TITLE PAGE

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SYNOPSIS

Bangkok is a city of contrasts. Enormous wealth alternates staggering poverty, ancient temples stand next to glittering office towers and constructing workers have their lunches at the roadside stands together with the minions of international business. Furthermore, "*most of Bangkok's inhabitants live behind gates. Low-income people live in walled slums like Khlong Toei, close to their workplaces. At the same time, the urban middle classes move out to Bangkok's extensive suburbs in walled housing estates. This reality of spatial partitioning also characterizes the spatial organisation of work, shopping and leisure. Spatial form thus functions to maintain and enhance social-economic inequality, creating exclusionary spaces that physically separate the "haves" from the "have-nots"* (Wissink, Dijkwek & Meijer 2006).

The project works with the Lock 1-3 community of the Khlong Toei slum in Bangkok. The vision for the project is to enhance the inhabitants' life quality by legalising the land, providing them access to public services and improve their functional and aesthetical physical environment. The project furthermore seek to build a symbiotic relationship, understood and carefully nurtured between the formal and informal city, through creating new opportunities for social interaction and thereby suppressing the urban barriers between them.

FOREWORD

This project is carried out as a Master Thesis on the Urban Design 4th semester MA program at the Faculty of Architecture & Design, Aalborg University, Denmark. The theme for the project is slum upgrading and integration, which has been inspired by the challenges of the accelerated rising of slums and the consequential urban segregation of the contemporary world related to the continuous urbanization and the growing number of megacities.

The aim of the project has been to investigate and illustrate the potentials of physical design regarding upgrading of slum dwellers' living conditions and integration of the informal and formal city.

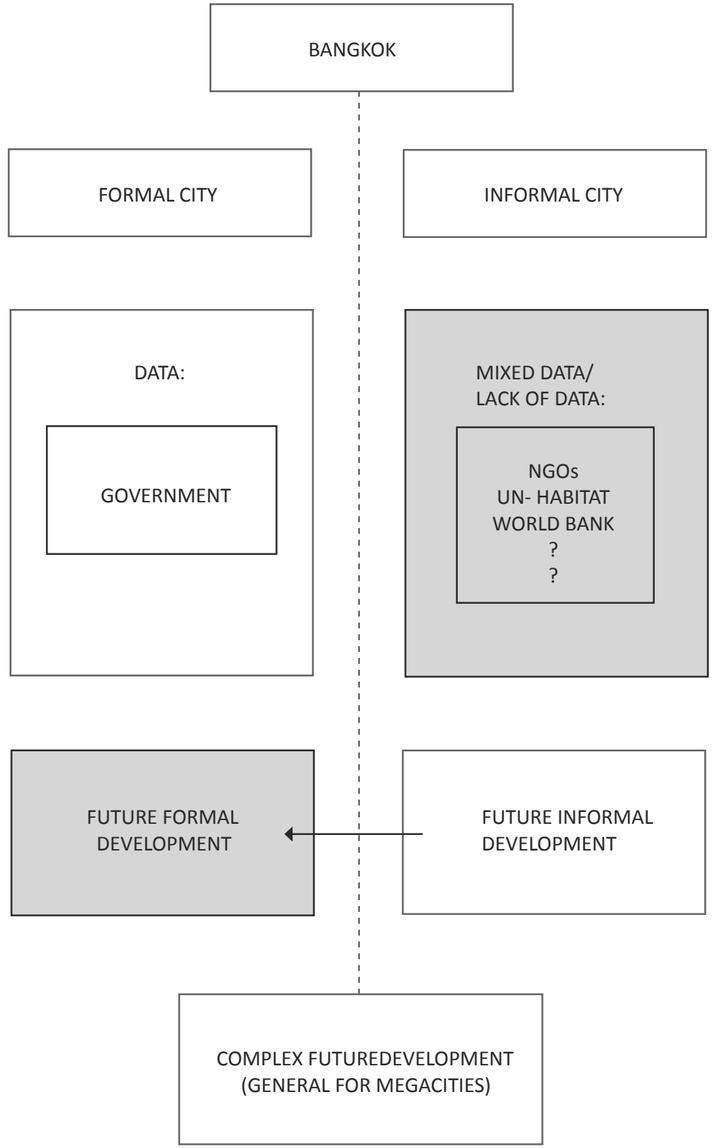
The project has been carried out with the assistance of a few external professionals. In that relation we would like to thank Duang Prateep Foundation for assistance during our stay in Bangkok, with special thanks to Mr. Nicholas Holloway and Miss Jiraporn Buasuk. Furthermore we want to thank our co-supervisor, Jes Vollertsen, for technical support concerning water management. Finally we would like to give a special thanks to our supervisor, Victor Andrade Carneiro da Silva, for his enthusiasm and great involvement during the project development, of which we are very grateful.

REPORT STRUCTURE

The report starts with a presentation of Bangkok, followed by the foundation of the project, which leads to the overall concept. The project works with the concept in three scales; the Neighbourhood, the Community and the Design Area. The registrations and the appurtenant proposals of each scale are presented in chronological order. In closing is a reflection on the project proposal and a presentation of the project approach.
Attached to the project report are a prospectus - section A-A and section B-B in scale 1:100, and a CD featuring a digital copy of the report. In addition, 40 selected photos from the community Lock 1-3 gives an insight in the physical framework and the daily life of the community.

SOURCE CRITICISM

Information concerning the informal city is limited and largely based on estimations, resulting in mixed data. Working with the informal city, aiming to integrate it with the formal city, the missing link between the informal and formal city, regarding information, becomes highly relevant. Due to lack of information, we have had to make some presumptions and calculations based in the estimated number of inhabitants in Khlong Toei slum. Furthermore, there were no complete maps for the area. The map presented in the report is drawn based on Google Earth, information gathered in Bangkok – at the Planning Department and the local NGOs and on-site registrations.



ill. 1: Common development situation in the world's megacities

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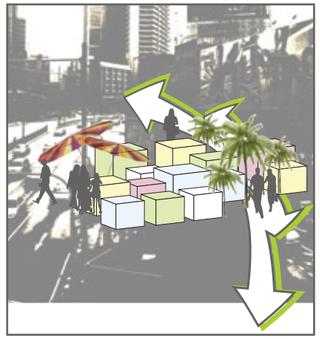

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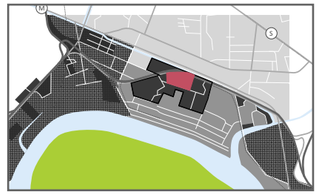

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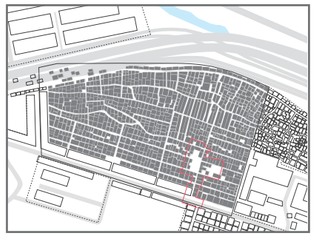

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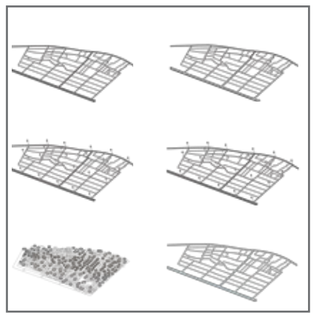

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PREFACE

The project is inspired by the challenges of the accelerated rising of slums and the consequential urban segregation of the contemporary world related to the continuous urbanization and the growing number of megacities. The project is carried out in Bangkok, Thailand. Bangkok is chosen as the project site based in our personal interest in the city, after having visiting the city several times over the last couple of years. During a study tour with Aalborg University in 2006, we got to see a side of the city, unknown to most tourists, the underside of the growing urbanization – poverty.

"While the world's urban population grew very rapidly over the 20th century (from 220 million to 2.8 billion), the next few decades will see an unprecedented scale of urban growth in the developing world. This will be particularly notable in Africa and Asia where the urban population will double between 2000 and 2030, after which developing countries will have 80 % of the world's urban population" (UNFPA 2008). An outstanding feature of urban population growth in the 21st century is that it will be composed, to a large extent, of poor people (UN Millennium Project 2005). Cities are the main beneficiaries of globalisation. Still, very few developing-country cities generate enough jobs to meet the demands of their growing populations. Moreover, the benefits of urbanization are not equally enjoyed by all segments of the population, resulting in large socio-economic disparities within the cities (Kötter 2004). Poor people are, for the most part, consigned to socially segregated areas of slums.

Today, slum dwellers worldwide include one out of every three city dwellers, adding up to a billion people. Over 90 % of slum dwellers today are in the developing world. South Asia has the largest share, followed by Eastern Asia, sub-Saharan Africa and Latin America (UNFPA 2008).

Over the past several decades, Bangkok's population has risen sharply, as a result of urbanization. Including daily commuters, Bangkok's current total population is estimated to approximately 16 million.

Bangkok surely is a city of contrasts. On the one hand it is emerging as a regional centre for tourists and business visitors, extending beyond a horizon bristling with skyscrapers, elevated expressways and skytrains, blending shopping centres, pockets of greenery, and glittering temples. On the other hand Bangkok struggles with the consequences of the city's rapid urbanization, with a whole range of issues, such as poverty, density, urban segregation, waste management and pollution.

Most of Bangkok's inhabitants, regardless of income groups, live behind gates. Low-income people live in walled slums like Khlong Toei, close to their workplaces, while the affluent population moves out to Bangkok's extensive suburbs. This reality of spatial partitioning also characterises the spatial organisation of work, shopping and leisure.

Spatial form thus functions to maintain and enhance social-economic inequality, creating exclusionary spaces that physically separate the "haves" from the "have-nots" (Wissink, Dijwel and Meijer 2006). We see Bangkok as a city with great potentials, but we stress the importance of reacting to the urban segregation by integrating of the city's various social groups in the future development of the megacity.

The project site is situated in the city's largest slum; Khlong Toei slum, more specifically the 7,2 hectare Lock 1-3 community, located on Bangkok Port, 6 km from the city centre.

In the course of working with a specific slum community, our hope is to acquire a more comprehensive understanding of the current megacities' prevailing challenges, related to poverty. The project aims to create a design proposal to address the physical obstacles of the community – upgrading the slum dwellers' living conditions by improving housing conditions, infrastructure, open space and sanitary conditions, and further to promote the integration of the slum community and the formal Bangkok.

RESEARCH QUESTION:

How can we, as Urban Designers, upgrade Khlong Toei slum and promote its integration with the formal city, through physical design?

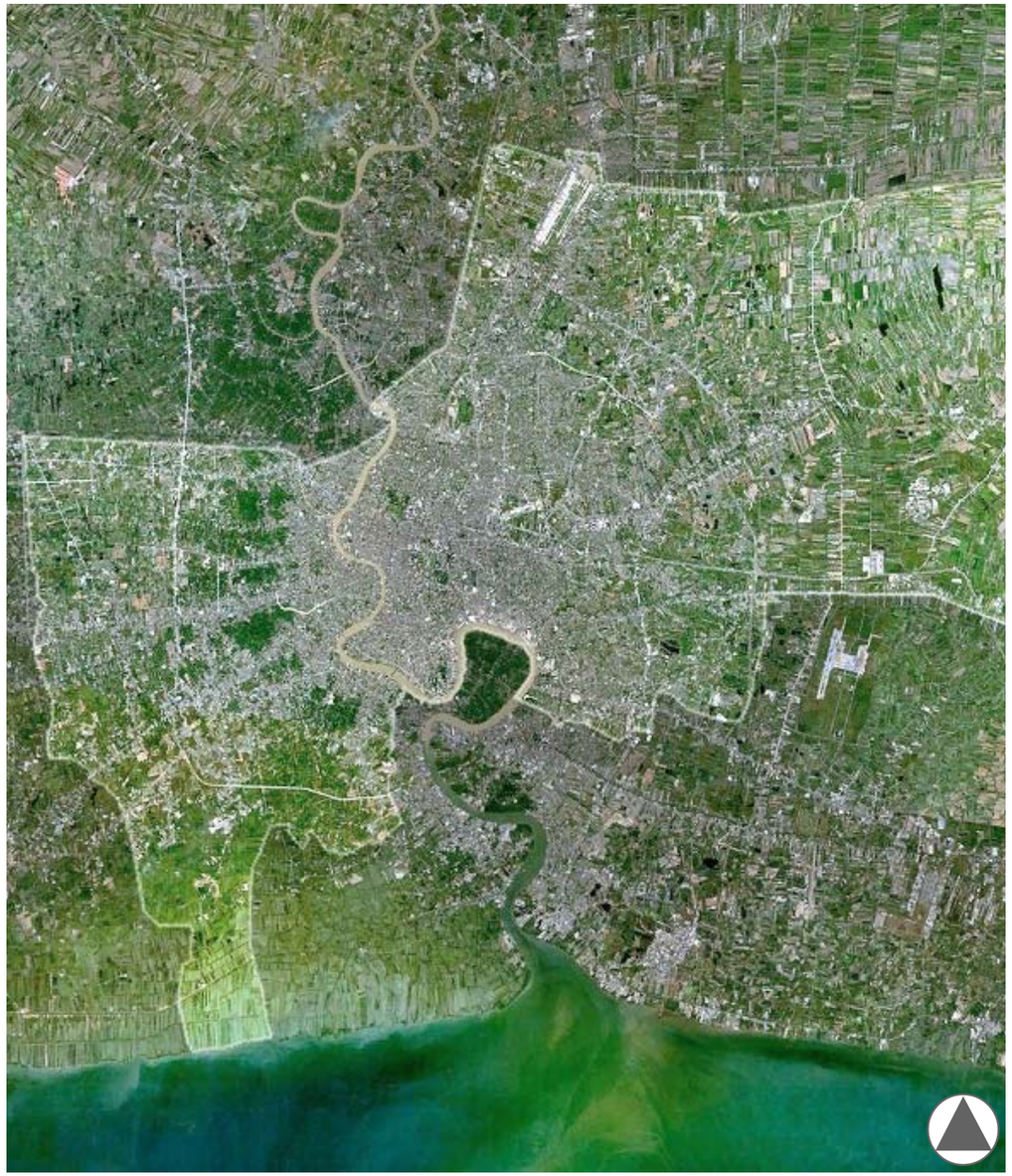
PRESENTATION BANGKOK

Thailand has a population of 65 million people. 85% of the population is Buddhist and 10% Muslim. There is a constitutional monarch with party elections held every 4 years. Urbanisation in Thailand began in the 1960's and intensified in the 1980's. Currently 65% of the population is rural and 35% urban. 5,500 low-income communities exist in 300 cities comprising a population of 8.25 million people. 65% of these people pay land rents, but have no contractual tenure security, and 35% are squatters. 445 communities are currently under threat of eviction. 70% to 80% of the urban population cannot afford housing in the public and market housing systems so they stay in slums (UN-Habitat 2009).

Bangkok, the capital, has a population of 10-11 million people, and is about thirty five times as big as Thailand's second largest city (UN-Habitat 2009). Including the people who live in the city without registration, the city's population is estimated to 16 million. There are about 1600 poor and informal communities of the city, constantly growing, both in area and number (CODI 2004).

Among the most significant reason for the inward migration of people formerly residing in rural areas is that the city is the centre for the most significant aspects of modern living, including: commerce; finance; governmental administration; education; medical advancement; transportation; and art and culture.

However, far from all immigrants reach their dream coming to Bangkok. The combination of the city's surging tourism, high class business districts in contradiction to the informal labours, the sex- and drug industry, represent the strong urban segregation that is present in the city.



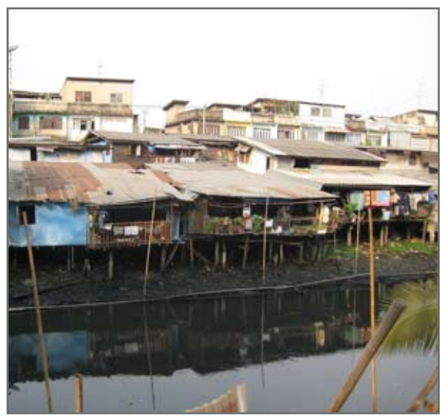
Satelite photo of Bangkok Metropolitan area

CITY OF CONTRAST

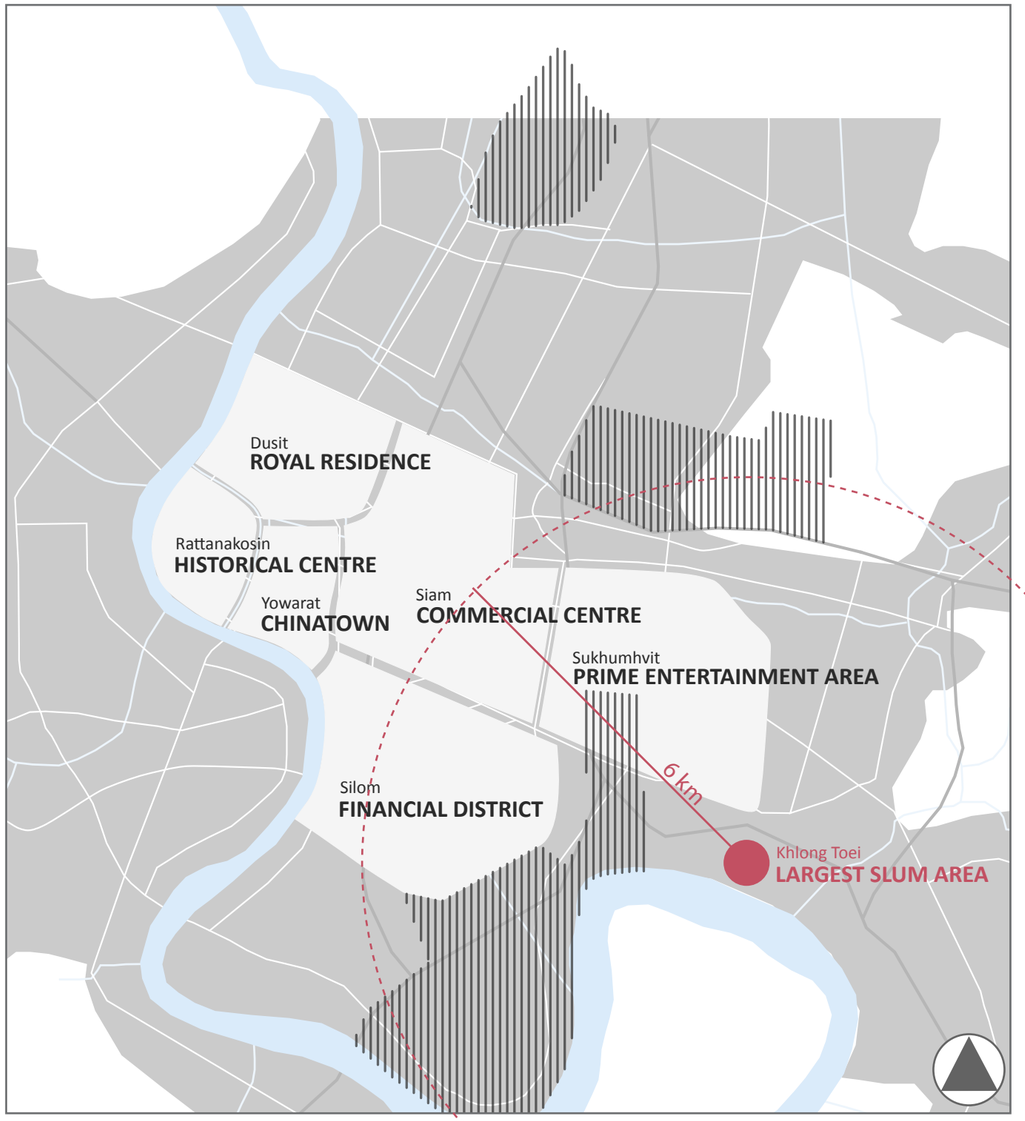
Bangkok is a city of contrasts. Enormous wealth alternates staggering poverty, ancient temples stand next to glittering office towers and constructing workers have their lunches at the roadside stands together with the minions of international business. The city has a multi-core structure with a range of commercial, financial, recreational, industrial and transitory centres. The historic buildings are situated along the Chao Phraya River in the Thornbursi and Rattanakosin areas. A cluster of shopping malls and designer shops are located in Siam Square, while the tourists flock from there and along Sukhumvit Road, where countless hotels, tailor shops, restaurants, bars and massage clinics in the narrow sidewalks make up the urban scene (Marling, 2005: 28).

"For the urban scientist, this city stands out because of the incredible amounts of walls and gates that surround endless amounts of mono-functional and mono-cultural enclaves. For instance, take housing. Remarkably, most of Bangkok's inhabitants live behind gates. And this feature regards all income groups! Low-income people live in walled slums like Khlong Toei, close to the workplaces. At the same time, the urban middle classes move out to Bangkok's extensive suburbs in walled housing estates. Extensive market segmentation of these neighbourhoods leads to a remarkable selection of income groups. Higher middle class people live amongst higher middle class people; low income groups amongst low. This reality of spatial partitioning also characterizes the spatial organisation of work, shopping and leisure. In short, the urban field of Bangkok consists of a series of separate spatial walled units that are selectively connected" (Wissink, Dijkwek & Meijer, 2006).

Shopping Centre, Silom - COMMERCIAL CENTRE



Ramshackle canal-side settlements, KHLONG TOEI SLUM



ill. 2: Bangkok's multi-core structure and future Central Business Districts
The hatched areas are planned future Central Business Districts. (BMA 1999)

MOBILITY

Bangkok has two types of mass transit systems that connect with each other: the BTS Sky Train and the MRT subway. Bangkok's Sky Train covers much of the central city and its many commercial, residential and tourist areas with extensions planned to outlying areas. It carries approximately 300,000 passengers per working day (BMA 1999). The MRT subway system connects the northern train station to the Hua Lamphong railway station near the city centre.

In addition there is also a network of busses and express canal boats. These are affordable and well connected with the city's low income areas, and are therefore the primary mean of public transport used by the low income inhabitants. The difference in cost and location of the different type of public transportation induces a clear separation between the different social groups.

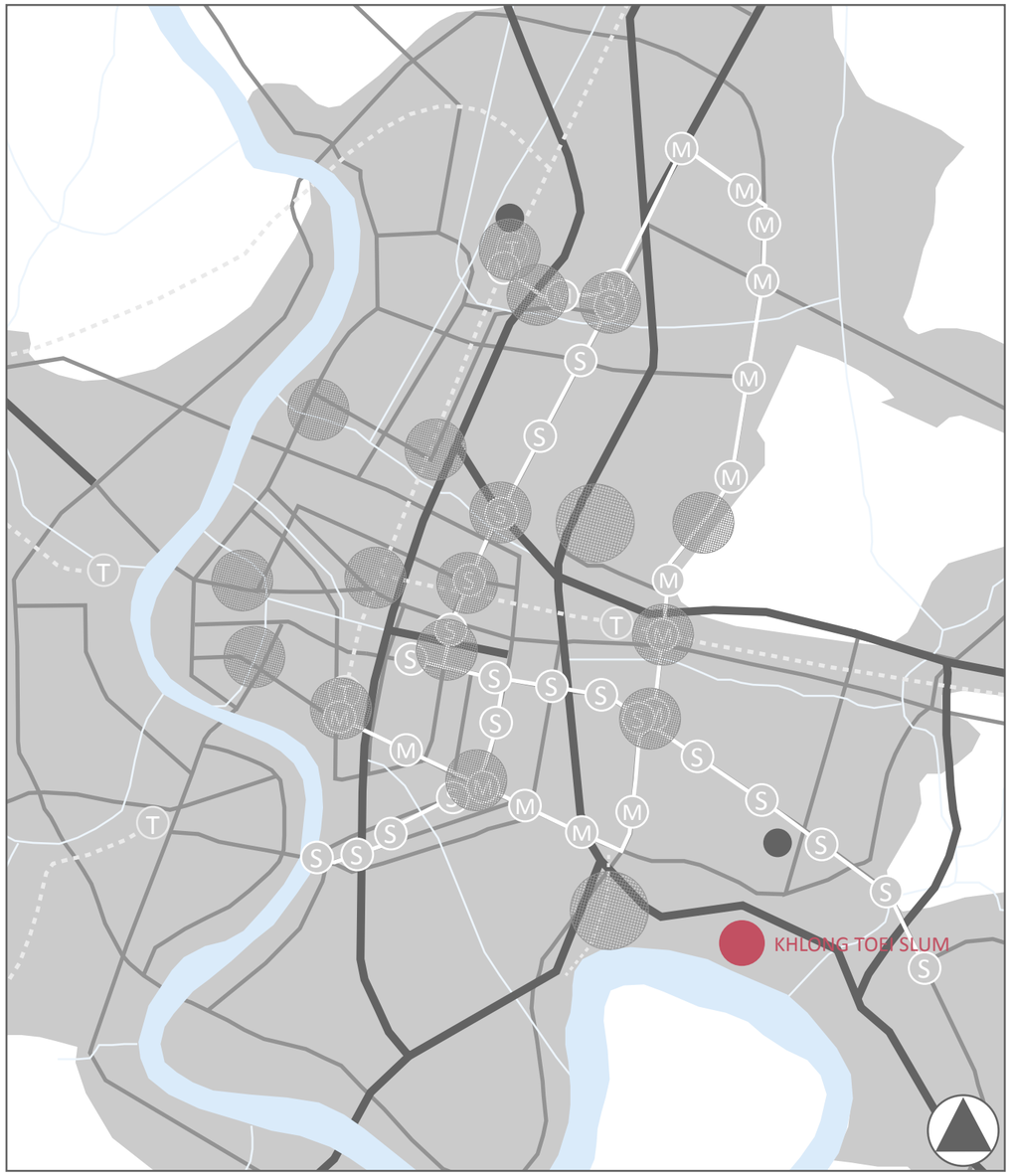
Bangkok's layered expressway network serves millions of cars each day. Still, as Bangkok's 10 central districts account for 80% of the work places in the city, the network cannot cope with the massive commuting from the outer suburbs to the centre, resulting in massive traffic congestions in the inner city area (Thadaniti, lecture 2004).

FUTURE PLANS:

THE BMA, DEPARTMENT OF CITY PLANNINGs transportation system plan aims to solve the city's traffic problems in order to promote Bangkok as the economic development centre. It is set to develop the expressway system, public mass transportation and public medium transportation. In relation to the planned expansion of the city's transportation system, several transportation nodes will be distributed throughout the city (BMA 1999).

Bangkoks elevated expressway network

Bangkoks express canal boats connects the city's poorer areas



ill. 3: Bangkok's transportation system and future transportation nodes (hatched).

FUTURE GREEN PLANS FOR BANGKOK

The public city parks play a major role in the citizens' life, regardless of social groups. The parks are multifunctional spaces in the city, used for temporary markets, concerts, recreation, workout, etc.

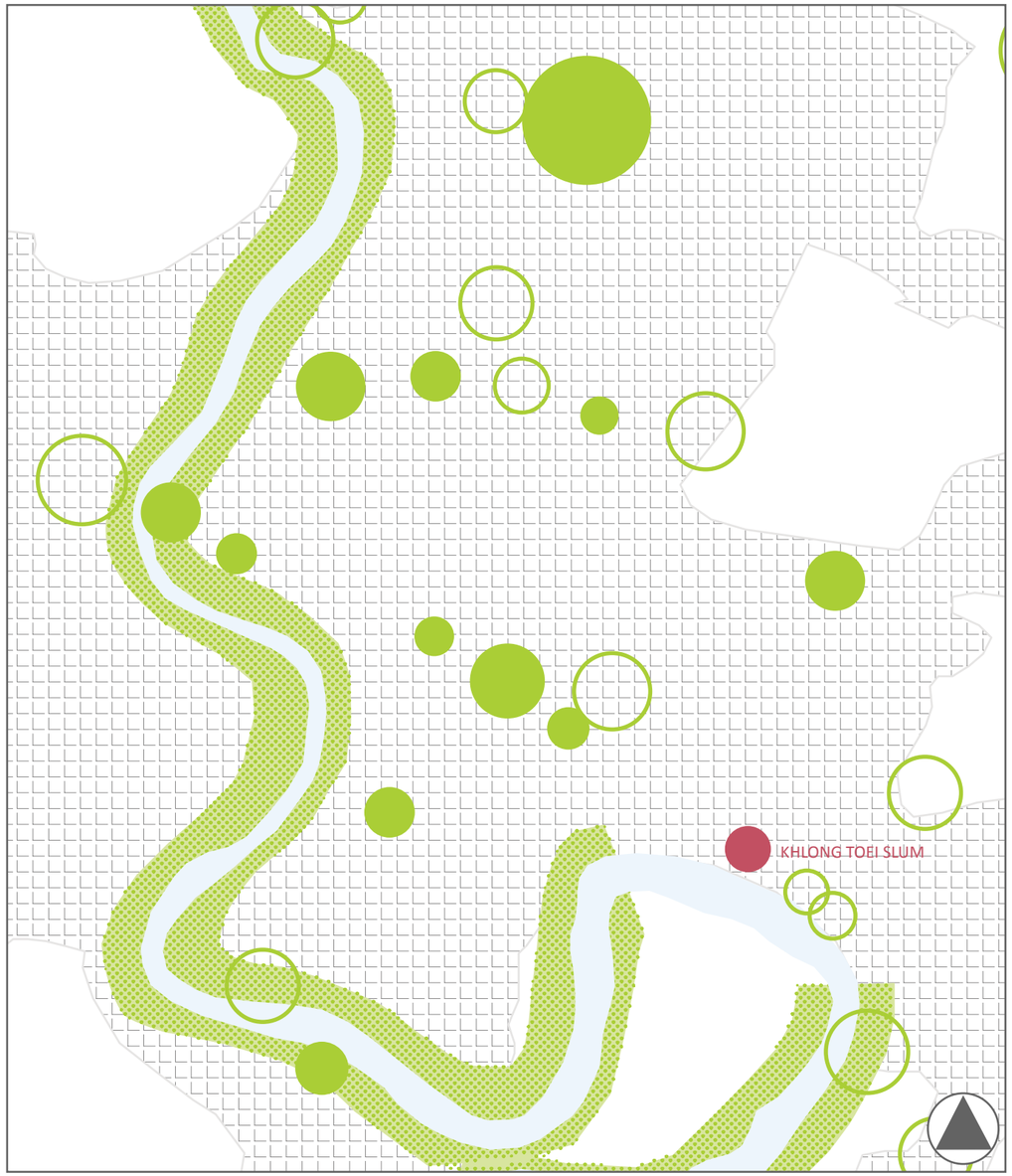
Compared to other large cities around the world, Bangkok has far fewer public parks where people can go for recreation. In 2002, public parks had a ratio of only 1.46 m2/person.
The "BMA Green Area Master Plan" established milestones: within 5 years, the ratio should not be less than 2.5 m2 / person, within 15 years the ratio should be 3.5, and within 25 years the ratio should be 4.0 (WWF 2006).

THE BMA, DEPARTMENT OF CITY PLANNINGs open space plan is for recreation and environment conservation. This plans policy is to promote, renovate, restore and conserve the urban environment along with the cultural identities. The open space plan focuses on the two categories of recreation and environmental conservation, and flood prevention.
The open space plan presents the vision of a green structure alongside the Chao Phraya River – with the exception of the stretch along Bangkok Port (BMA 1999). The area under the expressway will be developed to be public parks, sport area, library mobile, playground, and others activities for public benefits.

The 2004 "BMA Green Area Master Plan" is a 25-year strategy master plan for green area land usage. The Plan proposes a framework in order to create green areas and public parks in Bangkok, aiming for a ratio of no less than 2.5 m2/person.

Open spaces and wetland areas will be considered as a very important as they may also help relieve flood problems.

Left: Planted trees under the skytrain at Sukhumvit Road
Right: Chatuchak Park, Northern Bangkok



ill. 4: Bangkok's planned green structure along Chao Phraya river (BMA 1999)

Current City Parks
Proposed City Parks

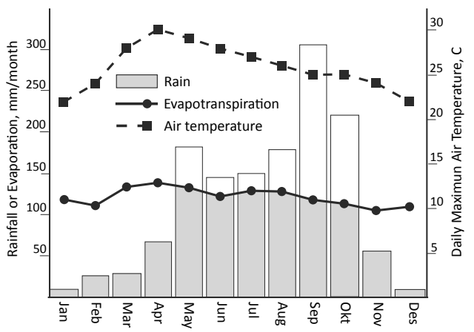
CLIMATE

Bangkok has a seasonal monsoonal climate where average daily high temperature remains relatively constant over the year, largely fluctuating within a range of 31–34 1C (see ill. 5). Like many tropical cities in the latitudinal belt between 151 and 251, Bangkok has a 6-month monsoonal wet season from May through October that ameliorates the heat. December–April is the dry, sunny season, somewhat cooler the first 3 months, but March and April have high solar intensity and longer days and thus can become quite hot.

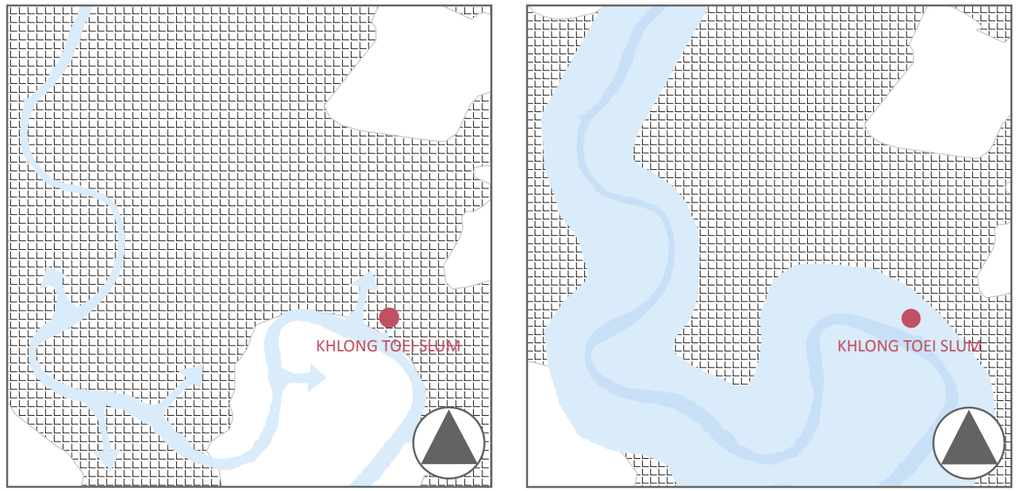
The feel of the hot temperature is intensified in the packed, dense slum communities of the city, where the shortage of shaded spaces and lack of ventilation between built environment result in stagnant air and immense heat.

The flooding of Bangkok is a huge problem for the city as a whole, but even more so for the informal settlements. Illegal land is often tantamount to risk areas, for instance areas more vulnerable to flooding. Furthermore, in the event of flooding the informal settlements are often worse afflicted as they are less equipped to tackle the possible damages.

More than one-tenth of the world's population, or 643 million people, live in low-lying coastal areas at risk from climate change, Thailand being amongst the 10 most imperilled. Bangkok is at risk of being swamped as sea levels rise in coming decades, according to warnings at the 2007 Intergovernmental Panel on Climate Change. Once known as the "Venice of the East," Bangkok was founded 225 years ago on a swampy floodplain along the Chao Phraya River. But beginning in the 1950s, on the advice of international development agencies, most of the canals were filled in to make roads and combat malaria. This fractured the natural drainage system that had helped control Bangkok's annual monsoon season flooding (Associated Press 2007). Today, the still expanding megapolis rests about 1 to 1,5 meters above the nearby gulf, although some areas already lie below sea level. The gulf's waters have been rising by about 0,25 cm a year, about the same as the world average, says Anond Snidvongs, a leading scientist in the field (Associated Press 2007).



ill. 5: Monthly rainfall and daily high temperature of Bangkok based on 30-year historical average data.



Top: Flooding in Bangkok
Lower left: Historical image of Chao Praya's natural drainage system - before the canals were filled in to make roads
Lower right: Today's situation: Chao Praya River floods, filling large areas with polluted water

SANITATION

The locations of high-rise buildings in Bangkok are mainly governed by the market forces making it difficult for the utility organization such as public transportation, water supply, telephone and electricity to cope with. The increasing density of population (due to population growth and migration) and disorderly urban settlements, together with the rapid economic development, have brought an exceeding demand of infrastructure, public utilities and public services. This results in the deterioration of urban environment, urban services and also urban quality of life (BMA 2007).

WATER SUPPLY:

The Metropolitan Waterworks Authority supplies piped water, equivalent to 91% of total demand, to residential, industrial and commercial sectors using surface water withdrawn from the Chao Phraya River and Mae Khlong River, which is treated by conventional processes before distribution. The remaining 9% of the water demand is being met by abstracting from deep wells.

Recently, due to uncontrolled discharges of agricultural runoffs including domestic and industrial wastewaters into the Chao Phraya River and Mae Khlong River, the river water quality is deteriorating. Further, the effects of global warming have caused the river flows to be unreliable with too high or too low flow rates during the rainy and dry seasons, respectively. Heavy pumping of ground water has resulted in land subsidence of 2-15 cm/year in most Bangkok areas and ground water contamination with salinity, nitrate, coliform bacteria and volatile organic compounds. Since Bangkok city is expected to continue to grow within the next ten years, the problems of water supply and contamination of both surface and ground waters would also exacerbate (Polprasert 2007).

SEWAGE SYSTEM:

At present the Bangkok Metropolitan Administration has invested about Baht 17,500 million in the construction of seven central wastewater treatment plants which can treat about 40% of the total wastewater and the treated effluents are mostly disposed of into nearby water courses. All private properties are required to have some form of wastewater treatment facilities. Small private houses are at least required to have septic tanks to accept toilet wastes. Septic tank effluents cannot generally be disposed off by leaching into the soil because of the high groundwater and impermeable clay soils. Therefore, these septic tanks have outlets to the drains or canals.
The remaining wastewater, raw or partially treated, is being discharged directly into nearby storm drains or water bodies without treatment (Polprasert 2007).

The city's sanitary conditions varies greatly from gated communities well equipped with all necessary services to slum communities living in an unhealthy environment in lack of basic services.

Top left: Sanitation serviced apartment, Bangkok
Top right: Sanitation Khlong Toei slum
Bottom: Wastewater discharged into canal

WASTE MANAGEMENT

According to a 2007 study by the Bangkok Metropolitan Administration, Thai households produce 39,000 tonnes of waste each day, or 14.2 million tonnes each year. Bangkok alone accounts for about one-fifth of the total waste, adding up to 7,800 tonnes each day. For disposal, the present system of compost-plants and sanitary landfill cannot cope with the amount of garbage collection each day. Only 80% of the garbage produced nationwide is collected, leaving roadsides, rivers and fields littered with garbage. Perhaps more alarming is this fact that only 25% of the municipal waste collected by authorities goes to sanitary landfills, and another 15% is recycled, digested and incinerated, leaving 60% openly dumped in someone's backyard (Bangkok Post 2009).

Bangkok waste management system is under tremendous pressure. Furthermore, considering the fact that the numbers presented concerning production of waste in Bangkok does not include the informal part of the city, the waste management problem is even worse. Illegal settlements are not included in the government waste collection system. Therefore many slum communities live in a constantly growing "waste disposal sites".

RECYCLING PRACTICES IN BANGKOK:

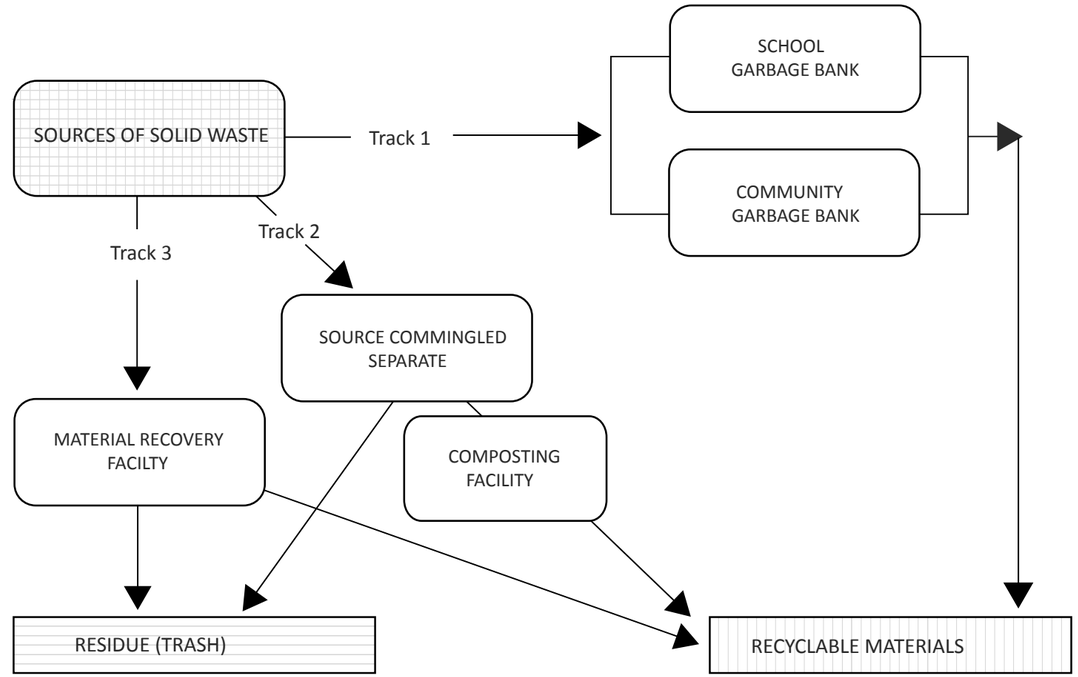
Solid waste recycling practices in Thailand are mainly dominated by the informal sector. Most ongoing efforts have focused on encouraging communities to establish programs like school garbage banks and community garbage banks. Some Local Government Authorities have established composting facilities on a small scale and material recovery facilities. There are three fundamentally different types of recycling programs, or tracks, implemented in Thailand (see ill 6).

In the first track, which is the most common, separation is done primarily by individuals at the point where the materials become waste. School Garbage Banks and Community Garbage Banks are established to collect those recyclable materials and sell them to recycling buyers. World Bank (2003) reported that there were 500 schools in 30 provinces of Thailand which have implemented School Garbage Banks since 2001, recycling a total of 2500 tons of recyclables per year. The Garbage Bank is very typical of the buyback centre, where the recyclers are financially compensated for recyclable materials. The recycling members take the recyclable materials and receive earnings in exchange, depending on the weight and the type of the recyclable materials. The amount earned at the time is recorded into a passbook, which is analogous to that of commercial bank, which can function as a banking transaction (e.g. cash withdrawal and loans).

In the second track, wastes are separated into compostables, recyclables, and non-compostables at the source and then further separated by different technologies and additives used. Advanced technology is used for the large to medium scale, while a domestic technology (windrow composting) is used for the small scale.

In the third track, materials are sorted for recycling but are still mixed, which are referred to as commingled. Commingled wastes are separated into recyclables and non-recyclables by specialized equipment at a large, central facility called a material recovery facility (MRF). The function of MRFs is to serve integrated solid waste management and to serve in the preparation of municipal solid waste to be a fuel for combustion plants (Suttibak, & Nitivattananon, 2008).

There are good incentives to recycle and separate items. The going price (beginning of 2008) for paper is 12 baht (0.25€) per kilo and for compressed cans (beer, cola drinks etc.) is no less than 50 (1€) baht per kilo. The maids (and security personnel) have a good trade collecting paper and cans (and possibly also plastics and bottles) and selling in to 'private' garbage collectors who seem to roam Bangkok's side streets at all times. It is also a common sight in Bangkok to see people actually work the garbage bins to pick out the valuable items (Thai Websites 2008).



ill. 6: Three types, or tracks, of recycling programs implemented in Thailand (Suttibak, & Nitivattananon, 2008).

FOUNDATION PART I

WHAT IS A MEGACITY?

Asian Development Bank defines megacities as urban areas with a population of over 10 million. "Megacities and urban agglomerations are complex and dynamic systems that reproduce the interaction between socio-economic and environmental processes at a local and global scale" (Kötter 2004).

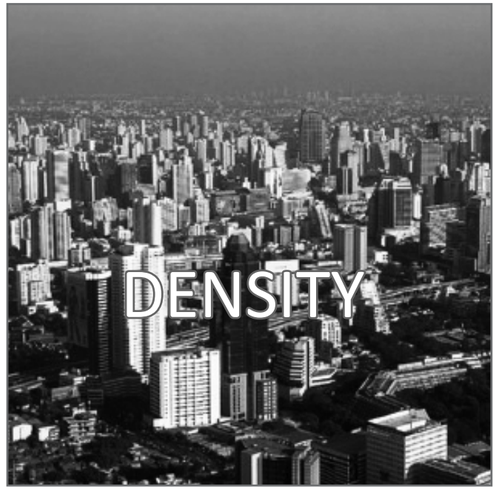
WHAT ARE THE CHALLENGES FOR MEGACITIES?

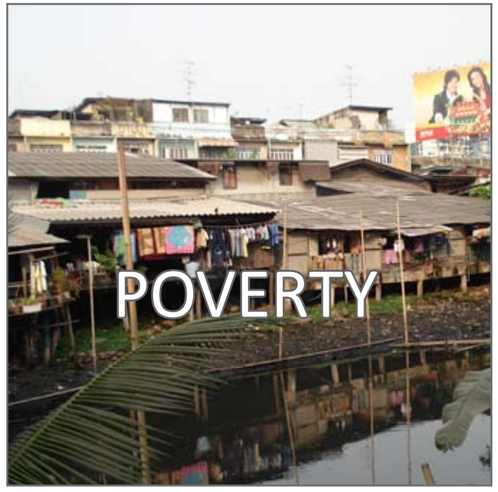
Asian Development Bank discusses megacities as having both positive and negative features. Megacities generate a higher-than-average proportion of the nation's output of goods and services; are centres of innovation in science, arts and lifestyles; contain many of the cultural assets of the country; and offer some of the best opportunities for people to lead full and satisfying lives. Yet, they also suffer from water shortages, environmental pollution, traffic congestion, and proliferation of slums, crime, and social alienation (ADB 1997).

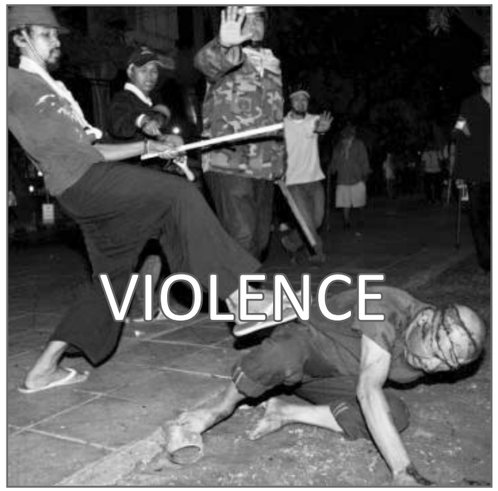
Kötter (2004) underlines that the extension of megacities is always in advance of urban development work and the provision of public facilities. Beside the "proper city", which is in the focus of strictly conventional urban planning, all other quarters and districts of the agglomeration and megacities grow outside the law and without the benefits of urban planning. Especially the informal housing areas and in many times also illegal housing areas (squatters), that are build up by the migrants themselves lead to an extensive settlement structure. The illegality of these residential areas results mainly from the land tenure system.

"Asia, which is home to 80 % of humanity, is urbanising and currently 36 % of Asians live in cities. Some of the world's largest cities, such as Mumbai, Calcutta and Bangkok, have over 10 million people and between one third and one-half of them live in slums." (UN-Habitat 2007)

The UN- Habitat (2007) states that there are no reliable global estimates of urban poverty and that the absolute number of poor and undernourished in urban areas is increasing, as is the share of urban areas in overall poverty and malnutrition. In general, the locus of poverty is moving to cities, a process now recognised as the "urbanization of poverty".







Top: View of Bangkok city
Bottom: Crime scene with poor inhabitants, Bangkok

Top: Canal slum, Khlong Toei, Bangkok
Bottom: Traffic jam, Bangkok city

GROWING CITIES, GROWING SLUMS

WHAT IS SLUM?

"A heavily populated urban area characterised by substandard housing and squalor." UN-Habitat
This straightforward quote from UN-Habitat (2007) reflects the essential physical and social features of slums, but more meat needs to be put on these bones.

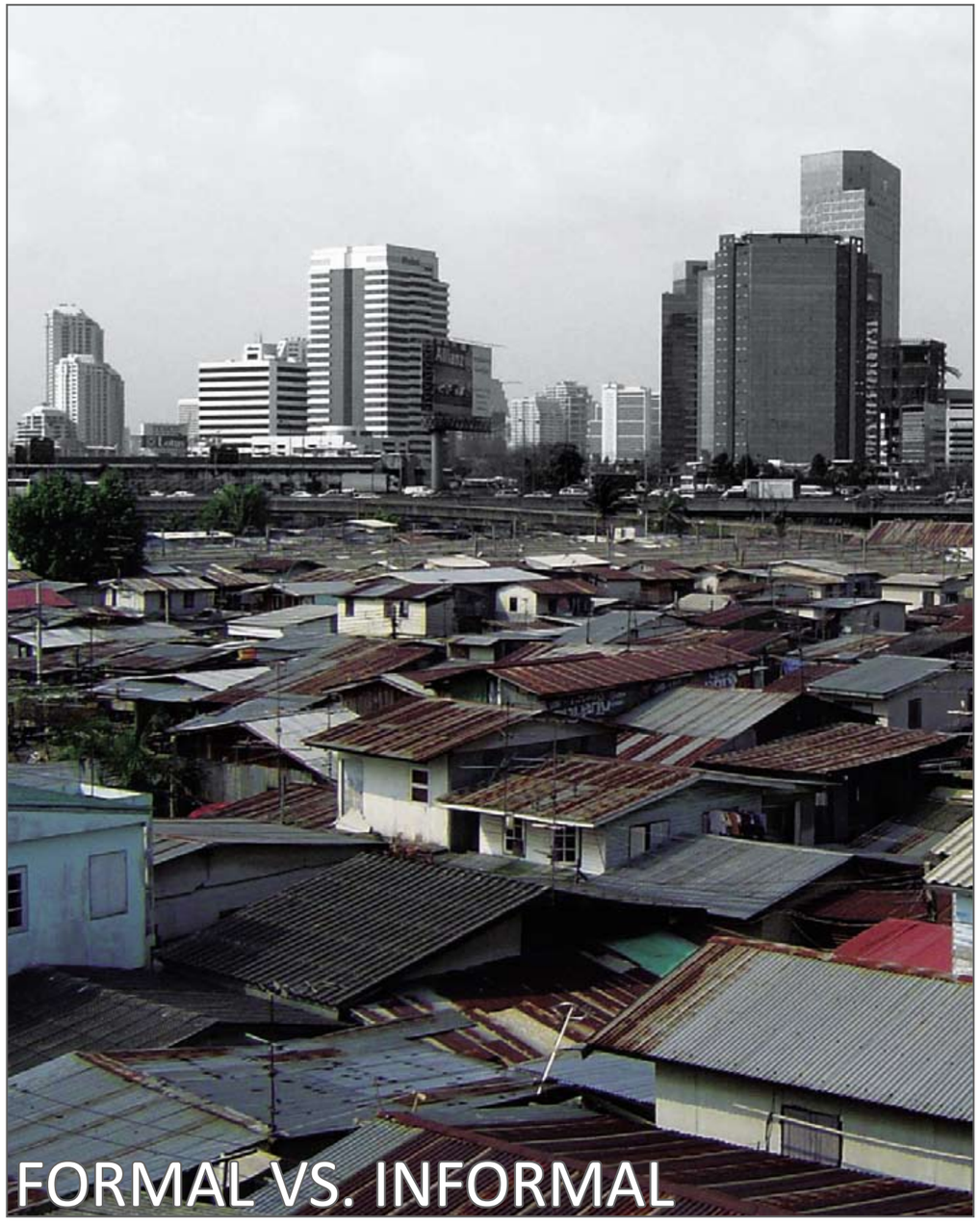
Slums are according to UN-Habitat in the traditional sense, housing areas that were once respectable – even desirable – but which deteriorated after the original dwellers moved on to new and better parts of the city. The condition of the old homes declined as they were progressively subdivided and rented out to lower income people. Today, slums have come to include the vast informal settlements that are quickly becoming the most visible manifestation of urban poverty in developing world cities. Such settlements are known by many different names and are characterized by a variety of tenure arrangements. In all cases, however, the buildings found there vary from the simplest shack to permanent and sometimes surprisingly well-maintained structures, but what most slums share in common is a lack of clean water, electricity, sanitation and other basic services.

WHY DO SLUMS EXIST?

According to UN-Habitat slums exists because of, and are perpetuated by, a number of forces. Among these are rapid rural-to-urban migration, increasing urban poverty and inequality, insecure tenure, and globalisation – all contributing to the creation and continuation of slums. (UN-Habitat 2007)

SLUM, A GLOBAL PROBLEM:

Mike Davis (2006:26) states that there are probably more than 200 000 slums on earth, ranging in population from a few hundred to more than a million people. The five great metropolises of South Asia (Karachi, Mumbai, Delhi, Kolkata and Dhaka) alone contain about 15 000 distinct slum communities whose total population exceeds 20 million. Davis defines the largest slums as "Megaslums" – arising when shantytowns and squatter communities merge in continuous belts of informal housing and poverty, usually on the urban periphery. In many cities, wealth and poverty coexist in close proximity; rich, well- serviced neighbourhoods are often located next to dense inner- city or peri- urban slum settlements that lack basic services and adequate shelter. (UN- Habitat 2008: 48)



View of Khlong Toei slum, Bangkok, with the formal city in the background

URBAN SEGREGATION

"Urban segregation is not a frozen status quo, rather a ceaseless social war in which the state intervenes regularly in the name of "progress," beautification," and even "social justice for the poor" to redraw spatial boundaries to the advantage of landowners, foreign investors, elite homeowners, and middle class commuters." (Davis 2006: 98)

Kötter (2004) declares that the development and extension of cities is accompanied with mounting urban poverty, and that the growing socio-economic disparity within the megacities and the lack of social cohesion is the most serious explosive charge. From our point of view, the importance of including the poorer and underprivileged areas of the city, in the urban development, is highly underrated. Urban segregation will continue being a problem, and will become an even larger problem, as long as the lower social groups are not accepted and integrated in the city. We therefore argue that integration of the various social groups in the city play a key role in the future development of the megacity.

Sennett (2008) argues that the right type of action to promote social interaction between the different social classes in the city is to create public realms. A public realm can be simply defined as a place where strangers meet. Traditionally, this place could be defined in terms of physical ground, which is why discussions of the public realm have been, again traditionally, linked to cities; the public realm could be identified by squares, major streets, theatres and cafés. According to Sennett "the most important fact about the public realm is what happens in it. Gathering strangers' enables certain kinds of activities which cannot happen, or do not happen, in the intimate private realm."

We support Sennett concerning the importance of creating public realms to encourage social interaction between the different social classes in the city, with the intent to reduce the social segregation. However, for a public space to become a public realm, the social classes must tolerate each other and agree to share the space, both for physical constructions and open spaces for social interaction.

From our point of view; in the contemporary city, where the social classes are physically and socially segregated, the fear of the unknown is a major issue that needs to be addressed in order to stop the polarisation of cities.

This is only possible if the social classes stop "fearing" each other, and if the lower social classes gain the same rights of access to public facilities and to use the city as the more privileged population. Our arguments are substantiated by Davis, who postulates that intense class conflicts over urban space take place in downtowns and major urban nodes. He uses an example from Ernard Berners studies, were Berner discusses the case of Manila. The case explains the situation in Manila, where globalised property values collide with the desperate need of the poor to be near central source of income, because distance from place to work means prohibitive costs in time and money. Street vendors and other informal entrepreneurs crowd Manila's central plazas, street corners, and parks.

Berner describes the failure of market mechanisms or even private security to turn back this invasion of poor people who, after all, are only behaving like rational economic actors in the end. Landowners are dependent upon state repression to keep squatters and vendors at bay, as well as to help evict residual populations of working-class renters and tenement dwellers (Davis 2006: 99). Kötter (2004) argues that at many times the location of new squatters of rapid growing cities and agglomerations is not suitable according to a proper and safe urban development. The main reason for this is that e.g. in the 1990's, the larger part of urbanization was unplanned, often in areas adjacent to industrial zones, known to be highly seismic or flood prone.

The accelerated and uncontrolled growth has contributed to the ecological transformation of the cities and their immediate surroundings. Furthermore other factors depending on the local circumstances contribute to the urban vulnerability: lowering or rising water table, rising sea level, earthquakes, storms and landslides. Through lack of choice the ongoing urbanisation forces more and more populations to settle on those disasters prone areas.

Left: Siam square, Bangkok city centre. Upper class people uses the square for social interaction and as a flow space.
Right: Local market, Khlong Toei Port. Local low income people uses the space for shopping and social interaction.

NON- ACCEPTANCE OF POOR COMMUNITIES IN THE CITY:

The contemporary scale of removal of urban poor is immense: every year hundreds of thousands, sometimes millions of poor people - legal tenants as well as squatters - are forcible evicted from Third World neighbourhoods. The urban poor as a result, are nomads, “transients in a perpetual state of relocation”. Davis postulates that ideological symbols and promises made to the poor, when it comes to the reclamation of high value land, mean very little to the bureaucrats in power. In communist-governed Kolkata, for example, squatters have been evicted from the centre to the edge, and then evicted again when necessary to create space for middle class subdivision (Davis 2006: 98,101).

Scenes of eviction

THE GATED URBAN FIELDS OF BANGKOK:

In the research report “Bangkok Living, Social Networks in Gated Urban Field”, Wissink, Dijwel and Meijer argue that walls and gates create exclusionary spaces that physically separate the “haves” from the “have-nots”. The lucky ones can retreat in their own spatial worlds, leaving the less fortunate urban citizens behind. Spatial form thus functions to maintain and enhance social-economic inequality. On top of this, it is argued that the resulting physical separation of social groups undermines the public sphere. After all, groups that don’t meet won’t know and understand each other.

“In the Asian metropolis of Bangkok, not only the rich, but also the poor live behind gates. At the same time, the relational networks of inhabitants of various neighbourhoods within this splintered urban field turn out to leave space for cross-cultural encounters. However, this doesn’t necessitate understanding and solidarity” (Wissink, Dijkwek & Meijer, 2006)

Most of Bangkok’s inhabitants live behind gates. The feature regards all income groups. Low-income people live in walled slums like Khlong Toei, close to their workplaces. At the same time, the urban middle classes move out to Bangkok’s extensive suburbs. This reality of spatial partitioning also characterises the spatial organisation of work, shopping and leisure. As a result of this, Bangkok consists of a series of separate spatial walled units that are selectively connected (Wissink, Dijwel and Meijer 2006).

The research group present Bangkok as a city were “the rich have separated themselves spatially from the poor; they have abandoned public space and retreated into the pseudo public spaces of shopping malls, golf clubs and gated communities. The global elite, living in the space of flows, make up a society separated from the rest by the means of money, culture and more and more spatial barriers. They minimize contact with the rest of the society by only visiting places exclusively designed for their specific purposes. They work in exclusive office towers, eat in fancy restaurants, spend their limited leisure time at their private country club, shop at exclusive shopping malls and live in their gated communities and guarded condominiums. Within the city, when in transit, they retreat into their private vehicle or when the conditions demand it switch to rapid mass transit.

Because the elite require spatial separation to maintain its privileged position, it creates gated communities and private shopping complexes in which to retreat. And by separating itself it automatically shuts out the rest of the society, thereby separating them as well.
(Wissink, Dijkwek & Meijer, 2006)

FOUNDATION PART II

UPGRADING

To enhance the inhabitants' life quality by legalising the land, providing them access to public services and improve their functional and aesthetical physical environment.

INTEGRATION

To build a symbiotic relationship, understood and carefully nurtured between the informal and formal city, through creating new opportunities for social interaction and thereby suppressing the urban barriers between them.

ACTORS

IN SLUM UPGRADING AND INTEGRATION PROJECTS:

Slum upgrading projects rely on international, national and local actors playing significant economic and managing role. We find the international actors to be very important in local projects applying their global knowledge about the standard issues occurring in slums and experience from working with slums worldwide.
This part provides an explanation to how these projects are operated and financed and gives a brief introduction of different actors on the field, which would also be highly adequate for this specific project to be carried out in a realistic setting.

NGOs:

Non-governmental organisations are any non-profit making, non-violent, organised group of individuals not seeking government office.
There is no such thing as a typical NGO, but it is in the nature of the NGOs that they will often be raising new issues and expressing public unease with the policies of governments. Changing the agenda for debate is their most important impact on politics. They are involved in agenda setting, policy-making and implementation of policy locally, nationally and internationally. They vary greatly in size and type structure. They may represent privileged elites or the oppressed and the disadvantaged. They can be small specialist groups based in a single country, influencing governments behind the scenes, or they may be mass movements, gaining coverage in the global news media. Amnesty International is an example of a highly-centralised international NGO with “sections” in more than 50 countries. Development NGOs may receive substantial resources from governments, either in cash or supplies, to support their operational activities, particularly for disaster relief. (Willetts, 1996)

There are several NGOs located in Khlong Toei slum, working locally and nationally. The two major organisations of the area are the Duang Prateep Foundation and the Human Development Foundation.

“NGOs have established a role for themselves as sources of organised criticism of the imperfections of international society, as a stimulant to progress, as promoters of new ideas and programmes, as sources of additional voluntary funds for development, and as channels of publicity for the United Nations and its Agencies.” Peter Willetts

ASIAN DEVELOPMENT BANK:

ADB is a regional development bank established to promote economic and social development in Asian and Pacific countries through loans and technical assistance. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their citizens.
Under Strategy 2020, a long-term strategic framework adopted in 2008, ADB will follow three complementary strategic agendas: inclusive growth, environmentally sustainable growth, and regional integration. It will focus on five core areas of operation: infrastructure; the environment, including climate change; regional cooperation and integration; finance sector development; and education.
Strategy 2020 requires ADB to bring four specific elements of good governance more deeply into the mainstream of its activities: accountability, participation, predictability, and transparency.
ADB has many productive relationships with its member governments, the World Bank, International Monetary Fund, World Trade Organization, United Nations agencies, and other multilateral and bilateral agencies. Partnerships are the key to planning, financing, and implementing ADB operations. (ADB 2009)

UN-HABITAT:

The United Nations Human Settlements Programme, UN-HABITAT, is the United Nations agency for human settlements. It is mandated by the UN General Assembly to promote socially and environmentally sustainable towns and cities with the goal of providing adequate shelter for all.

UN-Habitat's programmes are designed to help policy-makers and local communities get to grips with the human settlements and urban issues and find workable, lasting solutions.

UN-Habitat’s work is directly related to the United Nations Millennium Declaration, particularly the goals of member States to improve the lives of at least 100 million slum dwellers by the year 2020, Target 11, Millennium Development Goal No. 7, and Target 10 which calls for the reduction by half of the number without sustainable access to safe drinking water.

UN-Habitat's strategic vision is anchored in a four-pillar strategy aimed at attaining the goal of Cities without Slums. This strategy consists of advocacy of global norms, analysis of information, field-testing of solutions and financing. (United Nations 2009)

THE WORLD BANK:

The World Bank Group's mission is to fight poverty and improve the living standards of people in the developing world. . It is not a “bank” in the common sense, but an international organisation which provide low-interest loans, interest-free credit, grants, policy advice, technical assistance and knowledge sharing services to low and middle-income countries to reduce poverty. The Bank promotes growth to create jobs, and to empower poor people to take advantage of economic opportunities. The Bank is strongly committed to the Millennium Development Goals which target poverty, school enrolments, child mortality, maternal health, disease, and access to water (The World Bank 2007).

HUMAN DEVELOPMENT FOUNDATION:

The Human Development Foundation and the Mercy Centre is another non-profit NGO in Bangkok. The organisations work to build and operate schools, improve family health and welfare, protect street children's rights, combat the AIDS crisis, respond to daily emergencies, and offer shelter to orphans, to street children, and to children and adults with AIDS.
Mercy Centre is a shelter for street kids and orphanages, a hospice and home for mothers and children with HIV/AIDS, a 400-pupil kindergarten and a community meeting place in the slum (HDF 2009).

CODI:

The Community Organizations Development Institute (CODI) is an independent public organization, a Thai government agency, under the Ministry of Social Development and Human Security.

CODI aims to build a powerful society from the basis by the power of the community organizations and the civil society. It supports the development of the Community Organization and the public society by coordination power from every sector (CODI 2008).

DUANG PRATEEP FOUNDATION:

The Duang Prateep Foundation is a non-profit NGO in Bangkok, founded and directed by Prateep Hata, who is also a Senator in the Thai Ministry.
Prateep Hata was born in Khlong Toei slum and has spent the past 30 years helping and educating the children of the slums in hopes of a better future. The foundations programs help protect children from diseases, AIDS, physical and sexual abuse and provide educational projects to enrich their lives (DPF 2007).
Today the activities of DPF extend far beyond the slums of Khlong Toei, including: educational scholarships, kindergarten projects, community development, HIV/AIDS project, Credit Unions/ microfinancing, projects for the elderly, special education for the hearing impaired, New Life Project for children at risk, tsunami relief and development.

UPGRADING- AND INTEGRATION PROGRAMS

Since 1977, the National Housing Authority, Thailand, has been the sole agency developing low-income housing and undertaking slum upgrading. Before this, the only concept was to push the slums and squatter settlements out of the city. Upgrading was therefore a major change because it recognized that these communities have to be considered a part of the city (UN-Habitat 2009).

In recent years it has become common for governments and international agencies to support 'upgrading' programmes for 'slums' and squatter settlements. These have generally been government funded programmes providing support for physical improvements in infrastructure or housing, in which inhabitants of the settlements to be upgraded have mainly been recipients or beneficiaries to the projects decided by government and implemented mainly by contractors.
Furthermore, these initial attempts of upgrading did not know how to deal with the urban poor communities' status, with their illegality and with their contravention of by-laws. Thus there were no changes in land tenure status, so the inhabitants did not receive secure tenure (Boonyabancha 2005).

CASE STUDIES:

Next we will present two innovative slum upgrading- and integration programs, from Thailand and Brazil, with two appertaining case studies. Studying and evaluating these programs we have gained a deeper understanding of the key issues connected to slum upgrading and integration. The cases are chosen strategically according to our approach in the project, aiming to upgrade the Lock 1-3 community of Khlong Toei slum and integrate Khlong Toei slum and the formal city.

SLUM, BANGKOK

SLUM, RIO DE JANEIRO

BAAN MANKONG

PROGRAMME FOR UPGRADING AND SECURE TENURE IN THAILAND:

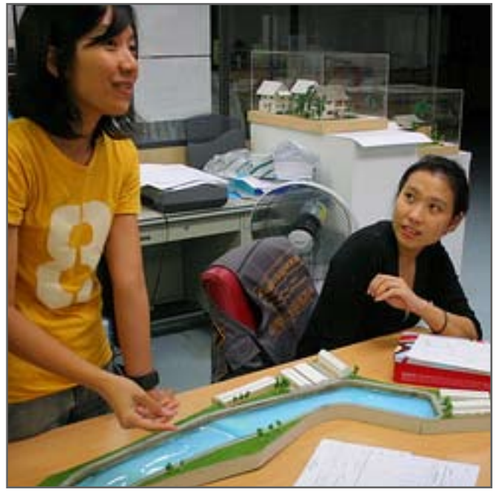
CODI set a slum upgrading target for the Baan Mankong programme to achieve “cities without slums” in 200 Thai cities, covering 2,000 slum communities, within five years. At that time, there was information on slums in 300 Thai towns and cities, and this target represented about two thirds of those cities. That upgrading target was important, because it reflected the real scale of change needed, and it was big enough to be attractive to politicians and policy-makers (CODI 2008).

The Thai government announced the Baan Mankong ‘secure housing’ programme in 2003 – an ambitious programme that seeks to build on and leverage community resources. The programme, implemented by the Community Organizations Development Institute (CODI), channels government funds in the form of infrastructure subsidies and housing loans direct to poor communities who, in collaboration with local governments, professionals, universities and NGOs, plan and carry out improvements to their housing, environment and basic services and manage the budget themselves (Slum Dweller International 2004).

Upgrading existing settlements is supported whenever possible, and if relocation is necessary, a site is sought close by to minimize the economic and social costs for households. Secure tenure is one of the most important parts of the new housing program, and communities have to work this out before they can access the housing loans and infrastructure subsidies under the program. This can be negotiated through a variety of means such as cooperative land purchase, long-term lease contracts, land swaps or user rights.

The program channels government funds, in the form of extremely flexible infrastructure subsidies and soft housing and land loans, directly to poor communities. The urban poor community organizations and their networks are the key actors and control the funding and the management; they also undertake most of the building (rather than contractors) which makes funding go much further and brings in their own contributions.

Further, the program promote more than physical upgrading; as communities design and manage their own physical improvements, this helps stimulate deeper but less tangible changes in social structures, managerial systems and confidence among poor communities. It works to develop urban poor communities as an integrated part of city; people plan their upgrading within the bigger city development framework. This also helps trigger acceptance of low-income communities in the city’s larger development process as legitimate parts of the city and as partners (Environment&Urbanization 2005).



Top left: Houses in Khlong Toei slum, upgraded after fire
Top right: User involvement Baan Mankong
Bottom: Upgrading in process Khlong Bang Bua

THE UPGRADING OF KHLONG BANG BUA

About 3,400 families live in the 12 informal settlements which line the 13 kilometer stretch of Bangkok's Bang Bua canal. After almost a century of living in insecurity, with the daily risk of fires and eviction, and facing constant accusations of polluting the canal, the people living along the Bang Bua canal joined hands with the Baan Mankong Program to upgrade their communities and secure their land tenure. Under the Baan Mankong program, Baan Bua also became one of the relocation areas for slum communities evicted from the land they occupied.

This was Bangkok's first-ever case of public land being leased to a network of canal-side squatter communities.

With good collaboration from the two district authorities (Bang Ken and Laksi) on either side of the canal, the nearby Sripathum University and CODI, the 12 communities along Khlong Bang Bua formed a network, started savings groups, prepared plans for redeveloping their settlements and revitalizing their canal and formed a cooperative society. In the process, the Bang Bua communities have become the city's ally in revitalizing and cleaning this important canal. As a network of 12 communities, and with the "network power" support of the city-wide network of 200 canal-side communities in Bangkok, Bang Bua was able to convince the authorities that redeveloping their communities in the same place is good for the people and good for the city as a whole.

Besides new houses and infrastructure in the community, the canal is also getting a face lift and a brand-new 6-meter lane along its edge, built partly on the swampy edges where houses used to perch, and partly on land reclaimed by the District Authorities in the canal. This new canal-side walkway will provide access to the communities along the canal and enable fire-trucks to enter the slum in an emergency. Though it will be open to motorbikes and cycles, the community people see this walkway as an important pedestrian amenity, providing space for children to play, people to visit and vending carts to sell their food and wares.

In the Baan Bua case most community members have taken housing loans from CODI, which have to be repaid in 15 years, with monthly repayments of about 1,000 Baht (20€). Most families can afford that. But for people who can't afford it, or for people who were renting and didn't own structures in the old community, the project presented ways of helping them get housing and staying in the community.

Top and centre left: New colourful houses
Bottom left: canal-side walkway

Top right: New house
Bottom right: Settlement on the othe side of the canal, yet to be upgraded

THE FAVELA BAIRRO PROGRAM

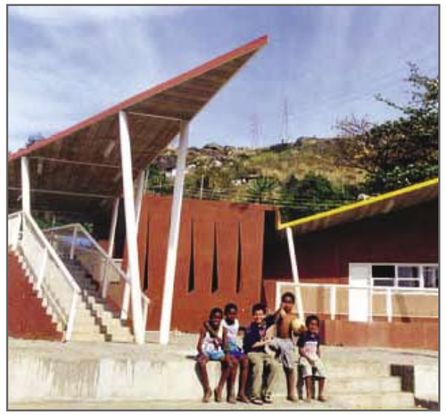
Launched in 1993, by the Rio de Janeiro Municipal Government, the Favela-Bairro "slum to neighbourhood" programs aim was to improve the physical conditions to enable favelas to be seen as part of the formal city – tackling poverty, lack of infrastructure and spatial segregation (Andrade 2008). The program further sought to upgrade the living conditions in the city's slums and illegal subdivisions by providing water and sanitary services, improving streets, reforestation, storm drainage, garbage collection services and increasing the supply of social services.

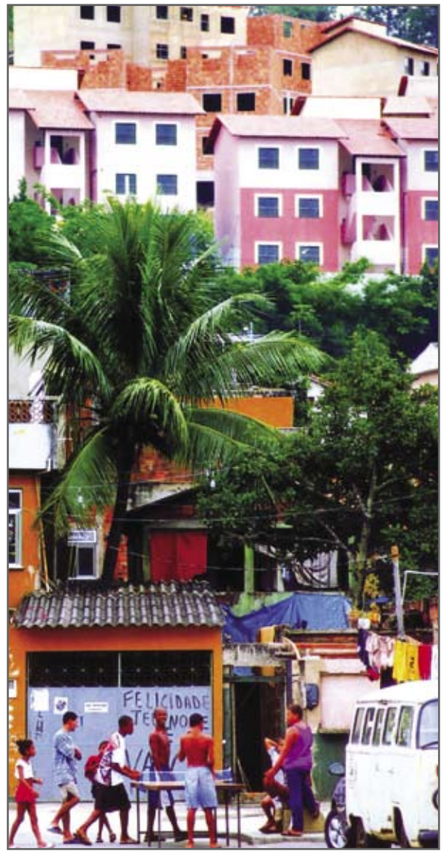
Key to the success of this large project was a committed and flexible city government and the use of intra- and extra-institutional partnerships with the private sector, churches, NGO's and the general population. The project involved 253,000 residents in 73 communities. (IDB 2009).

Searching a more socially integrated city, urban design strategies were developed to integrate the urban fabric of the favelas and the formal city. In order to integrate favelas into the urban fabric of the formal city, the programs key actions were:

- Promoting the legalisation of land subdivision and providing land titles
- Building up a street network interrelated to the formal city
- Completing or constructing key urban infrastructure
- Providing environmental changes that made the favelas resemble "normal" city quarters
- Introducing visual symbols of the formal city that characterizes a neighbourhood, such as paved streets, plazas, urban furniture and public services
- Consolidating the insertion of the favelas into the planning process of the city
- Implementing activities of a social nature, such as setting up day-care centres, income generation projects, training programs and sports facilities, etc.

The design of public spaces was a major element in the physical and social change of the favelas. This became a strategic element in the project, emphasising the importance of public space for social interaction (Andrade 2008).





Top left: Community centre Morro do Fubá
Centre left: Street in Favela Fernao Cardim
Right: Upgraded housing
Bottom: Football pitch in Favela do Vidigal

CELULA URBANA: FAVELA JACARECINO, RIO DE JANEIRO

In 2000, the Bauhaus Dessau Foundation was invited by the municipal authority of Rio de Janeiro to develop a model project for Favela Jacarezinho.
The Favela Jacarezinho is the Brazilian metropolis' second largest favela, a "city within the city", with 58,000 inhabitants dispersed on a 35 hectare large area.

In the context of Favela Bairro, a special urban development policy was pursued: spatial-social structures grown inside the favela as well as the favela architecture as something evolved were recognized and serve as basis for planning. The city development was to consider the individual life perspectives of the inhabitants. Above all it was to initiate a lasting and self-dynamic process by cultural, technological and economic interaction with the urban surrounding and to create a new image for the favela.

The Celula Urbana project consists of three integrated core areas: the model neighbourhood – the "block", a footbridge as the new gateway to the favela, and the foyer – a "Taba universitaria", as an extension to the favela (Bauhaus Dessau Foundation 2004).

The projects central point is the "block", that propose solutions for prototypical urban construction and architectural intervention, which can be put to use throughout the favela. The four-storey media centre – the nucleus of the project – comprises a media school, an internet café and an information centre for the Jacarezinho favela. One of the main objectives, in addition to improving the living conditions, is to encourage cultural, technological and economic interaction with the urban environment and thus trigger sustainable, self-propelling processes in the favela (Bauhaus Dessau Foundation 2004).

The bridge and foyer with campus formulate a new entrance, as well as the content and spatial interaction of city and neighbourhood. PraçaConcordia is the new entrance, where the tribune is a staircase, a place to stay, an advertising media and a name sign all at the same time. The space below the tribune is envisioned to be used as a library and café in a further stage of the development. For the foyer, the establishment of a "Taba universitaria", an international centre for projects in poverty-stricken areas, has been suggested. It pursues the aim of educating the favela inhabitants and wants to enhance and encourage the international exchange when dealing with these sorts of areas (etuipop 2004).

Top left: View on the place Praça Concordia, with tribune, nucleus and the buildings at the courtyard
Top right: Courtyard - November 2003
Bottom: Plan for the model project, marking the "Block", the Bridge and the Foyer

CONCEPT UPGRADING & INTEGRATION

- The vision of the project is to promote the integration between the Neighbourhood and the formal city and further to upgrade the slum dwellers' living conditions by improving housing conditions, infrastructure and open spaces.

- The interventions are to be made for the slum dwellers, aiming to trigger self-propelling processes in the slum communities and create a new image for the area. Moreover, the objective is that the suggested solution as a whole will enable the area to be seen as part of the formal city.

CONNECT THE AREA TO THE CONTEXT
CREATE A GREEN CORRIDOR
ADD EDUCATION

UPGRADING & INTEGRATION

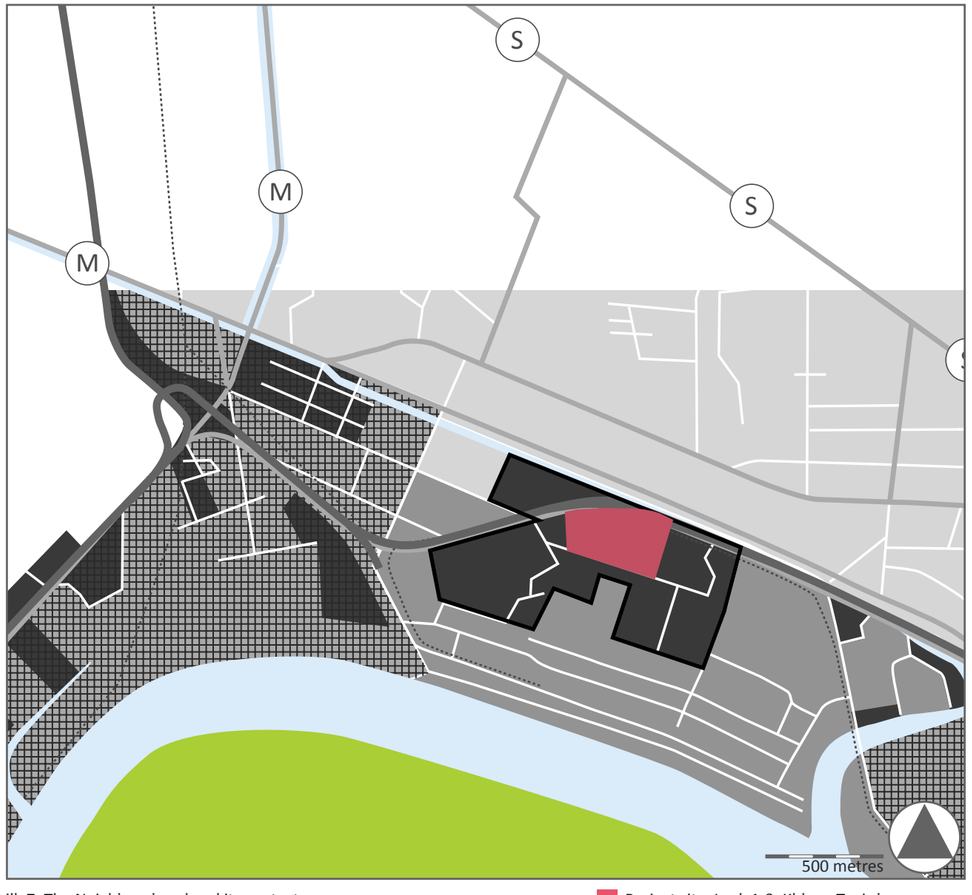
UPGRADE INFRASTRUCTURE
CREATE SOCIAL NODES
UPGRADE HOUSING
IMPROVE SANITARY CONDITIONS
ACCESS TO PUBLIC SERVICES

REGISTRATIONS NEIGHBOURHOOD

THE NEIGHBOURHOOD AND ITS CONTEXT

The project site, the Lock 1-3 community, is part of a larger 44 hectare slum Neighbourhood consisting of approximately 75.000 residents, located on Bangkok Port - on land owned by the Port Authority of Thailand. The settlement is part of the massive Khlong Toei slum, dating back to the 1950's when dwellers settled in the low-lying arc of land surrounding the port area or along the nearby canals as they worked on the construction of the port.
The following registrations are based on official data, on-site registrations and interviews.

Khlong Toei is a district of substandard housing in central Bangkok, by the Chao Praya River.
The Neighbourhood consists of eight slum communities of the massive Khlong Toei slum. The Neighbourhood and its context make up a monotonous area largely consisting of light industry, middleclass housing and the remaining Khlong Toei slum communities.



ill. 7: The Neighbourhood and its context

Slum communities | Bangkok Port | Light industry | Middleclass housing | Project site, Lock 1-3, Khlong Toei slum | The Neighbourhood

Top: Bangkok Port
Centre left: Light industry

Lower left: Middle class housing
Lower right: Khlong Toei slum

ADJACENT FACILITIES

Sukhumvit Road provides a multitude of hotels, apartments, condominiums, restaurants, and vendors of all kinds line the road, serving Thais and foreigners alike.

1. The Emporium, located on the Sukhumvit road, is a giant upscale shopping mall. Along with The Emporium department store, it contains a cinema multiplex and book, record, fashion and trinket shops, a grocery store, a food court and many upscale restaurants.

2. Queen Sirikit National Convention Center, a highly sophisticated multi-purpose facility, was specifically designed to meet the almost limitless demands of today's meeting planners and exhibition organizers.
The key areas of the Center are a partitioned Plenary Hall that can accommodate up to 5,000 people; exhibition, display and office areas covering 35,000 square meters capable of housing hundreds of trade booths and smaller deluxe meeting and seminar rooms suitable of meeting from 10-600 people. The center hosts various exhibitions around the year.

3. Benjakitti Park is located around Lake Ratchada, between Sukhumvit and the Queen Sirikit Convention Center. The park is mostly occupied by Ratchada Lake. However, to the west of the lake are pavilions, Buddhist artifacts, playing ground for kids and jogging and cycling paths.

4. Khlong Toei Market is a major "fresh" market, though not touristic. The market offers low prices on raw meat, seafood, farm produce, hot meals and other items (clothing, kitchenware, etc).

   Rama IV Road is a trafficked road with several office buildings and hotels and various shopping facilities.

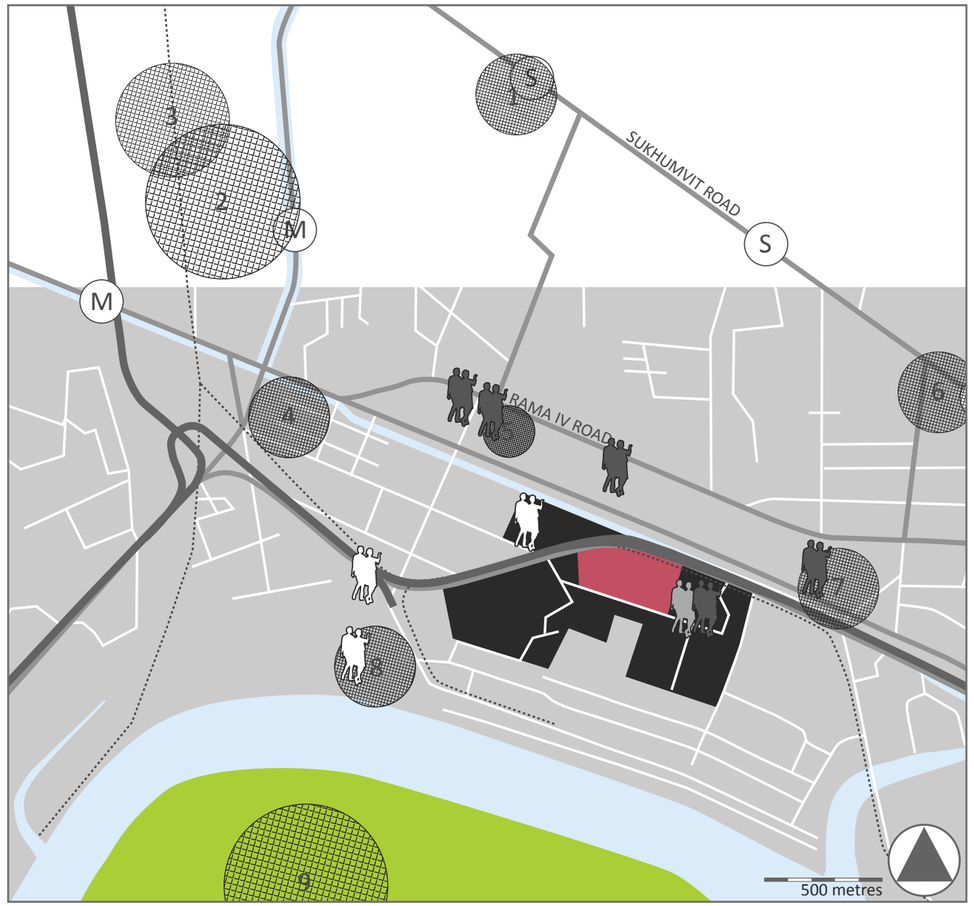
5. Tesco Lotus, situated on Rama IV Road, is a hypermarket chain in Thailand and China. It stores stock groceries (western and local products) as well as a selection of stationery, school supplies, clothing, shoes, electrical equipment and many other non-food products at very competitive prices.

6. Bangkok eastern bus terminal offers bus service from Bangkok to eastern provinces of Thailand such as Pattaya, Rayong, Koh Samet.

7. Bangkok University is a private, non-profit co-educational institution under the patronage of the Bangkok University Foundation.

8. The temple, Wat Khlong Toei Nai, is located on the banks of the Chao Phraya River.

9. Located on the banks of the Chao Phraya River, just opposite the Bangkok Port, Bang Krachao is a world apart from chaotic Bangkok. The change in air and scenery is immediate and astounding, and catches one by surprise.



ill. 8: Adjacent facilities

Private school · Public school · NGO school

Project site, Lock 1-3, Khlong Toei slum

The Neighbourhood

Top: Queen Sirikit National Convention Center
Bottom: Benjakitti Park

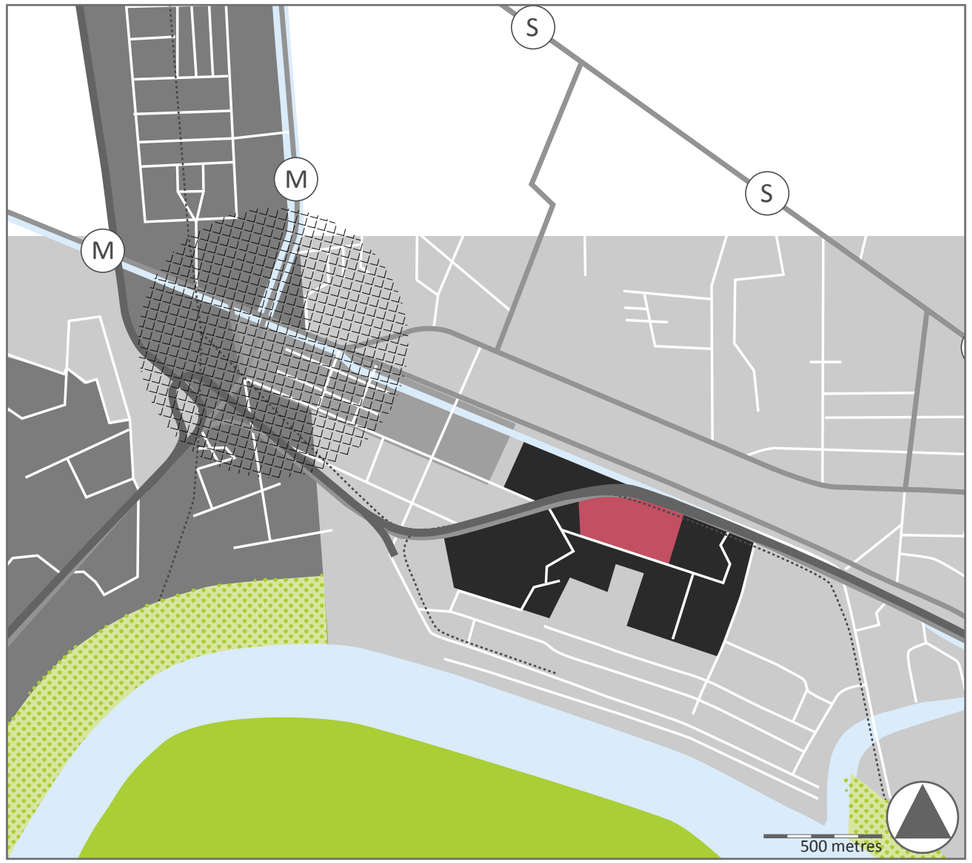
Top: The Emporium
Bottom: Khlong Toei market

Top: Tesco Lotus hypermarket
Bottom: Bangkok University

Top: Wat Khlong Toei Nai
Bottom: Bang Krachao

RELEVANT FUTURE PLANS

The BMA, Department of planning, future plans, regarding a new large business district along the Chao Phraya River and the new transportation hub, will be of importance for the area. If these plans are implemented, the business district will function as an expansion of the city centre towards the site. Further the new transportation node and the expansion of the city's transportation network will improve the physical connectivity to the rest of the city. The Port Authority of Thailand, the owner of several acres of land, has pointed out four areas as development areas, mainly for business and commercial purposes. Two of these areas are bordering the Neighbourhood, to the north-west. The PAT has signed a 10- year concession with Legal Professional Co. Ltd. To build and manage a modern market that complies with sanitation and environmental standards (Logistics Digest 2009).



ill. 9: Relevant future plans

Future business district
PAT development areas
Middleclass housing
Project site, Lock 1-3, Khlong Toei slum
The Neighbourhood

Photos illustrating the focus of the BMAs future plans

THE NEIGHBOURHOOD

The Neighbourhood consists of eight communities of the massive Khlong Toei slum. Settled on swampy land, the larger part of the land has been filled in while part of the settlement is constructed with houses and pathways on stilts.

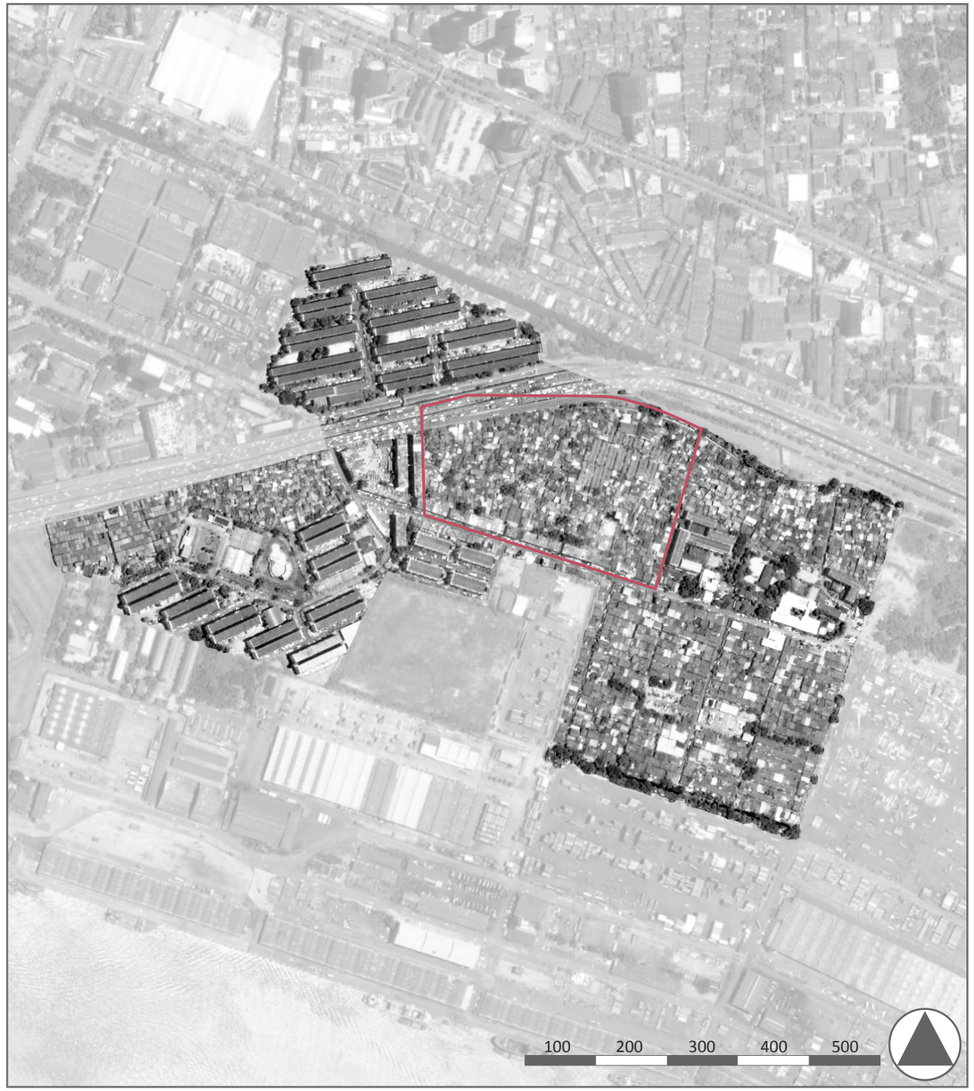
Originally slum dwellers settled in the low-lying arc of land surrounding the port area or along the nearby canals as they worked on the construction of the port in the early nineteen fifties. They then stayed to work as manual labourers at the port. Still today many Khlong Toei slum dwellers work at the Bangkok Port or for shipping companies that have their offices in the area.

With a population of some 130.000 residents, made up of a majority of rural migrants from Northeast Thailand who came to Bangkok for job opportunities, the slum comprises a settlement marked by considerable variation in history, size and socio-economic status.

Slum communities are either:
A: on legal land, or
B: on illegal land.
In the case of Khlong Toei slum here are areas of registered squatting, meaning that the people living are not in title to the land, but that their existence is registered and all households are numbered.

The housing range from the officially laid-out subdivision of 70 Rai community and blocks of NHA flats, to ramshackle settlements strung out along railway lines and canals, or hemmed in between warehouses. The tenure status of residents and the security of settlements also differs (Askew 2002: 153).

The 44 hectare large Neighbourhood consists of approximately 75.000 residents and stands out as a special case in terms of its socio-economic structure, its history of successful mobilisation against eviction, the critical role of its NGO s and the identity of its people. Being a long- standing slum with a well-established community organization this has enabled the slum to develop more than many other slums. Most of the wooden walkways have been replaced by concrete paths and the majority of the houses have electricity and mains water supply (Askew 2002: 152).



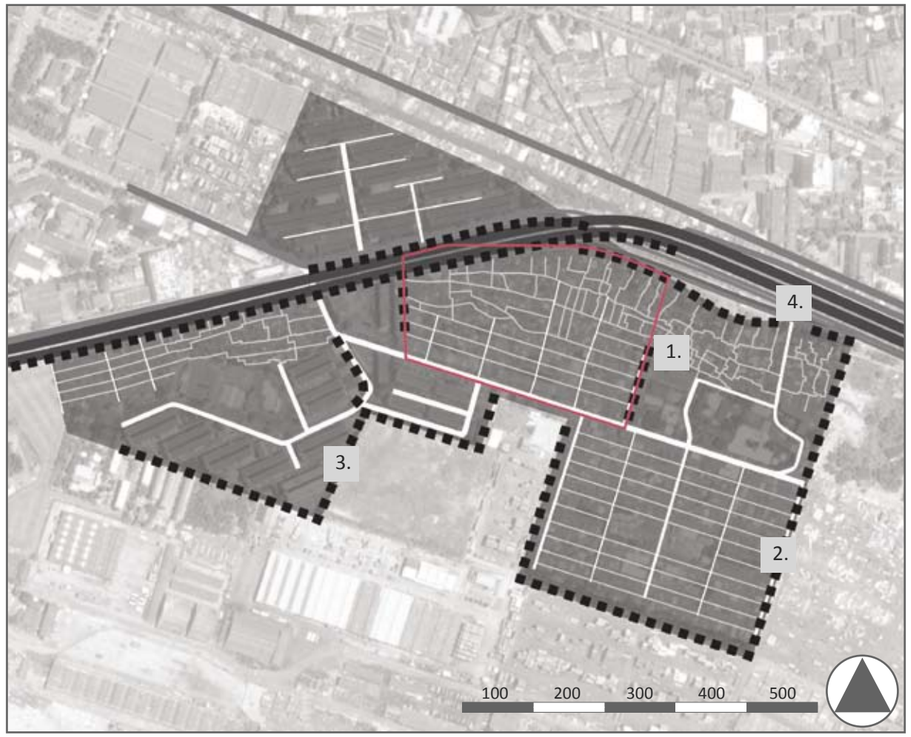
The Neighbourhood of Khlong Toei slum

Project site, Lock 1-3, Khlong Toei slum

STREET HIERARCHY AND BARRIERS

The elevated expressway runs pass the areas northern part. Kheha Phatthana Road, runs through the Neighbourhood, and connects to At Narong Road on both sides. This is the areas main road, dominated by various shops, garages, motorcycle-taxi stands and internet cafés, and trafficked by cars, motorcycles, bikes and pedestrians. From Kheha Phatthana Road unfolds a network of smaller streets and pathways, serving the different slum communities.

At Narong Road and the elevated expressway divides the Neighbourhood in two. Moreover, the areas southern part is literally immured with huge concrete walls (see photos page 71).



ill. 10: Street hierarchy and barriers
■ ■ ■ ■ Physical barriers

☐ Project site, Lock 1-3, Khlong Toei slum

1.

2.

3.

4.

Top: concrete wall towards DPF school
Bottom: concrete wall towards the port

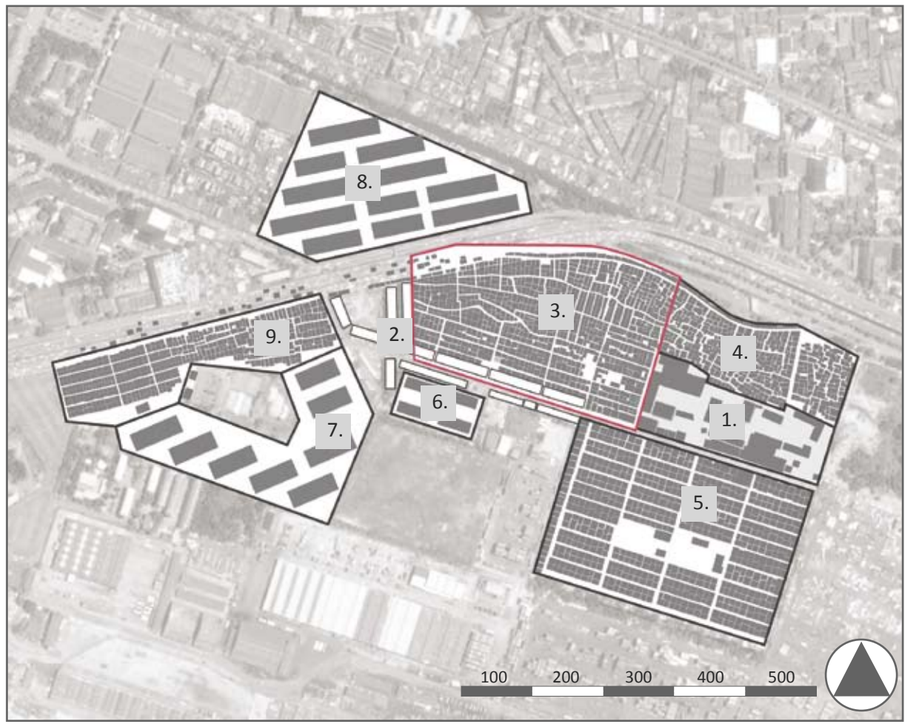
Top: concrete wall towards the port
Bottom: concrete wall towards the express way ramp and toll bar

COMMUNITIES AND TYPOLOGIES

1. NGOs AND SCHOOLS
Several NGOs have their premises in the area, working both locally, nationally and internationally. Two primary schools and one vocational school are located here, serving the Neighbourhood and its adjacent residential areas.

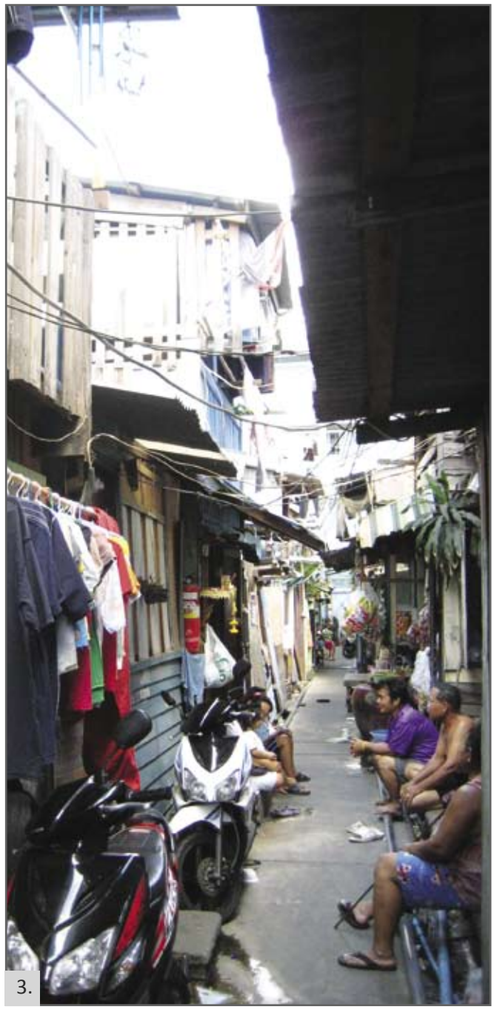
2. PAT SHOPHOUSES
Along Kheha Phatthana Road, the Neighbourhoods main road, are four storey shop houses, owned by the Port Authority of Thailand. These are oriented towards the street, with a variety of stores, garages and offices on the ground floor and apartments on the upper floors.

3. LOCK 1-3
The Lock 1-3 community is settled on illegal land. The community is characterised by narrow walkways and 1-2 storey settlements of varying standard, from ramshackle shacks to newer houses. The community is the Neighbourhoods disadvantaged when it comes to facilities. There are very few, and the standard is unsatisfying.



ill. 11: 1. NGOs and schools
2. PAT shop houses
3. Lock 1-3
4. Lock 4-6
5. Rai 70
6. Block 19-22
7. Block 11-18
8. Block 1-10
9. Rom Klao and Hua Khong
Project site, Lock 1-3, Khlong Toei slum

1.


3.

2.

Top left: Duang Prateep Foundation and school
Lower left: PAT shophouses
Right: Lock 1-3

4. LOCK 4-6:
Lock 4-6 is also settled on illegal land. The structure of this community resembles the one in Lock 1-3, except for Kheha Phatthana Road running through the community, connecting to At Narong Road. This community is better off when it comes to facilities, due to its location close to the helping organisations. The community centre includes both indoor and outdoor leisure activities.

5. RAI 70:
The 70 Rai community is located on legal land. (1 Rai equals 1600m2. 70 Rai equals 11,2 hectare) It was built as a relocation area, after an agreement between the National Housing Authority and the Port Authority of Thailand in 1982, giving the residents, evicted from Lock 10-12, a 20 year leasehold agreement on the land (Askew 2002: 157). When it was redeveloped, the land was filled in and laid with sewers and drains and the houses arranged in a stringent network of streets. Today, this community stands out as the Neighbourhoods most developed. This is because the settlement is on legal land and therefore receives financial support from the government. In this community wide streets lead in from Kheha Phatthana Road – three as car roads and two with pathways on each side of a drain leading out of the community. Transversal narrow pathways connect the community. In the core of the community is the community centre with a sports field, a playground and a market.

There are three block communities in the Neighbourhood; Block 1-10, 11-18 and 19-22. These are officially laid out relocation areas for slum dwellers after numerous fires over the years. Families are relocated in 3-4 storey apartment blocks, with unities of 27m2.

6. BLOCK 19-22:
Apartment blocks 19-22 are gathered around a courtyard, mainly used as a parking lot. Still, hemmed in between the cars, people have set up small shacks, implementing their customary life, with local shops and street life.

7. BLOCK 11-18:
These apartment blocks centre around an open space with mixed use of basketball field and market space. Moreover the residents gather in the smaller streets in between the blocks, in the same way as in Block 19-22.

8. BLOCK 1-10:
These blocks, situated on the other side of At Narong Road, are placed in an antenna structure with one main road going in to the area, and smaller streets leading to the blocks. These streets are again used as in the above mentioned Block 11-18 and 19-22.

9. ROM KLAO AND HUA KHONG:
Rom Klao and Hua Khong are two slum communities on illegal land with the same standards as Lock 1-3.

4.

7.

5.

8.

6.

9.

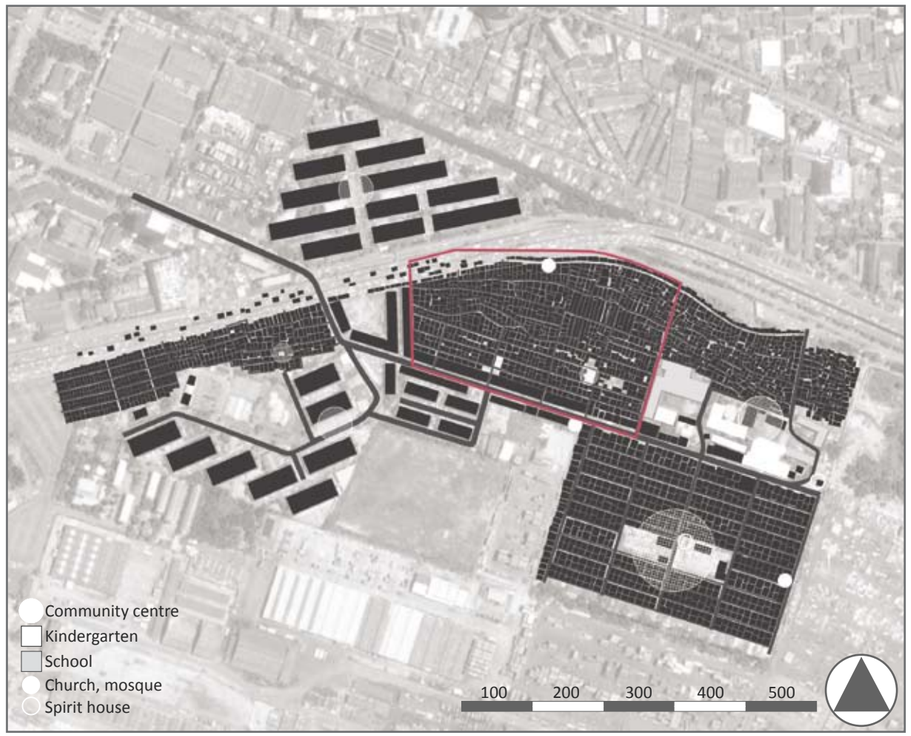
Top: Lock 4-6
Center: Rai 70
Bottom: Block 19-22

Top: Block 11-18
Center: Block 1-10
Bottom: Rom Klao and Hua Khong

LOCAL FACILITIES

The facilities in the Neighbourhood largely consist of necessary facilities for everyday life, such as health care centres, schools, kindergartens and smaller shops.
The larger part of these facilities are financed and run by the local NGOs, and are concentrated on their premises. Being of great importance to the area, the facilities do not fully reach out to the inhabitants. There is shortage of schools and kindergartens in the area, and for leisure activities, fences enclose the majority of the playgrounds and sport fields connected to the existing schools and kindergartens, leaving them unreachable to the public.

Each community has a community centre, typical used for temporary use like markets, sport activities and special events. However, the community centres vary in content and quality, depending on the state of the community and the level of involvement of each community leader.



ill. 12: Local facilities

Project site, Lock 1-3, Khlong Toei slum

A variety of shops, garages and offices are found in the main street, Kheha Phatthana Road. Internet-cafés in the main street and “pay and play” activities, like pool and video games, in the different communities, are popular amongst the teenagers. Also the Tesco Lotus hypermarket, on Rama IV Road, is popular - to hang out and enjoy the air-conditioning.

Smaller shops continue into the different communitiess, through the “veins” running from Kheha Phatthana Road. The shops – selling everything from soda water and chips, to hot meals and handicrafts – are mostly private and run by the locals. Within the different communities one can spot tendencies of shopping strips, with a variety of shops lined on a row, as well as isolated shops spread throughout the whole area. Aside from the shops there are also the street vendors walking the streets selling their goods, reaching out to the whole community.

Top: playground, community centre Rai 70
Bottom: internet cafe, main street

Top: market, community centre Block 11-18
Bottom: Tarua Khlong Toei Church

STRATEGY PHYSICAL INTEGRATION

Most of Bangkok's population, rich or poor, live in "gated communities". In order to integrate the community and the formal city, making this a worthy, respected community in Khlong Toei district, the physical conditions that would enable the area to be seen as part of the formal city needs to be addressed.

- Firstly, the concrete walls enclosing the Neighbourhood must be removed in order to render the area visible in the city.

- The project seeks to connect the area to the adjacent residential areas and facilities taking point of departure in existing and potential physical connections:

Kheha Phattana Road is an orbital road to At Narong Road, running through the Neighbourhood. At Narong Road connects to the context towards the west and east. Today, the canal constitutes a boundary, physically separating the community from the residential areas located to the north. A wooden footbridge is the only existing connection across this canal. In order to augment the areas accessibility, the project proposes a reconstruction of this footbridge and adding an additional connection over the canal, where Kheha Phattana Road meets At Narong Road. The project further seeks to elaborate and follow up on the BMAs future plans regarding a green structure along the Chao Phraya River (see ill. 4 page 21).

Whereas the BMAs plans exclude the section along the Bangkok Port, the project intends to utilise the rail tracks running through the area, converting this into a public green corridor, and thereby completing the planned green structure along the Chao Phraya River.

The rail tracks are at present used by the Bangkok Port, for shipping goods. The rail tracks run in a loop around the port, through the settlement, constituting a great risk to the people living along the tracks. As part of the upgrading of the area, the project arguments for the train traffic to be repositioned at the operative part of the port.

Lack of adequate education is a big issue for the area – and for Bangkok in general.

- The project adds more education to the Neighbourhood, including new kindergartens, primary schools and a vocational school. The latter is levelled at the locals, as well as for the neighbouring residential areas.

PROMOTE PUBLIC REALM

SOCIAL INTEGRATION

RECREATION SHOPPING

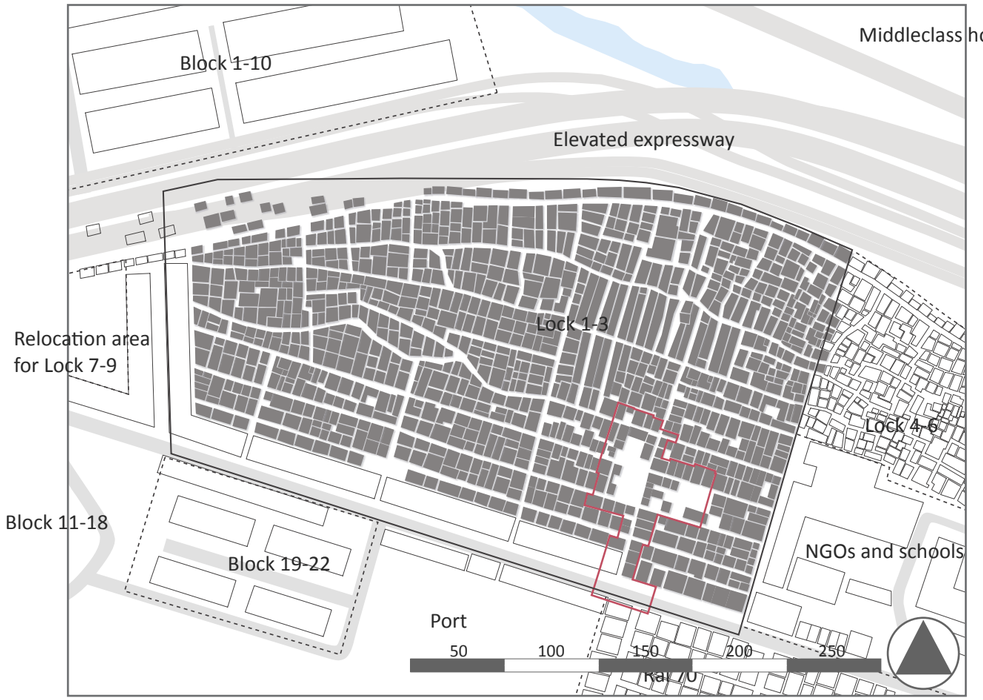
ill. 13: Strategy physical integration

REGISTRATIONS COMMUNITY

The aim for the following registrations was to get a feel of the life in the community and detect the issues to be addressed in the project.

Area: 7,2 hectare
Inhabitants: approximately 10.000

The community, settled on illegal land, has a long history, dating back to the 1950s. Families have lived here for generations. The community is constructed on stilts as a tangled network of narrow pathways, with breadth varying between one and two meters. The settlement of one- and two storey houses vary in standard, from ramshackle shanties to newer houses.
Today, the approximately 350 by 200 meters large slum community, has hardly any open spaces and poor building possibilities for future generations. With 10.000 inhabitants, it adds up to only 7 square meters available to each inhabitant.



ill. 14: Lock 1-3, Khlong Toei slum

Street life

PHYSICAL FRAMEWORK

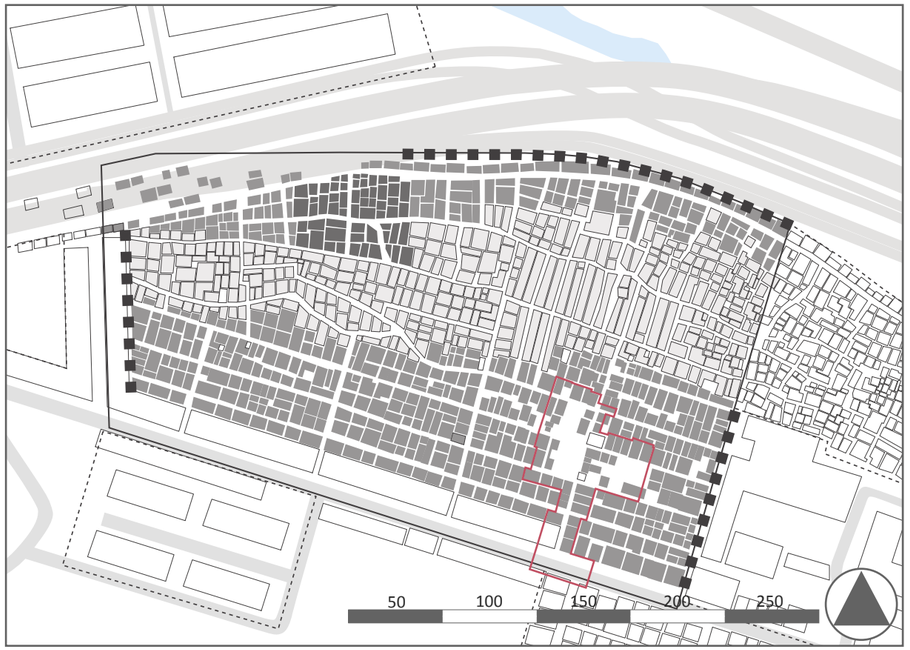
INFRASTRUCTURE: The community's tangled network of narrow pathways, with a maximum breadth of two meters, appears – for an outsider, as a bewildering maze, and makes urban services, such as rescue, fire brigades and police, hard, if not impossible.

HOUSING CONDITIONS: The housing standard varies throughout the community, but some areas can be characterised as "better or worse" areas, depicting the level of income as well as the history of the community. The better-off live in concrete hutches, with wire-fenced windows and balconies. Next down in the social scale are wooden-shack coops on plots of flood-prone ground. Then there are kennels: festering shantytown alleys of plank, sheet-iron and debris sheds.

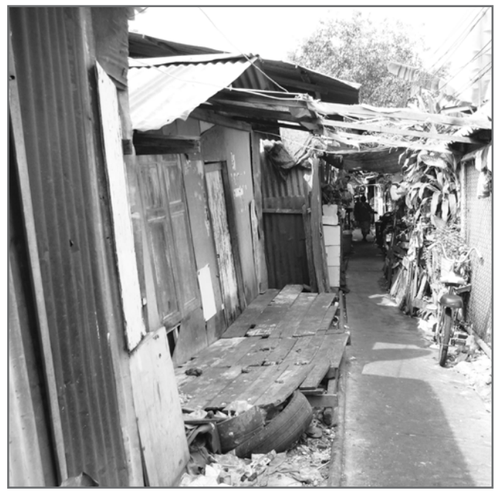
BUILDING HEIGHTS: The community consists of one- and two storey houses.

AVERAGE FOOTPRINT: 30 m2.

BOUNDARIES: To the north, the community is bordered by the At Narong Road and a concrete wall against the toll bar and the ramp of the expressway, the expressway also constitutes a visual barrier. Towards Duang Prateep Foundation's premises and appurtenant primary school, is another concrete wall. The PAT shop houses are seen as a physical barrier to the east, but only as visual barriers towards Kheha Phattana Road, as they adhere to the overall structure of the community.



ill. 15: Physical framework



Top left: New houses - after a fire in 2007
Lower left: Ramshackle shanty
Right: Narrow walkway

OPEN SPACES AND PUBLIC FACILITIES

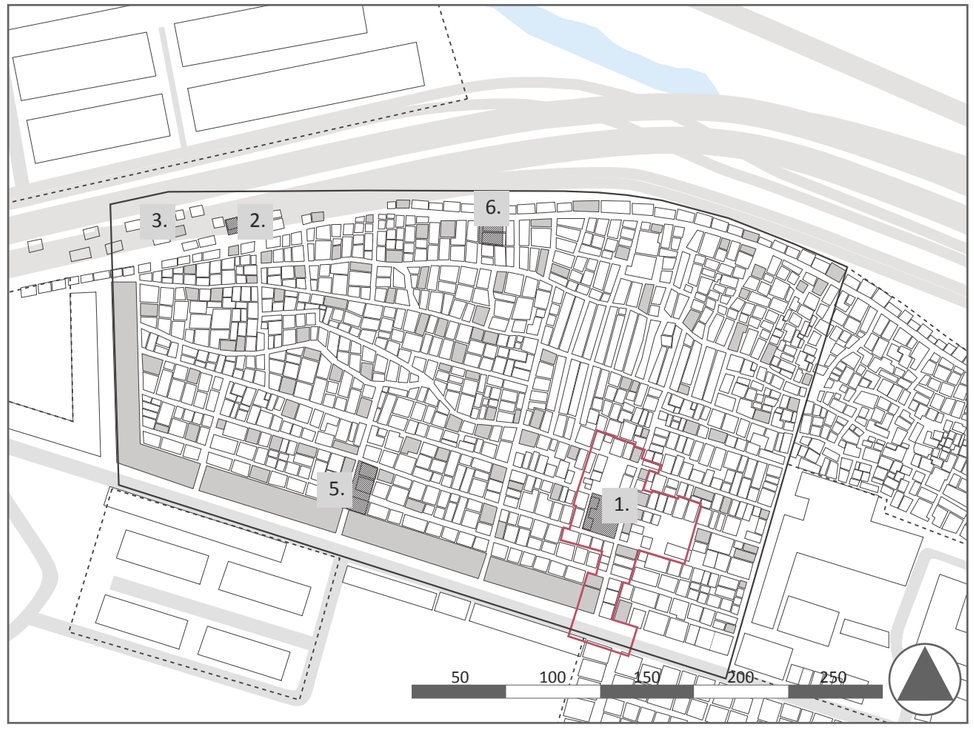
OPEN SPACES:

Looking at the conditions of the community regarding official facilities we found that there are few facilities, and that the standard of the existing facilities are unsatisfying. For instance the space referred to as the Community Centre (1), is a bare concrete area, walled with a torn fence. The space borders on the pond which originally was kept clear to function as a reservoir in case of fire. At present the pond is a disgusting sight, filled with garbage and covered with a green bacteria-mass. During our stay in the area we saw the Community Centre being used as a football field, as a food sales spot, for drying chilli, for parking scooters and for kids to watch cartoons on a television set up by the house police (the house police are volunteers, keeping the community in order). Talking to the locals we were told that the space is also used for special events such as New Year's celebration, the yearly water festival, Buddhism ceremonies, etc.
The space is not organised for the activities taking place here. There are no appurtenant buildings, no furniture, no playgrounds, no nothing! But since this is the only larger open space in the community, apart from the area under the expressway, people make the best of it.

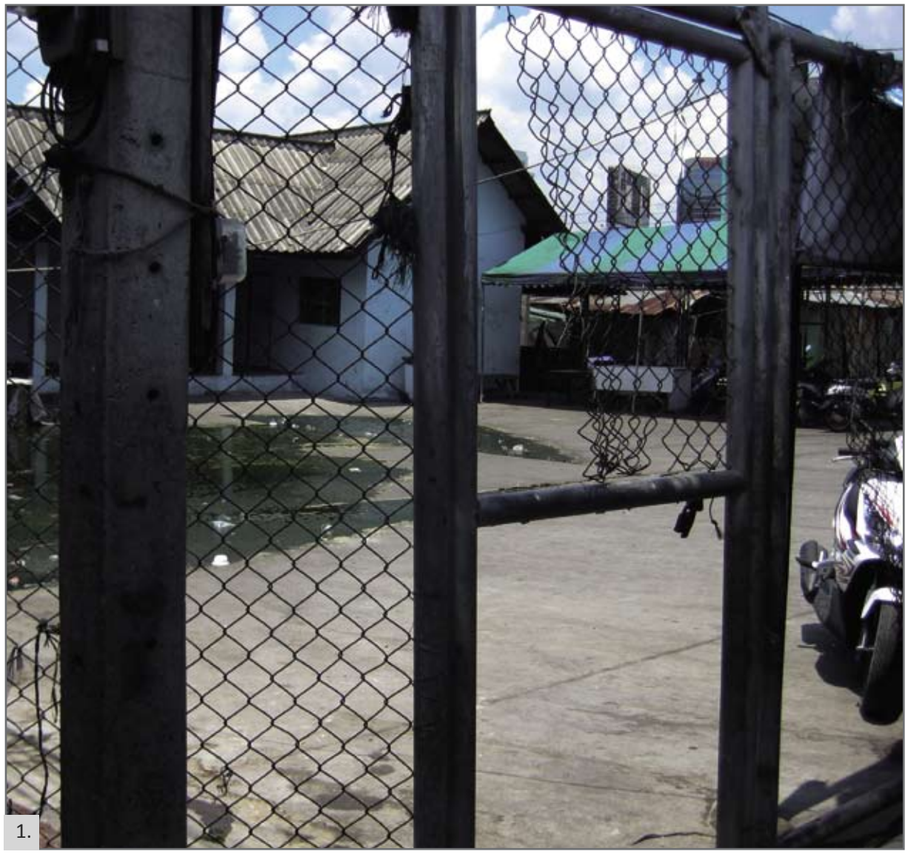
The only other larger open space of the community is found on the northern edge, under the expressway. This area is used as the community's backyard (2). Here are small shops and a flow of street vendors, meeting places like pool and videogames, kids playing hide and seek in between the parked trucks and riding their bicycles back and forth.

PUBLIC FACILITIES:

- The area under the expressway is also the location of the community health care centre (3). This primitive centre consists of a couch and a counter on an elevated plateau.
- Smaller shops are spread throughout the community (4). People gather in front of the shops, socialising with their neighbours.
- Lock 1-3 has only one kindergarten (5), nowhere near adequate to the community's needs. For security reasons, based in a serious problem of kidnapping, the kindergarten building and its outdoor play areas are secured with window railings and fences respectively. Unfortunately, this results in the outdoor play areas being closed for the kids after hours.
- A mosque is located in the area (6).



ill. 16: Open spaces and public facilities



1.

2.

1: Community Centre
2: Under the express way

3.

4.

5.

6.

3: Health care centre
4: Shop

5: Kindergarten and appurtenant outdoor play area
6: Mosque

LIFESTYLE

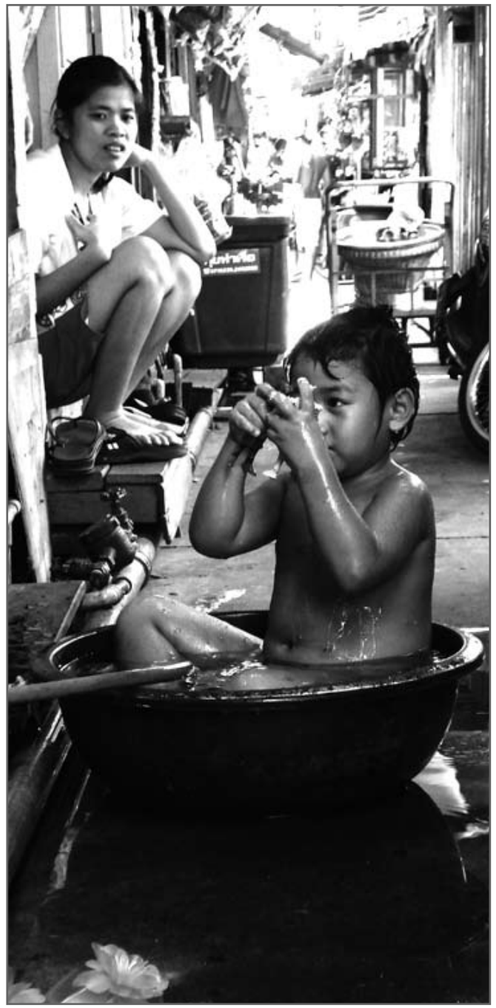
DOUBLE- PROGRAMMING OF OPEN SPACE:

As an answer to the shortage of open spaces it is common for people to use the available spaces for different activities. One example of double programming is using a sport field for market.

EXPOSURE OF DAILY LIFE:

The households tend to have open facades, exposing the daily life of the dwellers. Moreover, having a limited amount of space - living in small houses and often many people under the same roof - it is very normal for people to make use of the street, as an extension of their living room. Walking Lock 1-3 we saw the inhabitants working, preparing food, eating and reading the paper in the streets.

Example of double-programming of space. Sport field and market



Making use of the street as an extension of the living room

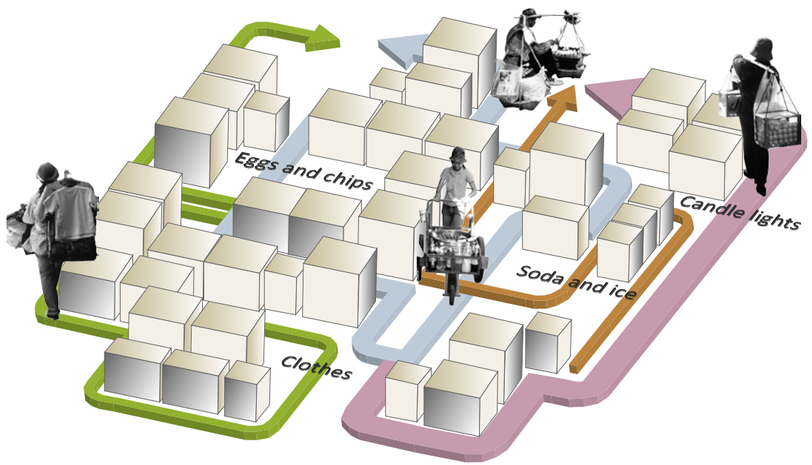
TYPES OF INCOME:

Typical for the informal city, and for dwellers of the Lock 1-3 community of Khlong Toei slum, is having little income certainty, unstable working conditions and informal jobs both inside and outside the slum communities, no tax payment and little- or no access to social safety net.

Many Khlong Toei slum dwellers work at the Bangkok Port or for shipping companies that have their offices in the area. Moreover, the neighbouring light industry area and the local garages are places of employment for several dwellers. Other typical means of income are driving taxi and street vending, whilst the poorest of the poor make their living as garbage collectors. (see page 100, waste management lock 1-3)

STREET VENDORS:

Numerous slum dwellers make their living selling prepared food, handicrafts or prefabricated articles. Many work as street vendors on markets, along the streets of Bangkok and/or within the slum communities.
Vending on markets the person finds his spot and sets up his temporary store. In the slum on the other hand, because of the minimum of open space, the vendors walk the streets selling their goods. Street vendors are highly conspicuous and play an important role in the street life of Lock 1-3.



ill. 17: Flow of street vendors

Streetvendors selling soda water, candles, food and clothes

SOCIAL ISSUES

LACK OF EDUCATION:

Compulsory education is free in Thailand. Still, a major constraint is serious shortages of resources – lack of schools or inadequate facilities, lack of teachers and/or shortage of qualified staff, lack of learning materials and absence of support (UNESCO Bangkok, 2008).
Besides the concern of lack of adequate education, there is also the issue of slum dwellers' financial constraints. Even though compulsory education is free in Thailand, it is too expensive for many slum dwellers to afford. This paradox exists because of the many school items which must be paid for, such as books, uniforms, and school-bags, before a child can attend school and because of the many additional charges raised by schools to compensate for inadequate government funding. As a result many slum children cannot go to school. Instead, they work to contribute to the family income, missing both the education and the social benefits of going to school (DPF).
Several social issues in the community can be alleged to be related to the lack of education. We therefore see the lack of education as one of the main issues to address regarding the community's, and the Neighbourhoods future.

DRUG DEALING, -USE AND BLACKMAILING:

Drug use is a big concern in the community as many slum- dwellers find relief from the ugliness of their world in a bottle of thinners, amphetamine pills or heroin injections. Furthermore several dwellers are also tempted by the prospect of easy money related to drug dealing (DPF 2007). The business of drug dealing is a key issue in the community, luring children into the downwards spiral related to drug use, creating an unsafe environment within the community and leading to countless blackmailing situations occurring between the slum- dwellers.

PROSTITUTION:

Teenage girls with no - or only a limited education are an especially vulnerable group in slum communities, often having difficulties finding suitable work. Unwanted teenage pregnancies are common. The problems of finding work and the stress of adapting to adulthood are two of the factors leading numerous girls to solvent abuse and other forms of addiction. Many are attracted by the higher earnings of the sex trade, with all the risk that entails (DPF 2007).

UNCERTAIN FUTURE...

TRANS- PROSTITUTE

GLUE SNIFFING

LACK OF EDUCATION

SANITATION AND ELECTRICITY

ELECTRICITY SUPPLY:

The settlement has electricity supply and the majority of the houses are connected to the system. There is no public lighting however, so the streets go dark at sundown. The locals primarily use power for indoor lighting, smaller fans and television.

WATER SUPPLY:

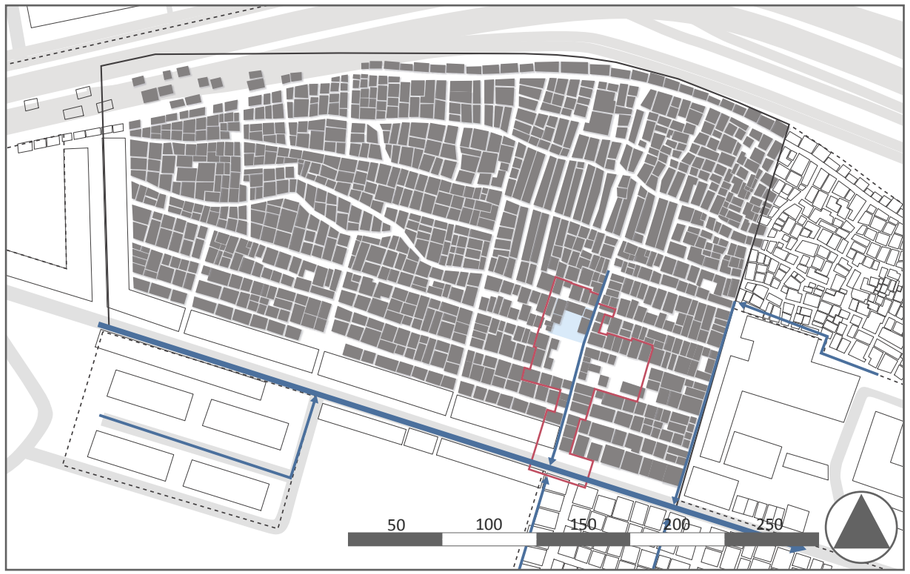
An external water supply network connects to the area. Water pipes run alongside the paths providing the households through taps.

SEWAGE SYSTEM: The houses are equipped with toilets. The sewage (black wastewater) is pumped through the ground, 40 metres down the groundwater.

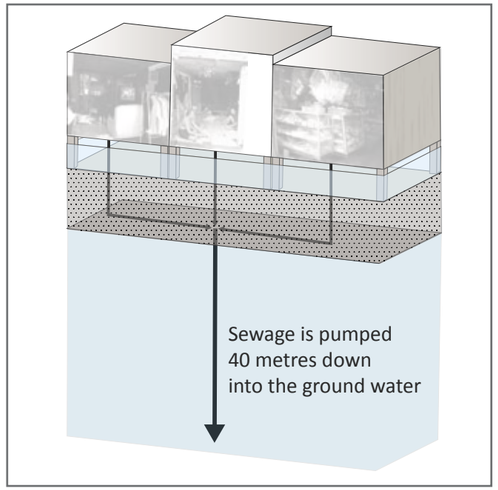
DRAINAGE SYSTEM:

Most of the grey wastewater is poured directly into the groundwater as the community's drainage system is far from adequate. The community has only two (under-dimensioned) drainage/storm water canals. These canals cannot cope with the large amounts of water in consequence of heavy rain during the yearly monsoon. Moreover, these canals are presently clogged with garbage.

The settlements on legal land on the other hand are equipped with well-developed drainage systems. These canals connect to two canals in the Kheha Phatthana Road, from where the water is lead out of the area. The canals in the main street are however not dimensioned for the monsoon.



ill. 18: Drainage system



Top: Water supply
Bottom: ill. 19: Sewage system

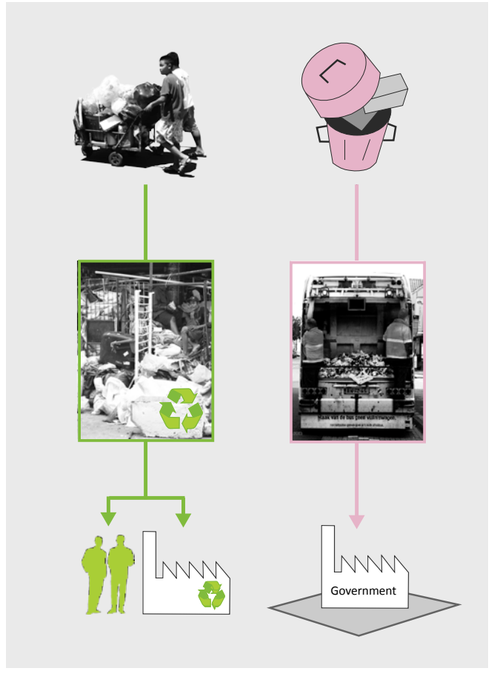
Top: Environment by the community centre and pond
Bottom: Typical toilet facility in the houses

WASTE MANAGEMENT

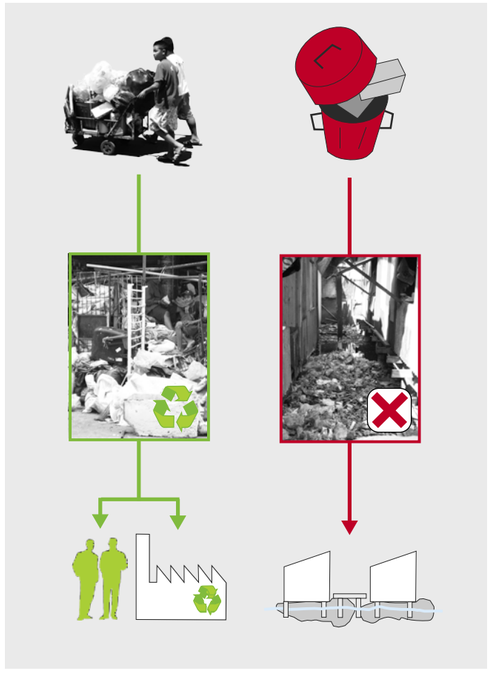
Being located on illegal land the community is an outsider to the government system on many counts, one of the more critical counts being the garbage system.
Whereas the neighbouring communities, located on legal land, have their garbage collected by the government, the garbage in Lock 1-3 is piling up, posing a serious health threat.

For the communities located on legal land the government picks up the non-recyclable garbage. There are three garbage-banks (see description page 26) within the Neighbourhood, to where recyclable materials are sold. The procedure of collecting recyclables is managed by the poorest inhabitants. They walk the streets with their trolleys, search through people's garbage (placed in plastic bags on the street) for recyclables, and leave the rest for the garbage truck.

The above-mentioned procedure for collecting recyclable material is the same in Lock 1-3, only in this area, as they are not connected to the government arrangement, the non-recyclable waste, largely consisting of plastic, stay in the community – chucked under or behind the houses or wherever there is space. In consequence the people are living in a "growing gar¬bage disposal". The proliferation of rats, mosquitoes, cockroaches and bacteria constitute a serious health risk.



ill. 20: Garbage system in communities located on legal land



Garbage system in Lock 1-3

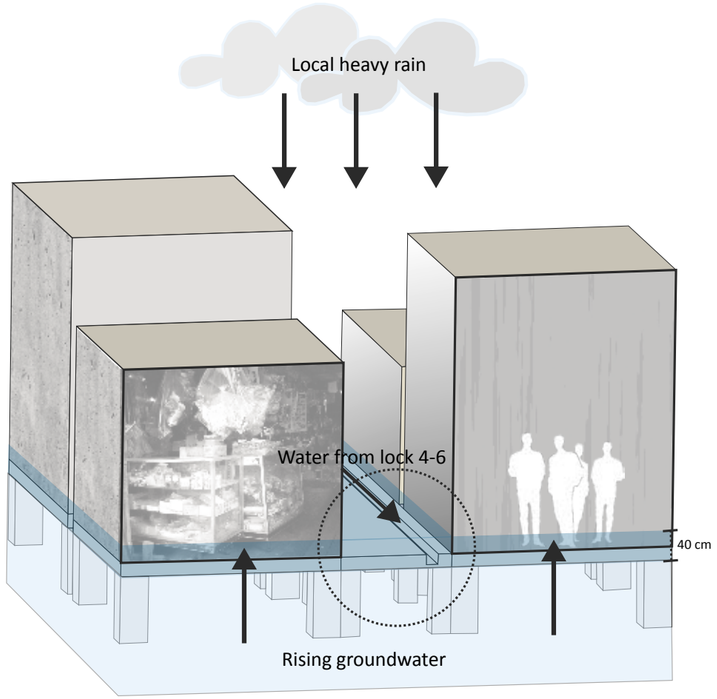
Typical environment under and between the houses in Lock 1-3.

RISK AREAS

THE RISK OF FLOODING:

Lock 1-3 is very vulnerable to flooding during the monsoon. Lock 1-3 is disadvantaged having an incomplete and ineffectual drainage system, and therefore takes longer to get rid of the water. In addition, the community also suffers from water running from the neighbouring Lock 4-6, which is settled higher. The most critical area is south-eastern part of the community (1), as this is the lowest. This area floods every year. Normally the flooding due to heavy rainfall last for hours or a few days, but occasionally it lasts even longer. Ironically, this is the only part of the community actually fitted with drainage canals. But the canals are not dimensioned for the actual amount of water. The remaining Lock 1-3 has no drainage system and is therefore also vulnerable during the monsoon (2).

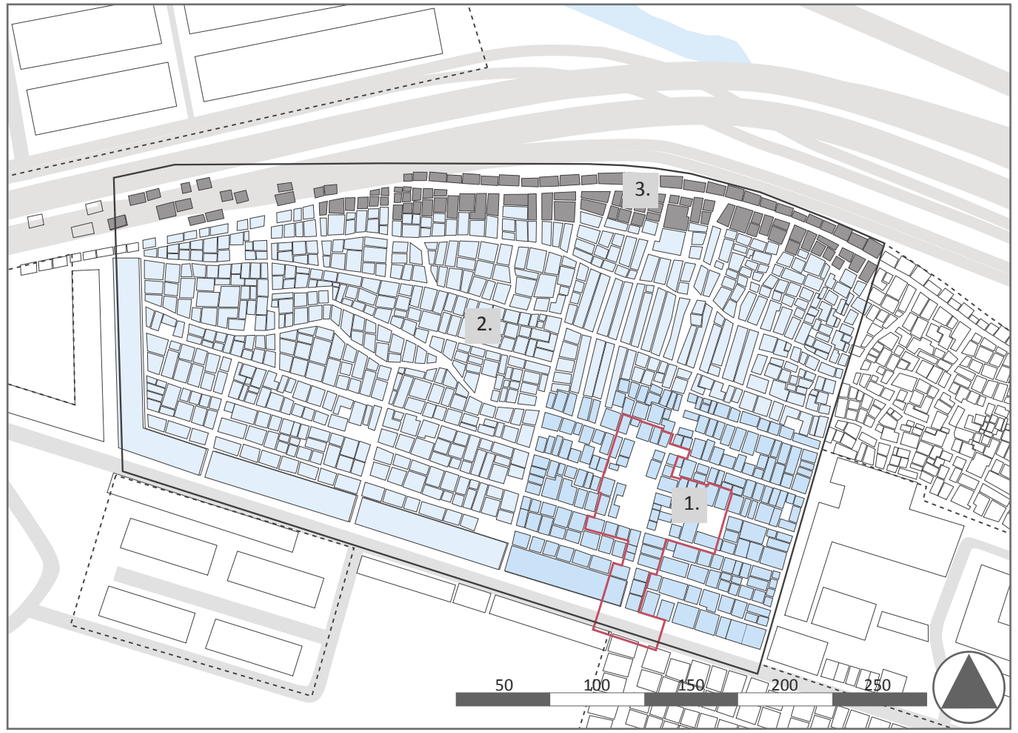
The community's location also makes it very vulnerable to the infrequent flooding of the Chao Phraya River, on average every third-fourth year. This is a more long term flooding, lasting up to at worst, a couple of months.



ill. 21: Existing situation in risk area 1 and partly risk area 2

SECURITY RISK ALONG THE TRAIN TRACKS:

Another critical area in the community is the settlement alongside the train tracks. People are literally living on the tracks, with goods train running back and forth to the port. (see photo page 104)



ill. 22: Map of risk areas

Design area

Current situation along the train tracks in risk area 3.

THE RISK OF FIRE:

Lock 1-3 is very vulnerable to fire. The Neighbourhood has a long history of devastating fires because of explosions at the port and accidents within the households. Whatever the circumstances, the main problem of the area is the building materials and the density.

In case of fire there is also the trouble of the narrow streets, leaving parts of the area unreachable for fire brigades, impeding the rescue operation.

A fire in 2007 caused great devastation.
More than 300 homes were destroyed and more than a 1,000 people were left homeless.

STRATEGY UPGRADING & INTEGRATION

The Lock 1-3 community is part of a larger well-established slum neighbourhood, dating back to the 1950's when the first dwellers settled in the area as they worked on the construction of Bangkok Port. As a long-standing slum it has been able to develop more than many other slums. Most of the wooden walkways have been replaced by concrete paths and the majority of the houses have electricity and mains water supply.

However, Lock 1-3 is the neighbourhoods disadvantaged, with physical and environmental conditions not adding up to the satisfactory.

- The project stresses the need for this community of regularised land tenure, negotiating a long term-leasing contract with the Port Authority of Thailand, preferably backed by the Thai government.

- On site registrations revealed a linkage between the community's physical structure and the lifestyle of the dwellers. Based on these registrations, the project strives to maintain the existing structure and upgrade the community focusing on the dwellers' health, safety and life quality.

OPEN SPACES FOR PLAY

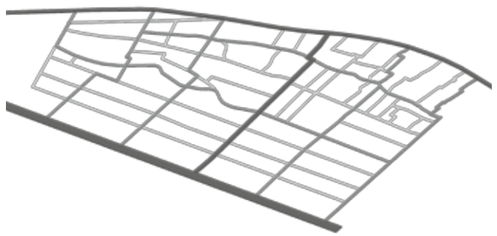
UPGRADING URBAN FABRIC

RECREATION

TEMPORARY SHOPPING

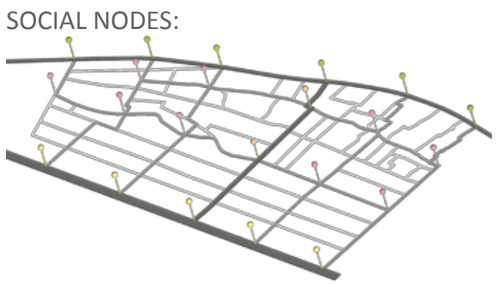
LAYERS

STREET HIERARCHY:



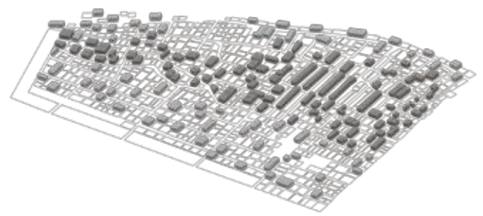
Kheha Phatthana Road and the green corridor form the northern- and southern border of the community. Together with the thoroughfare, intersecting the community, these make up the main connectors of the area.
A network of pathways serves the community. The project keeps the existing structure of these pathways, but ranks them as community paths and internal paths.

SOCIAL NODES:



The infrastructural crossings are emphasized as nodes, inviting to social activities and promoting social interaction. The nodes will be double- or multi programmed, based in the shortage of open space, and will further appear differently, relating to the street hierarchy.

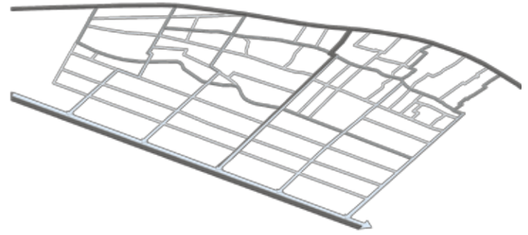
HOUSING:



The registrations of Lock 1-3 revealed a disparity in housing conditions (see ill. 15 page 86). Based on these registrations the project proposes upgrading of the houses characterised as being in a bad condition, followed by a follow-up every fifth year.

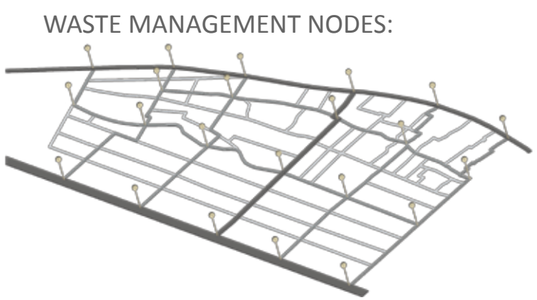
DRAINAGE SYSTEM:

The new drainage system follows the community's network of pathways. Smaller distributing channels in the bypaths leads grey wastewater into the five main drainage canals, which runs from the north and connects to the canal in Kheha Phatthana Road, from where the water is lead out of the area.



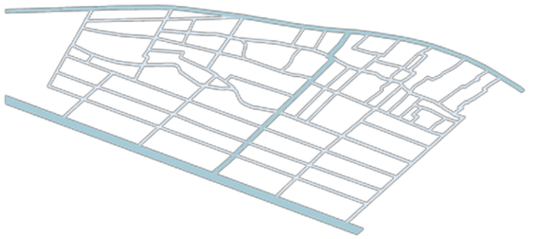
WASTE MANAGEMENT NODES:

With secure land tenure, the community will be connected to the governmental waste collection system.
Garbage stations, consisting of garbage bins and bio recycling boxes, will be placed in the community in connection to the social nodes.



WATER SUPPLY:

Water supply will be installed inside the houses, connecting to the existing pipes.



STREET HIERARCHY

- The street hierarchy functions as a tool to render the area more accessible and readable. The street hierarchy further defines the use- and constitutes the foundation for the programming of the area.

  Kheha Phatthana Road, the green corridor and the thoroughfare makes up the main connections, and play a very important role connecting the community to the neighbouring areas and to open up the area and making it more inviting to outsiders.
  Walking the area we found that Kheha Phatthana Road, being the commercial street of the Neighbourhood, needs to be made more pedestrian friendly.

- The project proposes the road as a multimodal boulevard, making the street a better organised space, to enhance the possibility of social interaction.

  The thoroughfare will be designed as a wider street, with a breadth of four meters, to emphasize its function as the community's thoroughfare and to make the community accessible in case of emergency. From the main connections unfolds a network of pathways, serving the community.

- The project keeps the existing structure of these pathways, but ranks them as community paths and internal paths, of two and one and a half metres breadth, respectively.
  The street hierarchy is underlined by breadth, paving, greenery and public street lights

SOCIAL NODES

The nodes will provide spaces for social interaction within, and along the border of the community. The nodes will be designed as flexible spaces, with double- and multi programming of space, based on the community's shortage of open space. Moreover, the nodes' physical appearance, concerning the layout and programming of space, will vary relating to the ranks of its appertaining intersecting streets. The alternation of layout and character of the nodes aims to meet the diverse needs and desires of the dwellers, being spaces arranged for physical activities, shopping and social intercourse. The multiprogramming of space permits varied usage of a node throughout the day and the week.

Also the purpose of the nodes differs related to location. The nodes placed in the main connections have the potential of becoming public realms, whilst the main objective of the remaining nodes is to encourage social interaction between the local dwellers.

The new community centre will function as an extensive social node, consisting of the same programming as the community paths, but with a wider range in the facilities and larger spaces for social interaction. The community centre provides the community, currently lacking ,basic public services.

The green corridor will represent the programs of WORKOUT and REPOSE.
The green corridor connects to the overall green structure of Bangkok, running along the Chao Phraya River, and is therefore a potential attractive area and an addition to the very popular city parks, actively used for exercise and leisure.

The programming of the community paths centre around the community dwellers, providing spaces for SHOPPING – being stands for vending carts and temporary markets, REPOSE, various SPORT and PLAY.
The play program will be of a challenging and educational character, to have a stimulating effect on the children.

The programming of the thoroughfare is based on the programming of the community paths, with SHOPPING and REPOSE. Furthermore, being one of the areas main connectors, an additional feature is added: ART. This programme intends to promote the area through an artistic approach, based in the many art programs of the local NGOs (DPF).

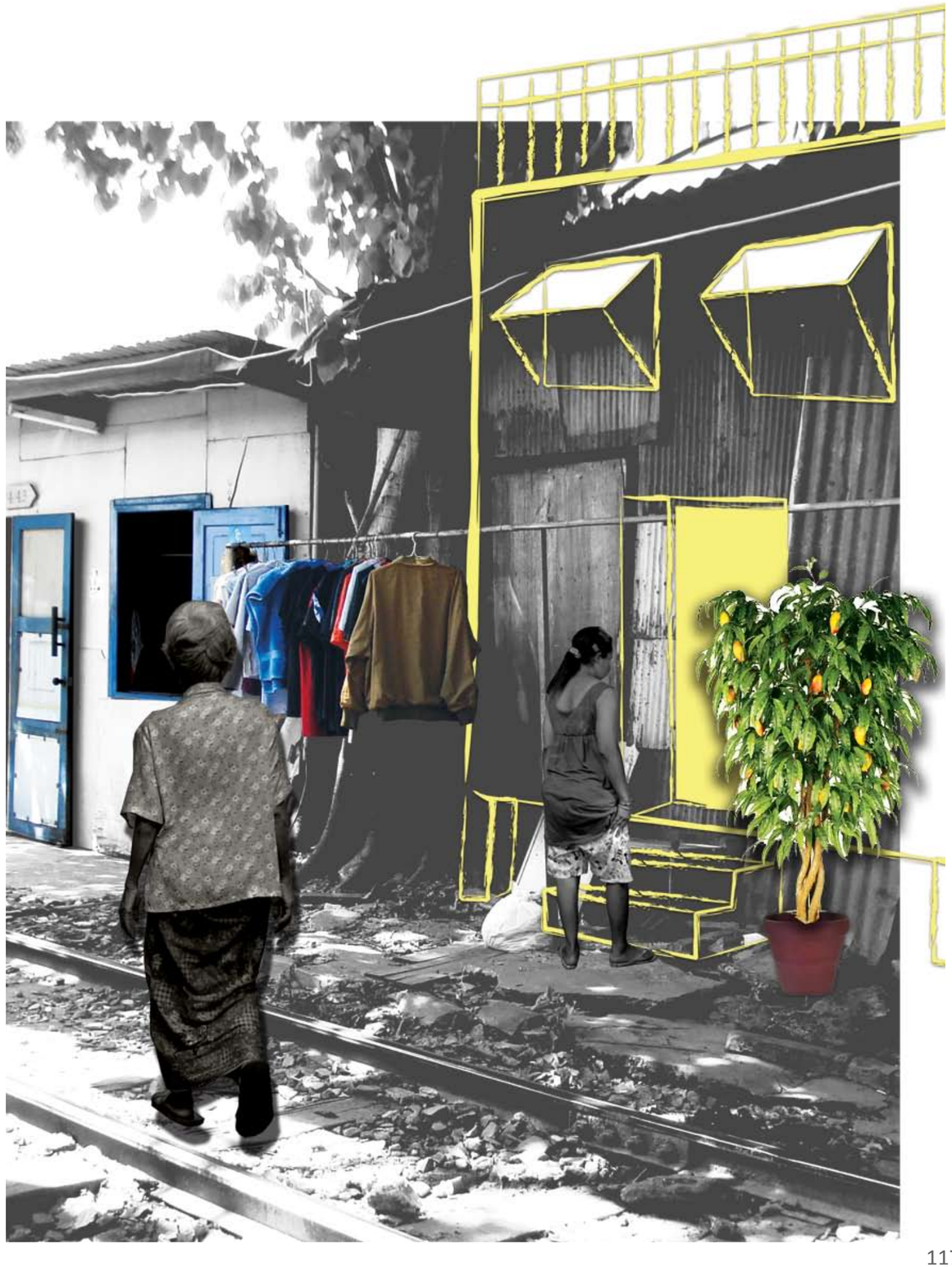
Kheha Phattana Road is the commercial street of the area, with various shops, garages, motorcycle-taxi stands and internet cafés. However, walking the street, there is an evident lack of seating and the entrances to the Lock 1-3 community are hardly visible, in between the shop houses. The nodes in Kheha Phattana Road are programmed to mark the entrances to the community and to emphasise the commercial activity through, providing spaces for SHOPPING, and PUBLIC SEATING for social interaction.

HOUSING

Grounded in the observed linkage between the community's physical structure and lifestyle, the project strives to preserve the existing structure, focusing on safety and identity.

The project proposes an upgrading of the houses of hazardous conditions regarding sanitation and safety. In order to maintain the physical structure of the community, some regulations for future development are constructed.

The regulations concerns a maximum footprint of 50m2 followed by a maximum of building height – set to three storey's. With regards to the risk of flooding the project further propose new houses lifted an additional 50 cm and finally, both for protection against flooding and fire, to build in concrete.



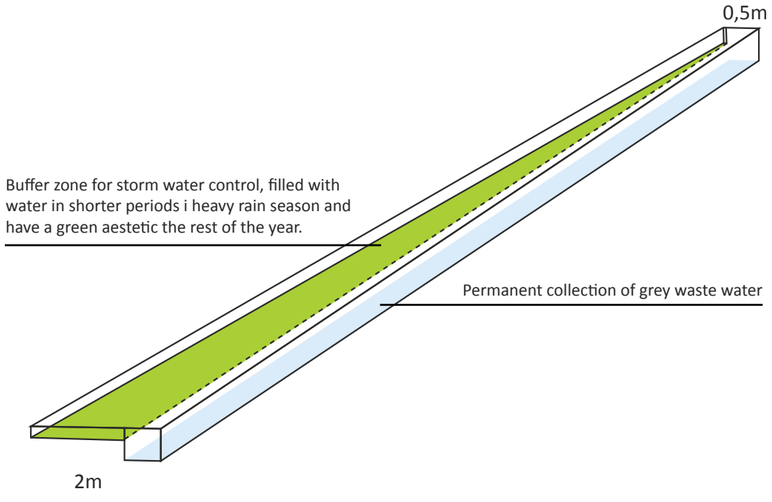
DRAINAGE SYSTEM

The new drainage system takes point of departure in the existing well-functioning system of the neighbouring Rai 70 community, making use of the dimensions and design of these canals as basis for a new proposed design.

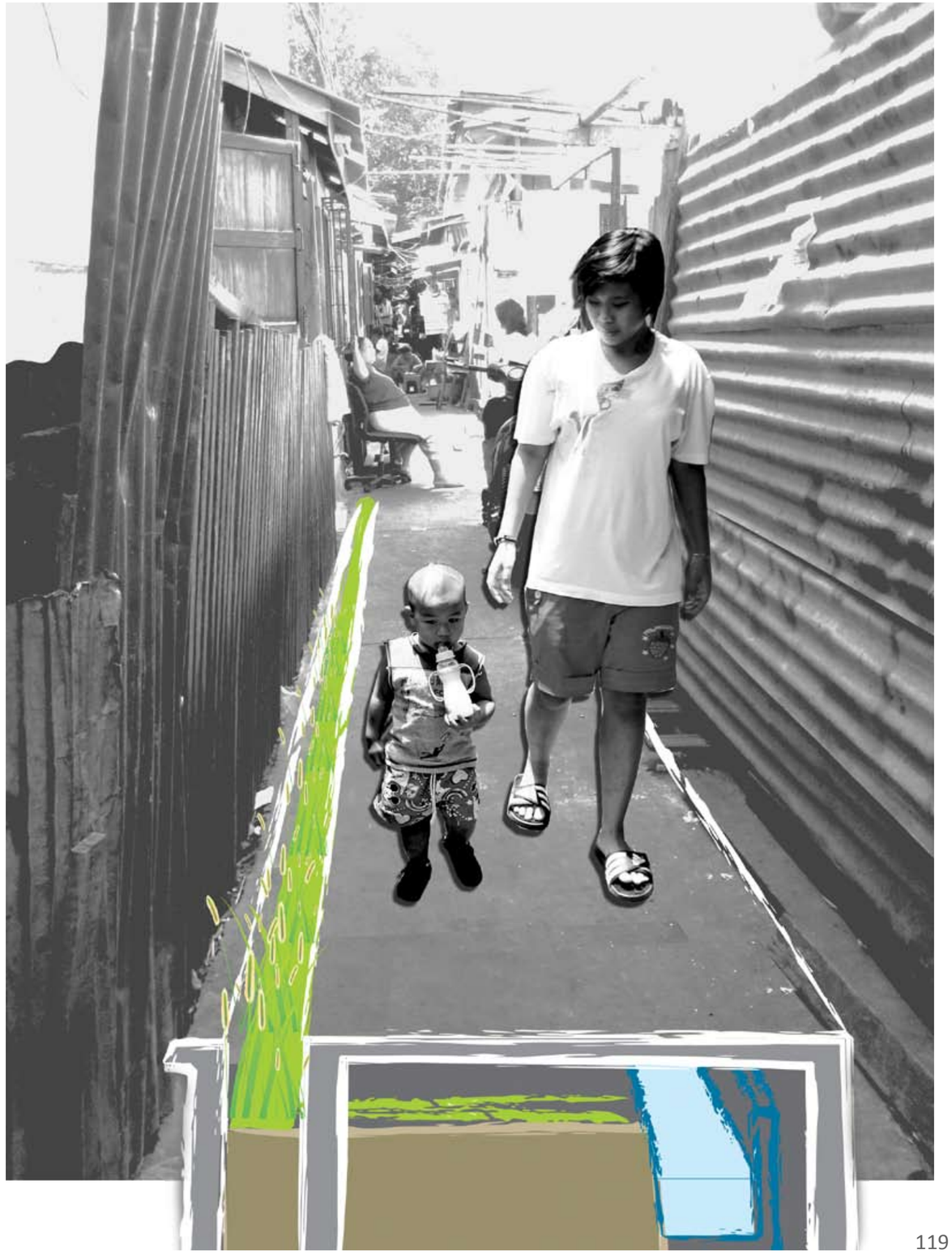
The new main drainage canals are designed to transport the grey waste water and function as storm water control in the monsoon season. It will relieve the magnitude of the problems when Chao Phraya River floods and solve the problems related to heavy rain.

The system follows the community's network of pathways. Smaller distributing channels in the bypaths leads grey wastewater into the five main drainage canals, which runs from the north and connects to the canal in Kheha Phatthana Road, from where the water is lead out of the area.

The main canals are designed as canals for the grey wastewater and appurtenant buffer zones for tackling the heavy rainfall during the monsoon. The buffer zone will be planted with herbaceous perennials, appearing as a green band along the pathway.



ill. 23: Profile main canal



WASTE MANAGEMENT

- First and foremost the community must undergo an operation to remove the garbage piled up under and in between the houses and in the pond.

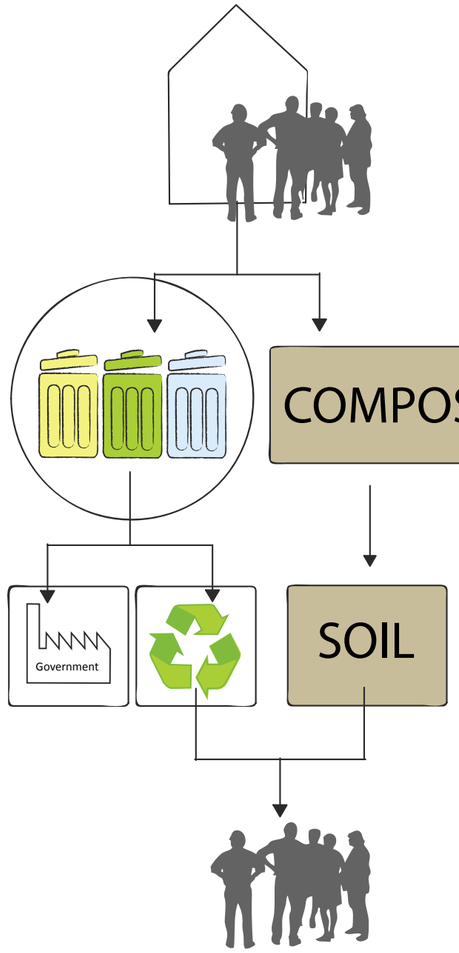
- With secure land tenure, the community will be connected to the governmental waste collection system. To promote an internal well-functioning garbage system, garbage stations – consisting of garbage bins and bio recycling boxes, will be allocated throughout the community in connection to the social nodes.

  As mentioned earlier, the solid waste recycling practices in Thailand are mainly dominated by the informal sector (see page 26), and there are three garbage banks located in the community's Neighbourhood, collecting glass, metal and paper. (see page 100).

- The project encourages an expansion of this practice plus initiating recycling of organic waste. This would help relieve the pressure on the already congested governmental waste collection system, as well as granting the community high-quality soil.

- Regarding the problematics of waste management, the project argues that Bangkok could benefit from introducing bio-degradable plastic bags. If this was the case, the city's waste collection system would be considerably relieved and communities like Lock 1-3 could yield a good profit selling soil to gardeners and farmers.

  For more details and calculations, see appendix page 178.



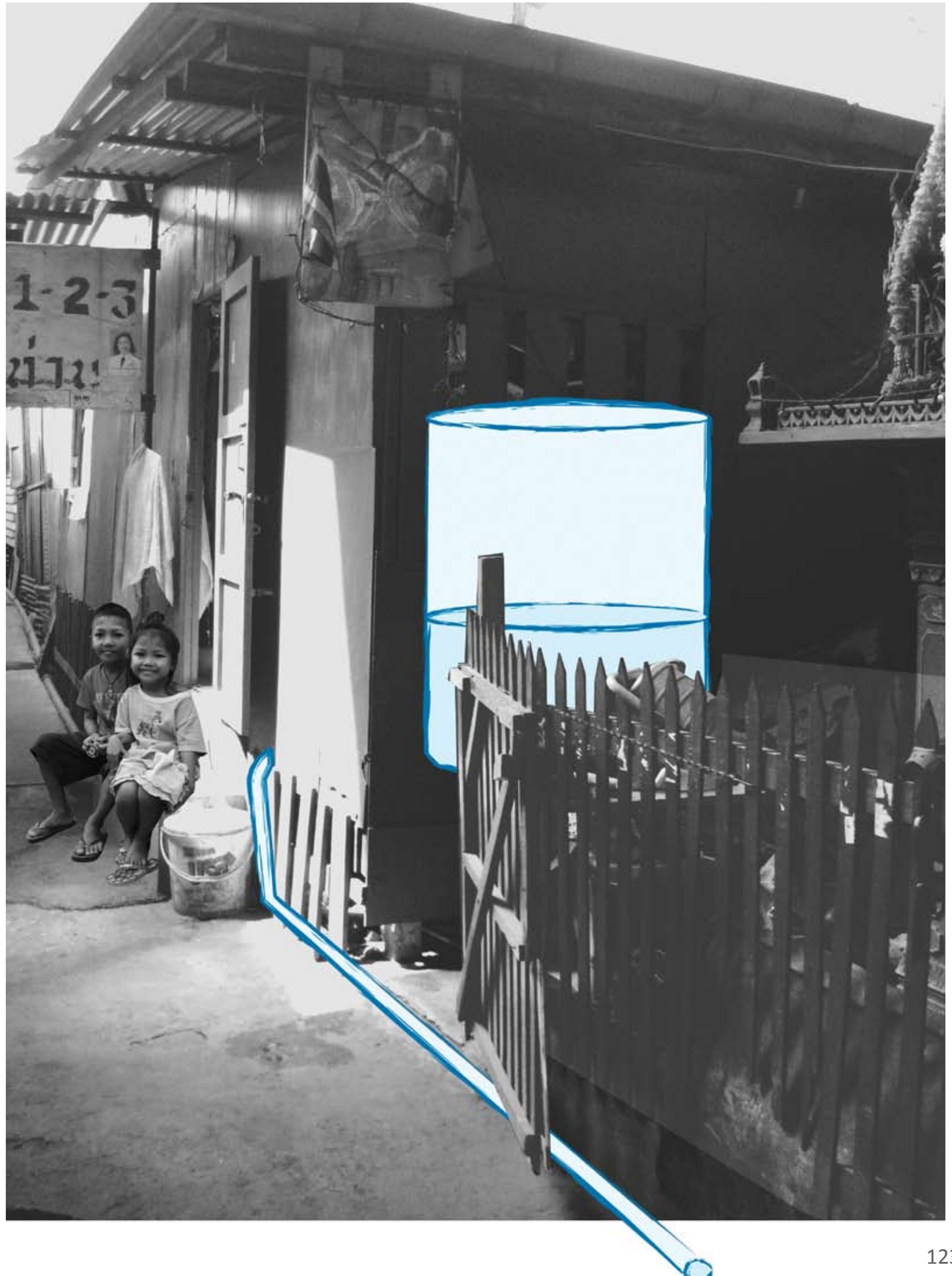
Waste management network

WATER SUPPLY

- In order to raise the sanitary standards of the community the project installs water supply inside the houses. The pipelines will be connected to the water pipes, which will be repositioned under the pathways for aesthetic reasons.

- Providing the dwellers water supply inside the houses will most likely induce a raise in the consumption of water. The project therefore suggests private water storage tanks for the houses.

Reference pictures from Lock 1-3 showing use of water storage tanks



DEVELOPMENT STRATEGY

ACTORS:
GOVERNMENT
NGOs
COMMUNITY ORGANISATION
ARCHITECTS/ENGINEERS

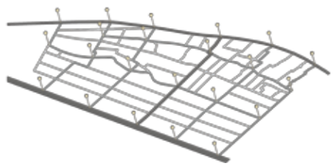
"The task of ensuring a good supply of urban low income housing, in the quantity and varierty needed, is too big for any single group to handle alone. Partnership is essential. But if partnership are to be effective, the urban poor must the central partner." (UN- Habitat)

2010

SECURE LAND TENURE

"Granting legal land tenure to people that are already residing informally on public or private land is the best way of ensuring the poor´s sustained access to land and housing." (UN- Habitat)

CLEAN UP THE AREA



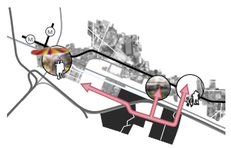
IMPROVE THE WASTE MANAGEMENT SYSTEM

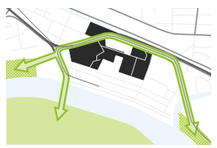
ACTORS:
UN- HABITAT/WORLD BANK
CODI (GOVERNMENTAL INSTITUTION)
ARCHITECTS/ENGINEERS
COMMUNITY ORGANISATION

"Poor community members, if well orginised and provided with some simple technical help, can be very efficient and effective designers, builders and maintainers of their settlement´s internal roads, sewers, drains, water supply and electricity networks." (UN-Habitat)

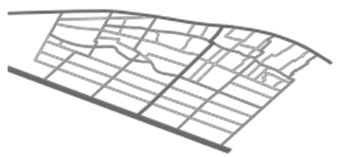
2015

CONNECT TO THE CONTEXT

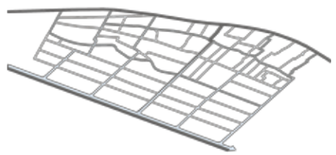




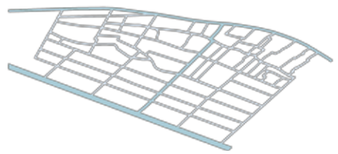
CREATE A GREEN CORRIDOR



ENHANCE THE STREET HIERARCHY



EXPAND THE DRAINAGE SYSTEM

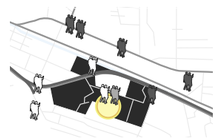


UPGRADE THE WATER SUPPLY SYSTEM

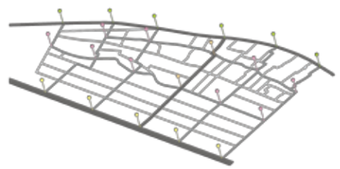
ACTORS:
UN- HABITAT/WORLD BANK
CODI (GOVERNMENTAL INSTITUTION)
ARCHITECTS/ENGINEERS
COMMUNITY ORGANISATION

"In poorer areas, the centres of learning are often inaccessible largely because buildings are rundown or poorly maintained. They are unhealthy and unsafe for all learners. Many schools are not equipped to respond to special needs, and the community does not provide local backing" (UNESCO Bangkok, 2008).

2020



ADD EDUCATION



CREATE SOCIAL NODES

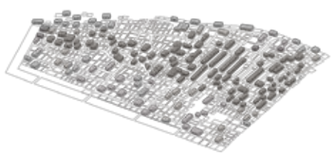
CREATE ACCESS TO- AND BUILD PUBLIC SERVICES

ACTORS:
CODI (GOVERNMENTAL INSTITUTION)
ARCHITECTS/ENGINEERS
COMMUNITY ORGANISATION

"And when a little housing finance and secure tenure are made available for people, the quality of housing, even at the bottom end of the economic ladder, can be improved dramatically."
(UN- Habitat)

2025

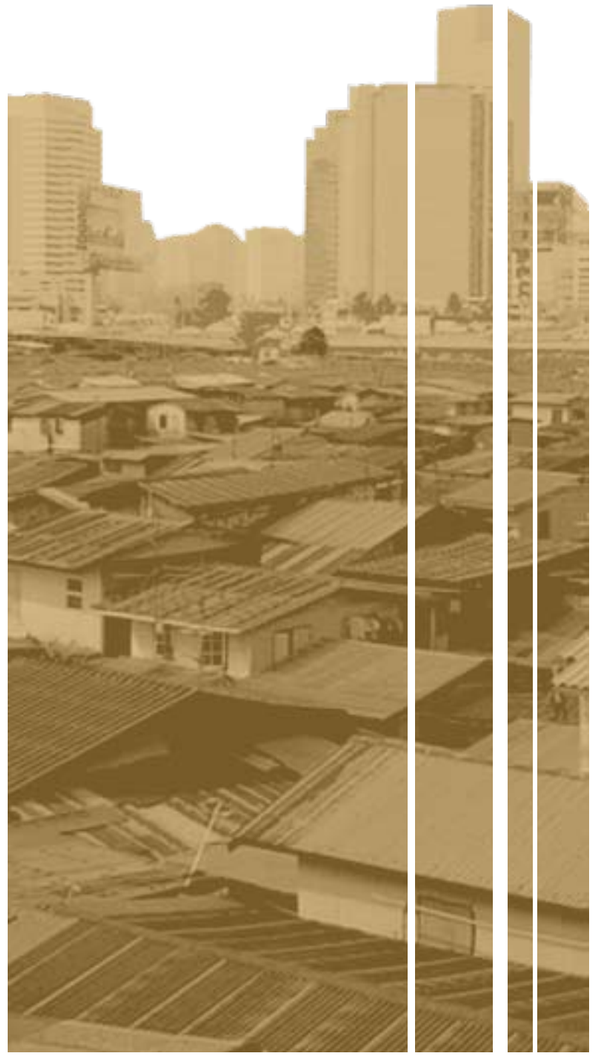
"Housing is not a product, but a process. It is not something that is completed all at one time according to a plan, but is developed in stages, as a household needs and resources changes"
(UN- Habitat)



CONSTRUCT NEW HOUSES REPLACING
THE MOST HAZARDOUS HOUSES

MAINTENANCE OF THE PHYSICAL ENVIRONMENT,
FOLLOW UP ON HOUSING CONDITIONS

REGISTRATIONS COMMUNITY CENTRE



The design proposal emphasizes the community centre's important role to enhance community affiliation. The design area stretches from Kheha Phatthana Road to the community centre and aims to visualise how the community centre relates to its immediate context, and exemplify how the community's physical framework can be upgraded, through design.
The present community centre is from our point of view nowhere near worthy its status as the community centre. The area, more specifically a bare concrete open space, which purpose is to function as the main meeting point for the community's inhabitants is in a wretched state.

The community centre is from our point of view nowhere near worthy its status as the community centre. The area, more specifically a bare concrete open space, which purpose is to function as the main meeting point for the community's inhabitants is in a wretched state. The areas sanitary conditions are awful and the smell is unbearable. The concrete area and its appurtenant streets are littered with garbage and the appurtenant pond is filled with garbage and covered with a green bacteria-mass.

Moreover, as a result of the community centre's location in a risk area concerning flooding, and due to the lack of drainage system, the community centre floods every year.
The design area as a whole consists of one- and two storey houses with conditions varying from hazardous shacks, not acceptable regarding safety and sanitary requirements, to low standard acceptable housing worth preserving (see ill 25 page 130). Furthermore, there are several smaller potential open spaces or spaces for building, at present covered with garbage or old building materials (see ill 26 on page 131).

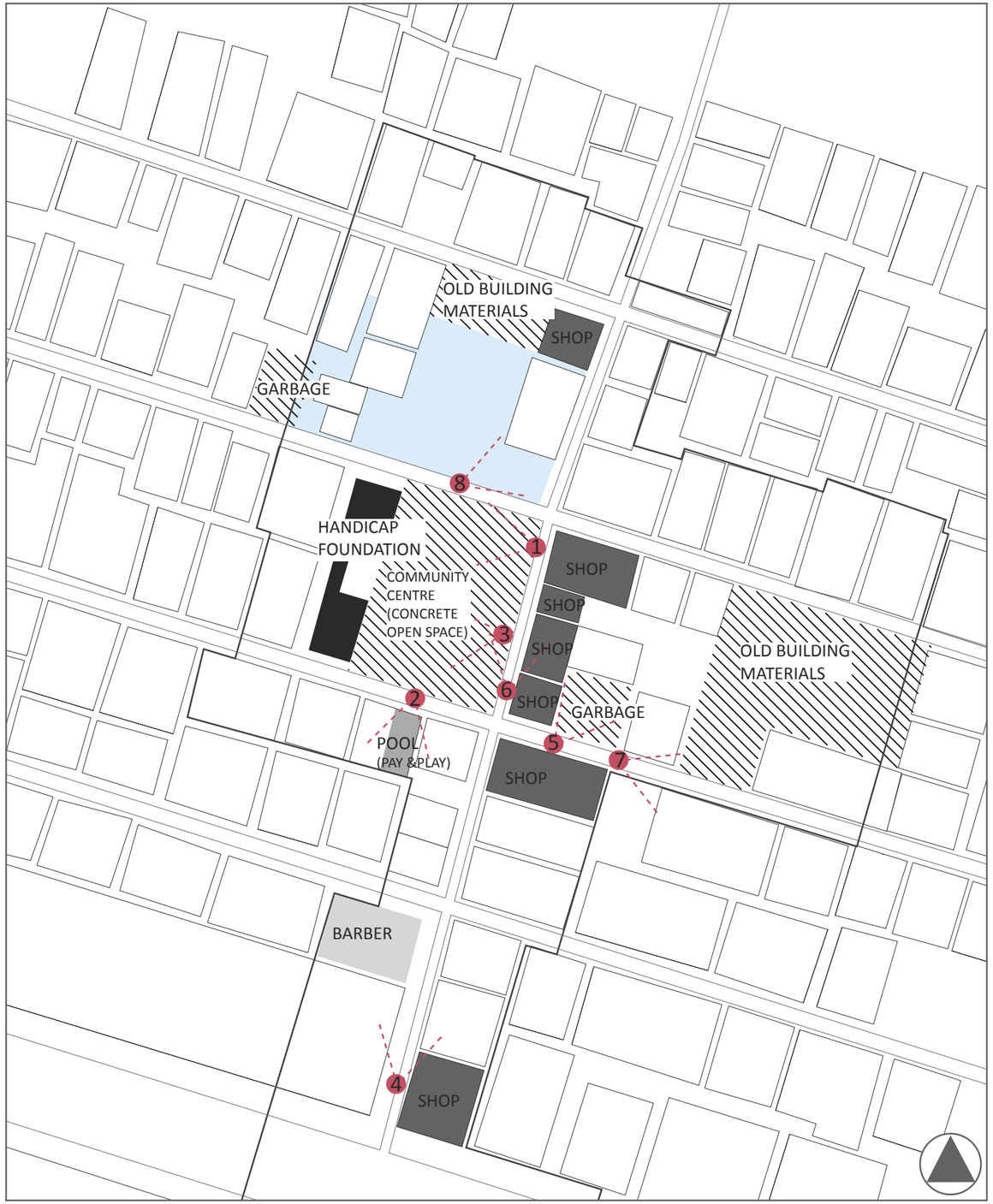
ill. 24: Design area - community centre

1:500

ill. 25 Housing conditions and number of storeys

Better housing conditions, preservable | Medium housing conditions, to be renovated | Bad housing conditions, to be replaced

1:500



ill. 26 Functions
The hatched areas are open spaces
See page 132-133 for photos

1:500

1.

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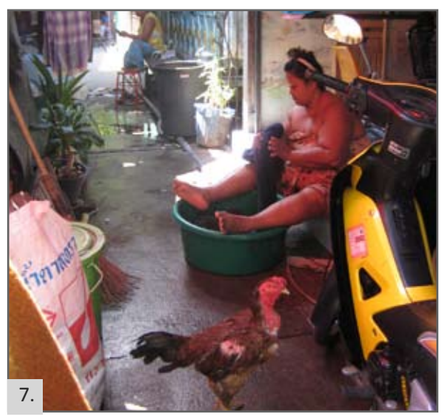


7.

8.

DESIGN COMMUNITY CENTRE

VISION

The design proposal is a visualisation of the upgrading of the community centre and its surrounding area based on the strategy for upgrading and integration for the whole community, presented on page 110.

The main goals for the design proposal are to:

- COMMUNITY CENTRE:
  - Emphasize the community centre as the core, and the main meeting and socialising area for the community
  - Aggregate shared experiences, activities, and interests within the community and thereby generate the feeling of membership and unity within the community
  - Design spaces for REPOSE, SPORT, PLAY and SHOPPING (see page 114)
  - Multi- programme the open spaces for different and flexible use
  - Provide access to basic public services, at present lacking in the community

- INFRASTRUCTURE:
  - Upgrade Kheha Phattana Road and the network of paths and underline the street hierarchy through breadth, paving, greenery and public street lights
  - Utilise the new drainage systems profile with the green buffer zone, to enhance the aesthetical aspect of the pathways

- ARCHITECTURE:
  - Design the new architecture in accordance with the overall goal of preserving the existing physical structure and lifestyle by designing the houses in modules, fulfilling the regulations set in the overall strategy; maximum footprint of 50m2 and maximum building height of three storeys.
  - Incorporate design parameters for new architecture. Parameters aimed at climatic protection are of high priority based in the risk of flooding and the extreme heat in the packed, dense community.

plan 1:200 fold out

section A-A 1:200
fold out..

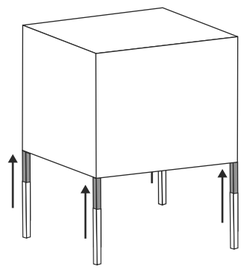
(section 1:100 extra)

section B-B 1:200
fold out..

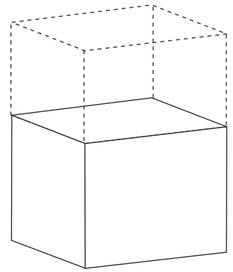
(section 1:100 extra)

DESIGN PARAMETRE:

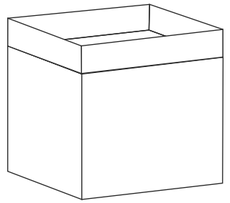
The design parameters are to function as guidelines for new housing in the Lock 1-3 community. They are focused on climatic protection and exploiting the potentials of the small scale housing, as regards recreational space.



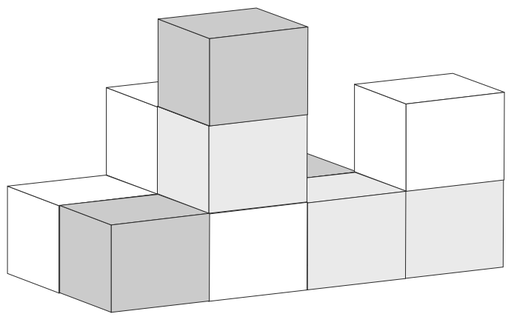
New buildings should be lifted an additional 50 cm over street- level as protection from flooding.



Adding storeys in consequence of addition to the family is very common in slum communities. Building houses with flat roofs eases potential future adding of storeys.

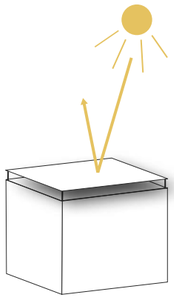


Building with flat roof, the roofs can be designed as functional spaces, e.g. terraces and gardens, giving the dwellers the possibility of having their own private outdoor space. Furthermore the project proposes implementing roof terraces, as playgrounds, in connection with kindergartens and primary schools, creating a safe environment for the children.

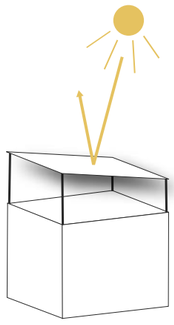


Building in modules will make the larger constructions intermingle with the existing physical structure of the community and at the same time render possible many of the same valued qualities found in the single family houses.

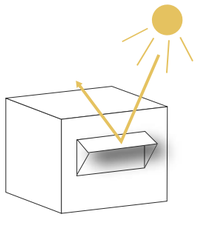
SUN PROTECTION:
The roof is the building envelope component exposed to the greatest amount of solar radiation, and therefore is the main-contributor to the heating of the buildings. Its performance depends on its form, construction and materials.
When the outdoor air temperatures are higher than the indoor air temperatures, the outer surface of the roof absorbs radiation and heats up. It transfers heat to its inner surface, causing the inside temperature to rise. This heat in turn radiates out and is absorbed by people and objects within a building. In composite roofs with a separate roof and ceiling, the heat transfer between the two surfaces is partly radiated and partly conducted. If the space created between the roof and ceiling is enclosed, the trapped air may reach a very high temperature, which further increases the transfer of heat into the building. Different roof forms have varying effects in terms of dealing with specific climatic conditions (Kohc-Nielsen 2002).



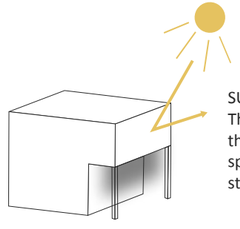
FLAT ROOF
Flat roofs are exposed to solar radiation throughout the day. With a reflective outer roof and an air cavity incorporated, solar radiation will be partially reflected and partially trapped in the roof space, causing great transmission of heat to the inner surfaces. Adding gaps, roof ventilation will remove trapped heat and reduce heat gains (Kohc-Nielsen 2002).



ROOF TERRACE
Flat roofs can be designed as functional spaces, e.g. terraces and gardens. Roofing the terrace with a light construction either made of bamboo or corrugated steel, reduces the light and heat intake, providing a shady recreational space.

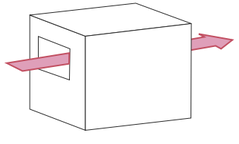


SHADING DEVICES
Horizontal shading devices help reduce the heating of the interior spaces and also reduces glare, helps ensure privacy and provides protection from the rain. The shading devices should be made of light and reflective materials, to avoid absorption and re-radiation of the heat through an opening. Finally, integrated, flexible slats regulate the air circulation (Kohc-Nielsen 2002).

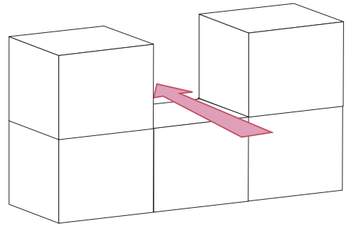


SUBTRACTION OF FACADES
The subtraction of the facade provides the houses semiprivate shaded outdoor spaces for the daily activities and for staying.

VENTILATION
The Lock 1-3 community gets awfully hot as a result of the low, extremely dense typology. The lack of ventilation retains the heat in the streetscape and inside the houses.



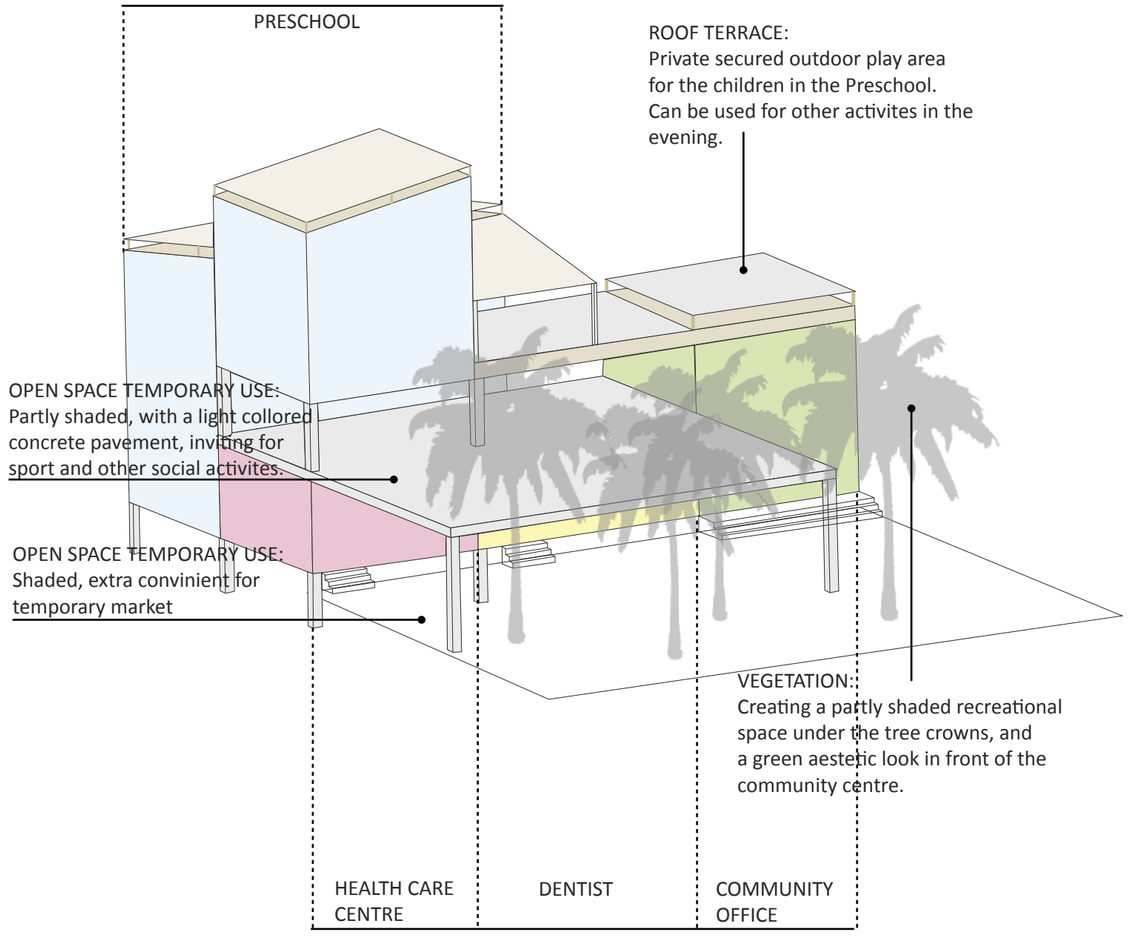
CROSS VENTILATION
The windows should be placed strategically according to wind direction to enhance natural cross ventilation.



VENTILATION BETWEEN THE BUILDING VOLUMES
Larger constructions should be fragmented to create open corridors between the building volumes, to promote natural ventilation.

COMMUNITY CENTRE

The new buildings aim to fulfil the needs concerning climate protection and exploit the potentials of the small scale housing, according to recreational space. The design parameters will function as guidelines for new housing in the Lock 1-3 community.



Flexibility, social interaction, indoor/outdoor space, layering, multi-programming, shade

MATERIALS

The car lanes of Kheha Phattana Road will be paved with permeable asphalt. The parallel sidewalks will be of concrete. The community paths and the internal paths are proposed as concrete paths, like the sidewalks in the main street and a shade lighter, respectively, to underline the street hierarchy.

The regulation for building the houses in concrete raises the personal cost when building a house, but is found necessary for protection from fire and flood protection.

To follow up on the design parameters concerning climate protection, designing the roofs to reflect solar radiation, the project proposes corrugated steel material as reflective material, over the constructed buffer zone. For the houses with a roof terrace, bamboo, being a strong and durable local material, is recommended for providing shade. For the roof terrace, in relation to the design areas kindergarten, the project suggests grass to create a green environment and a soft surface and because of its cooling effect on the building.

ASPHALT:
Proposed in the main street for the neighborhood.

CORRUGATED STEEL:
Proposed as the light roof construction over the buffer zone as a reflective material for solar radiation.

CONCRETE:
Proposed in the community paths.

BAMBOO WOOD:
Proposed as a light construction over the recreational terrace space.

CONCRETE (light):
Proposed in the internal paths.

GRASS:
Proposed on a part of the roof terrace of the Kindergarten.

VEGETATION

The project adds a layer of vegetation to the community, having both an aesthetical and a functional purpose. Palm trees are placed in the community centre, with the main objective to create shadow and strengthen the recreational value of the space. The main canals will be planted with lemongrass and iris. The lemongrass is insect repellent and will together with the iris appear as a green band alongside the community paths.

Top: Lotos flower - Pond, Iris and Lemongrass - Main canal
Bottom: Banana tree - Pond pavillion

Coconut tree - Community centre

Photos used for inspiration

fold out collage..

on the back: plan showing point and angle of collage

fold out collage..

on the back: plan showing point and angle of collage

collage
Kheha Phattana Road (mainstreet)

fold out..
on the back: plan showing point and angle of collage

REFLECTION PROJECT PROPOSAL

REFLECTION

This section will reflect on the possibilities and critical aspects of the design proposal, focusing on: social integration, identity and densification.

Social integration:

This section discusses in what extent the physical upgrading and integration of the slum community is able to promote the social interaction between the different social groups of Khlong Toei district.

The project aims to integrate the community and the formal city. However, urban design is only a tool to plan and design the physical framework, to promote social integration between different social groups. Though the projects interventions make the community and the formal city more physically integrated, this is not necessarily enough to promote social integration between the dwellers, but it is a big step in the right direction. Social policies are critical to enhance a more equal society where the urban spaces are less polarised and spatially segregated. The project therefore requires a comprehensive plan, including a network of specialists – architects, engineers and sociologist, etc.

The project proposes different types of physical connections, and a physical upgrading of the community to a standard on par with the low middle class residential areas of the formal city. Through the projects enhanced accessibility of the community and furthermore by granting the community's dwellers equal rights and access to public services, we argue that this integrates the community and the formal city. A highly relevant question is however if these physical interventions are enough to obtain social integration between the community and the formal city?

Through our on-site registrations and according to the report of the research project "Bangkok Living: Social Networks in a Gated Urban Field" (Wissink, Dijkwek & Meijer, 2006) it is clear that there is a high level of social interaction, across communities, among the low income inhabitants. We therefore postulate that our proposal would function to make the already existing social interaction between the low income inhabitants in the neighbourhoods of Khlong Toei district stronger. A critical question is however if the residents of the middle class neighbourhoods on the other side of the canal and expressway would start involving and socialising with the slum community, only owing to new physical connections? Most likely they would not, as there are several psychological barriers that needs to be addressed (referring to the foundation page 34).

Yet, the projects proposed social nodes (see page 114), in the community's main connectors, has the potential of attracting different social groups. We therefore see the potential of these nodes to become public realms, according to Sennetts supposed strategical location of nodes, encouraging the social integration to the formal city.

On the other hand, we argue that the question of potential social integration is also a question of location. The Lock 1-3 community's location in a monotonous area dominated by light industry and a larger percentage of slum communities, with the canal and expressway as physical and visual barriers, respectively – seperating the community from the middle class neighbourhoods, does not make up the best basis for promoting social interaction accross social classes. We therefore see the interventions regarding the potential public realms as more of a future vision for the area, depending on the future development of the neighbouring area.

Further Sennett (2004) refers to sociologist Steven Gold, who makes a distinction between a boundary and a border. He explains how the boundary lays out a zone of prohibition: "this is my territory, and you know that you not belong there". Whereas the border is that kind of edge in which energy is concentrated and intensified by a difference, by meeting of different "species". The project proposal aims eliminate the boundary between the formal and informal city, and create an active border, with physical connections and social nodes along the edges of the community. Sennett also argues that privileging the centre rather than the edge is an undemocratic direction to work. We agree with Sennett, voicing the importance of processing the edge of communities, but at the same time we oppose to his lack of focus on a community centre. We argue in favour of both promoting social activity on the edge and emphasizing a strong community centre, giving the two different roles for the community. This is substantiated by Hester, stating the importance of creating a community centre for the local inhabitants, to aggregate shared experiences, activities, and interests within the community. The feeling of membership and unity is very important to get the inhabitants to want to be involved in their community and interact with the local inhabitants, and thereby enabling the development of a respected community.

The discussion of social integration concerning solidarity in the community, leads to the next paragraph which argues for the importance of a strong identity.

The weekend market in the northern part of Bangkok is an example of a public realm in the city, attracting tourists as well as the cities different social groups.

IDENTITY

In the following section we will discuss the level of success of the proposal regarding upgrading and integration of the physical environment of the Lock 1-3 community, taking into account and bracing the lifestyle of the dwellers, pointed out as the positive part of the community's identity. In the process we have strived to maintain the physical structure of the community, to enable the retention of the community's lifestyle when upgraded.

"The community must discover its inherent and unique internal form because this allows the community to be what it is. This leads to the creation of the new landscapes based on the particular form of place." Randolph T. Hester

Through his book "Design for Ecological Democracy", Hester inspired us to see the potentials of upgrading the community based in its existing qualities, to encourage the dwellers to become proud of their community and strengthen their affiliation with the community to form the basis of a new reinforced positive identity for the community.

Through our registrations we observed the linkage between the physical structure and the lifestyle of the dwellers. Basing our design proposal on these registrations, we have strived to preserve the existing structure, only interfering to make necessary improvements concerning sanitation and security. We therefore argue that our design respects the existing fabric, and preserve and enhance its characteristic internal qualities. The proposal transforms the community's physical identity, from being a community with bad living conditions, through interventions which underlines its positive characteristics, to become an alternative, valued and respected community, forming a whole with the formal city.

DENSIFICATION

"In 2008, the world reaches an invisible but momentous milestone: For the first time in history, more than half its human population, 3.3 billion people, will be living in urban areas. By 2030, this is expected to swell to almost 5 billion. Many of the new urbanites will be poor. Their future, the future of cities in developing countries, the future of humanity itself, all depends very much on decisions made now in preparation for this growth." (UNFPA 2007).

"Poor people will make up a large part of future urban growth. This simple fact has generally been overlooked, at great cost. Most urban growth now stems from natural increase (more births than deaths) rather than migration. But wherever it comes from, the growth of urban areas includes huge numbers of poor people. Ignoring this basic reality will make it impossible either to plan for inevitable and massive city growth or to use urban dynamics to help relieve poverty" (UNFPA 2007).

Based in the above-mentioned quotes concerning the challenges related to urban growth, we will in this section review a critical aspect of our proposal. The project is focused on addressing the specific challenges of the Lock 1-3 community in Khlong Toei slum, and the design proposal is based on the wish to preserve of the existing physical structure of the Lock 1-3 community.
Zooming out, the slum community is located in a dense megacity. Working in a megacity, urban growth and densification are highly relevant topics, and further, as stated above "the growth of urban areas includes huge numbers of poor people." We therefore find the lacking focus on dealing with the challenges of density and preparation for future urban growth to be a critical aspect in the projects.

But is it possible to densify a slum community and at the same time maintain the flexible slum structure and their lifestyle? We argue that the approach of relocating slum dwellers in apartment blocks is a solution for the issue of density – reducing the settlements footprint, but the life quality of the dwellers is a big issue as the typology makes it impossible for them to maintain their lifestyle. We argue that a solution on the issue of density should be based in the dwellers' lifestyle and needs, which is the main focus in our proposal.

PROCESS PROJECT APPROACH

PROCESS PROJECT APPROACH

The project has been developed over a multifarious process defined as a hands-on approach.

Reading up we acquired knowledge concerning the global challenges of slums and locale challenges for Thailand, and Bangkok, in particular. This knowledge formed the foundation for our on-site registrations and project focus.

Visiting the site on two occasions, five weeks in January-February and one week in late March 2009, we carried out comprehensive on- site registrations. These registrations gave us a profound understanding of the area, gaining an insight into the dwellers' lifestyle, walking the streets and talking to the locals.

The project result reflects the process, combining the theoretical foundation and the on-site registrations, through a process of sketches, physical models and 3D visualisations.

DOBBELTOPPSLAG PROCESS

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page 69. Google Earth

The remaining photos and illustrations are our own.

APPENDIX

ESTIMATION BANGKOK TOTAL POPULATION

ESTIMATING BANGKOK'S TOTAL POPULATION. FORMAL+INFORMAL

Population figures are low because only the people who are registered as their home being Bangkok, which is mainly only people who were born there, are counted in the census figures. Most people are registered in the province they were born in, so they are added to those census figures, even if they've lived and worked in Bangkok for a long time.

www.rrcap.unep.org/reports/soe/bangkok_profile.pdf

POPULATION

The total population of Bangkok in 2000 was 5.68 million, which was 9.18% of the total population of Thailand. Figure 1.2 shows the trend of the population dynamics in the Bangkok city. The trend during 1987-2000 shows the decreasing number of population in the inner area and increasing in the middle area. The population density in the inner area decreased from 15.27 to 11.09 thousand/Sq. Km(that is 3.25 to 2.36 million) during 1987 to 2000 respectively. The outer area shows increase in population density from 0.77 to 1.28 thousand/ Sq.Km(which is 0.67 to 1.12 million) in 1987 to 2000 respectively.
Figure 1.3 shows population migration in and out of Bangkok. In later year (1995-2000) Bangkok seems to lose populations. However, the actual population of city may not be known, as there are people who commute to work in Bangkok or live in the city without registration. They are estimated to be around 3.21 million. Therefore, the actual population of Bangkok in later years was likely around 8.89 million (NIDA, 2000)

http://www.citypopulation.de/Thailand.html

Population 2008:
Thailand: 66,148 million
Bangkok: 11,971 million

Informal population 2000 = 36%
formal population 2008 = 11,97 = 64%
informal: 11,97+36%=16,2 million

16,2 mill x100/66,148mill= 24,5% of total population lives in Bangkok

PLOT RATIO HOUSING

RAI 70:
55.205m2 x1,5etg=82.807m2 buildings
90.580m2 area
Housing plot ratio volume: 91,4%
Landuse:
Housing footprint: 55.205 x100/90580= 61%
Open space plot ratio: 8545 x100/90580= 9,4%
Infrastructure plot ratio: 26830 x100/90580= 29,6%

LOCK 1-6:
67.410m2 x1,5etg=101.115m2 buildings
105.476m2 area
Plot ratio: 95,8%
Landuse:
Housing footprint: 67.410 x100/105.476= 64%
Open space plot ratio: 2593 x100/105.476= 2,4%
Infrastructure plot ratio: 35.473 x100/105.476= 33,6%

NGOs:
12.335m2 x2,5etg=30.837m2 buildings
30.098m2 area
Plot ratio: 102,5%
Landuse:
Housing footprint: 12335 x100/30098= 41%
Open space plot ratio: 15692 x100/30098= 52,1%
Infrastructure plot ratio: 2071 x100/30098= 6,9%

BLOCK 11-18:
19.154m2 x5etg=95.770m2 buildings
45.263m2 area
Plot ratio: 211,5%
Landuse:
Housing footprint: 19154 x100/45263=42,3%
Open space plot ratio: 1354 x100/45263= 2,9%
Infrastructure plot ratio: 24755 x100/45263= 54,7%

BLOCK 19-22:
3319m2 x5etg=16590m2
11.637m2 area
Plot ratio: 143,5%
Landuse:
Housing footprint: 3319 x100/11.637= 28,5%
Open space plot ratio: 0%
Infrastructure plot ratio: 8318 x100/11637= 71,4%

PAT SHOPHOUSES:
11.395 x4etg=45580m2
25704m2 area
Plot ratio: 176%
Landuse:
Housing footprint: 11395 x100/45580= 25%
Open space plot ratio: 0%
Infrastructure plot ratio: 34185 x100/45580= 75%

HUA KHONG and ROM KLAO:
21.339m2 x1,5etg=32.008m2
30949m2 area
Plot ratio: 103%
Landuse:
Housing footprint: 21339 x100/32008= 66,6%
Open space plot ratio: 0%
Infrastructure plot ratio: 10669 x100/32008= 33,3%

BLOCK 1-9:
17702m2x4etg= 70808m2
51382m2 area
Plot ratio: 137%
Landuse:
Housing footprint: 17702 x 100/51382= 34,5%
Open space plot ratio: 0%
Infrastructure plot ratio: 33680 x 100/51382= 65,5%

Buildings:
Housing plot ratio: 109%
Permanent Cultural facilities: 0,5%
Educational facilities: 4,5%
Religious facilities: 0,1%
Office/light industry: 3,0%

FACILITIES NEIGHBOURHOOD

CULTURAL FACILITIES:
Car repair shop (6) 200m2= 600m2
Internet shop/service (4) 10m2=40m2
Minimarket (30) 10m2=30m2
7-eleven (2) 20m2=40m2
Pawn shop (1) 10m2
Laundry service (3) 20m2=60m2
Recycle shop (3) 40m2=120m2
Photo shop (1) 20m2
Hair dresser (4) 30m2=120m2
Beauty salon (2) 30m2=60m2
Restaurant/café (25) 20m2=500m2
Clothing shop (2) 20m2=40m2
Total: 1640m2

EDUCATIONAL FACILITIES:
School (2) 1250m2 x2,5
etg.=3125m2=12500m2
Kindergarten (3)750m2= 3000m2
Total: 15500m2

RELIGIOUS FACILITIES:
Mosque (1) 160m2
Church (2) 140m2
Spirit house (4) 80 m2
Total: 380m2

OFFICE/LIGHT INDUSTRY:
Helping organisation (6) 1178m2 x2=9426m2
Office (5) 150m2 =750m2
Tailor/light industry (3) 100m2 =300m2
Total: 10476m2

Total facilities: 27996m2

NGOs:
1 Duang Prateep Foundation: Focusing on poor children. They support children by giving scholarship and urgent help. Duang Prateep also provides elderly service, anti-drug group and teen group. Duang Prateep also has a kindergarten.

2 Mercy Center: The main focus is on strayed children, poor children, Aids patients and disables. They also provide scholarship for poor students.

3 Santisuk Foundation: Helping poor children and providing budget kindergarten.

4 Sikkha Asia Foundation: Supporting people in career field and provide a community library.

5 Baan Chivitmai: A Christian organisation helping poor mothers and kids. They arrange the handicraft group and sell the product worldwide.

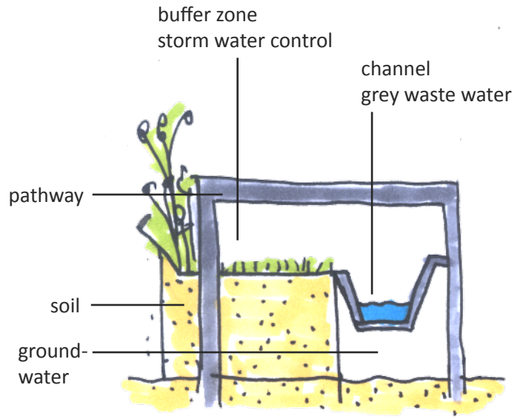
6 Foundation for slum child care: a nursery under the Royal Pratonage. They grant the daily care for babies in the poor area while the parents go out to work.

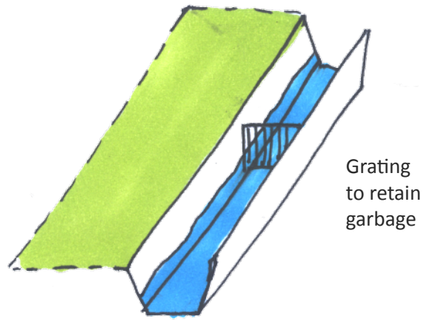
SCHOOLS/KINDERGARTENS:
Kindergarten:
There are 3 kindergartens in the neighbourhood:
Duang Prateep,
Santisuk and
Red-skirt kindergarten

Primary school: 1 school called "Chumchonmoobanpattana" from grade 1 – 9
Vocational school: 1 school

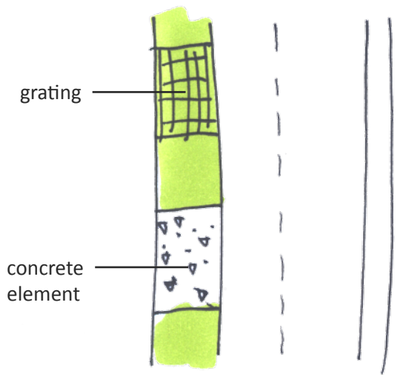
DRAINAGE SYSTEM

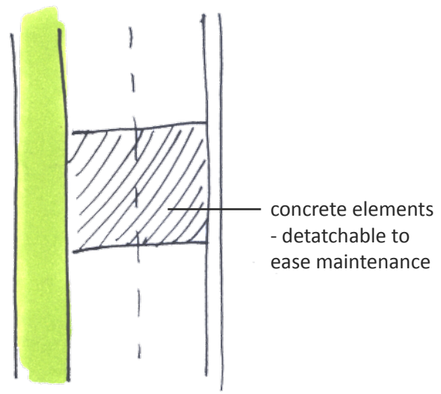
DESIGN PRINCIPLES MAIN CANALS





Two alternatives for covering buffer zone:





WASTE MANAGEMENT:

WASTE PRODUCTION:

Thai households produce 39 000 tonnes of waste each day, or 14,2 million tonnes each year. Bangkok alone accounts for about one- fifth of the total waste according to a 2007 study by the Bangkok Metropolitan Administration.

The formal Bangkok produces 7800 tonnes of waste each day
Estimation of waste produced each day in the informal Bangkok:
36% extra:
7800ton x 36%/100= 2808 tonnes of waste each day

In total estimated production of waste each day in Bangkok:
7800 ton + 2808 ton= 10608 ton

We presume that the formal city of Bangkok produces in average more garbage than the informal part of the city, due to a larger consumption.
We therefore estimate that the formal inhabitant produce in average 0,8 kilo each day, and that the informal inhabitant produce in average 0,5 kilo each day.
Estimated population Lock 1-3 community: 10 000

Estimated garbage production in total in the community: 10 000 x 0,5 kilo= 5000kg

RECYCLING:

“In Bangkok, and throughout Southeast Asia, recyclables are recovered by both official garbage collectors and so called “pickers”- individuals who pick out and sell recyclables for income. Sounds great right? Chuck everything into one bin and let someone else make a living out of sorting it out. Unfortunately there are drawbacks. “Pickers”- many of whom are children- are exposing themselves to health risks by working in unsanitary conditions. And because recycling is market- driven rather than mandatory, not everything that could be recycled is getting recycled.” (Blogspot 2008)

The project proposes that the 22 nodes in the community will be equipped with garbage stations, for the inhabitants to sort their own garbage when delivering, to spare the garbage pickers for the unsanitary conditions pointed out above. Adding the garbage stations and connecting to the governmental waste collection system – as a result of secure land tenure, will improve the sanitary conditions greatly. Furthermore by incorporating a system to sort the garbage, will ease the recycling and hopefully lead to an even larger part of the garbage to be recycled.

The informal Lock 1-3 community suffers from not being a part of the governmental waste management system, and as a result, the dwellers are practically living on a growing garbage disposal.

FOUNDATION FOR ARGUMENT FOR THE UNIQUE POSSIBILITIES OF LOCAL COMPOSTING:

“Plastic bags litter both sidewalks and the waterways in my neighbourhood. And since the bags can take as many as 1000 years to break down, they are going to be there for a while.” (Blogspot 2008)

According to BMA´s studies, 21% of the garbage in Bangkok is made up of plastic bags. The BMA states that by cutting plastic bag consumption, greenhouse gas emission could be cut by up to 1 million tons/year and garbage collection costs could be reduced by 650 million bath/year (13,6 million €).

“There are good incentives to recycle and separate items. The going price (beginning of 2008) for paper is 12 bath (0,25€) per kilo and for compressed cans is no less than 50 bath (1€) per kilo.”

“At all possible occasions one is inundated by unnecessary plastic bags. One interesting new development is that the Mall department stores (including Siam Paragon and Emporium Shopping Complex) have started issuing biodegradable plastic bags, and other department stores, no doubt, will follow this example” (Thai Websites 2008)

Waste management is not only a huge potential business in Thailand, but one that would be critical for the country’s environmental future. Mr Brewster estimates that more than 90% of waste in the country is unmanaged (Bangkok Post 2009).

“Only 80% of the garbage produced nationwide is collected.”

“Perhaps more alarming is the fact that only 25% of the municipal waste collected by the authorities goes to sanitary landfills, and yet another 15% is recycled, digested and incinerated, leaving 60% openly dumped in someone’s backyard.”

HOW COULD THE COMMUNITY IMPLEMENT AND BENEFIT FROM A LOCAL COMPOSTING BUSINESS IN THEIR ENVIRONMENT, IF THE GOVERNMENT IMPLEMENTED THE USE OF BIODEGRADABLE PLASTIC BAGS?

ESTIMATION OF POSSIBLE RECYCLING PERCENTAGES IN THE LOCK 1-3 COMMUNITY:

21% plastic bags (BMA)
25% organic waste (presumed after discussion with Lektor Tjalfe Poulsen, Institute of Chemistry, environment and Biotechnology, Aalborg University)

If the plastic bags where replaced by biodegradable plastic bags the community would be able to recycle in total 21% + 25 %= 46% organic waste through local composting.

We argue that the rest of the garbage produced within the community consists mostly of recyclable materials delivered to the Garbage Banks in the Neighbourhood. This would therefore leave only a small percentage of the garbage left for the government to pick up. This would furthermore contribute largely to relief the waste management collection issues of the present, within the community, and in Bangkok as a whole.

CALCULATIONS OF POSSIBLE COMPOSTING BUSINESS:

5000 ton x 46%/100= 2300kg (1ton bio= 2m3)
- 90 days is the average process time for composting in the Thailand climate

Total amount of biodegradable garbage in the process of 90 days:
4,6m3 x 90 = 414m3

The project proposes that there will be placed 1 bio recycling station in each node (see page 111)
Each node will have composting volume of: 414m3/22= 18m3
To make the composting boxes more user friendly and not too dominant in the node, the project proposes 4 boxes in each node with the dimension: 1,5x1,5x2,5m (including a buffer zone on 1m3) (see section A-A page 139). Each box in the node will be equipped with a ladder that provide access to the top of the box for throwing the biodegradable garbage into the composting process, and the box have a hatch in the lower front for taking the produced soil out from the process.

The composting process would be most efficient by using vermi- composting technique, using tiger worms in the process.
The composting business will be source of a new possible income for a group of inhabitants living in the community, selling high quality soil to gardeners and farmers.