open space</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>community facilities</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>commercial area</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Marketable area is 75%, cross-subsidy factor for commercial area is 3. The revenue per m² is Y. Total revenue is \((0.65 + 0.05 + 3 * 0.05) * Y\), thus \(0.85 * Y = X\), or \(Y = 1.18 * X\).

Revenue needed from the residential area is \(0.65 * 1.18 * X = 0.76 * X\).

2. The affordability of the groups A-E is as follows<4>:

<table>
<thead>
<tr>
<th>Group</th>
<th>10-20&lt;sup&gt;th&lt;/sup&gt; percentile income</th>
<th>20-30&lt;sup&gt;th&lt;/sup&gt; percentile income</th>
<th>30-50&lt;sup&gt;th&lt;/sup&gt; percentile income</th>
<th>50-70&lt;sup&gt;th&lt;/sup&gt; percentile income</th>
<th>70&lt;sup&gt;th&lt;/sup&gt; percentile and up</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2580-3500 B/m</td>
<td>3500-4500 B/m</td>
<td>4500-6170 B/m</td>
<td>6170-8750 B/m</td>
<td>&gt; 8750 B/m</td>
</tr>
<tr>
<td>B</td>
<td>500 B/month</td>
<td>1000 B/month</td>
<td>1750 B/month</td>
<td>2500 B/month</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>30%</td>
<td>30%</td>
<td>25%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>5%</td>
<td>5%</td>
<td>10%</td>
<td>5%</td>
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</table>

3. Distribution of income groups depends on plot size and cross-subsidy. We have a close look at three alternatives X, Y and Z.

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<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
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<tr>
<td>plot for group A:</td>
<td>40 m²</td>
<td>10%</td>
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<td>plot for group B:</td>
<td>60 m²</td>
<td>30%</td>
<td>30%</td>
</tr>
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<td>plot for group C:</td>
<td>80 m²</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>plot for group D:</td>
<td>100 m²</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>plot for group E:</td>
<td>130 m²</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>shop/house:</td>
<td>80 m²</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

average plot size in m²: 76.5 71.5 75.0
average density units/rai: 13.6 14.6 13.9
average revenue in B/month: 1775 1613 1738
revenue in B/m² per month: 15.1 14.7 15.1

Average affordability used by NHA calculations is 2000 Baht per month, with a density of 12 this gives a revenue of 15 B/m² per month.

4. Loan for hire-purchase: term is 15 years with 15% interest per year and 10% downpayment, payable in monthly instalments. Total rent paid is 105%.
5. The total project-costs are estimated as $X$ Baht.
We can make the following break-down of the costs<5>:
13% land acquisition
20% infrastructure and flood protection
37% construction and building materials
30% interest, overhead and contingencies.

About one quarter of the costs is covered by selling areas for commercial development and community facilities. The rest ($0.76 \times X$) has to be paid by the residents.

6. The maximum price that the target-group is able to pay for raw land can now be calculated.

\[
0.76 \times X = \frac{15 \times 12 \times \text{instalment} \times \text{density} \times \text{area (rai)}}{0.9 \times 2.05}
\]

Thus $X = 128 \times \text{revenue} \times \text{area (m}^2) \text{ Baht.}$

The maximum land-price is 13% of $X$, that is $16.7 \times \text{revenue} \text{ Baht/m}^2$.

Alternative X: maximum land-price is $250 \text{ Baht/m}^2$.
Alternative Y: maximum land-price is $245 \text{ Baht/m}^2$.
Alternative Z: maximum land-price is $210 \text{ Baht/m}^2$.

7. By lowering the standards of infrastructure by 10% and reducing the costs for contingencies and overhead by 10% through a more efficient management, the percentage of land-price may increase to 17% of the total project costs. Maximum land-price is then about $325 \text{ Baht/m}^2$.

From this calculation we can see that by means of cross-subsidy and variation in plot size it is possible to accommodate even the 10-30th percentile income groups. At the same time we found a more or less fixed criterion for affordability: a maximum land-price of 250-300 Baht/m$^2$ (equal to 400,000-480,000 Baht/rai) for low-income housing projects.

NOTES APPENDICES 2 AND 4

<1> These provisions have been kept in abeyance, since a subsequent government policy decision in October 1984 was taken to review subsidies to be provided, pending which no new subsidy commitments will be made.

<2> see <1>

<3> NHA Project administrative division (Nakhon Pathom, Samut Sakhon, Samut Prakan)

<4> see table 4.1

<5> see <3>
Appendix 4.2: Overview requirements for low-income housing projects

<table>
<thead>
<tr>
<th>REQUIREMENTS</th>
<th>INDICATOR (for locational criteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. affordable land-price</td>
<td>* land-price under 300 Baht/m²</td>
</tr>
<tr>
<td>2. low development costs to make land suitable</td>
<td>* close to trunk infrastructure, protected against flooding</td>
</tr>
<tr>
<td>3. long-term housing finance affordable to each target group</td>
<td>instalment is 20-30% of income, downpayment is 15-20% of total costs</td>
</tr>
<tr>
<td>4. affordable standards of housing, infrastructure and facilities</td>
<td>total project-costs under approximately 2000 Baht/m²</td>
</tr>
<tr>
<td>5. increasing affordability of low-income people</td>
<td>saving-schemes, on-site employment opportunities and cheap daily services (market, school, building materials)</td>
</tr>
<tr>
<td>6. easing of the housing market</td>
<td>protection of existing housing stock, target group in the 10-50th percentile</td>
</tr>
<tr>
<td>7. competition housing sector with other sectors</td>
<td>* existing land-use versus potential land-use</td>
</tr>
<tr>
<td>8. stimulating private investments in the housing sector</td>
<td></td>
</tr>
<tr>
<td>9. possibilities for informal sector</td>
<td>* proximity to other settlements</td>
</tr>
<tr>
<td>10. proximity to diverse employment opportunities</td>
<td>proximity to combined centres of employment and services</td>
</tr>
<tr>
<td>11. proximity to Central Business Area</td>
<td>* travel time to CBA under 75 minutes</td>
</tr>
<tr>
<td>12. good accessibility of services and employment</td>
<td>* good connection residence with BMTA public transport</td>
</tr>
<tr>
<td>13. community participation in decision making and maintenance</td>
<td></td>
</tr>
<tr>
<td>14. co-operation with governmental agencies</td>
<td></td>
</tr>
<tr>
<td>15. minimum standards for housing, facilities and infrastructure</td>
<td>dry walkways, street lighting, private taps, electricity, plot-size ± 60 m²</td>
</tr>
<tr>
<td>16. security of tenure</td>
<td>hire/purchase or lease for 15-20 years</td>
</tr>
<tr>
<td>17. wide range of supply of suitable types of housing</td>
<td>apartments, shophouses, sites &amp; services, habitable core-houses</td>
</tr>
<tr>
<td>18. contribution to the development of Bangkok</td>
<td>* concordance with plans and investments for infrastructure (DTCP, NESDB)</td>
</tr>
<tr>
<td>19. raising efficiency of land-use</td>
<td>* stimulating development in vacant areas already serviced</td>
</tr>
</tbody>
</table>

*= locational criterion
Appendix 5.1: Operationalization of the criteria

A. Proximity and accessibility of employment and services

1. Proximity to the Central Business Area, map 1.
   
   Score:  
   - 0-30 minutes = 5  
   - 30-45 minutes = 4 or 3  
   - 45-60 minutes = 3 or 2  
   - 60-75 minutes = 2 or 1  
   - > 75 minutes = veto

   In chapter 4 we found that the CBA offers the widest range of employment opportunities. Commuters are willing to travel long distances; more than one hour by bus. The scores vary with the travel-time, the higher the score, the better. The scores may vary for the same travel-time, when STTR investments reduce travel-time in the future. The weighting factor of 2 emphasizes the importance of the CBA. The travel times are measured in travel time by car: 75 minutes by car corresponds approximately with 120 minutes by bus, which is the maximum acceptable travel time for people to go to work.

2. Proximity to city-subcentre, map 2.
   
   Score:  
   - 0-2 kms medium centre = 4  
   - 2-4 kms small centre = 3  
   - 4-7 kms medium centre = 2  
   - > 7 kms small centre = 1

   Here we make a distinction between small and medium centres, according to their importance. The acceptable travel time is less, since these centres are less important than the CBA; furthermore there is always a centre within 30 minutes (4 km) range in Bangkok.

3. Proximity to industrial centres, map 3.
   
   Score: see 2.

   
   Score:  
   - > 3 BMTA buslines = 3 (in mass transit corridor = 4)  
   - 1-2 BMTA buslines = 2  
   - minibus service = 2  
   - other bus service = 1

   For the BMTA and BawKawSaw buslines a zone within distance of 1000 m to the road (i.e. busstop) is considered to be served by that busline.

B. Affordable housing costs

5. Land price, map 5.
   
   Score:  
   - built-up area = veto  
   - 50-100 Baht/m² = 10  
   - 125 Baht/m² = 9  
   - 170 Baht/m² = 8  
   - 200 Baht/m² = 7  
   - 250 Baht/m² = 6  
   - 300 Baht/m² = 5

   In chapter 3 we found that the price of land can be a major constraint in the planning of a low-income housing project. According to a calculation in appendix 4 the maximum affordable land-price is somewhere around 250-300 Baht/m². The scores are based on the land-study by TISCO. Since the estimates of prices in an area may vary (e.g. from 100 to 500 Baht/m²), we have assumed that prices increase when the accessibility improves.

For the second step, the generation of alternatives, we made use of a distinction between land-prices under 300 Baht/m² and land-prices over 300 Baht/m².

   
   Score:  
   - within flood protection area = 4  
   - within King's dyke = 3  
   - within study area west = 2  
   - outside flood protection area = 1

   This subcriterion takes into account the plans of the Royal Thai Government to protect Bangkok against flooding. Housing locations that are or will soon be protected against flooding do not need the costly infrastructural investments on dyking and drainage as in other locations. The lower score for the western area finds its origin in the fact that implementation of the plans there will start later; the plans for the eastern area are
map 1.
Proximity to Central Business Area in 2000.

5 0-30 minutes travel-time
4 30-45 minutes travel-time
3 45-60 minutes travel-time
2 60-75 minutes travel-time
1 60-75 minutes travel-time
V veto, over 75 minutes

scale 1 : 250,000
map 2.
Proximity to city-subcentre.

4 0-2 kms medium centre
3 2-4 kms medium centre
2 4-7 kms medium centre
1 over 7 kms from medium centre

scale 1 : 350,000
map 3.
Proximity to industrial centres.

<table>
<thead>
<tr>
<th>Distance</th>
<th>Medium Centre</th>
<th>Small Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 kms</td>
<td>Medium centre</td>
<td>Small centre</td>
</tr>
<tr>
<td>2-4 kms</td>
<td>Medium centre</td>
<td>Small centre</td>
</tr>
<tr>
<td>4-7 kms</td>
<td>Medium centre</td>
<td>Small centre</td>
</tr>
<tr>
<td>&gt; 7 kms</td>
<td>Over 7 kms from med</td>
<td>Over 4 kms from smal</td>
</tr>
</tbody>
</table>

scale 1 : 350,000
map 4.
High accessibility with public transport.

% proposed mass transit corridor

3 over 3 BMTA buslines
2 1–2 BMTA buslines, minibus service
1 other bus service
0 no bus service

scale 1 : 350,000
map 5.
Land-price

The lines distinguish between areas with land-prices falling into one of the next categories: 150, 300, 500 and over 500 Baht per m².

4 under 150 Baht per m²
3 150 - 300 Baht per m²
2 300 - 500 Baht per m²
1 over 500 Baht per m²
map 6.
Flood protection costs

4 within flood protection area
3 within King's dyke
2 within study area west
1 outside flood protection area

scale 1 : 350,000
finished and work is expected to be finished by the year 2000.

Score: 
- within road system = 4 or 3
- < 1000 m from major road = 3
- 1000-2000 m from major road = 2
- > 2000 m from major road = 1

For this subcriterion we will use the road network in 2000 to evaluate locations, based on the STTR basic investment programme. The costs for a connection with the main roads do not only depend on the distance to that road, but for the major part on the presence of a barrier (e.g. a klong) that has to be crossed. However it is not very practical to use this latter criterion in a general sense, it is more suitable to evaluate a specific location.

Score: 
- within MWWA service envelope = 3
- < 1500 m from service envelope = 2
- far from MWWA service envelope = 1
- suitable groundwater = 2
- brackish groundwater = veto

Here we will also use the 2000 network. When the location is situated far from the network, there is a possibility of using deepwells. Because of their negative impact on ground subsidence, deepwells are not allowed everywhere and moreover can not be used when the groundwater is brackish. This is a major constraint for development of housing.

C. Spatial concordance with government policy and investments

Score: 
- residential zones = 4
- non-urban zones = 2
- other urban zones = 3
- restriction zones = 1

The Masterplan for Bangkok by the Department of Town and Country Planning is the only official policy document on spatial planning. Although enforcing of this plan is not likely, we expect that public investments will be in concordance with the plan. When planning new housing locations it will be advantageous to comply with these investments and thus with the plan.

10. Efficiency of infrastructural investments, maps 6, 7 and 8.
Score: 
- within water-supply network = 2
- within road network = 2
- within flood protection area = 2
- within all three = 4 or 3
- outside two of three = 1

The efficiency of infrastructural investments will be increased when new housing locations make use of the existing network instead of making new public investments necessary. The subcriteria for flood protection and off-site infrastructure are good indicators for this efficiency. Note: Bang Plee Bang Bo New Town has its own flood protection and watersupply systems.

11. Agricultural potential, map 10.
Score: 
- orchards = 0
- high potential = 1
- medium potential = 2
- idem, vacant = 1
- idem, vacant = 2
- idem, vacant = 3

Urban growth usually takes place at the cost of rural output. The potential land-use versus the existing land-use is an important indicator for the (economic) desirability to stimulate new developments or strengthen existing activities. Orchards have a high economic value, so it is desirable to secure this land with a high potential for agriculture. Land suitable for agriculture but already vacant is less valuable than land still in use by farmers. A high score for this criterion means a low potential for agriculture and hence urban development is more desirable here from a government point of view.
map 7.
Off-site infrastructure costs road

4 within road system (dense)  
3 within road system  
3 less than 1 km from major road  
2 1-2 kms from major road  
1 over 2 kms from major road

scale 1:350,000
map 8.
Off-site infrastructure costs water-supply

3 within MWWA service envelope
2 less than 1500 m from MWWA service envelope
1 more than 1500 m from MWWA service envelope but suitable groundwater
V more than 1500 m from MWWA service envelope and brackish groundwater

scale 1 : 350,000
map 9.
Governmental policy DTCP Masterplan

Built-up area 1985

1 restriction zones
2 non-urban zones
3 other urban zones
4 high density residential zones

scale 1 : 350,000
map 10.
Agricultural potential

- Built-up area 1985
- 0 orchards
- 1 high potential paddy
- 2 medium potential paddy
- vacant area (score + 1)

scale 1 : 350,000
### Figure 11

<table>
<thead>
<tr>
<th>Score 2000 Criteria</th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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<td>4</td>
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<td>170</td>
<td>7</td>
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This programme performs a "mixed" multi-criteria evaluation, in which explicit account is taken of the quality of data and methodical uncertainties (technical prepropositions). For more information about this programme, see Dr. J. H. Voogd: Multicriteria Evaluation for Urban and Regional Planning, Pion Ltd., London 1983.

| Location Housing Bangkok Vision NHA 2000 |

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- 114 -
INPUTTED WEIGHTING FACTORS FOR VISION NHA 2000

Subject of evaluation: Location Housing Bangkok
Number of alternatives: 24
Number of criteria: 11

*THE FOLLOWING CHARACTERISTICS WERE IMPUTTED:*

QUALITATIVE CRITERIA ARE: 1 2 3 4 5 6 7 8 9 10 11

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<tr>
<td>23. Pathum Thani Rangsit</td>
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W = weak; S = strong
Appendix 5.3: Criteria to be used if data are available

A. Criteria indicating the availability of land
   1. Present land-use: orchards, forestry, rice-fields, upland crop, fish-ponds, salt-industries, vacant, water-logged, built-up.
      The present land-use versus the potential land-use gives an indication of the land-owner's willingness to sell or develop the land. Data could be obtained from aerial photographs.
   2. Land-ownership. For vast areas of land the major land-owners should be traced. A useful distinction can be made between public and private land-owners. A frittered land-ownership pattern (in combination with vacancy and poor accessibility) may indicate inefficient development of that area. Data could be obtained by the Land Survey Dept. or the BMA.
   3. Comparison of past and present land-use. Speculation in vacant areas, or inefficient development of land are indicated by the years that an area is vacant. Data could be obtained from aerial photographs.
   4. Availability of buildable land. The total vacant land adjacent to roads, serviced by the MWWA, protected against flooding, etc. per district indicates the availability of buildable land in each district.
   5. Land-price. The BMR-study includes a land-price survey on a 100 metre grid across the built-up area and surrounding land of the BMR. Along each major road, spot measurements at 40 metres interval are to be plotted. With help of these data, the evaluation can be more accurate.

B. Criteria indicating urban growth (development pressure)
   6. Investments in infrastructure and industry per district or subdistrict. Data could be obtained from the NSO and the BMR-study.
   7. Population growth. In map 3 the projections are shown for the population growth from 1985 to 2000 by the NESDB. In combination with the density this will give an indication of the development pressure caused by population growth. However, since the projections are preliminary and thus inaccurate, the indication shown here should be used only broadly. This criterion is useful for determining the potential land value, e.g. in case of land pooling schemes (see section 5.5).
   8. Level of employment and services. (confer C. below and table 5.1)
   9. Costs of development. (confer D. below and table 5.1)

C. Criteria indicating the level of employment and services
   10. Diversity and quantity of employment opportunities. Number of employees per district or sub-district, distinguished between skilled and unskilled.
   11. Location of major services and utilities: schools, markets, parks, bus terminals, post-offices, etc. Density of such services per district and subdistrict.
   12. Location of informal sector employment and activities.

D. Criteria indicating the physical suitability of land
   13. Level of the ground surface versus the level of the ground-water and surface-water in that area. This indicates the need for flood protection measures and the cost of land-fill. For data see Flood Protection and Drainage Masterplans.
   14. Type of soil. This may indicate the firmness of the ground to be built upon and the ground subsidence. Is important for the costs of on-site infrastructure and foundation of buildings. Data could be obtained from the Land Dept.

E. Criteria inhibiting public housing
   15. Pollution of environment. Data could be obtained from the National Environment Board.
   16. Preservation areas: Green Belt, watersupply resource areas, monuments, national parks, etc.. See DTCP Masterplans, NEB, etc..
APPENDIX 5

map 13.
Development pressure

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List of amphoe or khet:
1. Phra Nakhon
2. Phra Phutthadithaya
3. Pathumwan
4. Samphan Thawong
5. Bangrak
6. Yanawa
7. Dusit
8. Phaya Thai
9. Huai Khwang
10. Phra Khanong
11. Bang Khen
12. Bang Kapi
13. Hong Chok
14. Phahurat
15. Lad Kribbang
16. Thanon
17. Khlong San
18. Bangkok Noi
19. Bangkok Tai
20. Bang Khun Thian
21. Path Charoen
22. Taling Chan
23. Rat Burana
24. Kong Kham
25. Nakhon Chaiari
26. Sam Phan
27. Bang Lea
28. Muang Nonthaburi
29. Bang Bu Thong
30. Pak Eret
31. Bangkok Kruai
32. Bang Tai
33. Sai Mai
34. Muang Pathum Thani
35. Lat Larn Lao
36. Thanyaburi
37. Lao Lek
38. Khlong Luang
39. Muang Samut Prakan
40. Phra Pradiphat
41. Bang Phiee
42. Bang Bo
43. Bang Pho
44. Muang Samut Sakhon
45. Prathum Beem
46. Nakhon Chaiari
47. Phra Pradiphat
48. Muang Samut Sakhon
49. Prathum Beem

scale 1 : 350,000

- 118 -
nr. 1 Wouter de Herder,  
"Stand van zaken in Nederland met betrekking tot milieu-effect-rapportage" (1980)

nr. 2 Lex Arkesteijn, Arie Bleijenberg, Johan van Dalen,  
"Wind en Ruimte", een planologische studie naar toepassing van kleine windturbines (1981)

nr. 3 Tibert van Dijk en Frans de Jong,  
"Fundering en Stadsvernieuwing", onderzoek, beheer en herstel (1982)

nr. 4 Marien de Langen,  

nr. 5 Wybo Jurgens, Daan Sperling,  
"Interim Saldo Regeling, Integrale Sloopregeling?" (1983)

nr. 6 Paul Ike en Henk Luijpers,  
"Grind in de toekomst" (1983)

nr. 7 Nico Borreman en Nelleke Geertsen,  
"Als het regent houden we ons hart vast......", de problemen van een hoge grondwaterstand in stedelijk gebied; een inventarisatie (1984)

nr. 8 Paul Ike, Henk Voogd en Koos van Zwieten,  
"bedrijfsterreinen; moeilijkheden en mogelijkheden" (1984)

nr. 9 Albert Dekker en Derk Hueting,  
"Tijdelijke opslagplaatsen voor verontreinigde grond" (1984)

nr. 10 Mark Maimone,  

nr. 11 Hendrikus de Jager en Willem Stam,  
"Het gebruik van kortparkeerparkeergarages" (1984)

nr. 12 J.C. Kuipers,  
"Stadsverwarming, orde op zaken", DUP (1985)

nr. 13 S.J. Bennema, P. Ike en H. Voogd,  
"Grind en geluid", DUP (1985)

nr. 14 P.P.M. Ruijs,  
"Stadsvernieuwing, de nieuwe aanpak", DUP (1986)

nr. 15 Rob den Haan en Ron van de Kuilen,  
"The planning of public housing sites in Bangkok", DUP (1986)
Haan, R. den / Kuilen, R. van de:
THE PLANNING OF PUBLIC HOUSING SITES IN BANGKOK.

SUMMARY.

In Bangkok, Thailand, land suitable for developing public housing is becoming increasingly scarce to obtain, at least at a reasonable (i.e. affordable) price. The consequent choice until now of the National Housing Authority has been to locate projects further away from the city-centre where land-prices are low. These locations however appear to be less suitable for the target-group (i.e. low-income people) and more costly to develop.

The goal of this study was to select and evaluate locations for public housing, in relation to the priorities of the target-group and to the cost of land and its development. During the course of the study the impact of (new) infrastructure on the locational possibilities for public housing appeared to be of major importance. This resulted in a strong emphasis on urban and infrastructure development as well as land management options.

The report covers four aspects:
1. urban development of Bangkok and related problems
2. the land- and housing-market, and the role of public and private sectors
3. evaluation of the efforts of the National Housing Authority to fulfil the needs and wishes of low-income people
4. a strategy for appraisal and selection of public housing sites, by finding an optimum between suitability and costs.