No toilet at home:

Implementation, Usage and Acceptability of Shared Toilets in Urban Ghana

By

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Abstract

In Ghana, over 70% of urban dwellers do not have private sanitation facilities in their home and rely instead on an informal network of shared toilets. The predominance of shared toilets in Ghana is the result of unplanned urbanization, specific features of housing, socio-economic characteristics of the population and political orientations.

Shared sanitation includes a whole range of models from large toilets blocks owned by the municipality to toilet cubicles shared by tenants of the same house. Shared toilets are not considered as improved sanitation facilities as access for vulnerable groups, maintenance, hygiene, privacy and safety of the users are not always guaranteed. However, for millions of urban dwellers, shared toilets are the only alternative to open defecation and are used daily. Some of these facilities, through better management models and through better standards, provide services appreciated by the users.

The aim of this research is to determine which models of shared facilities are acceptable sanitation solutions for urban dwellers, depending on the local circumstances. To do so, the research framework compares the perspectives of dwellers and sanitation providers, acknowledges the characteristics of the specific urban context and considers the relationships between the key stakeholders. In a fast growing city in Ghana, Ashaiman, 432 house units representing over 8000 residents were surveyed, over 40 participatory exercises and 38 interviews with a range of stakeholders were conducted.

This research concludes on four main points. Firstly, many apparently similar areas are actually not uniform; the heterogeneity of urban planning and housing influences any past and future sanitation developments. Urban planners need to integrate sanitation in their future decisions but base these on appropriate solutions. The second finding is that some models of shared sanitation can be considered as adequate given the particular context and its likely evolution. The different models have legitimacy at different stages of urban development and their successful selection depends on the quality of the contextual understanding. Thirdly, cleanliness and affordability are key determinants when the dwellers select shared toilets. Given the toilet options available, these determinants are often mutually exclusive and are a dilemma for the users. This dilemmas result in variations in use of shared toilets within a neighbourhood, and at intra household and individual levels. The final point is that choice and then acceptability of a facility depends on the options available. Therefore deciding which facilities are best adapted to the local context should be in the hands of both local providers and dwellers, supported by other local stakeholders who enable relationships through adapted policies and facilitated dialogues.

Acknowledgements

Table of contents

List of figures

All figures and tables are realised by the author except when stated otherwise.

List of tables

List of abbreviations and symbols

ANCOVA	Analysis of Covariance
AshMA	Ashaiman Municipal Assembly
BOO	Build, Operate, Own
BPD	Building Partnership for Development
CBO	Community Based Organization
CSB	Community Sanitation Block
CLTS	Community Led Total Sanitation
CLUES	Community Led Urban Environmental Sanitation
CSO	Civil Society Organizations
EAWAG	Swiss Federal Institute of Aquatic Science and Technology
GoG	Government of Ghana
GTZ	German technical cooperation
HCES	Household-Centred Environmental Sanitation
IDS	Institute of Development Studies
IWA	International Water Association
JMP	Joint Monitoring Programme
KVIP	Kumasi Ventilated Improved Pit Latrine
MDG	Millennium Development Goal
MESSAP	Municipal Environmental Sanitation Strategy & Action Plan
MLGRD	Ministry of Local Government and Rural Development, Ghana
NGO	Non-Governmental Organization
OPP	Orangi Pilot Project
PS-EAU	Programme Solidarités Eau
SANDEC	Department of Water and Sanitation in Developing Countries
SAT	Stand Alone Toilet
SEI	Stockholm Environment Institute
SPSS	Statistical Package for the Social Sciences
SSA	Sub Saharan Africa
SuSaNa	Sustainable Sanitation Alliance
TDC	Tema Development Corporation
TREND	Training Research and Networking for Development
UESP	Urban Environmental Sanitation Project
UN	United Nations

UNFPA	United Nations Population Fund
UN-HABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
VIP	Ventilated Improved Pit Latrine
WEDC	Water, Engineering and Development Centre
WHO	World Health Organization
WSP	Water and Sanitation Program
WSSCC	Water Supply & Sanitation Collaborative Council
WSUP	Water and Sanitation for Urban Poor
WTP	Willingness to Pay
χ^2	Chi Square

Currencies conversion:

1 Ghanaian Cedi (GHS) = 0.51 US Dollar (USD) = 0.33 British Pound (GBP)

1 Ghanaian Pesewa= 0.01 GHS = 0,005 USD = 0.0033 GBP

Currency rate 19th April 2013.

1 Introduction

1.1 Background of the research

Currently 2.6 billion people do not use improved sanitation. The United Nations Millennium Development Goals (MDGs) set a 2015 target of reducing the proportion of people without sustainable access to basic sanitation by 50% (UN 2010). The WHO / UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation estimates that:

- Although 1.3 billion people have gained access to improved sanitation since 1990, the world is likely to miss the MDG sanitation target by a billion people.
- Seven out of ten people without improved sanitation live in rural areas, but the number of people in urban areas without improved sanitation is increasing because of rapid growth in urban populations (WHO & UNICEF 2010).

Urban populations recently surpassed rural population which made us "*Homo sapiens urbanus*" (UN-HABITAT, 2008). The growth of urban population is particularly felt in Africa where the urban population will increase from 294 million to 742 million between 2000 and 2030 (UNFPA, 2007, p. 8). While urbanisation had 'a positive impact both on the economy and on the migrant themselves' (ibid, p12), it also results in the development of low-income and often unplanned settlements, regularly labelled as slums. In sub-Saharan Africa (SSA), the UNFPA report indicates that slum growth and urbanization has become synonymous:

> *72 per cent of the region's urban population lives under slum conditions, compared to 56 per cent in South Asia. The slum population of sub-Saharan Africa almost doubled in 15 years, reaching nearly 200 million in 2005. (ibid p.16)*

Amongst other key services, population in these low-income settlements lack sanitation infrastructure. In growing SSA cities, 43% of population has access to improved facilities and 18% to unimproved one. This means that 40% of the population do not have private facilities and rely on open defecation or on toilets shared by more than one household referred to as shared toilets (WHO & UNICEF, 2012).

The shared toilets are often presented as the only solution in high density and low-income urban areas (Tayler, et al., 2003; Schaub-Jones, 2006; COHRE, et al., 2007; Mara & Alabaster, 2008). Shared toilets are not considered to be improved facilities by the global monitoring programme despite the role they play in many urban areas. This appreciation shared by many academics is justified by the poor hygiene and maintenance observed in these facilities, their security and accessibility for certain groups of dwellers (Cairncross & Valdamis, 2006; Allen, et al., 2008; Schouten & Mathenge, 2010).

> *While the use of shared sanitation does reflect demand, limited data confirm the widely held perception that many of these facilities, especially public ones, fail to ensure hygienic separation of human excreta from human contact. Serious concern has also been expressed about the actual accessibility of such facilities throughout the day and about the security of users, especially at night. Further research on the nature and acceptability of shared facilities is needed. (WHO & UNICEF, 2008, p. 14)*

The shared toilets encompass a range a facilities from a toilet shared amongst tenants to large public toilets shared by transient and residential population. Practitioners and monitoring agencies do not necessarily recognise this diversity of models and diversity of practices. As mentioned in the above quote, it is necessary to understand the acceptability of these types of facilities but it requires a better appreciation of the different forms of shared facilities.

1.2 Research problem

If individual sanitation cannot be in the short term granted to all in low-income and high density urban areas, alternative solutions need to be implemented. Shared sanitation is criticized by many practitioners and seems to be rejected by some academics as a potential solution. But in the reality, a third of the sub Saharan African urban dwellers use them. This disparity between the percentage of people relying on shared toilets and the amount of attention given by many practitioners raised several issues partially ignored in the recent literature.

Most of the existing research failed to investigate and recognize the diversity of existing models of shared sanitation. The critics of mismanagement, hygiene and safety risks, exclusion of vulnerable groups apply to some extents to all type of toilets but are particularly relevant for some types of shared toilets. Existing comparisons of shared toilets often focus on management or technical issues and fail to integrate the perceptions of urban dwellers. It is necessary to know how users compare and value the different model of sanitation they have access to. The investigation of the two previous points should also lead to the assessment of the viability of different model of shared sanitation from both dwellers' and implementers' perspectives.

1.3 Aim and objectives of the research

While the thesis aspires to contribute to the general goal of improving sanitation in low-income and high density urban areas, the specific aim of this research is to: **determine which types of shared facilities are acceptable sanitation solutions for urban dwellers depending on the local circumstances**. Local circumstances include socio-economic parameters, institutional and physical factors, and urban development.

To achieve this aim, the objectives of the research are:
1. Understand the approaches of agencies and individuals who provide, manage, support and regulate shared sanitation;
2. Assess the availability of toilet facilities in low-income urban areas;
3. Consider the major factors of usage and acceptability of shared sanitation expressed by the users;
4. Consider potentially viable forms of shared sanitation;
5. Develop an approach for assessing the dwellers' acceptability of shared toilets.

The thesis is an original contribution to knowledge in several ways. It first provides empirical data on the use and perceptions of shared toilets in urban areas. These data will feed the current debate about post 2015 sanitation's monitoring, particularly concerning the potential inclusion of shared facilities into the improved sanitation category.

Then despite the prevalence of shared toilets in urban Ghana, there have been almost no structured studies covering their management and their use. The research provides a holistic view of the sanitation facilities of an urban area, investigating the

implementation, management, use and perception of all form of shared toilets within a same municipality. This holistic view provides a better understanding of the relations between options given by the providers and choices made by the dwellers.

Finally, the methodology applied is novel, particularly as it draws on both urban development planning, history, and participatory assessment methods.

1.4 Boundaries of the research

The research recognizes the importance of the whole sanitation chain but needs to reduce its scope due to financial and time constraints. Therefore the thesis focuses on the implementation, use and management of the toilet, and not particularly on the transport, treatment and potential reuse of the sludge.

While this research does recognize the importance of appropriate shared sanitation technology, technological issues are not a primary focus. Similarly the research does not have a financial focus, but the literature review several works that have looked in details on the financial challenges of urban sanitation from both funding agencies and local implementers' perspective. However the key findings of this research and the recommendations will be addressed to a large audience including engineers, funding agencies and implementers.

The last boundary of the research is geographical. As explained in the methodology chapter, it is necessary to reduce the geographical scope in order to understand in sufficient details the relation between the context, the different stakeholders and the sanitation infrastructures services. While the literature review includes literature and cases from all developing regions, the findings and discussion chapter focus on low-income urban areas in Ghana. Some generalizations are made to sub-Saharan Africa when appropriate.

1.5 Definition of terms

This research uses some words that are common language but which can have an ambiguous meaning. To avoid misunderstanding, the keywords of this thesis are defined in this section. These definitions do not aim to provide a universal meaning but intend to put the researcher and reader on an equal footing. Definitions are

adapted to the context of this research and are drawn from different literature sources appropriate to the sector. Some of these definitions are further explained in the literature review section.

Developing countries

The United Nations states that they do not have official definition to differentiate between developing and developed countries (UNSD, 2008). This concept is used for convenience and the list of countries included in one or another category varies from one sector to another. Structures, such as the World Bank, use mostly the Gross Domestic Product to build their categories. In this research, the terms developing countries and low-income countries will include most of the sub-Saharan and south-Asian countries. When necessary, clarifications will be made to avoid misunderstanding.

Urban

Definitions of urban spaces often differ from one country to another (Brockerhoff, 2000). Density of population, level of infrastructure and other factors are analysed differently to decide which space is urban, rural or peri-urban. Due to the range of definitions, it is necessary to analyse 'urban' statistics with caution and to look at the national definitions (ibid). The UN statistics are based on data defined and provided by their members (Cohen, 2004). This research can do only same and refers to national definitions and national statistics when needed.

Household – Neighbourhood – City

Definitions of these three terms vary widely from context to context and are analysed differently by authors. This research will use the definition published by IWA sanitation 21:

- 'Household' describes a social group of individuals (families, individuals, small units) who take together investment and behavioural decisions. A household is not a synonym for house. A house could be occupied by many households, and a household may in some cases occupy several houses;
- 'Neighbourhood' describes a continuum of 'areas' within the city that represent a distinguishable entity for their inhabitants;
- The 'city' describes the level at which services are centrally planned and organized, and financial decisions are taken (IWA, 2006).

Low-income urban areas

The research focuses on low-income urban areas. This can obviously include a large range of areas with different characteristics as the notion of urban and low-income is subjective depending on which parameters and thresholds are selected.

> "The terms slums, informal settlements, (…) low-income areas, and peri-urban settlements are more or less interchangeable" (Crow & McPike, 2009, p. 65).

According to the common definition of the UN, a slum is an area that combines to various extents some of the following characteristics (UN-HABITAT, 2008):

- Inadequate access to safe water;
- Inadequate access to sanitation and other infrastructure;
- Poor structural quality of housing;
- Overcrowding;
- Insecure residential status.

This research will mainly use the term low-income settlements as the terms 'slums' or 'squatter settlements' have a negative connotation for the general public (Gilbert, 2007).

Urban poor

Poverty definitions include a lack of income but are also associated with a lack of access to education, health services, basic infrastructure and social representation (UNDP, 2010). Definition of poverty is often a discrete characteristic: "either one is poor or one is not" (Glewwe & Van der Gaag, 1990). It is based on a poverty line drawn depending often on wealth factors. However, there is no agreement on how best to define and measure poverty (Satterthwaite, 2004).It could be done by using essentially income and consumption data as the World Bank does (World Bank, 2011) or by whether a certain number of human needs are met. Poverty can also be better defined by the people instead of being in the hands of outsiders (Masika, et al., 1997; Brockerhoff, 2000, p. 21). Experts do not reach a consensus in defining urban poverty and the definitions of poverty vary from one country to another and from one institution to another.

If low-income and informal settlements are often associated with urban poor it should be stated that the low-income areas are characterized by a high degree of heterogeneity in terms of income, housing and diversity of people (Gilbert, 2007) and,

for instance, urban poor doesn't mean that the population are unemployed or unskilled (UN-HABITAT, 2008).

Sanitation

In its wide meaning, 'environmental sanitation' refers to all activities that influence the physical environment and the related human health; it typically includes faeces management, solid waste, drainage, and vector control (DFID, 1998). This research project focuses on one aspect of 'sanitation' the one that refers to the provision of facilities and services for the safe disposal of human urine and faeces.

Within this focus, different approaches co-exist such as environmental, ecological and right-based sanitation. The 'environmental sanitation' indicates that the reflexion about sanitation is not limited to its health impact but is linked with food handling or environment (Pickford, 1995). Protecting health and environment are the two main objectives of sanitation (Kvarström, et al., 2004).

Toilet

Toilet refers to the technological user's interface of the sanitation system. Latrine is used by some practitioners as a close synonym.

Sanitation facilities

Sanitation facilities refer to the users' interface with the sanitation system. In this thesis, the meaning is not limited to the technological aspect and includes the overall quality of the service (hand washing, access, affordability…)

The Joint Monitoring Programme

The Joint Monitoring Programme (JMP) is an official mechanism of the UN system which monitors global progress towards MDG Target 7. The JMP's reports published every two years by UNICEF and WHO "describes the status and trends with respect to the use of safe drinking-water and basic sanitation, and progress made towards the MDG drinking-water and sanitation target" (WHO & UNICEF, 2010).

Improved sanitation

A sanitation facility is considered improved by the JMP when the facility hygienically separates human excreta from human contact.

<u>Unimproved sanitation</u>

A sanitation facility is considered unimproved by the JMP when the facilities does not ensure hygienic separation of human excreta from human contact

<u>Shared Sanitation</u>

Shared sanitation is a sanitation facility shared by two or more households (Pickford, 1995; WHO & UNICEF, 2010). This includes toilets shared with neighbouring households, community blocks, and public toilets. For the JMP, shared sanitation constitutes a single category and it is not considered as improved sanitation.

<u>Open defecation</u>

Open defecation refers to defecation in open spaces without any storage or treatment. Defecation in plastic bags or in buckets at home (thrown afterwards in the open) is also considered as a form of open defecation.

<u>Providers</u>

In a broader definition used in this thesis, providers refer to any private, public or civil society organization involved in the provision and the management of shared sanitation facilities through their conception, funding, regulation, operation, and maintenance. They include contractors but also private households when they are implementing sanitation for themselves.

<u>Users</u>

User refers to any individual that can potentially use a given facility. This meaning is similar to customer, but customer implies a commercial side not always present in this research. The term 'users', when not specified otherwise includes any urban 'dwellers' that can possibly use shared toilet facilities. It also includes visitors to the settlements.

1.6 Structure of the thesis

This chapter one has introduced key concerns and terms of this research. It has explained the importance of shared sanitation for dwellers in low-income urban areas. Chapter two details, through a review of different sets of literature, the challenges related to shared urban sanitation in low-income and high density areas. It presents

the different debates related to users' perception, consumer voice and acceptability of toilet facilities.

Chapter three reviews existing conceptual framework and details the research framework supporting the research objectives.

Chapter four summarizes the ethical, practical and theoretical considerations that led to the choice of research design. It also justifies the selection of the fieldwork and different collection and analysis methods. The field work which took place in Ashaiman, Ghana, entailed a survey of 432 housing units in four low-income areas, covering 2914 households. Sanitation surveys were done for 18 shared toilets used by the residents. 16 participatory groups of 110 dwellers did a mapping of their daily sanitation usages and scored the type of facilities they used. Semi-structured interviews with 27 individuals and 11 sanitation stakeholders offered a clearer picture on the evolution of the sanitation facilities in Ashaiman.

Chapter five describes the study area at three different and interrelated levels. The macro-level focuses on the description of Greater Accra, the meso-level describes Ashaiman and the micro-level provides information on the four selected neighbourhoods.

Chapter six is divided into five data sets that present the results from the fieldwork which took place in 2011. The chapter six describes the range and interests of providers and stakeholders, the characteristics of the house toilets and shared toilets. The chapter finally details the dwellers practices and their determinants to select toilet facilities.

Chapter seven triangulates and discusses the findings, presents three scenarios of changes that may lead to sanitation improvement. It finally suggests an approach to better assess the relations between dwellers, providers, other stakeholders and to improve sanitation infrastructures and services.

Chapter eight concludes the thesis through answering the five research objectives and stating four key findings. The last part of the conclusion suggests recommendations and areas for future research. It concludes by a more personal appreciation of the research exposing some elements of reflection for the future of urban sanitation.

The structure of the thesis is summarized in the figure 1-1.
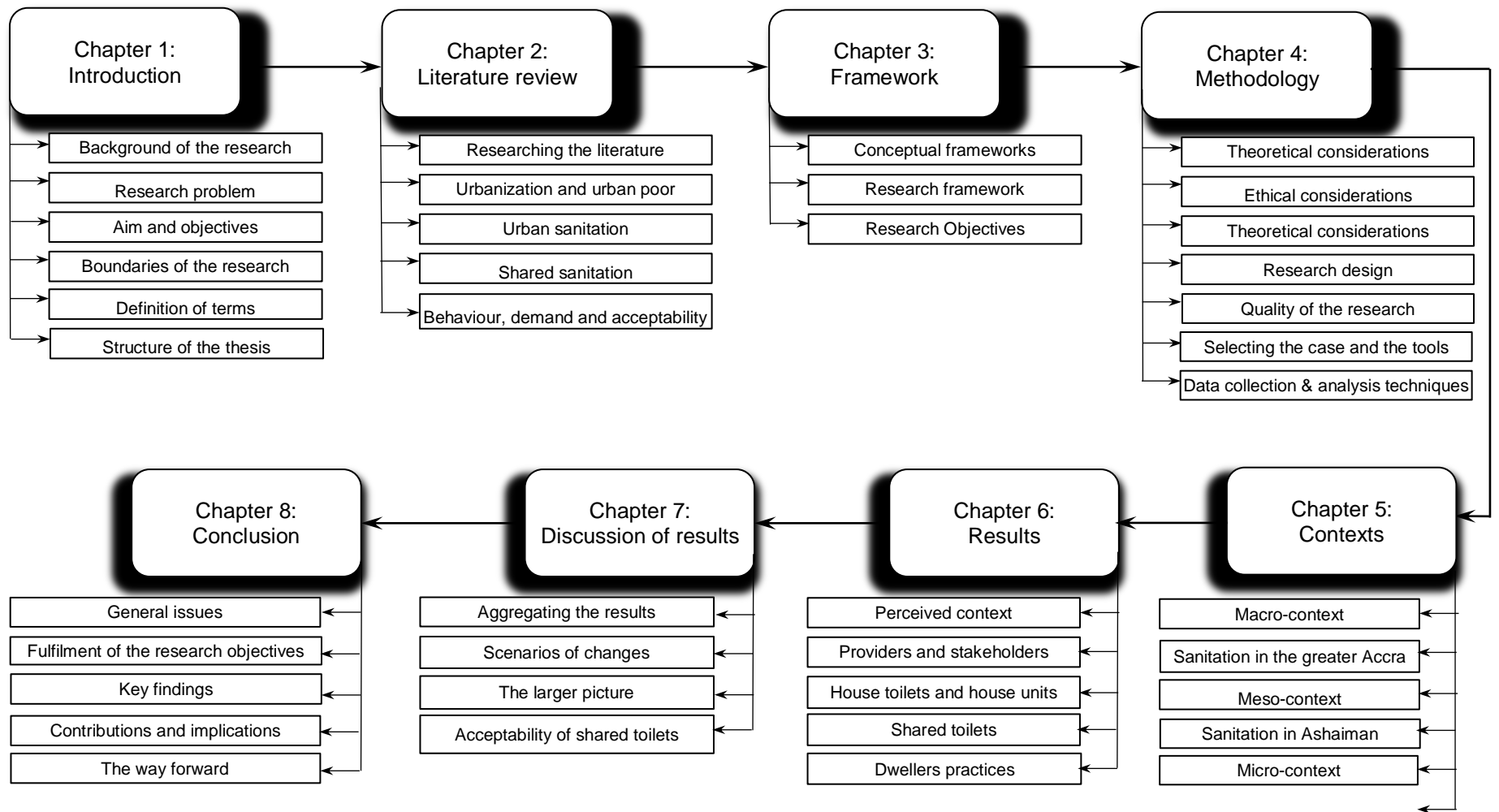
Figure 1-1 Structure of the thesis

2 Literature Review

2.1 Chapter outline

The literature review chapter aims to set the research in the context of available knowledge. It identifies the evolution of thoughts and research in the sectors of interest and points out the knowledge gaps that this research can tackle. To do so, this chapter is organized into five sections:

2.2 Researching the literature. This section details the aim of the literature review and specifies how the literature search is carried out. It identifies the key areas of interest to this research and sets the boundaries of the literature investigated. It finally shows how the information is organized.

2.3 Urbanization and urban poor. This section analyses the latest trend of urbanization in developing countries and lists some of the current challenges related to the development, often badly planned, of the poorest low-income areas.

2.4 Urban sanitation. This section, based on the latest statistics, explains the nature of the so-called sanitation crisis. It justifies the need for investigating urban sanitation by detailing some of the latest research in the sector and the unanswered questions. It gives a special focus on the difficulty of both providing sanitation facilities and monitoring the sanitation coverage and access in urban areas.

2.5 Shared sanitation. This section details the different ways in which toilets are shared focusing on urban areas in developing countries. It explains the difficulty of monitoring and appreciating the quality and the impact of the different forms of urban shared facilities. It finally attempts to provide a typology of the existing models and describes the providers of such services

2.6 Understanding behaviour, demand and acceptability. This section reviews some of the key literature in the sectors of behaviour and sanitation. It first reminds why the voices of the users need to be heard and summarizes the challenges to overcome the lack of information and communication. It then summarizes some of the framework existing to assess sanitation behaviour and demand. Finally, based on literature from other sectors, it explores wider concepts such as acceptability.

2.7 Summary. The latest section gives a summary of the knowns and unknowns in the sector of urban shared sanitation and their relations with dwellers. It identifies clear gaps that this research aims to answer, at least to some extent.

2.2 Researching the literature

Purpose of the literature review

The literature review provides background information about the topic. This information means both the understanding associated with the topic in the past and in the present and the way that data are investigated and analysed by professionals (Hart C. , 1998). This background information and its analysis allow the researcher to:

- Locate the research in an academic and professional context.
- Provide general information on the topic and on the geographical focus
- Identify methodologies used in similar research.
- Show the level of knowledge developed in the sector.
- Identify existing gaps and uncertainties in the literature.

Methodology

The topic investigated is at the intersection of several areas: sanitation, urban areas, and users' perspectives. The literature search favoured any documents that linked some of the research components previously listed. Two metabases were used to collect the first set of documentation: '*ScienceDirect*' and '*CSA* illumina'. In the case of '*CSA illumina*' both social sciences and technology database sets were searched. The sets of keywords used in different combinations in the cited metabases were:

- **Sanitation set:** toilet, latrine, sanitation, shar*, pit, sewerage, ecosan.
- **Urban context set:** slum, urban, city, town, settlement, shanty, *favelas*, *bidonville*, shacks, informal, illegal, low-income,, middle-income, neighbourhood, household, community.
- **Socio-cultural dimension set:** socio, cultural, gender, religion, caste, usage, use, acceptance, preference, view, acceptability, behaviour, perception, demand.

The review focusing only on shared sanitation and users' acceptance and satisfaction was scarce. It was then necessary to go beyond the central topic and explore the three sets of keywords detailed above. Facing the amount of data, only the documents

matching a minimum of two sets of keywords were kept. This corresponds to the darker area in figure 2-1. Therefore documents focusing only on technology of pit latrines or studies focusing on urban agriculture were discarded after reading of the abstract.
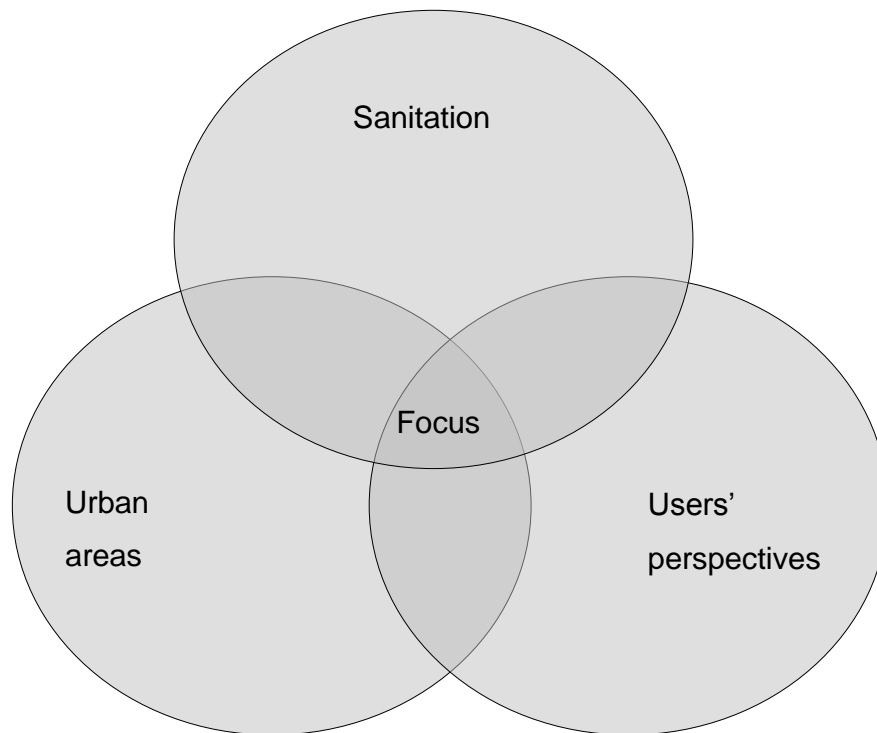
Figure 2-1 Interconnection of the three reviewed sets of information

Complementary searches were done through '*Google Scholar*' using both French and English languages. A snowball effect was also applied to the list of references of all documents selected. To find more recent information, databases and websites of some relevant organizations involved in urban sanitation and urban research were also a direct source. These organizations are BPD, IDS, GTZ, IRC, PS-EAU, SANDEC, SEI, SuSana, WEDC, WHO, WSUP, and World Bank. Publications processed through this media are produced faster than journal articles and can link research areas to the current field context. On the other hand accuracy and reliability of these documents need to be questioned as they are not peer-reviewed by external sources and can, in some cases, be oriented to support organizations' decisions.

Two other parallel literature reviews were carried on during this research, one focusing on methodology (section 4) and one focusing on the geographical scope of

the research: Ghana (section 5.2). In total more than a thousand books, journal articles and papers have been consulted. Approximately 400 are directly referred to in this research.

<u>Analysing and presenting the information</u>

To facilitate the reading of the review, the literature is presented in a linear way, as shown in the figure 2-2, going from the general topic of urbanization to the more specific area of urban shared sanitation. Socio-cultural aspects are then introduced and link to the sanitation issues via the different ideas of demand and acceptability.

Urbanization and urban poor		
Description and trends	Low-income areas	Services & infrastrucures

Urban sanitation			
Barriers	Providing	Accessing	Measuring

Shared sanitation			
Definition & trend	Current debates	Typology	Providers

Behaviour, Demand and acceptability		
Users' voices	Assessing user's views	Assessing acceptabillity

Key findings and identified gaps
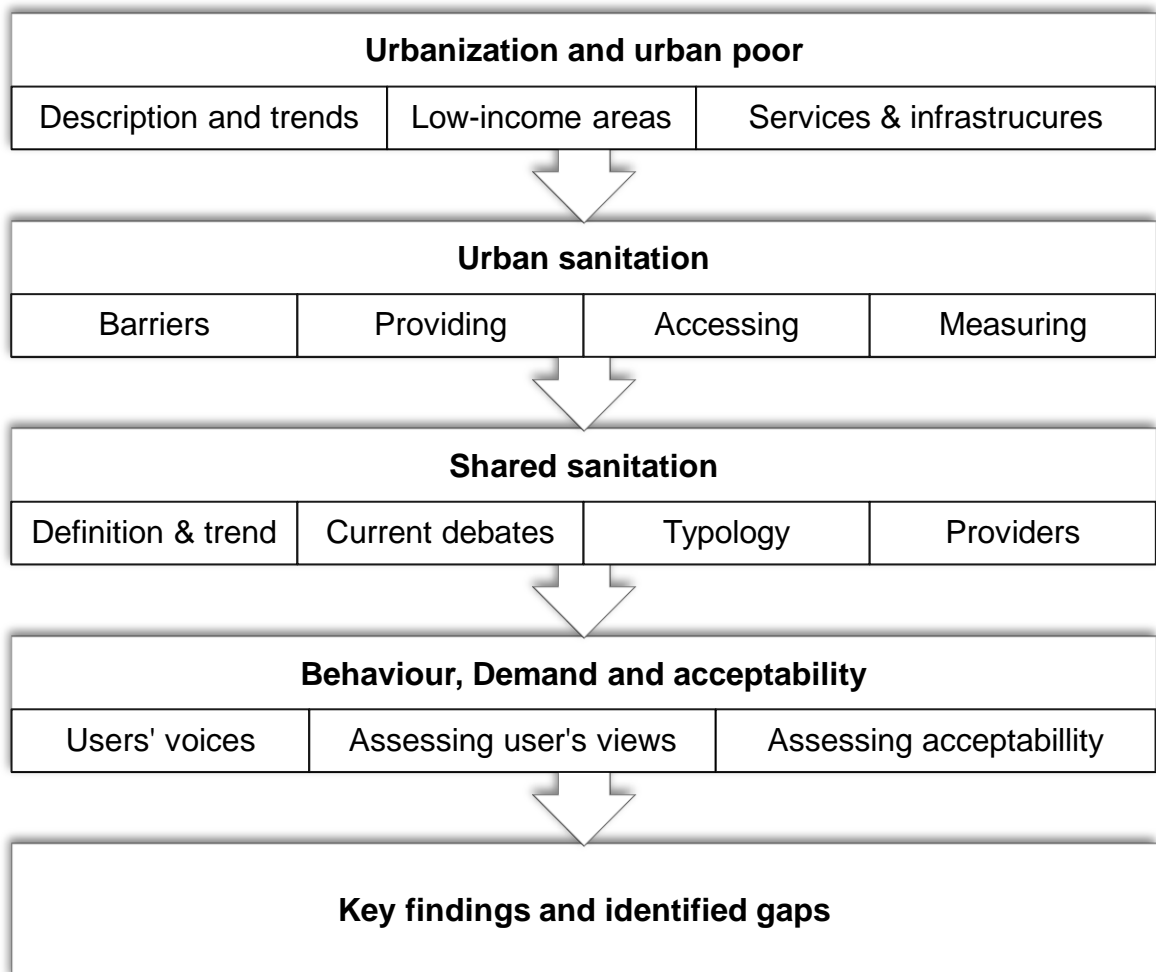
Figure 2-2 Structure of literature review

The literature review was initially carried out during the first stages of the research, but the review was regularly revised and enriched during the different stages of the research (Meth & Williams, 2006, p. 218).

2.3 Urbanization and urban poor

2.3.1 Trends in urbanization

Urban populations recently surpassed rural populations which made us "*Homo sapiens urbanus*" (UN-HABITAT, 2008). Data and predictions from UN agencies, shown in the Figure 2-3, also announced a decrease of rural population in less developed regions and a constant increase of the urban one in those countries.
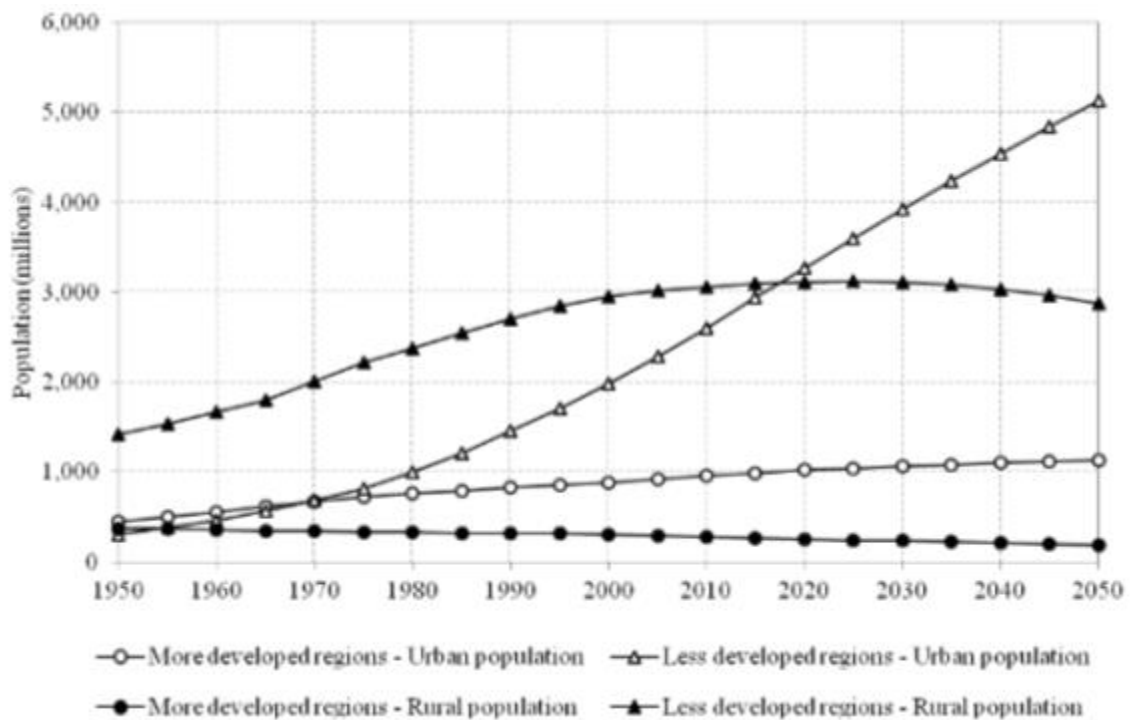
Figure 2-3 World Urbanization Prospect (UNDESA, 2012)

This growth of urban population is explained by the natural increase of the population, the rural-urban migration and the annexation process (Cohen, 2004). Annexation is a process where growing cities seize villages which become urban areas; their population is then counted as urban by the new censuses (Satterthwaite, 2005). The rural-urban migrations are explained by push and pull factors. The push factors correspond to the deterioration of living conditions in rural areas often caused by an overexploitation of land and a decrease of soil fertility. The pull factors correspond to the perceived advantages of the city where there are more job opportunities, often supported by an informal economy and a comparatively better health situation (Satterthwaite, 2005; Vestbro, 2011).

While the urbanization trend should certainly be used with caution (Cohen, 2004), the amplitude of the urbanization curve is significant enough to understand that many of the challenges related to development and poverty reduction are actually changing. The urban areas and the urban poverty have for many years been ignored or underestimated by donors and aid agencies (Satterthwaite, 2003b, p. 19).

After 1950, most of the newly independent countries saw a significant increase of the urban areas and of the urban population. The technical and political structures were not able to absorb, accommodate and control the growing population and their activities. Urbanization in developing countries brings political, economic, technical, environmental and social challenges.

The lack of urban planning, development of infrastructures and public services, still observed today, is often related to the absence of effective governance (Satterthwaite, 2005). Many researchers have used the lack of governance to explain the difficult management of many cities in the developing World. The governance difficulties have more incidences in urban areas than in the rural ones (Brockerhoff, 2000, p. 35). The quality of the governance determines whether the city makes an advantage of having a concentration of population or if it turns into a disadvantage (Hardoy, et al., 1992, p. 16). The combined urban population growth and the lack of governance and economic resources have contributed to the development of urban poverty and the multiplication of low-income urban areas (Vestbro, 2011).

2.3.2 Development of low-income areas

Those low-income areas are often labelled as slums, see the note on terminology. This categorisation is supported by criteria that are mostly technical (water and sanitation infrastructure, land tenure, density of population, and housing).
The recent statistics underline a decrease of the percentage but a significant increase of the absolute number of the population living in such areas. The absolute number of slum dwellers was estimated to be over 800 million in developing countries in 2010 (UN-HABITAT, 2008), with a quarter of them living in Sub-Saharan Africa (SSA). More than 60% of the urban population in SSA lives in slums, and more than 40% of the urban population in Southern Asia.

The definition of a slum given by the United Nations focuses mainly on the lack of built and functional infrastructures. However the quality of the political power and its representation (McFarlane, 2008a), and the health effects of the urbanization including stress (McGranahan, et al., 2001; Montgomery M. , 2009) play an important role in the daily burden of the slum dwellers. While the whole city produces wastes and pollution, the poorer groups bear most of the ill-health and other costs of environmental problems (Hardoy, et al., 1992, p. 100). The poor are both more exposed to environmental risk and have less access to public services.

Devas (2011) detailed in six points why local governments are often not able to provide services to the urban poor:

1. Poor may be excluded from official city boundaries;
2. Local government may not be responsible for all services (land, waste collection…);
3. Some legal restrictions limiting interventions from the local government;
4. The local government lack information on its population size, characteristics and needs;
5. There is a lack of skilled staff;
6. There is a lack of financial resources combined with bad management and corruption (Devas, 2001, p. 398).

Taking the case of sanitation programmes they have not benefited the poorest but rather the better-off populations that have the capacities to capture the subsidies (Mara, et al., 2010, p. 3).

Low-income areas are often characterized by a high density of population. High density may facilitate the provision of infrastructure and service to a larger population and decrease the cost per inhabitant of an infrastructure. But high density reinforces technical challenges particularly when it comes to sanitation. Overall very high density settlements in low-income countries experience poor health conditions. But it is difficult to determine what is caused by poverty and what is caused by density as the highest density areas are often occupied by the poorest (Acioly & Davidson, 1996, p. 9).

2.3.3 Spatial and social role of the low-income areas

Because the poorest cannot afford the choice, they "do not consider a minimum requirement to move in" (Bolay, 2006, p. 286). The dwellers suffer from the lack of infrastructure and services engendering environmental degradation and health related risks. Many consider that low-income areas are located on the peripheries of the urban centres. Influenced by historical, political and social factors, the developments of towns are context specific, "urban changes are shaped by local factors" (Satterthwaite, 2005, p. 17). Low-income settlements, symbolize this complexity. They are often not a homogeneous area lying on the side of the business and middle income housing areas. They are made of several clusters or pockets occupying unwanted empty spaces in the city (Dwyer, 1975, p. 30; Barros & Sobreira, 2002). The so called low-income areas are not only inhabited by the poorest and are sometimes characterized by a high degree of socio-economic heterogeneity (Gilbert, 2007).

Politicians and planners may also consider the social roles played by the low-income areas. Often perceived as unstable pockets within the city, the low-income areas are necessary for the structural stability of the global system (Barros & Sobreira, 2002, p. 9). The poorest urban dwellers are also key economic players of urban centres. They have been building housing, investing a lot in the land compared to the government, and participate actively into the informal economy which makes their contribution to the gross national income largely underestimated (Satterthwaite, 2003b, p. 7). Some authors support also the view that urban slums are under constant transformation creating opportunities for their inhabitants (Owusu, et al., 2008).

2.3.4 Services and infrastructure challenges

Evaluating infrastructure through quantitative criteria is often used to describe the urban development. It is more easily measured than social or institutional development and communicated better to a large public. There are of course links that exist between infrastructures and health outcomes (Butala, et al., 2010). However measuring infrastructure, and for example the provision of water or power cannot be limited to the inventory of pipe units or kilometres of electric cable. Quality of the supply, such as the continuity of the service day and night, individual or collective, the quality of the water supplied and the quality of the final treatment of the sewage also matter (Briceño-Garmendia, et al., 2004).

The cost of the services is also a key issue in the urban environment as significant disparities are observed within a single town. The poor are poor because they are often excluded from infrastructure services, living far from school, health services and working areas. Access to such services always requires an extra cost for the poorest (Bolay, 2006, p. 287). In many African municipalities, water utilities do not provide water directly to the poorest as they often live in area not served by the mains. The dwellers are still supplied by the water from the utility but through several intermediaries which increase the cost of the water (Collignon & Vézina, 2000) and also the burden and the time to get it. The wealthiest dwellers are more likely to access piped water or benefit from door to door waste collection (McGranahan, et al., 2001, p. 76; WHO & UNICEF, 2012).

There are serious disparities within a city, between cities and between sub-regions concerning the quantity and the quality of infrastructure. In Africa more than anywhere else, the levels of infrastructure and services are often not matching the rapid urbanization (Foster & Briceño-Garmendia, 2010); and sanitation is probably the most obvious example of this disparity.

2.4 Urban sanitation

Figures in all global recent monitoring reports clearly show that there are at least three times more rural populations without improved sanitation than urban populations. But the same figures show that the proportion of unserved population is decreasing in rural areas while increasing in urban areas (absolute numbers). Both the absolute population and the relative population without sanitation are increasing in urban areas (Black & Fawcett, 2008, p. 43; WHO & UNICEF, 2012). This sanitation crisis has consequences on the health, income and well-being of billions of urban dwellers. The sanitation crisis has consequences beyond the individual. Poor sanitation is also a political burden that costs 1.6% of the national gross domestic product (GDP) of Ghana (WSP, 2012). This loss of GDP is typically made up of lost time to find toilets, premature death, productivity loss due to sickness from sanitation-related diseases and money spent on health care. Other costs can be added such as epidemic outbreak costs, tourism losses and water pollution costs (ibid). Sanitation has an impact on the eight Millennium Development Goals, not only on MDG 7 that concerns

the environmental sustainability. Sanitation impacts for instance child mortality, education, nutrition… (Mehta & Knapp, 2004).

2.4.1 Barriers to urban sanitation

Simpson-Hébert and Wood (1998) acknowledge that after forty years the barriers to the development of sanitation infrastructure remain the same. The following factors are commonly mentioned to explain the existing situation (Wright, 1997; Simpson-Hébert & Wood, 1998; Schouw & Tjell, 2003; Evans, 2005):

- Lack of political will
- Poor institutional framework and policies
- Economic and political priorities are given to the water infrastructure
- The non-recognition of all stakeholders
- Neglect of consumers preference
- Lack of space and land tenure
- Consideration of appropriate technologies
- Inappropriate approaches.

Those factors are intensified in the urban context (SuSanA, 2008) due to the greater fragmentation of the responsibilities, the specificities of the social structures, and the technical specificities such as lack of space and land tenure.

<u>Lack of political will</u>

In informal and low-income settlements, most of the sanitation initiatives do not fit into global planning but are often the results of individual initiatives (Jenkins & Sugden, 2006). The notion of urban planning itself is blurred (Rakodi, 2005). Some argues that this absence of sanitation and urban planning is the consequence of a political drive to maintain these areas as less attractive to slow down urban migration, even if this strategy has proven to be ineffective (McGranahan, 2007). Low-income settlements are likely to expand and any infrastructure plan should integrate these areas (Evans, 2007, p. 3). The politicians may now be aware of how to deal with some of the sanitation issues but unwilling to do so as it may mean the restructuring of some organizations leading to high political costs (ibid).

There is in many countries a difference between an official national discourse and the reality in the field. It seems that sanitation is less of a political taboo and several

countries have issued national policies but their implementation on the ground is questioned:

> *"National sanitation policies and most countries have an accepted definition of sanitation and a hygiene promotion program. But only seven countries have policies that include cost recovery, and only eight have a sanitation fund or a dedicated budget line" (Foster & Briceño-Garmendia, 2010, p. 329).*

Poor institutional framework and policies

Lack of political will is only one challenge at the government level. The financial and human resources of the different political bodies are also essential. Konteh (2009) also draws attention to the disparities between the size of the problem and the capacities of the government, the lack of "democratic structures" and the low quality and availability of data.

Governance was pointed out as a key explanation in the lack of infrastructure provision in growing cities. The same factor is pointed out by the literature to explain part of the sanitation crisis in urban areas. For example, Chaplin attributes environmental problems in urban India to

> *"The failure of the states to implement schemes that provide adequate and equitable access to sanitation and other basic urban services" (Chaplin, 2011).*

Technology options exist for most of the situation and some authors argue that money and funds are available for those who are well skilled to get it. The core issue seems then to be political. Mara describes three political reasons to explain why some countries have not experienced any progress:

- Senior politicians are not motivated to invest in actions ensuring a cleaner environment;
- Local engineers lack skills, and are paid too little to be motivated to initiate changes;
- The high level of corruption, particularly in the water sector (Mara D. , 2012, p. 91).

Priorities are given to water infrastructure

> *"In urban areas, sanitation is a much more difficult problem than water supply."* (Nordberg & Winblad, 1994)

> *"Sanitation remains the poor cousin in the water and sanitation facilities."* (Evans, 2007, p. 4)

There is seventeen years between those two statements; it remains that water supply is both a sexier and more lucrative activity than sanitation (Black & Fawcett, 2008, p. 8). Municipal water utilities, sometimes closely linked with the political authorities are often reticent to be involved in the costly and complex activity of providing sanitation (Collignon & Vézina, 2000). It is also more difficult to make customers paying for sanitation services than for water supply. According to a recent study of Africa's infrastructure, utilities providing both water supply and wastewater services are not transparent with their investments and are not likely to favour sanitation infrastructure (Foster & Briceño-Garmendia, 2010, p. 334).

The non-recognition of all stakeholders

The elements cited before confirm that sanitation at household level has rarely been the direct concern of the local government. Therefore several alternative stakeholders have developed. As an example, in illegal settlements of Zimbabwe, South Africa or Zambia sanitation services are only provided by Non-Governmental Organizations (NGOs) (Mulenga, et al., 2004). Apart from NGOs, private and informal entrepreneurs are responsible for most of the sanitation activities in many cities (Sansom, 2006; Schaub-Jones, 2010).

These small scale providers have the best understanding of the needs of the populations and the different constraints. Therefore governments should concentrate their funds on supporting such stakeholders to deal with the household level while they can finance larger infrastructure such as treatment plants (Evans, 2005). Similarly, Eales thinks that the support of small scale providers is more important than governance issues (2008, p. 10).

Neglect of consumers' preferences

The change in sanitation observed in England in the second half of the nineteen century was the result of engineering progress, local government involvement, implementation of housing and health policies and their enforcement (Fisher, et al., 2006). But such changes have been possible because of the emergence of a middle

class that succeeded in becoming involved in the local politics. This middle class was seen as a threat from below: a threat for the upper class due to the possible diseases they carried and due to their capacity to generate social revolutions. Such mobilization and threat from below do not seem possible in India for example as the middle class are not that organized, which reduces the pressure on the government (Chaplin, 1999). Organization of the dwellers seems to remain difficult more than a decade later in most of places. Population adapt to their sanitation burden and sometimes accept it without lobbying their governments (Konteh, 2009, p. 74). Government and many providers fail to ask, hear and understand the consumers' preferences. Some examples of successful community led projects in the water and sanitation sector blur the reality (Evans, 2007, p. 25). Evans (ibid) notes that:

"Interestingly it often seems easier to organize against change than for it."

<u>Lack of space and land tenure</u>

Some physical and planning-related aspects are particular to urban areas and often reduce the number of feasible technical options. The high density of some areas, size of the streets and their irregular patterns and the multi-storeys houses challenge some of the classical and appropriate technology (SuSanA, 2008). As observed in Uganda by Letema et al., (2010, p. 156):

"Sanitation is spatially defined by the nature of urban development."

The density of the population, the rapid turnover of tenants, the land tenure, the relations between landlords and tenants can stop any initiatives before even considering the technology challenges (Wegelin-Schurinda & Kodo, 1997; SuSanA, 2008; Mels, et al., 2009; Scott, 2011). A recent research in Dakar highlights that the household with the lowest levels of tenure security were the most unlikely to invest in sanitation facilities (Scott, et al., 2013, p. 62). A comparative study of neighbourhoods in some West African towns shows that water and sanitation management is more difficult and the nuisances more strongly felt by the population in the most densely populated compound houses and neighbourhoods (Morel à l'Huissier, 2003, p. 162). The relations between landlords and tenants to construct and manage toilets are discussed in greater details in the section 2.5.6.

Consideration of appropriate technologies

During the last decade many publications have summarized the potential technical solutions for urban sanitation. The *sanitation compendium* includes technical description of solutions both in rural and urban areas (Tilley, et al., 2008), the *SuSanA* website offers many case studies often applying ecological sanitation in different contexts. Different tools exist to support sanitation technology based on the physical and local challenges (Loetscher & Keller, 2002; Mels, et al., 2009).

Large sewerage systems usually served the richest part of the town and are in many cases underused (Kebbede, 2004; Oosterveer & Spaargaren, 2010). The water scarcity and quality of the supply, as well as some environmental considerations question the applicability of such systems in low-income areas. Low-cost sewers are developed in certain parts of South America (Mara & Alabaster, 2008) but their development in other sub-regions such as SSA are questioned, mostly when targeting the poorest (Norman, 2009). According to a review of 22 evaluations of sewerage in Africa, most of the sewers were properly built but underused due mostly to the high connection costs. Very few poor households were then served by sewers (Norman & Pedley, 2011, p. 14).

Given the lack of constant water supply, water scarcity, financial funds, and local expertise, on-site sanitation which has already served most of the population in developing countries will remain the main technology (Koné, et al., 2007; SuSanA, 2008). This on-site technology usually requires less initial investment (Cotton, et al., 1995) but the emptying of the sludge is often problematic for urban households (Koné, et al., 2007) and density of the built environment is an important limit.

Some technical solutions seem to exist for most urban situations but they need to be applied after careful appraisal of the local context. The Orangi Pilot Project (OPP), Karachi (Pakistan) is a good example of the importance of the local context and of how the different perspectives need to be included. The OPP, often presented as a sanitation success story, has in a decade provided close to 90 000 houses with toilets in a decade in low-income areas. The key elements of success were the development of low-cost technologies, health education, motivation campaigns, the elimination of some contractors and the use of local knowledge and manpower to reduce the cost and increase the responsibility of the communities (Hansen & Bhatia, 2004, p. 36).

However there are clear limitations to replication of such a model. The success of OPP was possible because amongst other factors there was a strong community spirit, the existence of strong leaders and specific topographic conditions (Zaidi, 2001). Replication of the OPP has failed in the past because the new project did not integrate the particularities of the local context. The OPP is not 'the' ideal technical solution; it was the appropriate solution in a particular context.

Inappropriate approaches

Many historical parallels have been drawn between urban planning in developing countries and in more developed countries. Sanitation is often taken as an example when looking at the evolution of services in London during the three last centuries. If some similarities are clearly identified, such as the density of population, lack of water and sanitation infrastructures and social inequalities (Fisher, et al., 2006; Konteh, 2009), differences such as lack of technological and financial resources as well as institutional capacities are also specified (Konteh, 2009).

Because the contexts are different, it is now clearly established that a sanitation development model from the North cannot be simply copied to the South (Satterthwaite, 2003a; Evans, 2005; Konteh, 2009). Such transfer was the rule during the colonial period (McFarlane, 2008a), and it had often led to the increase of social disparities and the emergence of new technical issues (Crow, 2007). Therefore, new models need to be developed based on consultation with stakeholders (Konteh, 2009), responsibilities of politicians (Evans, 2005; Fisher, et al., 2006), and respect for the social and technical specificities of the area (Crow, 2007).

2.4.2 Providing urban sanitation

This section describes the diversity of stakeholders involved in the field of urban sanitation. It also summarizes some of the attempts made to capture the connections between these stakeholders and concludes with a short presentation of the existing sanitation framework.

Implementation model of sanitation

Before technological issues, institutional setting is the first concern when considering urban sanitation (Tayler, 2008). Looking at the involvement of stakeholders in the

implementation of sanitation facilities, Schubeler (1995) identifies three modes of development:

- A **conventional model** where initiatives and funds are driven by central and local government or private companies. This pattern is then characterized as a supply-driven (Tayler, Parkinson, & Colin, 2003) and top-down approach.
- An **informal model** where decisions are first taken by users or local informal business, often described as alternative providers (Solo, 1999; Schaub-Jones, 2010).
- A **low-cost model** where initiatives are taken by NGOs together with a local participation.

Those three models provide different technical answers but also different financial and management patterns. However this classification tends to be too simple as it becomes difficult to categorize stakeholders and their relation in a single box. The coming section details the number of stakeholders involved in sanitation development, management and funding. Relationships that exist between those stakeholders, from toilet implementation to treatment of final sludge, go beyond the three models described above.

<u>Diversity of stakeholders</u>

Sanitation services are characterized by both a large range of stakeholders involved and by a poor understanding of the responsibilities of each actor which result to a deficient coordination of the whole sector (Mulenga, et al., 2004; Konradsen, et al., 2010). The growing decentralisation movement in Africa for instance increases the numbers of actors, private, public and informal, involved in the sanitation services (Foster & Briceño-Garmendia, 2010).

Schaub-Jones et al. (2006) interestingly note that this fragmentation of is also seen at household level where women are often more concerned by the maintenance and men by the construction. It is then not surprising that at town scale, sanitation is often managed by a large range of groups both formal and informal. Looking at official bodies in Maputo, seven departments share the management and the responsibilities of the sanitation chains (ibid). To cope with the sometimes necessary overlapping, the authors have highlighted the need of coordination and collaboration, moving from finding the appropriate leader to funding the appropriate intermediaries (ibid). This can also be done through the development of sector-wide approaches (DANIDA, 2010).

Such wishes need to be supported by national policy and political will (Konradsen, et al., 2010) which is again lacking in many situations.

<u>Stakeholders dynamics</u>

Instead of looking at the nature of the stakeholder who takes the initiative, it is possible to look at the dynamics that exist between these different actors. Without focusing only on sanitation, three models of infrastructure and environment improvement can be identified: (McGranahan, et al., 2001):

- The **planning model** described as a top-down approach has received much criticism. This model focuses on technical approach and represents a huge financial investment without considering the future cost recovering and the consumer preferences (Wright, 1997). It does not consider specificities of the low-income countries such as the heterogeneity of the urban area (Satterthwaite, 2003a).
- The **market model** places the sanitation users in a position of consumers which is supposed to stimulate and also regulate the sanitation market, encouraging the development of sanitation providers (public, private, partnership or informal).
- The **local collective action model** described as a bottom-up approach is characterized by the involvement of dwellers often gathered in grass-root organizations (McGranahan, et al., 2001).

Tayler et al (2003) state the weaknesses and the strengths of each model as shown in table 2-1.

	Strengths	Weaknesses
Planning model	• Specialist's knowledge	• Low consideration of the user's needs
Market model	• Follows the users' choice • Gives a realistic price of the service • Open both to public and private	• Low consideration of the wide context of sanitation such as the wastewater or sludge management.
Local collective action model	• Users' initiative • Better adaptation to informal areas	• Lack of specialist knowledge • Based on strong community organization

Table 2-1 Description of implementation model (adapted from Tayler et al 2003)

None of these models applied alone can "tackle all aspects of sanitation approach" (ibid, p. 9). Therefore authors insist on the need to go again beyond these models.

Sanitation frameworks

During the last decades, organizations and researchers have worked on new approaches offering guidance for the implementation of sanitation projects. Those frameworks recognize the need for a sanitation planning that includes the large range of stakeholders and the different dimensions of sanitation activities: socio-economic, technical, economic, environmental and institutional. However the weight given to these different dimensions, the participation involvement and the decision making process gives several frameworks:

- **The strategic sanitation approach** "focuses on incentives, demand responsiveness, unbundling of service delivery, and availability of choice between a range of technical, financial, and management options" with the final objective being the improvement of the delivery of urban services. (Peal, et al., 2010).

- **The Sanitation 21** Framework focuses on urban sanitation planning and favours coordination between institutional and technical components (ibid).

- **The Household-Centred Environmental Sanitation** is an approach where the "individuals, households and communities are at the centre of the planning, decision-making and implementation" (ibid).

- Some other frameworks are drawn more specifically for hygiene promotion and hand washing (ibid).

Most of those frameworks have been recently conceived or implemented. They are further discussed in the framework chapter. Debates and evaluations about their strengths and relevancy are on-going. Most of them today remain theoretical, they are not necessarily implemented and often serve to build new frameworks. However, they all underline the need to see sanitation implementation using both a horizontal approach (including stakeholders at the different city level) and a vertical approach. Most of sanitation projects now include the notion of a vertical approach through the integration of the sanitation value chain. This includes the different components of sanitation from the toilet implementation to the final treatment or reuse, as illustrated below in the Figure 2-4.
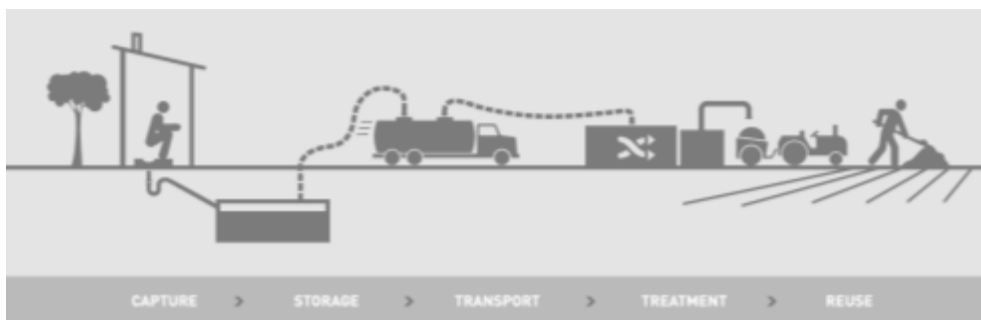
Figure 2-4 Sanitation value chain (Shah, 2011)

> **Note to the reader:**
>
> *At this point of the document, the researcher will focus on the first part of the sanitation chain. It is clear for the author that sanitation needs to be considered from the initial user to the final point of treatment or reuse, nevertheless this thesis needs to keep a focus. Therefore the word sanitation will mostly qualify the interface with the users: the toilet and the services associated, such as the cleaning and hand washing. The thesis focuses on the implementation, use and management issues of the toilet, and not particularly on the transport, treatment and potential reuse of the human excreta.*

2.4.3 Accessing sanitation

There is a growing gap between perception from some providers and stakeholders, mostly the government and the city's dwellers. Some politicians still consider sewers as key elements of the town's modernity but the population just wants to dispose their sanitation waste and often have to do so through self-building (Tuy, 2005, p. 19).

Self-building of toilets

The most direct solution for dwellers to access sanitation is to build and use their own facilities. Despite the different programmes managed by NGOs or governments, most of households' sanitation in Africa is the result of private initiatives (Collignon & Vézina, 2000; Jenkins & Sugden, 2006; Sansom, 2006) often supported by a very large and diverse network of small private providers (Schaub-Jones, 2010). Although the United Nations and other humanitarian or philanthropic organizations argue for the different health and economic impacts of sanitation, individuals see sanitation as a priority only when they have gained access to food and shelter (Chaplin, 1999). Even

when there is intention to build a toilet, the physical conditions of the settlement and the financial resources of the household may limit private initiatives.

To overcome such barriers, a community may decide to work together (physically, financially) to build an individual sanitation system with a common sewage system such as the Orangi Pilot Project or may work in common to build and operate a community toilet block (Hansen & Bhatia, 2004; Trecco, 2007). In high density areas, the providers could focus on groups of households rather than on individual household (Mara & Alabaster, 2008). The financial aspect is the main argument. It will be easier for groups of households to pay the connection for a common stand pipe and for a community to build a shared sanitation system. From this common infrastructure, households can in the future move to a more individual system.

It is finally noted that decisions of implementing a toilet may not be always in the hands of the community or neighbourhood but in the landlords' control (Eales & Schaub-Jones, 2005; Rheingans, et al., 2009; Scott , 2011).

Limited access

The previous section has described the level of intervention, when an individual or a social group initiates a sanitation project (finance, construction; management, maintenance). The level of access refers to the daily use of the facility. Daily cost of a facility, social pressure, physical barriers (steps, muddy streets …) may for instance limit access to community toilet blocks (Allély, et al., 2002; Evans, 2007). When a toilet exists, its access may not be granted to all.

2.4.4 Measuring urban sanitation

Measurements of the Millennium Development Goals progress present technical issues. As they are done by average, it is for instance difficult to picture regional variations and variations between socio-economic groups or by gender (Allouche & Mehta, 2010). Another point is that these statistics are managed at a national level. Resources involved, methods and definitions of concepts used for collecting the data will differ from a country to another. This process limits for instance the relevance of country comparisons.

<u>Improved, adequate, appropriate?</u>

Many debates around the monitoring of sanitation question the notion of 'improved'. The first point concerns the definition used to characterize sanitation. Different studies in East Africa highlight this difference between the 'improved' sanitation data used by JMP and the 'adequate' sanitation data used for instance by UN-Habitat (van der Hoek, et al., 2010). The differences in the terms used and in their associated meanings can have dramatic consequences according to Hansen & Bhatia (2004, p. 26) for the figures:

> *"For instance, 50–60 per cent of the urban population in Africa lack adequate provision for sanitation, more than three times the number lacking 'improved' provision."*

'Improved' sanitation is a technical appreciation of a sanitation system, used by the JMP (WHO & UNICEF, 2010) and defined as follows:

> *"Facilities that ensure hygienic separation of human excreta from human contact."*

'Adequate' sanitation as defined by UN-Habitat (2003, p. 2) is when:

> *"The quality of the provision is convenient for all household members, affordable and eliminates their (and others) contact with human excreta and other wastewater within the home and the wider neighbourhood. If households do not have toilets in the home, do they have access to toilets close by that are well maintained, affordable and accessible without queues?"*

The definition suggested by UN-Habitat is also a source of further debates on how to define and monitor maintenance, affordability and access. 'Appropriate' could also be considered to monitor sanitation. It is suggested that the use of 'appropriate' will better recognize the aspects of the local context (SuSanA, 2008), but again monitoring the notion of 'appropriate' may be difficult through a structured household survey.

<u>The Joint Monitoring Programme</u>

As introduced in the definition section, monitoring of progress of sanitation and water supply coverage is ensured internationally by the Joint Monitoring Programme that is managed by both WHO and UNICEF. The JMP, when focusing on sanitation, uses the definition of improved sanitation. According to this definition, 63 % of the world

population was covered by improved sanitation in 2008, 73 % of the urban population in developing countries (WHO & UNICEF, 2012).

To obtain such figures, JMP gather data from different independent surveys (van der Hoek, et al., 2010):

- DHS – Democratic and Health Survey
- MICS – Multiple Indicator Cluster Survey
- LSMS – Living Standard Measurement Study
- CWIQ – Core Welfare Indicator Questionnaire
- WHS – World Health Survey
- HBS – Household Budget Survey
- National Census Data
- Other user based household surveys

<u>Weaknesses of JMP</u>

The JMP monitoring is questioned by many authors (Satterthwaite, 2003; McGranahan, 2007; van der Hoek, et al., 2010; Sparkman, 2012). For instance, the appreciation of the quality of a toilet by the interviewee and/ or the interviewer may differ from one situation to another (Black & Fawcett, 2008). Then, the surveys on which the JMP is based are household surveys and do not include the usage of facilities at work place or schools where people spend a long part of their day (van der Hoek, et al., 2010). For the same reason, the survey cannot capture the differences within the household, for each member (ibid).

Another question concerns the idea of coverage. Gonzales argues that talking about usage will be more significant as living close by a facility does not mean that you can or want to use it (Godfrey & Gonzales, 2010). Therefore, counting the facilities is not enough and the frequency of use and of cleaning, the cost and ease of access should also ideally be included in the statistics (Hewett & Montgomery, 2001). Again, the respondents may not fully understand the questions and answer that they have access to sanitation facilities because they live by a public toilet. But it does not necessary mean that they are using it. (Evans, 2007, p. 9).

Another critic considers the full sanitation chain. The JMP figures focus on the users' interfaces and do not look at how the excreta are treated at the final stage. According to a recent research, figures will go from 60% of population using improved sanitation to 40%, if 'improved' sanitation was considering the sewerage connections and the

final treatment (Baum, et al., 2013). People answering monitoring survey just consider the toilet itself and not the whole sanitation chain (George, 2008, p. 210)

Agreeing to those arguments, Satterthwaite (2003a) questions the quality and therefore the usefulness of such statistics. For him these statistics are "dubious" because the definitions used are themselves "dubious". Because the indicators used for making these statistics are "simplistic", decision makers may tend to target short term objectives. Furthermore, the use of these rather simplistic indicators may be leading to short term strategic choices that can jeopardize future sustainability (van der Hoek, et al., 2010). Furthermore, the JMP focuses essentially on the households and therefore ignores some other dimensions of sanitation such as the whole sanitation chain, the sustainability, and the impact made by the different stakeholders (Sparkman, 2012).

The statistics provided by the JMP are sources of debates and tensions. For instance part of sanitation politics of Ghana has been historically based on the implementation of public toilets (Ayee & Crook, 2003). Facing international standardized statistics that excluded any shared sanitation, Ghana is now ranked as poor in terms of national sanitation coverage (WHO & UNICEF, 2006). But the Ghanaian statistics, using their own criteria, considered that more than 60% of their population have access to improved sanitation (WSMP, 2008).

Potential of JMP

If some practitioners call for a moderate use of statistics and for stopping the distractive debate about their methodologies (Lane, 2010), some others recognize those difficulties but defend the existence of those statistics in the name of accountability and advocacy (Hunt, 2001). Despite their critics on methodology and definitions used, van der Hoek, et al. (2010) recognized that JMP remains the only tool to monitor water and sanitation at a global level. The JMP will not necessary provide accurate data but will inform funding agencies, researchers, urban planners about the current trends (Bostoen & Evans, 2008).

However, hearing the different critics, the JMP have initiated some changes in their monitoring. As defended by Bostoen in his "crossfire debate" with Evans, data have been collected since 2000 via households' surveys:

"With the availability of national data from sources such as Demographic Health Survey and Multiple Indicator Cluster Survey, it became possible to determine access figures from information provided by individuals rather than from national authorities. This allowed for more comparable data to be collected in a more accurate way." (ibid, p.7)

Bostoen argues that the main role of the JMP is to give global trends of water and sanitation and recognize the need for improving the support to the actors in the field (ibid). In addition to the JMP, WHO has developed a new programme called GLAAS (Global Annual Assessment of Sanitation and drinking water) that aims to understand how the funding is distributed and used, what are the country's capacities and the different partnerships that can explain data found, for example by the JMP (WHO & UNICEF, 2010).

The sanitation ladders

During the last JMP reports (from 2008 onwards), changes appear, as for instance the place of shared sanitation has been questioned (WHO & UNICEF, 2006). Rather than addressing the issues of the dichotomy between improved or unimproved, organizations have added a new category. Such a model helps practitioners to better understand the trend of sanitation for a large area such as a country or a sub-region as shown in the figure 2-5 for the Sub Saharan Africa (SSA).

Improved:
Facilities that ensure hygienic separation of human excreta from human contact

From 43% in 1990 to 43% in 2010

Shared:
Improved facilities shared by two or more households

From 28% in 1990 to 31% in 2010

Unimproved:
Facilities that do not ensure hygienic separation of human excreta from human contact

From 19% in 1990 to 18% in 2010

Open defecation:
Defecation in open space without any storage or treatment.

From 10% in 1990 to 8% in 2010

Figure 2-5 Sanitation figures for urban SSA in 2010 (from Schouten & Mathenge, 2010)

Many practitioners advocate the use of the sanitation ladder. The most common and simple one is the one used by the JMP where the four main categories appear: open defecation, unimproved, shared, improved (see fFigure 2-5). The JMP categories are based on the technology used, apart from 'shared sanitation', which is a social classification. Adaptations to this ladder are suggested depending on the interests of the authors. Some focus on the environment (de Bruijne, et al., 2007), some focus only on the cost of technologies (Van de Guchte & Vandeweerd, 2003), and some argue for a ladder based on the functions of sanitation facilities and their impact on health and environment (Kvarnström, et al., 2010).

Focusing on low-income urban areas that are often characterized by a lack of space, a high density of population and a lack of constant water supply, Schaub-Jones (2006) advocates for adding new 'rungs' on the ladder as illustrated in the figure 2-6.
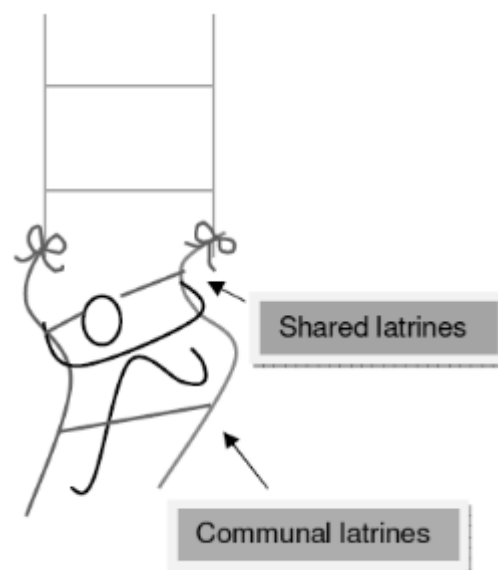
Figure 2-6 New rungs to sanitation ladder (Bayha 2009)

Communal facilities will be the lowest rung due to a more problematic management, and shared facilities at household level will be higher up (Schaub-Jones, 2006). Such a ladder will allow a better understanding and integration of such facilities and of their users in the development and upgrading programmes. Probably held up by the diversity of the software and hardware that can characterize shared facilities, the global monitoring does not follow the ladder of Schaub-Jones and does not recognize shared sanitation as improved. One of the reasons may be that the household surveys

supporting the JMP data do not all differentiate between communal and households shared toilets (UNICEF & WHO, 2010).

2.5 Shared sanitation

Shared sanitation is a common practice in urban areas of developing countries, but they are "*not incorporated in conscious planning*" (Schaub-Jones, 2006, p. 3). Additionally, the place of shared sanitation in sanitation literature is quite marginal. Most of the researchers who talk about it either focus on success stories such as Sulabh (Chary, et al., 2003) or SPARC (Burra, et al., 2003) or Water Aid in Dacca (Hanchett, et al., 2003); alternatively they mention it as an example when debating gender (Allély, et al., 2002) or the right to sanitation (COHRE, et al., 2007) or health (Timæus & Lush, 1995; Montgomery, et al., 2010). Classical books that focus on urban sanitation often mention shared facilities as another solution in specific cases but never enter into details (Mara, 1996; Tayler, et al., 2003).

In contrast, the fraction of people in developing countries, particularly those in urban areas, using shared sanitation has significantly increased during recent years (WHO & UNICEF, 2012). In 2010, 19% of the urban population in developing countries were using shared sanitation. This however was a much larger 31% amongst the sub-Saharan urban population.

In 2006, the JMP did not count shared or public toilets as improved (WHO & UNICEF, 2006) because often this form of sanitation does not ensure a good separation between excreta and potential human contact. The monitoring of improved sanitation as presented by the WHO and UNICEF is questioned (Bartram, 2008). A first element of answer relies on who sets the criteria for answers (Black & Fawcett, 2008). Public health officials will often look at the quality of the excreta containment when users may focus on different issues such as access, cleanliness or convenience.

Facing the lack of clarity of shared sanitation definition (Isunju, et al., 2011), the JMP has created a specific category to be found between improved and unimproved on the sanitation ladder (WHO & UNICEF, 2008). The JMP recognizes that many urban households have access to sanitation only through sharing facilities. This location on the ladder is justified by the health perception of these facilities by the users, their

security and accessibility. However, this 2008 report states the need for further research focusing on the acceptability of shared facilities.

2.5.1 Definition and example

Nowadays sharing sanitation is a practice found in different parts of the world under different circumstances:

- Emergency settings; sanitation facilities are often shared during an emergency and post emergency situations (Adams, 1999). The range of options go from trench latrines that can be used by a large number of users to pit latrines built and managed by 4 to 5 families (ibid).
- Post conflict; a report from ACF present public toilet network as the main sanitation option available in Monrovia despite the poor conditions of these facilities (ACF, 2005).
- School and institutional toilets (Zomerplaag & Mooijman, 2005).
- On street and off street public toilets found in city centre (Greed, 2003)
- Communal toilets shared within a neighbourhood or a village (Wegelin-Schurinda & Kodo, 1997).
- Individual toilets shared by a group of households (Günther, et al., 2011).

2.5.2 Trend of urban shared sanitation

There is an increase of shared sanitation mostly in urban areas, table 2-2.

	DEVELOPING COUNTRIES			SUB-SAHARAN AFRICA (SSA)		
	Urban	Rural	Total	Urban	Rural	Total
1990	13%	4%	7%	28%	9%	14%
2000	15%	7%	10%	29%	10%	16%
2010	19%	9%	13%	31%	12%	19%

Table 2-2 Population using shared sanitation facilities (sources from WHO-UNICEF 2012)

These figures have to be taken as estimations and might take too lightly the situation. The results are gathered by the JMP on the basis of different national household surveys. In those household surveys, the focus is clearly not on shared sanitation and there is little information on the number of people sharing the sanitation within the household. As mentioned earlier, the definition of household itself depends on national interpretation and on the understanding of the interviewer and interviewee. Therefore, the task force of the JMP expresses concerns about the reliability of some data

focusing on shared sanitation (UNICEF & WHO, 2010, p. 5). However and despite their imperfections, the figures confirm that a large part of the urban population share sanitation and the trend is increasing in sub regions such as SSA.

2.5.3 Current debate around Shared sanitation

> "Sometimes shared toilets work and sometimes they do not." *(Rakodi, 2005, p. 63)*

This quote from Rakodi has the merit to illustrate the complexity of determining the quality of shared sanitation. As indicated above, WHO and UNICEF have been unable to decide if shared facilities are 'improved' or 'unimproved'.

- The first difficulty in trying to answer this question is the non-consensus on the definition of shared sanitation. Researchers and practitioners who are working either on communal blocks or public toilets or household shared facilities may qualified them as shared sanitation and draw general conclusions without acknowledging the specificity of the model.
- The second point is that the concept of sharing depends on the local context. Sharing facilities within a neighbourhood in Mumbai and one in Lagos may be more or less widespread, perceived and accepted.
- The third point concerns the definition of household. The JMP uses the household as a unit of measure, but the definition of a household is differently understood depending on culture (Rakodi, 1995).
- The fourth point has been evocated above and concerns the definition of 'improved'. Who will rate the facility and using which criteria?
- Last but not least, most of the literature which investigates the shared sanitation question does it only from a single perspective, excluding it because it seems unhygienic or advocating for it because it appears more affordable. The following sections illustrate several of those perspectives.

<u>Shared sanitation and health</u>

Eales and Schaub-Jones (2005) wonder if shared, communal and public toilets are reaching dwellers and if they offer the appropriate health benefits for this population. Allen et al. (2008) agree that public toilets offer some appreciable services to a part of the population, but this form of sanitation typically does not meet the hygiene needs of women and children mostly due to the lack of maintenance. Shared facilities are also

often associated with a greater exposure to pathogens and it is assumed that their hygienic conditions are below those of private toilets ones (Surjadi, et al., 1994). This higher exposure in shared facilities is not clearly proven. Studies are unable to state that all individual facilities will necessarily be less at risk than any of the shared ones. There is for instance no clear evidence than a toilet shared by one household will ensure better containment of excreta that one toilet shared by three households (UNICEF & WHO, 2010).

A comparison of the risk of trachoma in rural Tanzania studying both type of facilities, concludes that sharing sanitation do not increase this specific risk (Montgomery, et al., 2010). Authors conclude that the key functions of a toilet (containing excreta) will be equally ensured by shared and individual toilets. However, this study was done in a rural setting, and management issues such as daily maintenance may be more sensitive in an urban crowded area. A review of DHS surveys focusing on child health states that, based on Egyptian data, children sharing toilets were more likely to have diarrhoea than the ones using private toilets (Timæus & Lush, 1995, p. 20). Then in Tamale in Ghana, observations were made that hand washing facilities were almost never provided in the shared toilets surveyed (Osumanu I. , 2007).

In the literature, a link is often made between the hygienic status of shared latrines and the number of users (Cotton, et al., 1995; Hunt, 2001; Beller Consult, et al., 2004; UNICEF & WHO, 2010). In camps, toilets are often better managed when they are used by up to five families (Adams, 1999). In urban Kampala, toilets shared by four households are clearly cleaner than the ones shared by five and more households (Günther, et al., 2012). Similarly there is a common link made between shared toilet and the need for a well-managed maintenance of the facility (Hunt, 2001).

There is then a common thinking that facilities shared by a low number of users may be adequate, based on maintenance and cleanliness factors. Community block projects in India show on the other hand, that the cost recovery of such facilities will depend on the number of users and that smaller blocks are not always a sustainable solution (WSP, 2009). In the case of pay-to-use facilities, equilibrium needs to be found between price, number of users, number of seats and cleaning procedures (Nijssen & Van Wijnbergen, 2005). Rather than the number of users, the involvement of the users in the toilet management and the clear definition of the group of users may ensure the cleanliness of the toilets (Wegelin-Schurinda & Kodo, 1997).

<u>Shared sanitation and specific groups</u>

The risks that exist for women and children of using shared facilities are clearly acknowledged (Joshi & Morgan, 2007; Allen, et al., 2008) as well at the difficult access for the elderly and disabled (Cairncross & Valdamis, 2006) Access to such facilities at night is often mentioned as a critical point (Schouten & Mathenge, 2010). However this does not mean that shared sanitation has to be excluded from being a potential solution. It just means that shared sanitation has to be implemented and managed while taking into account the needs of specific groups. For instance, and focusing on community managed sanitation blocks, these facilities offer an ideal solution to slum populations in India because they are centred on the people's demand and they are built following the wishes of the population including some specific groups (Burra, et al., 2003).

Conversely, access to shared sanitation might also be forbidden based on individual conflicts. Social tensions are reported in Mumbai when community blocks of an area are used by a neighbourhood area (McFarlane, 2008b) and in SSA access to such facilities may be forbidden to women (Allély, et al., 2002, p. 66).

<u>Shared sanitation as an unique solution</u>

In urban settings, shared facilities are probably the unique solution for the homeless (Joshi & Morgan, 2007; Mara & Alabaster, 2008), and in some cases the unique solution for the poorest. Sharing toilets is a practice more developed amongst the poorest urban dwellers (Surjadi, et al., 1994; Rakodi, 1995) which suggests that sharing facilities does not reply to a wish but to an absence of choice. Affordability, space and people's tenure are some of the main factors that can justify the use of shared facilities because no other options seem to be applicable (Tayler, et al., 2003; Schaub-Jones, 2006; COHRE, et al., 2007; Mara & Alabaster, 2008).

However, and related to the idea of price, the daily use of communal pay latrines may end up to be more costly than the ownership of an individual toilet (Tayler, et al., 2003). The appreciation of affordability, cleanliness, access or ideal number of users will depend on the kind of shared toilet facility used.

2.5.4 Criteria to define shared sanitation

Categorizations of urban sanitation exist (IWA, 2006; Tilley, et al., 2008) but most of them are based on technological and financial criteria. Little has been done on the

level of facility despite a need for investigation. Questioning the acceptability and appropriateness of shared sanitation in low-income urban areas, Van der Hoek et al. (2010, p. 48) call for an:

> *"Evidence-based maximum of the number of households using one improved sanitation facility."*

To determine the level of management of urban sanitation facilities, a list of criteria needs to be made. The following list corresponds to criteria identified in the literature and applied to rate or characterize a shared sanitation facility. Existing studies often partially answer this question focusing only on one or two aspects. Characterizing shared sanitation need to be done through the selection of criteria. The following list is based on the ones most cited in the literature:

- **Location:** In low-income areas, three main locations can be identified: the dwelling or the compound, the neighbourhood, and the public and communal areas (Schaub-Jones, et al., 2006).
- **Access:** This includes many elements such as the distance from the household (TARU & WEDC, 2005), safety, cleanliness (van der Hoek, et al., 2010) and the physical access to the facility (Hunt 2001).
- **Main users:** Depending on its location and/ or the initial agreement made or not, the facility may be used by a restricted allowed population (Hunt, 2001; Allély, et al., 2002).
- **Level of responsibility:** In a similar way to the allowed users, some entities are designed to be responsible from implementation to daily management (Hobson, 2000; Hanchett, et al., 2003; Allély, et al., 2002).
- **Ownership:** The notion of ownership might be context specific and both the ownership of the land and of the facility need to be considered (Schaub-Jones, 2006; Colin & Nijssen, 2007).
- **Income and charges:** The access to sanitation facilities is rarely free of charge and a large range of financial arrangement can be made concerning access to shared facilities, from monthly payment to pay-to-use basis, or as part of the house-renting (Hunt, 2001; Colin & Nijssen, 2007).
- **Operation and maintenance:** The running costs will often be in the hands of the users via direct responsibilities of the households or through community based organizations (Burra, et al., 2003).

- **Layouts:** Number of cubicles and the number of users will have consequences on time to queue and cleanliness (Hanchett, et al., 2003).

Technological options are often applicable to both individual and shared sanitation (Schaub-Jones, 2006) and are therefore not directly of concern in this discussion.

2.5.5 Range of urban shared sanitation

<u>Existing typologies</u>

Level of facility is used by Schaub-Jones to define if a population is using household, shared or communal facilities and at which local level the facility is managed (Schaub-Jones, et al., 2006, p. 5):

- ***"Household toilets*** *are facilities that are primary for the use of the household".*
- ***Shared toilets*** *refer "to facilities, often Ventilated Improved Latrines (VIP) or standard latrines, which are shared by several households" (ibid).*
- ***Communal toilets*** *correspond to "toilet blocks shared by a large group of users, and for which a fee for use is often charged. This may be a true' public toilet' open to all comers, or may be reserved for exclusive use of a particular community" (ibid)*

Similarly, WSUP differentiates between shared, communal and public (WSUP, 2011b) but for instance they use the term "communal" differently than Schaub-Jones:

- ***"Household toilets*** *are used only by a single household, typically a single family or extended family. However, facilities classified as "household toilets" often serve very large households, or they may be regularly used by neighbours. So the boundary between household toilets and shared toilets is not clear-cut.*
- ***Shared toilets*** *are shared between a group of households in a single building or plot. This can cover very different situations: for example, a toilet shared by 20 tenant families each occupying one room in a large building or a toilet shared by 3 related families living within a single plot or compound.*
- ***Communal toilets*** *are shared by a group of households in a community. In some cases each household will have a key to one of the toilets within a block: this may be one toilet per household or one toilet for a group of households. Communal toilets may be owned by the group of households.*

- ***Public toilets*** *are open to anybody, in public places or in residential areas: typically there will be a charge for each use. Sometimes each user pays for a monthly ticket. Users of public toilets will generally feel less "ownership" than users of communal toilets"* (WSUP 2011, p. 1).

Another typology, illustrated in the figure 2-7, and based on a research in urban India, identifies four criteria which are grouped into three classes: no sanitation, private sanitation and community sanitation (Quicksand, 2011).
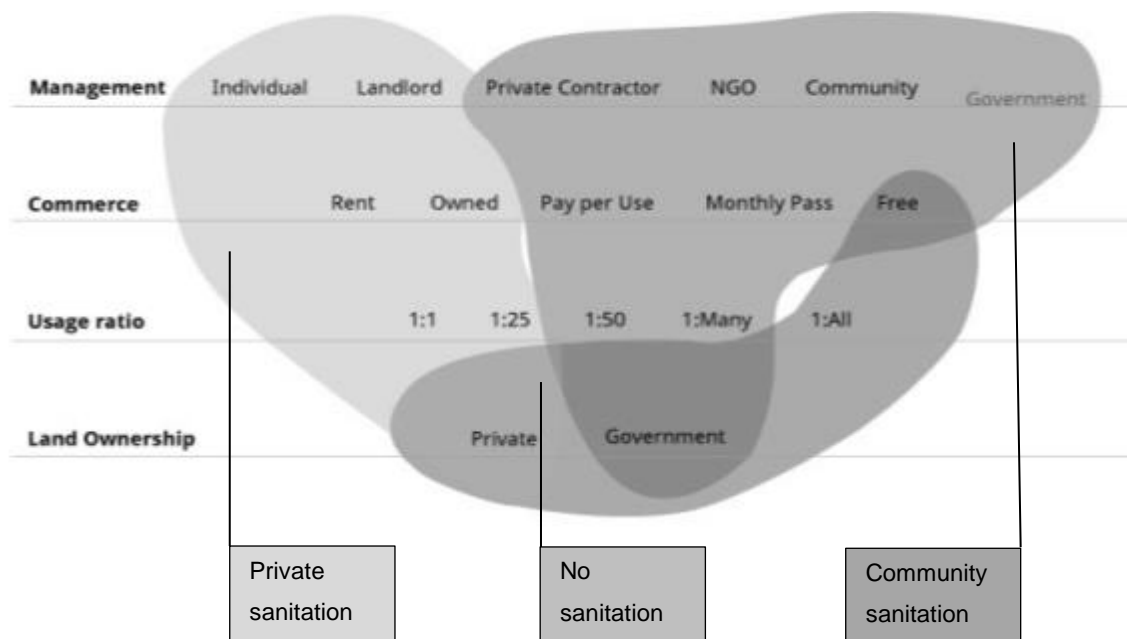
Figure 2-7 Sanitation spectrum (adapted from Quicksand, 2011)

In this spectrum, toilets shared by a group of tenants are considered semi private sanitation (ibid).

Proposed typology

To reduce the confusions that can occur when looking at the literature, the research suggest in the figure 2-8 below, a typology of urban shared toilets based on the criteria discussed above. The different components of the typology are discussed in the next section.
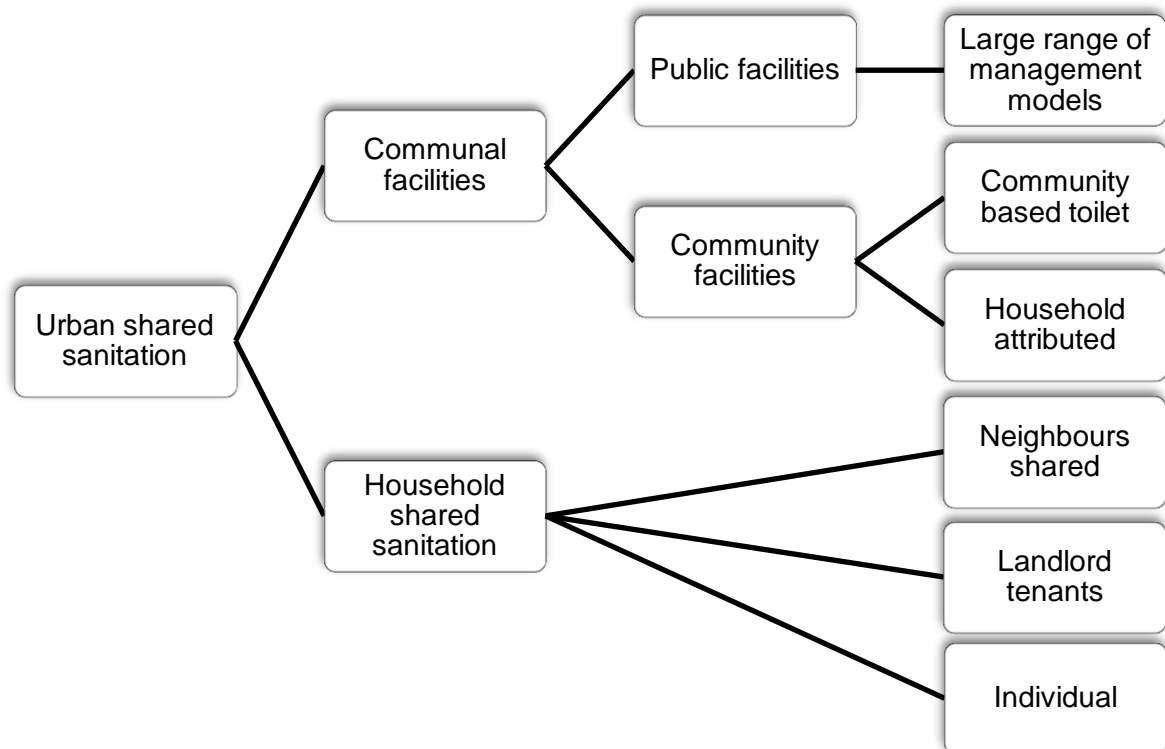
Figure 2-8 Typology of urban shared sanitation

2.5.6 Different models of management

The **communal facilities** include both community toilet-block and public-toilets (Schaub-Jones 2005b).

The **public toilet facilities** are often located in urban centres or near markets, train and bus stations, or within public institutions (hospital, administration building). Public facilities can be privately run (Schaub-Jones 2005b). Fees for use and access rights depend on the level of management. Based on public toilet facilities in India, three dominant models are identified by Colin and Nijssen (2007):

- Public sector management;
- Private leasing;
- Private sector development.

Management of such facilities and models differ from country to country and often depend on the national policies (Awortwi, 2006; Tukahirwa, et al., 2012).

The **community toilet facilities** target the needs of residential areas, and in most cases the low-income ones (Schaub-Jones, 2006; Colin & Nijssen, 2007). Community blocks are usually managed by members of the community. Financial support, mostly capital costs can be provided by external agencies. Two levels of management of the community-blocks can be identified:

- The **community-based** toilet is a facility used, operated and managed by members of a community (The term community will need further investigation in this case, as it can have slightly different meaning according to local context). External support from donors, municipal agencies or some commercial agencies can be provided within different forms.
- **Households attributed** toilet also called "group toilet" (TARU & WEDC, 2005) or "cluster toilet" (Hanchett, et al., 2003) corresponds to a cubicle used and maintained by a fixed group of households within a community-block located in the neighbourhood.

The **household shared sanitation** corresponds to any form of sanitation that is shared by several surrounding households following agreement made between the households themselves or by a common landlord. Within this broad definition, several levels of management can be identified:

- **Neighbours shared**. The construction, owning, operation and maintenance of the toilet are shared between neighbouring households without a necessary relation based on tenancy. Such toilets normally accommodate a low number of households (Tumwebaze, et al., 2012).
- **Landlord-tenants**. Many individual toilets are built and then owned by landlords. This category is further detailed in the next section.
- **Individual**. The latrine is built, operated and maintained by one household. But following informal arrangement, some identified neighbouring households can use the toilet. Very little literature has been found on this model despite several professionals coming across it.

A study of three SSA cities compared which type of toilet facilities are used by people who do not have a toilet in their plot, see table 2-3 .

	In-house toilet	Toilet used (percentages apply to those who do not have toilet in-house toilet			
		Use neighbours' toilets	Use public toilets	Share a toilet	Other (open defecation)
Conakry	96%	70%	0%	0%	30%
Port-Bouet	34%	15%	32%	44%	9%
Bobo-Dioulasso	96%	94%	6%	0%	0%

Table 2-3 Toilets used in three West African cities (Morel à l'Huissier, 2003, p. 83)

In Conakry and Bobo-Dioulasso, most of the inhabitants in the surveyed areas have a toilet in their plot. Most of the population who do not have a toilet use the facility of their neighbours. Because most of the houses are equipped, there are public toilets only in market areas and bus stations in these two cities. Dwellers use the beach for open defecation in Conakry.

The situation in Port-Bouet is well contrasted where the low number of private facilities has encouraged the development of different systems: public toilets, commercialisation of individual toilets and open defecation. Finally and in the three cities, having a toilet in its plot do not guarantee an adequate facilities for the inhabitants as some of the toilets are made of one cubicle shared by more than 50 dwellers (Morel à l'Huissier, 2003).

<u>The relation between landlord and tenants</u>

The way households may share toilets is influenced by their form of housing and their agreement with the landlord:

> *"Backyard shacks in South Africa that share the services of the main house; ten room 'line houses' in Maseru that share a common toilet; houses in India where construction of an indoor toilet allows a new rental room to be built above it, (…)" (Schaub-Jones, 2005a, p. 2)*

Compound houses, common in some West African cities, provide also examples of specific sanitation arrangements:

> *"The 27 covered toilets found in 20 compound houses were shared by 114 households." (Schwerdtfeger, 1982, p. 170).*

In houses that accommodate a large number of tenants, the landlords play a key role in providing sanitation facilities. The landlord occupiers of these houses become then both sanitation recipients and service providers (WUP, 2003; Schaub-Jones, et al., 2006). Some projects, such as the Stand Alone Toilet in Kenya, managed by NGO and external donors, implement toilets for several households through the involvement of landlords (Peal & Evans, 2010). The benefits of these projects are in some cases captured by the landlords who keep the usage of the toilets for their relatives (WUP, 2003). At the opposite end, and in some cases, the landlords are associated with the management of the toilets which provides a possible incentive for increasing the rent (Sansom, 2006).

The existence and the management of these toilets are often conditioned by the presence of the landlord in the house. In the case that the landlord is not present, operation and maintenance costs are shared between tenants (Scott P. , Personal communication, 2010). Sanitation is often a source of conflict between landlord and tenants (Homeless International, 2011) but situations are context specific, depending on the characteristics of tenure, ownership of the land and roles played by the government and its policy (Schaub-Jones, 2009).

2.5.7 Providers of urban shared sanitation services

During the last decades, emphasis has progressively been put on the importance of sanitation providers. Public authorities are rarely involved and often ineffective in the sanitation services, mostly when it takes place in low-income settlements (Moran & Batley, 2004; Mulenga, et al., 2004). Water utilities are often legally in charge to extend the sewage services. But they show low interest in developing sanitation perspectives as they think they will have to make large investments for little profit. In the case of low-income settlements, it is the often informal sector (McGranahan, 2007) that is in charge of building individual toilets, managing ablution blocks, or emptying individual and shared facilities.

In the case of shared sanitation, there is a large range of potential providers (Collignon & Vézina, 2000; Moran & Batley, 2004):
- A family or a group of families informally sharing their toilet
- Landlords
- An individual or group of individual providing access to a pay facility
- Community Based Organizations (CBOs) or NGO providing access to toilet

- Private company managing a facility
- Public company managing a facility
- And any combination of the previous examples

Sanitation represents a growing market where the role of private entrepreneurs is essential (Schaub-Jones, 2010) but the motivations and constraints of these providers are not investigated in details in the literature.

Greater focus is given to the management model and institutional mechanisms that are developed to improve the sanitation services. The notion of institution pluralism applied to shared sanitation. Many mixtures exist between government, NGO/CBO and private companies to implement and manage sanitation services and facilities (Tukahirwa, et al., 2012). An example of this range of stakeholders' involvement and collaboration is found in the slum sanitation programme in Mumbai (Nitti & Sarkar, 2003). The municipality sanitation is ensured by a large number of community toilet blocks. The capital cost of these blocks is shared by the municipality and the participation of the communities' members. The capital cost is supported by a loan from the World Bank. The running cost is covered by a monthly charge paid by identified users of the facility (community members) and by a-pay-to use participation of the transient population. The management of the blocks is ensured by a mixture of CBOs and some small local business enterprises. All of these mechanisms are supported by skilled and experienced staff, supervision from the municipality and a strong communication campaign. The good results reported are explained because community toilet blocks ensure a greater responsibility to the users for the utilization of the toilets, compared to public toilets (ibid).

The section describing sanitation in Ghana, section 5.3.2, will provide good examples of the different partnerships that exist and their limits in the national context.

However while investigating shared sanitation models and their providers, the literature was found to be scarce. Most of the peer-reviewed literature which investigates shared sanitation did not provide new case studies but revisited known challenges. The majority of new case studies result from reports from consultants or NGOS and are not peer reviewed. Grey literature and master theses (see below) provide field examples of some user satisfaction surveys. However these surveys are often limited in scope and fail to compare different shared sanitation options. They do

not include providers' views or are carried out only a few months after completion of the shared blocks, so limiting the information on operational and maintenance factors. The author often heard consultants or researchers saying "that block was a success although it was built only two months ago". Thus the sustainability of these shared facilities has not been examined in most of the literature reviewed.

In summary, there are schematically three types of literature and case study available:

- The studies investigating only one specific sanitation system such as Sulabh and SPARC in India and the slum sanitation programme in Mumbai (Nitti & Sarkar, 2003), or Mobisan in South Africa (Naranjo, et al., 2010) or several pilot projects (SuSanA website). The work is often carried out by those behind the project/ organizations and focuses mainly on positive aspects.
- There are studies focusing on municipally managed shared sanitation (Ayee & Crook, 2003). They are often very critical, pointing out the low level of cleanliness and maintenance but they do not necessarily look at the other options or at the absence of other options.
- Then there are few studies comparing different types of shared toilet management in a similar location. Some of them look at communal blocks with different management models (Bayha, 2009; Biran et al., 2011) and some of them at communal blocks using different technologies (Schouten & Mathenge, 2010). Finally some studies integrate comparisons of sanitation blocks, and smaller scale sharing (Wegelin-Schurinda & Kodo, 1997; Tumwebaze, et al., 2012; Peal & Evans, 2010).

A recent evaluation research in Mukuru (Peal & Evans 2010) provides, for example, a comparison between a communal approach and a plot approach to sanitation in urban settings, as detailed in the table 2-4.

Model	Communal Sanitation Block (CSB)	Stand Alone Toilet (SAT)
Approach	Communal	Plot
Short description	The CSB model provides separate toilet and washing facilities for men and women; each gender has three toilets and one shower room	SAT are smaller than the CSBs and occupy only a single house plot. Space is provided by group of landlord. They serve small groups of between five and 29 households and have two to four toilet seats and a hand-washing basin outside
Main advantages	• Serve a larger population	• Affordability • Buildability (available artisan) • Convenience (close to home) • Need little space
Main constraints	• Large structure and limited suitable land available • High capital cost require external funding • Women expressed lack of privacy, security and difficulty to pay	• Relocation of one tenant household causing potential conflict • Need of appropriate system to pay for maintenance, operation and water • Need a combined willingness to pay, ability to pay and willingness to change behaviour

Table 2-4 Comparison of toilet models in Mukuru, adapted from (Peal & Evans, 2010, p. 21)

The project evaluation carried out in Mukuru state that the community preferred the Stand Alone Toilet. Some landlords have built independently, toilet following the same model and using their own funds (ibid).

Such type of studies that compares and investigates different sanitation infrastructure and models in a similar context provides valuable information on providers' constraints but also on users' choice.

2.6 Understanding behaviour, demand and acceptability

"Understanding household dynamics and their interactions with the other elements in the waste and sanitation system are therefore essential. Targeting the urban poor requires understanding their way of life, including their particular culture, household-composition and dynamics, food security and income generating strategies in combination with the relevant formal and informal institutional settings" (Oosterveer & Spaargaren, 2010, p. 20).

As seen in the previous sections, implementation models and framework that are actually defended by sanitation specialists advocate giving more importance to the users. The role and importance of the users may be seen at different levels, from listening the needs of the users to involving the users in the construction and management process. The bottom-up approaches are encouraged and households are placed in the centre of the implementation process (Kalbermatten, et al., 1999). Some researchers argue that participation of users before and during the implementation of a water and sanitation project enhances its acceptance and future use (Prokopy, 2005; Roma, et al., 2010). The user is at the centre of the sustainable and positive use of any sanitation equipment (Lüthi, et al., 2009).

2.6.1 Voices and needs of users

Considering and understanding the people's views of a current or future sanitation systems are key requirements to positively address the different dimensions that lead to sustainable infrastructure (Deakin, et al., 2002; Tayler, et al., 2003).

However, including the voices of users in sanitation planning for low-income urban areas presents certain challenges. The first of them is the absence of voices. Contrary to water services claims, outcry for sanitation services seems to be low in certain regions such as sub-Saharan Africa (Collignon & Vézina, 2000) or India (Chaplin, 1999). Other challenges, such as the localization of the needs, or the identification of the poorest have to be approached at different geographical scales: city, neighbourhood and household.

City level

A key point to remember is the heterogeneity of cities, where the most vulnerable are living in pockets of poverty hidden by a larger mass (McGranahan, et al., 2001; Mitlin, 2004). Populations from the same city face different quality of service depending on their wealth and location (Chaplin, 1999; Konteh, 2009). This heterogeneity presents a risk in the reading of statistics that can lead to an exclusion of the poorest from an urban planning project (Satterthwaite, 2003a). The risk exists also when selecting case studies; any analysis and generalization to the whole city will need to be carefully made (McGranahan, et al., 2001).

Neighbourhood level

Several studies indicate that the overall quality of neighbourhood have more health implications than the quality of the house environment (McGranaham, et al. 1997). In particular, it is found that for maximum health impact, about 75% of households in a given community should have and use hygienic toilets (Bateman, et al., 1995).

A danger in the case of shared sanitation will be to think that a clean and well managed ablution block is necessarily reaching all individuals. Shared toilets may not benefit some women, children, elderly, poorest and disabled due to social, economic or physical barriers. The vulnerable population are often not consulted before an infrastructure projects, because it may be difficult to identify them. The poorest of the poor (Hanchett, et al., 2003) and migrants (Landau, 2007), also because they often don't have the financial resources (including time) or recognition by their neighbourhood, are often neglected in consultation and planning. Similarly external agencies have a tendency to see a community as a uniform group:

> *"Bottom-up approaches to development need to start from the recognition that exploitation and marginalization also take place inside the slum. Including structurally disadvantaged groups – be they women, children, ethnic or religious minorities, disabled people, renters, or the poorest of the poor" (Berner & Philips, 2005, p. 24).*

Household level

Acknowledging the low voice of users discussed in section 2.4.1, some municipalities and water utilities have introduced different systems to get feedback from their customers in order to improve their services. Citizen's report cards are for example used in several cities of India (Ravindra, 2004) and in Kenya. Another limitation in

hearing the voice of users is that some of them are hidden by their household. Household is often taken as the lowest unit when designing, monitoring (example of the JMP) or evaluating sanitation programmes. However within a household, and beyond the difficulty of defining the term household, individuals may have different needs and opinions regarding sanitation (Sijbesma, 2008). Thus the voices of women, the disabled, elderly and children of the household are not heard and listened to in all contexts.

2.6.2 Approaching sanitation behaviour

An important part of the literature looking at users' perceptions and sanitation does it through the exploration of the users' behaviours. The SANIFOAM report (Devine, 2009) supported by WSP is nowadays the main work focusing on sanitation behaviour and offering a general framework to investigate this issue. Works done in the past were either focusing on relatively small geographical areas, or focusing on Hygiene or health activities. This sanitation framework identifies different determinants grouped in three families:

- **Opportunity:** access/ availability, product attributes, social norms, sanctions/ enforcement
- **Ability:** Knowledge, skills and self-efficacy, social support, roles and decisions, affordability
- **Motivations:** Attitudes and beliefs, values, emotional/ physical/ social drivers, competing priorities, intention, willingness to pay.

Such lists may be used to analyse both existing projects and projects under development (Devine, 2009).

Another model of understanding behaviour is suggested by Curtis et al. (2009) during a cross-countries study of hand-washing practices. They identify three kinds of behaviour:

- **Planned behaviour** links to the cognitive and executive controls and refers to long term objectives such as the health of family.
- **Motivated behaviour** is linked to a reward.
- **Habitual behaviour** refers to the idea of automatism and repetition.

Based on these models, much research involving the idea of behaviour discusses behaviour change and the different drivers that can be used (Islam, et al., 2000; Curtis, 2001; Drangert, 2004).

<u>Behaviour change</u>

Drivers for change in sanitation practices can be security, status and food security (Kvarström, et al., 2004) while health of the children, disgust, aesthetics, order and status are drivers for changes of hygiene practices (Curtis V. , 2001). These drivers may also be context and gender specific (Jenkins & Curtis, 2005).

In rural Benin the decision to install a latrine can be conceptualized around two main drives: prestige and well-being. Identifying drivers of motivation allows sanitation providers to stimulate the right aspects of the individuals (ibid). Approaches such as CLTS and sanitation marketing use some of these behaviour aspects to develop sanitation programmes and favour the construction of toilets and their future usage.

Based on a critique of most of the studies mentioned in this section, a recent work suggests a new model to assess behaviour change for water and sanitation. This model, called 'RANAS', suggests a clear procedure made of eight steps to induce behaviour change (Mosler, 2012). However this model focuses on conditions where households are able to carry out changes without support from the outside. This may not happen in high density low-income settlements where the supply of sanitation is often in the hands of private and public providers. Household intention will be limited by the lack of space, right to land or financial constraints.

<u>From individual to societal perception of sanitation</u>

In high density urban areas, more than elsewhere, it is difficult to assess the socio-cultural dimension of each user's actions without considering the behaviour of others users, members of the household or of the neighbourhood (Assefa & Frostell, 2007, p. 68). As agreed by many anthropologists, the characteristic of a group's identity is always the result of an "*historical construction*" (Godelier, 2007, p. 23). The identity of a social group is then under constant modification influenced by insiders and outsiders. When thinking of any sanitation programme, it is then necessary to assess the social structure that matters but also to understand that these social structures may change (Harstaad, et al., 2001).

Cultural perceptions of dirt in general and excreta in particular have contributed to the shape of social structures (Douglas, 1991) and remains today a factor of discrimination in certain contexts such as Pakistan (Beall, 2006). This perception of dirt can influence and change behaviour. Hygiene promotion campaigns and Community Led Total Sanitation (CLTS) programmes work on the individual and on his/her relation with the group to change behaviour. They may for instance using disgust as a driver for change. In Orissa, India, targeting social drivers of behaviour changes may be more effective than those that focus only on private incentives (Dickinson & Pattanayack, 2007). Jenkins and Cairncross (2010) talk about a "*contagious effect of latrine adoption*" observed in rural Benin.

Additionally there are publications from the anthropology sector that focus essentially on the relation between individuals and the place of defecation (van der Geest, 1998; 2002; Bouju & Ouattara 2002). The most famous example is probably the work of van der Geest (1998) who investigates public toilets in Ghana, and some language specificities associated with the defecation practices. A study investigating cleanliness in urban West Africa sees that the little concern from dwellers for their dirty neighbourhood reflects the weakening of the social connections and community feelings (Bouju & Ouattara, 2002, p. 128).

Figure 2-9 attempts to schematize the different factors that influence the "societal sanitation approach" (Avvannavar & Mani, 2008). Curtis et al. (1995) give a quite similar list of factors when explaining determinants of hygiene behaviour in Burkina Faso.
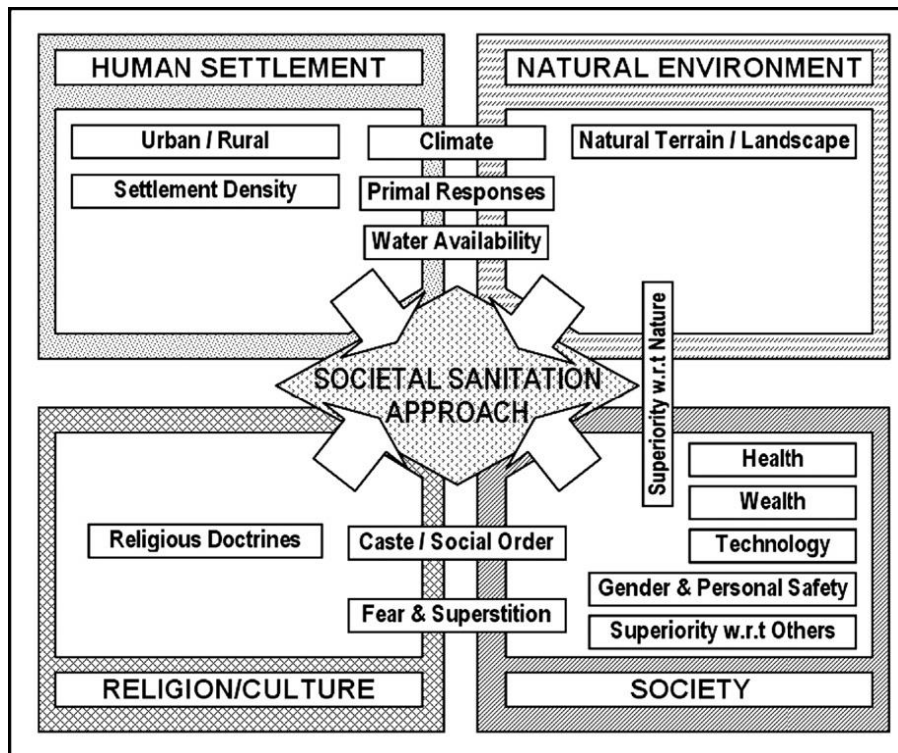
Figure 2-9 Societal approach to sanitation (Avvannavar & Mani 2008)

The list of factors that constitute a socio-cultural environment is probably far from being exhaustive. The ranges of factors make the understanding of these dimensions very context specific. In the sanitation literature, many calls have been made to integrate socio-cultural sciences in the planning of programme. But due to these local specificities, the systematic use of complete socio-cultural studies will be a "*cumbersome and expensive site by site approach*" (Kalbermatten, et al., 1982, p. 82).

Social impact assessment

The most known method to assess the social component of a project may be the social impact assessment. This social impact assessment (SIA) is normally done before the implementation of the project. Social impacts include all social and cultural consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope as members of society (Burdge & Vanclay, 1995). This method is often applied to a large project and probably does not correspond to the scale of this research, but some aspects of this method illustrate the difficulty of measuring social impact and social acceptability, both of them before the implementation of the project or structures. Burdge and Vanclay identify the following:

- How is the 'affected community' to be defined and identified?
- What should be the role of community participation in the SIA?

- What impacts are to be considered?
- How should impacts be weighted?

These questions are asked from an external perspective and do not include the perspectives of the users. Those four points illustrate the difficulty of assessing socio-cultural dimension and address challenges that will need to be fulfilled by the methodology section.

2.6.3 Assessing user and customers views

<u>Assessing sanitation demand</u>

In development programmes in general, and in water and sanitation projects in particular, planners use different tools and assessment methods to study the feasibility of a project. Demand assessment remains the most popular approach to estimate the users' needs and opinions. The different demand assessments aim to understand the needs and the wishes of the users or consumers (Parry-Jones, 1999). Depending on the researcher's background, different methods are carried out to assess demand. The table 2-5 summarizes the perceptions of demand by engineers, social scientists and economists.

	Engineers	**Social scientists**	**Economists**
Broad definition of demand for sanitation	Amount of excreta to be disposed	Basic need that must be addressed to any groups	Willingness to pay for a service
Assessment tools	• Household surveys • Feasible option studies • Supply norms	• Participatory Rural Assessment • Relative demand	• Contingent Valuation Method • Household surveys

Table 2-5 Demand and its different views (adapted from Parry-Jones 1999)

Most of the literature available focusing on shared sanitation does not look at the demand but assesses the perceptions and usages of the dwellers/ customers after completion of the facilities. Available literature on Willingness To Pay (WTP) for example tend to focuses on individual sanitation. It is more challenging to conduct collective WTP for households living in a multi house, as it has been tried in Kumasi, Ghana (Whittington, et al., 1993, p. 1557); and examples of WTP applied to shared toilets have not been found.

In the case of shared sanitation, work investigating users' views has been mostly carried out to assess their appreciation and their daily use of community blocks and public toilets (Hanchett, et al., 2003; TARU & WEDC, 2005; Alves Miranda, 2008; Bayha, 2009; Schouten & Mathenge, 2010; Biran et al, 2011). Such studies have often been undertaken as part of a M.Sc. thesis or to monitor and evaluate programmes of agencies. Observations, surveys of users and interviews of providers and managers of such facilities are the main methods used. The methodology chapter details techniques used to assess customers' preferences and acceptability.

While there is no clear available methodology to assess the users' views of shared sanitation it is necessary to look at how the concepts of user' satisfaction and sanitation acceptance are more generally defined and assessed.

2.6.4   Defining 'acceptance' and 'acceptability' in sanitation

There are no clear differences stated between acceptance and acceptability in the sanitation literature. The differences between the two notions are more discussed in the transport research (Schade & Schlag, 2003; Schuitema, et al., 2009). Acceptability is there understood as the attitude towards a project before its implementation while the acceptance is the attitude after the project's implementation (Schuitema, et al., 2009, p. 102). A similar definition is given here in a water and sanitation manual:

> *"In the opinion of the authors, acceptance means long-term integration of project measures into the everyday life of the target group" (Astor, et al., 1987, p. 21)*

Acceptance is often used in the sector in reference to the social acceptance. It is agreed that social acceptance leads to the social sustainability which is a key factor of the overall sustainability of a project (Assefa & Frostell, 2007). In a feasibility study of a sanitation system in Thailand, two type of acceptance are defined (Schouw & Tjell, 2003):

- the socio-cultural acceptance;
- the practical acceptance which is the perception of the user and his/ her behaviour in terms of use of the facility.

A similar interpretation is proposed by Kvarström et al. who state that socio-cultural sustainability has to be seen through "cultural acceptance, institutional requirements

and perceptions on sanitation" (2004, p. 105). The acceptance by the users can evolve with time (ibid) and perceptions and practices can change within a community (Cross, 1985; Winblad & Simpson-Hébert, 2004). These elements seem to indicate that acceptance is both an important factor of the sustainability of a project but also a factor that evolves in the time.

2.6.5 Assessing acceptability

In many studies and publications purporting to evaluate acceptability of sanitation systems, this acceptability is associated with usage patterns and then measured through the use of the facility or technology (van der Meulen, et al., 2004, p. 187; Naranjo, et al., 2010; Diallo, et al., 2010). The acceptability assessment corresponds then to a user satisfaction study. This puts forward two main questions. The first one relates to the idea of sustainability and reliability of the respondents. A user explaining his satisfaction with a system does not indicate how often and how correctly he uses it. The second one is that focusing on the observation of the usage may provide information about the acceptability at a specific moment but it does not provide enough elements for foreseeing the durability of this acceptance. These studies do not often integrate other options available.

The difficulty to grasp the concept of acceptance or acceptability may be explained by the non-consensus around the definition of the terms. The following questions were used in a reflection about acceptability of forest management (Stankey, 1996) and looked interestingly at the relation between the "passive" users of the forest (walkers, residents) and the managers:

- Acceptability of what?
- Acceptability to whom?
- Who makes the decisions about acceptability?
- What is the context within which acceptability is defined?

The specificity of these questions and the lack of clear methodology to answer them call for a need to set boundaries to the concept of acceptability. Acceptability expressed by users of a technology or practice cannot be absolute or final (Schindler, et al., 2004) as both characteristics of the user and characteristics of the technology may evolve over time. Shindler et al. conclude that *"it is unlikely that any simple "index*

of acceptability" can be (or should be) created" (ibid, p12). Thus the same authors state that acceptability is an ideal starting point for setting a debate between users and the decisions makers.

The term acceptability is not rigorously defined in social sciences (Brunson, 1996) but is based on the understanding of the values, perceptions, preferences of an individual or a group. The precisions given by Brunson on his own perceptions of acceptability give some indication on how to assess acceptability:

> *Social acceptability in forest management results from a judgmental process by which individuals compare the perceived reality with its known alternatives; and decide whether the "real" condition is superior, or sufficiently similar, to the most favourable alternative condition (ibid, p9).*

To avoid pitfalls of theoretical prediction of acceptability that are likely to be disconnected from the context, some studies use the idea of relative or comparative acceptability. Both the points of Brunson and Shindler indicate that acceptability may facilitate a discussion between providers and users based on the comparison of the product/ service provided with the ones available.

Such approaches are used in consumer studies, for example the ones launching new technologies such as non-soap cleaning bars (Hill, 2006). Comparative and relative acceptability studies have also been used in sectors dealing with sensitive cultural issues such as contraception (Smita, et al., 2005; Rogers, 2003, p. 254). Based on the idea of choice and sanitation options available, the acceptability of a sanitation option can be approached by comparing it to other facilities.

2.7 Identified gaps in the literature

The JMP report in 2008, and other academics since, have underlined the need for more research focusing on acceptability of shared sanitation. However, the literature review indicates that few publications have covered the issue of the users' acceptability of shared sanitation facilities in low-income urban settlements. No substantive information was found concerning the following:

- The influence of the location of the shared toilet facilities in a neighbourhood;

- Determinants used by the dwellers to select shared toilets in an environment where there are different options;

- Variations of sanitation choice for individuals and within the household;

- The range of motivations and constraints of shared toilets providers;

- Few comparisons of different models of shared facilities in a similar neighbourhood;

- No research guideline to assess the acceptability of an existing facility.

These gaps in knowledge are used to define the research question in the framework chapter.

3 Framework of the research

3.1 Chapter outline

Designing a research protocol that investigates sanitation choices in the context of low-income urban areas embraces several challenges. The major one is to bridge the different levels of knowledge and experience that exist between the researcher and the targeted population. Sitting in a chair in a well-designed working environment in England may not be the best setting for understanding the needs of urban dwellers in Ashaiman or in Kibera. The researcher looks during the first months of the work for data, publications, experts' reports, and correspondence from local practitioners. Based on this set of information, on his knowledge and on his preconceived ideas, he has to decide how meaningful the research should be for him, his research team, the academic environment and hopefully the targeted population.

Wadsworth challenges researchers by asking them if "their research is 'about', 'for', 'on', 'with' or 'by' people" (Wadsworth, 2005). The researcher needs thorough methodological reading and reflections to decide 'whose reality counts' (Chambers, 1995). Reflection should lead to a research framework and a research methodology that includes the participation of all stakeholders, but where the researcher remains in control in order to answer his initial aim.

This chapter shows the process used to build a research framework supportive of the research objectives. To do so, this chapter is organized into three main sections

3.2 Conceptual framework. This section reviews the existing conceptual frameworks developed during the last years by several organizations in the sanitation sector but also in geography sciences. The section extracts different elements of these existing frameworks to build the research framework.

3.3 Research framework. This section presents the framework used along the research to address the aim and the research objectives. The research framework acknowledges different dimensions of the context and identifies three elements central to the research namely the users, the shared toilet facilities and the sanitation providers.

3.4 Research objectives. This section explains how the research objectives are related together and articulated within the research framework. There is also a description of the evolution of the research objectives during the study.

3.2 Conceptual frameworks

3.2.1 Review of sanitation frameworks and approaches

During the last ten years, sector experts have been developing a range of sanitation frameworks both for research and implementation. The following section describes some of them that have influenced the development of the research framework. Other urban sanitation approaches are described briefly in the literature review. The figure 3-1 is an attempt to visualize the connection of different approaches impacting on sanitation research and projects. The identification of main drivers does not imply that the approaches are serving only one dimension of a holistic reality but indicate which topic is likely to influence most the adopter/ user of that approach. The borders between the different drivers are porous and this representation is to be understood as a reading guide rather than as a selection tool.
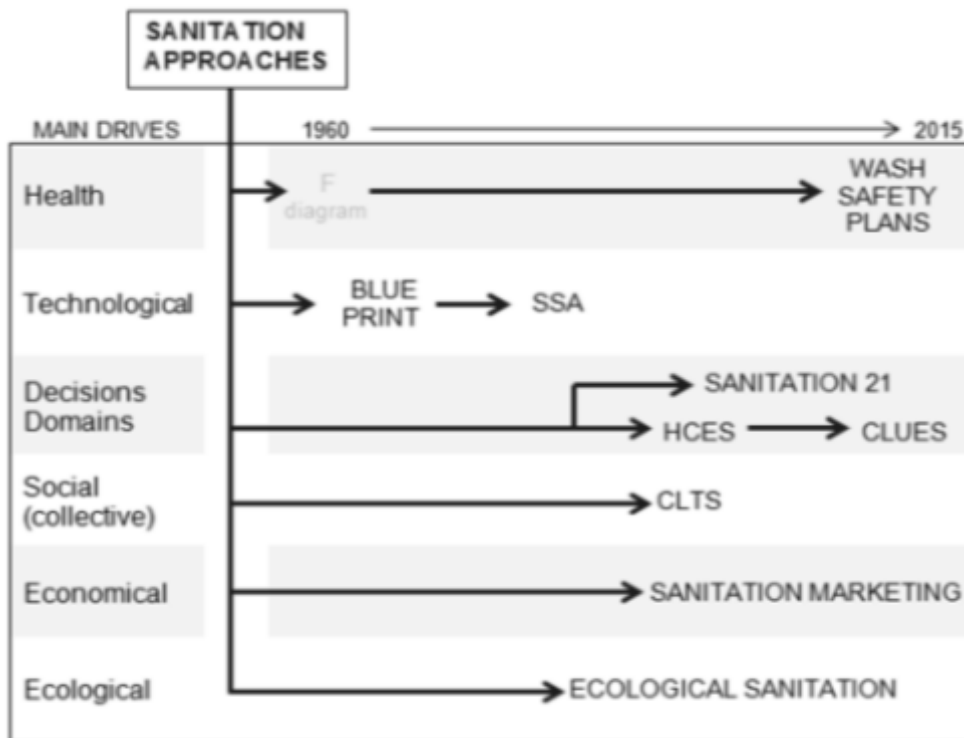
Figure 3-1 Relations and evolution of sanitation approaches

Strategic sanitation approach

Until the 1970s, the main way of conceiving economic and infrastructure development was the transfer of technology from the north to the south, referred to as a blueprint approach. The latest technology was praised, any opinion suggesting the challenges of transferability "was treated with ridicule" (Schumacher, 1974, p. 142). Developers used inappropriate models and approaches both for the technical and institutional development of cities (Wright, 1997) and overall users were rarely consulted before implementation of the projects.

Facing numerous failures, several planners and researchers called for a better understanding of the context's specificities. This would ensure the future utilization of the services by progressively encouraging community participation, including notion of costs and affordability. Community participation should be combined with the dialogue and the support of the different institutions (Kalbermatten et al., 1980, p. 21). The strategic sanitation approach introduced in 1989 by the Water and Sanitation Program of the World Bank built on the principles of consultation, demand orientation and the possibility to choose between a range of technical, financing and management options (Peal, et al., 2010, p. 97).

Household-Centered Environmental Sanitation (HCES) planning approach

The Bellagio Principles (IISD, nd) promote human dignity, quality of life and environmental security at the centre of the different planning approaches. This promotion needs to be done through the participation of all customers, the holistic management of the resources including the waste (seen as a resource) and the focus on the smallest practicable size of analysis or management (household, community,…) (EAWAG, 2005, p. 40). Building on these principles, the HCES planning approach was initiated in 2000 by the Water Supply & Sanitation Collaborative Council (WSSCC) and the Department of Water and Sanitation in Developing Countries (Sandec) and aimed to:

 "The HCES approach suggests a holistic planning process whose key participants are the stakeholders including those at the household level, especially women, who make the basic decisions on personal hygiene and environmental services" (Peal, et al., 2010, p. 103).

The figure 3-2 illustrates this shift in the decision process and places the household at the centre.

Decision-Making in the Past | Decision-Making in the Future

Legend:
I Household
II Community/Neighbourhood
III Local Government
IV District Government
V National Government
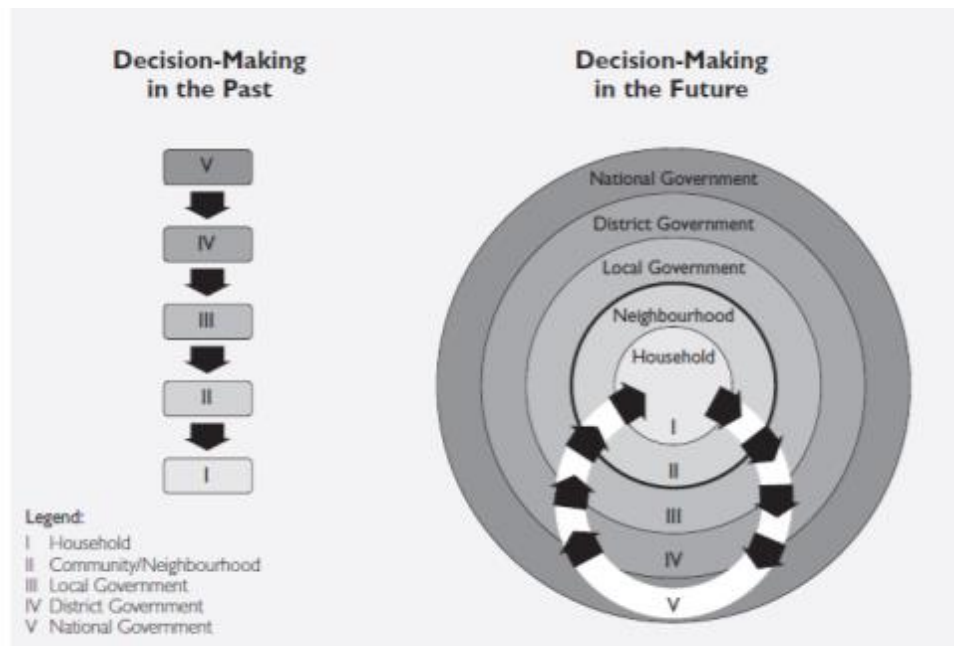
Figure 3-2 Shift in decision making model (EAWAG, 2005, p. 7)

The previous figure clearly demonstrates the change from a top-down to a bottom-up approach. It also introduces the concept of zones (EAWAG, 2005) developed later within the sanitation 21 approach.

Sanitation 21

Sanitation 21 is a city wide planning framework, initiated in 2006 by the International Water Association (IWA), which aims:

> *"to encourage sanitation planners to think more holistically about sanitation from a citywide perspective taking into account the needs of all communities" (Lüthi & Parkinson, 2011).*

Building on the HCES approach, four decision-making domains are identified: household, neighbourhood/ ward/ district, the city and beyond the city (IWA, 2006). This planning approach identifies the different interests of these four domains, explains how they can be contradictory, and shows how they are influenced by the context of any city; see below in the figure 3-3.
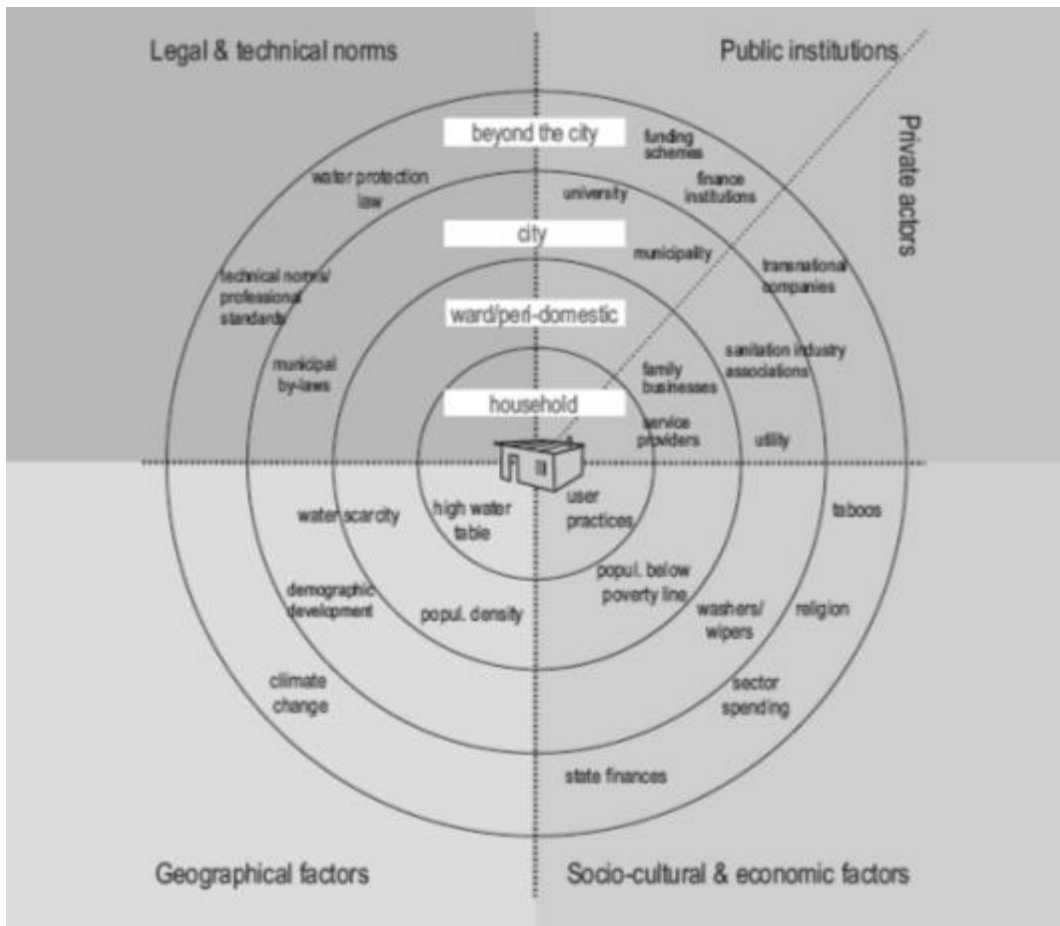
Figure 3-3 Multi-level map identifying context factors (Lüthi, et al., 2011b)

This framework demonstrates the need for collaboration between stakeholders at different levels and the need to foresee the consequences of future implementations.

> *"What the framework offers is a way of ensuring that the institutional realities of the whole city (all domains) are matched to the technical options under consideration or in operation" (IWA, 2006, p. 26).*

The graphical limit of such a framework is stated by the authors:

> *"a simple two-dimensional representation of the framework does little to convey the complexity of urban sanitation or the mental athletics required to identify systems which can work in the long term" (ibid).*

This work serves as a reminder to sanitation and urban planners of the "well-established principles of good planning and design practice" (Peal, et al., 2010) and can be seen as an assessment tool for urban sanitation planning (SSWM, 2012).

Community-Led Urban Environmental Sanitation Planning approach (CLUES)

The CLUES approach has developed since 2011, based on the different results from the testing of the HCES. CLUES proposes seven detailed steps from start to implementation of sanitation programme (Lüthi, et al., 2011a). It highlights the "importance of broad community involvement (beyond the household level) in the planning and decision-making process" (SSWM, 2012). As CLUES requires an enabling environment, it is meant to work together with other approaches such as the Sanitation 21 (Lüthi & Parkinson, 2011; SSWM, 2012).

Community Led Total Sanitation (CLTS)

CLTS was initially developed in rural Bangladesh and India. CLTS, through different participatory methods and triggers, mobilizes the community to transform themselves as the main agents of change. The approach uses a community-led approach to incite individuals to build their own toilets, progressively upgrade their facilities and aims to eradicate open defecation in communities. CLTS "emphasizes community action and behaviour change" rather than hardware and subsidies (Movik & Mehta, 2010, p. 1). Despite many success stories in rural areas in certain countries, CLTS is still a recent practice (Chambers, 2009). Its implementation in urban areas has been experimented but results are yet to be analysed. Recent discussions highlight the main difficulties in transferring CLTS to urban settings (Movik & Mehta, 2010; Kar & Scott, 2012), including:

- Heterogeneous populations;
- Lack of space for digging latrines;
- Land issues, tenure security;
- Importance of political leaders.

CLTS focuses on the first level of the sanitation system (chain) which corresponds to the collection of faeces. In urban areas, on-site sanitation may not be a long term solution and transport and off-site treatment of faeces needs to be considered. Motivating and giving responsibilities to households and community leaders as it is practised in rural CLTS may not be sufficient. The CLTS applied in urban settings needs to integrate other municipal and private stakeholders (Kar & Scott, 2012).

Sanitation Marketing

Social marketing, developed initially in the seventies, aims to stimulate social and behaviour change through marketing actions. It was presented as a "promising

framework for planning and implementing social changes" (Kotler & Zaltman, 1971). The use of a marketing approach in health programmes better identified and addressed the needs and preferences of consumers (Lefebvre & Flora, 1988). It later inspired the development of sanitation marketing. As illustrated by the figure 3-4 the user seen as a customer is in the centre of the marketing framework.
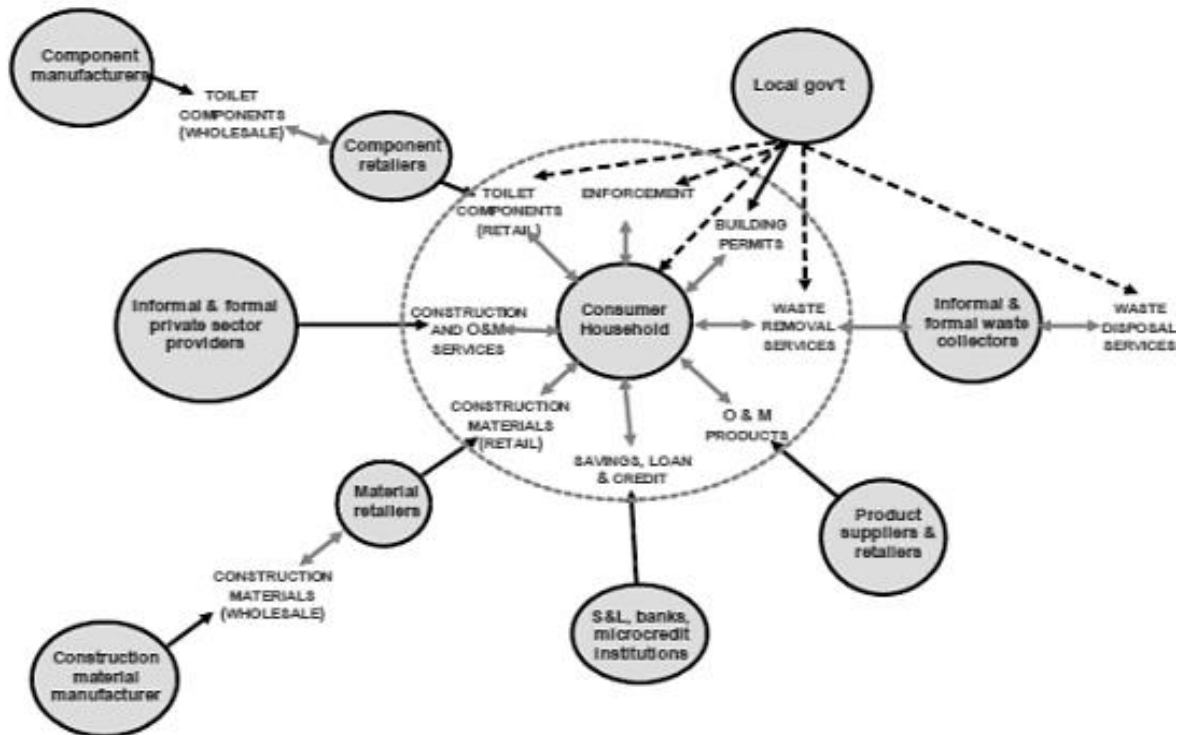
Figure 3-4 Framework of sanitation marketing institutional analysis (from USAID, 2010, p. 14)

In a favourable environment that combines a working supply chain, understands the users' expectations and the use of communication campaigns to stimulate demand, the consumer is encouraged to make his own choice to buy and access sanitation services.

3.2.2 Other relevant frameworks

Moving a city's vision from a homogeneous area to a succession of concentric circles and the superposition of contexts is a shift presented in many discourses outside the sanitation sector:

Such a multi-level approach highlights the inconsistencies and contradictions that may occur between social dynamics generated by the inhabitants themselves and decisions made by authorities and implemented in the city (these may be technical or transport networks, the

provision of services, zoning, etc.). Put side by side, these contradictory
choices and political or financial priorities may help redefine urban planning
to make it more strategic, flexible and adapted to the existing socio-spatial
context – and above all more attentive to the needs and demands of the
citizens (Bolay, 2006, p. 291).

In a similar way to the household centred approach, other development frameworks put the final user in the centre. One of them has influenced a large number of practitioners, researchers and policy makers over the two last decades (Solesbury, 2003). The sustainable livelihood approach was initiated in the late eighties, originally in rural settings by amongst others Robert Chambers.

The livelihood approach puts the people rather than the neighbourhood or the community at the centre of the framework. It goes to a further level than any of the sanitation approaches as it goes down to the individual level. It focuses on the understanding of the individuals' assets. Five kinds of assets are identified: human capital, social capital, financial capital, natural capital and physical capital. The livelihood approach framework allows the understanding of the relations between these assets, the 'vulnerability context' where individuals often live, and the strategies decided by the individuals to evolve in this context (Scoones, 1998).

One of the important aspects of the livelihood approach is the notion of access to opportunity. Presented as an intangible asset, access to services, information, market and employment are key components in the construction of the living of a household (Chambers & Conway, 1992). This access and its understanding depend mostly on the temporal and spatial characteristics of the context. In slums, the context is made of a combination of territories (Pattaroni, et al., 2008) making their approach complex but necessary.

In the different field of geography, different methods and frameworks have been developed to understand and describe complex human environments such as the one found in urban centres. A central question in geography as well as in sociology is to determine who and from which standpoint should the observed context be reported and then analysed. Knox & Pinch (2000) present two aspects that need to be differentiated:

- *"the designative aspects of people's imagery which relate to the mental or cognitive organization of space necessary to their orientation within the urban environment"; and*
- *"the appraisive aspects of imagery which reflect people's feeling about the environment and which are related to decision making within the urban environment"* (Knox & Pinch, 2000, p. 295)*.*

Assessing the designative aspects is often done by asking participants to sketch a map of their environment. The practice was developed among other by Lynch who identified five key elements used to describe an urban environment: districts, edges, landmarks, modes and paths (Lynch, 1960). In many contexts it has been showed that city or neighbourhood perceptions will change depending on the socio-economic characteristics of the participants (Guijt & Shah, 1998; Knox & Pinch, 2000; Chambers, 2008).

The appraisive aspects correspond to the meaning and feelings that dwellers attach to some of the Lynch's elements (the designative aspects). In other words, dwellers' behaviours are largely influenced by what a physical element in the environment evokes, reminds or symbolizes (Knox & Pinch, 2000). Balancing the focus from the individual characteristics to the 'environment' of the individual are two considerations often opposed and sometimes combined in many other disciplines such as sociology or environmental psychology.

3.3 Research framework

3.3.1 Input from existing frameworks

During the last decades, organizations and researchers have worked on new approaches to sanitation offering guidance for the implementation of projects. They all underline the need to see sanitation implementation through both a spatial approach (including stakeholders at different municipal level) and temporal approach (considering the full sanitation chain from toilet implementation to final treatment or reuse). Theories and planners all note the need to take into account the large range of stakeholders and the different dimensions of sanitation activities: socio-economic, technical, economic, environmental and institutional.

Similarly, all frameworks recognize the need to understand the superposition of contextual layers. Aware that this understanding of context will be better done in partnership with the actors experiencing it, all the sanitation approaches include some participatory methods. The development of participatory methods, which encompass a large range of techniques to be detailed later on, aims to provide a better description of the urban environment but also offers the possibility to better capture the perceptions and the wishes of the stakeholders, including end-users.

Analysis of literature on urban planning and urban sanitation clearly shows the shift of thoughts from the domination of a blueprint method or master planning to the predominance, at least theoretical, of bottom-up approaches. Most of the latest approaches rebalance the intentions of planners and providers with the users' needs and perceptions. Despite the emergences of these new approaches, research presenting the perspectives of dwellers and existing sanitation providers (which should be central to these approaches) were often lacking. There is also a need to consider the relationships between such key stakeholders, in order to gain a better understanding of why current poor sanitation services persist, despite the many public and private benefits of improved sanitation. Such insights can be useful for future urban planning and sanitation development.

While the roles of users have been enhanced lately in the planning of sanitation, sector professionals do not always agree at which level the users should be consulted: individual, household, neighbourhood, community. The frameworks suggested by HCES clearly identify the household as the centre of their attention before slightly evolving their model to CLUES, indicating a move of focus from household to community. The user interface ('the toilet hole'), direct concern of the household remains essential but the use of a larger unit such as community corresponds better to the idea of larger sanitation chain. 'Community' is here understood as:

> *"a group that perceives itself as having strong and lasting bonds, particularly when the group shares a geographic location" (Gottdiener & Budd, 2005, p. 11).*

Such definition remains often imperfect in urban areas. While entering a new urban environment as a researcher, it may be difficult to identify which 'units' provide the

strong and lasting bonds. Amongst others, research in urban Ghana confirms that individuals and households are parts of different units/ circles:

> *"People are therefore members of many different social circles, different in size and operating at distinct spatial levels and are likely to develop different aspects of their sociality in the various social spaces"* (Hanson, 2005, p. 1291).

Using the smallest unit available, which in many cases will be the individual or the household, will prevent the selection of an inappropriate larger unit. The notion of 'community' may be difficult to grasp in the heterogeneous urban context, particularly in cities characterized by a massive and diverse immigration. Similarly defining 'household' represents several challenges due to the range of existing definitions and the dynamics that exist within these units in the urban environment (Tipple et al.,1994). Even if this challenge is overcome, the 'household' is rarely a homogenous unit but a place of conflict and cooperation. While gender is the most debated intrahousehold dimension, children, age, disability, polygamy, 'poor relative' are other components of household diversity (Bolt & Bird, 2003).

Several frameworks have been elaborated, often in the sector of poverty assessment, to investigate the role and influence of the decision makers within the household (ibid). These intrahousehold differences are rarely included in existing sanitation approaches; this research shall when possible be individual-centred without isolating the individual from the different circles to which she/he belongs.

3.3.2 What to look for?

In low-income and medium/ high density urban areas, population characteristics, type of sanitation facilities, spread and quantity of sanitation facilities, characteristics of the built but also socio-economic environment, are likely to be very heterogeneous and inter related. The aim of the study encompasses these relations and heterogeneity:

Determine which types of shared facilities are acceptable sanitation solutions for urban dwellers depending on the local contexts.

Local contexts include socio-economic parameters, institutional and physical factors, and urban development. The research framework together with the research objectives must grasp the heterogeneity of the different elements to be analysed:

1. The contexts, and within that context:
2. The providers;
3. The sanitation facilities;
4. The dwellers.

The contexts

The context is a central element in the research but needs to be understood as a superposition of contexts. Figure 3-3 representing the multi-level map used by Sanitation 21 illustrates this superposition. To simplify these levels, the context is divided into three major categories:

- Micro-level: within the neighbourhood, physical aspects play a key role concerning the technical choice of sanitation facilities, social factors such as the spatial distribution of different ethnic and/ or socio-economic groups may influence the sense of community or neighbourhood;

- Meso-level: at the city level, the diversity of sanitation providers, the technical and financial support provided by the local authorities as well as its reinforcement policy affect provision, usage and maintenance of sanitation facilities;

- Macro-level: outside the city, national policy, international monitoring and national and international funding will condition the decisions and actions of sanitation providers.

The different layers are porous, the micro-context being for instance influenced by the urban planning or institutional decisions taken at the meso or macro-level. The different levels may also be contradictory (Bolay, 2006, p. 291)

The providers

Providers have a key role at this stage as they influence greatly the sanitation provision. The type of service they offer is largely influenced by elements of both outside and inside contexts. Providers cannot be seen as a single homogeneous group. The providers are influenced by the three levels of contexts. From the municipality to powerful businessman or isolated household sharing his own toilet, their motivation and their means to provide services are diverse. Different categories of providers need to be looked at: public, private, community, NGO/ CBO…

The sanitation facilities / Toilets

Some urban settlements (cities) are heterogeneous in terms of population characteristics, physical features and street patterns for instance. This heterogeneity influences the sanitation facilities that can for example be characterized through their users, their technological options, and their management model. The quality and quantity of toilets, shared or not, are shaped essentially by the decisions of the providers which are themselves affected by the local and global context.

The dwellers

The term 'dwellers' is used rather than 'users' or 'consumers' in order to include both the users and the non-users of the facilities. Individuals who rely on open defecation or plastic bags still need to be included in the framework.

While most of the approaches use the 'household' or the 'community' as smallest unit, this research makes the choice to use the 'individual'. The notions of choice and acceptability discussed in this research are often related to the individual and may be different within a single household. In contrast to the approaches described above, the research does not consider the full sanitation chain. This research is mostly concerned by the user interface. It is at the user interface that by definition the relations between the toilet facilities and the users are the greatest. In a situation where shared sanitation is the dominant options, dwellers have little to say and may know little about the other part of the sanitation chain.

Relations between the key elements

Dwellers make the choice of using a particular facility, several facilities or no facilities. This choice is influenced by their experiences, perceptions and desires but also by the accessible options. The quantity, quality and diversity of options available will determine the choice to the users. In the case that more than one accessible option is available (focus of this research), the user will balance his needs and perceptions with the characteristics of the different options available. An urban dweller may use and accept facility X rather than facility Y up to the moment that a new facility Z is introduced. He may then refuse to use X and prefer Z. The acceptability of facility X is then relative and conditioned by other existing options.

The relationships between the three major elements of the framework and the surrounding contexts remain the key interest of this study. The nature of these

relationships explains the overall quality of the sanitation services. Understanding the relation between potential users and shared toilets cannot be described only through the uses or non-uses of the facilities. The choice of the dwellers depends on options available and on their interaction with the providers. In the framework the relationship between the providers and the dwellers is simply described as 'interactions'. The nature of this relationship is one of the aspects researched here and therefore remains vague at the initial stage. The term 'interaction' does include potentially 'power', 'negotiation' and 'market based' relationships. It does balance the demand-led and the supply-led approaches.

3.3.3 Visualizing the framework

The four elements described previously are included in the formulation of the aim of this research and central in the construction of the framework. The framework locates approximately the connection of the three latter elements with the different levels of the contexts. To provide a realistic but still clear picture, the visual representation of the framework is limited to the three contexts described previously: macro, meso and micro, see the figure 3-5.

The representation of the framework in only two dimensions hides two others key aspects to be considered:

- Reader's eyes, the position of an external researcher and the readers, both being outside the contexts
- The dynamics of the relationships and evolution of the context in the future
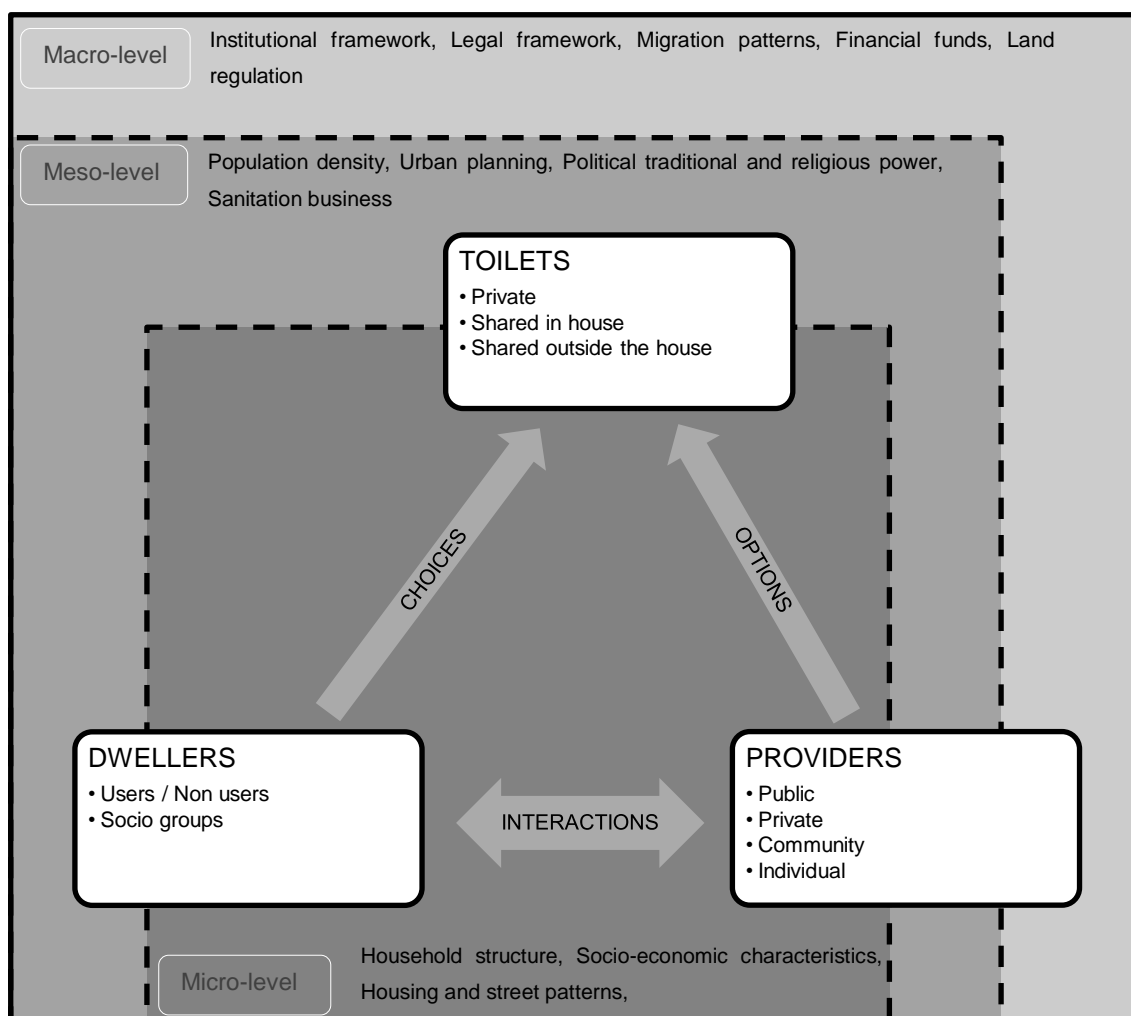
Figure 3-5 Research framework

The figure contains the following labels:

Macro-level — Institutional framework, Legal framework, Migration patterns, Financial funds, Land regulation

Meso-level — Population density, Urban planning, Political traditional and religious power, Sanitation business

TOILETS
• Private
• Shared in house
• Shared outside the house

CHOICES

OPTIONS

DWELLERS
• Users / Non users
• Socio groups

INTERACTIONS

PROVIDERS
• Public
• Private
• Community
• Individual

Micro-level — Household structure, Socio-economic characteristics, Housing and street patterns,

3.3.4 When to look at?

While building a framework, it is necessary to recognize the dynamic implied in the study of population: "both people and neighbourhood are continually changing" (Knox & Pinch, 2000, p. 303). Some central elements of the framework are changing over time.

New policies being implemented, new stakeholders intervening, natural events such as floods, seasonality issues such as rainy seasons, and evolution of power relations constitute a dynamic dimension to the context

The notion of choice, central to this research as it describes the relationship between the dwellers and the sanitation facilities, has to be seen in a dynamic environment. Choice is made by individuals who experience and approach their changing environment in a specific way. Thus the social structures, especially the power

relations, the choice of individual and the context have to be seen as a cycle under continual revision (Crewe & Harrison, 1998, p. 175). The choice can be seen as a response to the options available to the dwellers. The options available depend on the quality and the quantity of the toilet blocks, the service offered by the providers, the motives and the philosophy of the providers; all these elements are changing over time.

While the investigation and the analysis of the data will be done during a limited period of a few months, it should recognize whenever possible elements from the past, present and future to enable an understanding of this dynamic within the framework

3.3.5 Where to look from?

As mentioned several times in this section, sector experts have changed the way they implement projects or conduct research. Following the emergence of the top-down approaches, these various frameworks give more attention to the context. Many professionals see the local actors of this context as an ideal media to conduct such analysis or at least to collect the most relevant data.

Clearly the urban dweller has been positioned in the centre of the framework. However should the context be looked at from an external point of view or should the environment be viewed from a local perspective? To describe the actions and the perceptions of any dwellers, the easy way might be to use the dwellers' words but then the value of the dwellers' own explanations will be questioned (Lloyd, 1979, p. 83). It may be difficult to "*correlate people's perceptions and reality*" (Evans, 2007, p. 9). The observer/ researcher needs then to triangulate the statements of the dwellers by observing and analysing their actual behaviour. For Lloyd, it is not necessary to argue which view of the society/ context is better between the dwellers' perceptions and the researcher's observations. It is up to the researcher to balance the two views and to weigh them in its framework and methodology (Lloyd, 1979, p. 87).

Facing the challenges of multi-layered context, diversity of the stakeholders and their interests, the research will gain in quality and depth by encompassing a range of visions. The ideal framework will look simultaneously at the individual/ household and from the individual/ household.

3.4 Research objectives

The research framework supports the research objectives, the research questions and guides the construction of the methodology.

3.4.1 Evolution of research objectives

The aim of this research has evolved gradually. The initial concern about understanding the acceptability of shared sanitation in the urban context from the users' perspectives remains central to this research. The first draft of research objectives during the first year of the research was influenced by different participatory researchers and by the work of the few anthropologists involved in the sanitation sector, particularly van der Geest in Ghana (1998; 2002) and Bouju & Ouattara in Burkina-Faso (2002). These works describe the relation of individuals and community towards dirt in general and excreta in particular. Using established anthropological methods such as immersion and interviews, their focus was mostly on the perceptions of the individual and groups of individuals.

Reviewing the literature, a pilot study, and seminars confirmed the need to understand individual perceptions but also revealed that such a task cannot be done without putting this objective into a wider picture. The later works of the above cited anthropologists include the political dimension alongside the individual perceptions (Van der Geest & Obirih-Opareh, 2008; Bouju, 2008). More recently, anthropological work has used urban sanitation examples to describe the urban environment and the specificities of some of its social networks (Bouju, 2009).

This research has continued along a similar path. The initial ambition focused on the understanding of the individual in isolation, without acknowledging the importance and the influence of the surrounding elements. The specificities of the context at both local and global levels have consequences on the providers and facilities, influencing options and choices available and therefore shape the perceptions of the users. Therefore the main objectives have progressively included the notions of context and now encompass the relationships between the context, the needs of the users and the motives of the providers.

This development of the objectives led also to the evolution of the research methods. As mentioned previously, the focus on the users' perceptions led to the use of tools influenced by anthropological methods. The gradual interest in the understanding of the changing context required the use of a more mixed method approach. The context and the different elements anchored in the framework, each called for the use of specific tools, described in the next chapter. The iterative process of this research is also reflected during the analysis of the pilot study in the section 5.7.3.

3.4.2 Five research objectives

The specific aim of this research is to:
Determine which models of shared facilities are acceptable sanitation solutions for urban dwellers depending on the local circumstances.

The research aspires also to contribute to a greater goal which is the improvement of sanitation in low-income and high density urban areas.

To structure the collection of data, their analysis and the discussion, five research objectives support the research aim. The first three focus on each central element of the framework. The last two objectives build on the three first.

- RO1: Understand the approaches of agencies and individuals who provide, manage, support and regulate shared sanitation.
- RO2: Assess the availability of toilet facilities in Ashaiman
- RO3: Consider the major factors of usage and acceptability of shared sanitation expressed by the users.
- RO4: Consider potentially viable forms of shared sanitation.
- RO5: Develop an approach for assessing the dwellers' acceptability of shared toilets.

Each research objective investigates particular aspects of the framework; they are divided into more specific research questions aimed at guiding the selection and design of the collection and analysis tools.

RO1: Understand the approaches of agencies and individuals who provide, manage, support and regulate shared sanitation.

Individuals, community based, non-governmental, public and private organizations and landlords are involved in the construction and the management of shared facilities. These implementers respond to specific motives, constraints and drivers. Decisions made by providers are influenced by their interests, their obligations and the context levels. This aspect of the research framework is a major link between the different context levels. It is necessary to obtain a clear typology of the nature of these providers and managers of sanitation services, including the details of their management approach. The second research question of this objective will investigate why these providers develop a model that is not recognized as improved by the JMP.

- o Who are the individuals and agencies involved in the funding, provision, implementation, regulation, and management of shared sanitation facilities?
- o Why providers favour the construction of "shared" sanitation rather than "individual" toilets?

RO2: Assess the availability of toilet facilities in Ashaiman

Assessment and understanding of sanitation practices and preferences depend on the existing sanitation facilities on offer. Available options are in general different from one urban area to another within the same city. The quality, the spatial distribution and the quantity of toilets both shared and individual play a central role for the users and will influence practices but also their preferences. This research question is therefore essential to understand and support the other research questions.

- o What is the amount and type of sanitation facilities in a given area and how is it spread?
- o What is the quality of the sanitation facility and its use?

RO3: Consider the major factors of usage and acceptability of shared sanitation expressed by the users.

Within a neighbourhood, the use and acceptability of facilities will vary between socio-economic groups and between individuals but also over time following any changes on the sanitation facilities offered. It is necessary to see if a pattern of use and preferences can be drawn. Such patterns are likely to be influenced by a variety of determinants or by a combination of determinants.

- o What are the characteristics of the settlement, the population, and their housing in a given area?
- o What are the user determinants for using a given toilet? How does it differ from one user group to another?
- o Is the combination of determinants building the acceptability of the given toilet?

RO4: Consider potentially viable forms of shared sanitation

The viability of a shared toilet in a location does not depend only on its acceptability by the dwellers. The toilet should meet needed requirements for the providers and be used by a sufficient number of dwellers. This objective is based on the aggregation of the three previous objectives.

- o Which facilities are used and accepted by the dwellers?
- o Which facilities are viable from both the providers and dwellers perspectives? Are they viable in the whole city or for a specific geographical area?

RO5: Develop an approach for assessing the dwellers' acceptability of shared toilets

The research using an original approach and an original combination of investigation tools, there is a need to evaluate and suggest improvements to the methodology used in order to support similar studies.

- o How can the research framework be revisited to supported similar studies?
- o Which tools used in this research support best the findings and should be reused in similar studies?

3.4.3 Connecting the research objectives

The five research objectives are naturally integrated in the framework. Although they focus on particular aspects of the connections described in the framework, the different objectives complement each other. The objectives one and two are concerned with the facilities but they are approached through consultation with the stakeholders and the combined observation of the built toilets. Similarly the objective three focuses on the usages and choice of the dwellers but this cannot be done independently from the observation of the existing facilities. The RO four and five use

the elements analysed under the three other research objectives to gather an overall view. The figure 3-6 summarizes the connections between the existing framework and the research objectives.
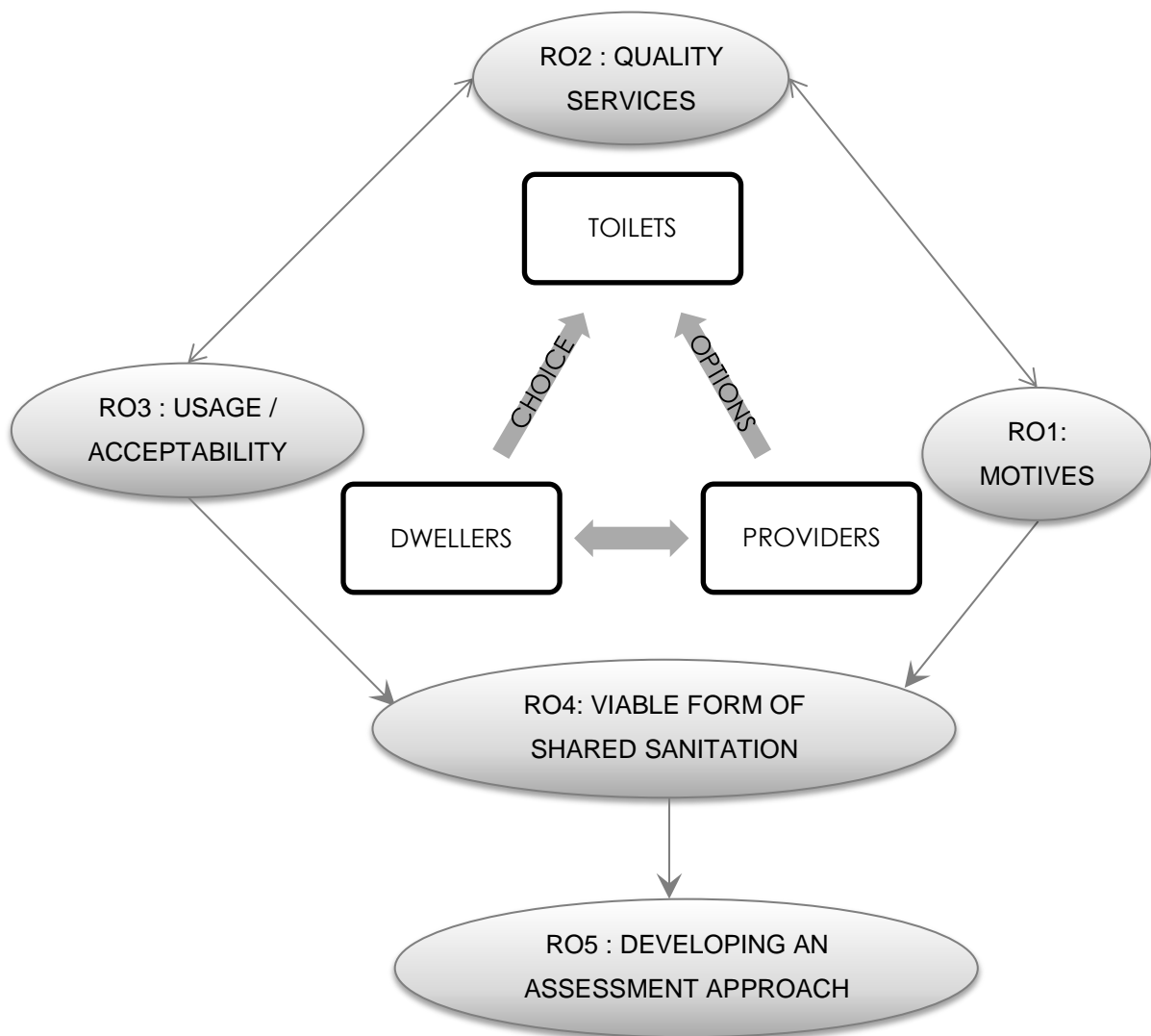
Figure 3-6 Connections of research objectives

Although the context is not represented in the figure in order to provide a clear picture, each research objective is influenced by the local context. As in many other researches or projects (Lloyd, 1979), the process is presented in a linear way while in the real world several stages of reflection or action happen simultaneously.

3.5 Chapter summary

The research approach used in this thesis focuses on balancing dwellers' perceptions with the providers' perspectives in order to understand which form of shared sanitation can best serve the dwellers in a given context. The research framework recognizes the different levels of context, the diversity of the stakeholders and dwellers, and the variety of their perceptions. The framework highlights the need to appreciate better the dynamic that exists and should exist between the dwellers, the sanitation facilities and the providers and other stakeholders.

The presentation of the research objectives concludes the framework section. It does explain how the research has evolved, influenced by the need of considering both the interests of the dwellers and the several dimensions of the context.

4   Methodology

4.1   Chapter outline

The research seeks to investigate the usage of shared facilities in low-income and high density urban settings. The investigation naturally includes the users' perceptions in order to understand which elements of sanitation provision are significant for explaining the acceptability of different shared toilets. The framework underlines that the research seeks to look at the dwellers' views but also to look at these issues from a providers' perspective. The previous chapter introduces the role that the dwellers can have in an investigation of their environment and practices. The methodology should ensure that the different methods used will serve the different research objectives without compromising the ambition of researching with and for the people.

To do so, this chapter is organized into seven main sections.

4.2 Theoretical considerations. This section demonstrates how the researcher has selected case study as the main method of enquiry based on epistemological stands.

4.3 Ethical considerations. This section echoes the previous chapter and presents the ethical challenges of conducting social research in urban Africa. It addresses specific measures to guarantee the ethical standard of the Loughborough University.

4.4 Practical considerations. This section analyses how practical constraints can influences methods and procedures to be used during the data collection.

4.5 Characterising the research design. This section introduces the ideas of quantitative, qualitative and participatory methods and justifies how they can be combined in this research.

4.6 Ensuring the quality of the research. This section defines four concepts to be used during this research to ensure its quality.

4.7 Selecting the case and the tools. This section justifies the selection of the case study based on a set of clear criteria. It introduces a list of potential collection tools and presents how the pilot study supports the research.

4.8 Data collection and analysis techniques. This section details each tool selected for the collection and analysis of data.

4.2 Theoretical considerations

Most of the recent sanitation and urban planning frameworks confirm the shift from a top-down to bottom-up approach, which values the appreciation of people's perspectives and the understanding of context. Chambers describes a paradigm of 'things and procedures' contrasting with a paradigm of 'people and process'. This 'people and process' paradigm allows contextual and flexible methods and calls for participation and triangulation. Chambers uses that dichotomy to make a clear contrast between the two paradigms (measurement/ judgement, supervising/ facilitating, linear/ non-linear …). However it is specified that both paradigms can be appropriate depending on the contexts (Chambers, 2008, p. 172).

4.2.1 Epistemological stand

Selecting a research paradigm draws boundaries and provides a foundation on which to build the research framework (Murray & Overton, 2003). It supports the methodological construction of the research (Willis, 2007, p. 8) and encourages the use of appropriate methodologies and techniques. Through the history of social sciences, different philosophies have been developed which support different visions of how the social realities should be approached (Bryman, 2008, p. 4). Names and definitions of the different philosophies differ from one author to another and these philosophies also overlap (Murray & Overton, 2003); however two major contrasted epistemologies are often identified: positivism and interpretivism (Bryman, 2008).

Positivism argues that comparison, quantitative methods and traditional scientific methods are the keys of valid knowledge (Willis, 2007). The scientific process should be objective, it "borrows the methods of natural sciences for the study of social reality" (Bryman, 2008, p. 13). Interpretivism calls for research strategies that recognize the differences between objects and people (ibid, p.16) and links with the points made earlier by Chambers (2008) in the definition of his paradigms.

This research is predominantly influenced by interpretivism, based on the following:

- Any findings are strongly linked to the context (Willis, 2007)
- Focus is on individual perceptions (Murray & Overton, 2003)
- Reflective discussions with participants are part of the data and should be analysed together, when possible, with the participants (Willis, 2007, p. 110)

- It also corresponds to the nature and background of the researcher (Murray & Overton, 2003).

Robson sees constructivism, interpretivism and naturalism as synonyms and give the following description of constructivist researchers:

> "*Constructivist researchers, as heirs to the relativist tradition, have grave difficulties with the notion of an objective reality which can be known. They consider that the task of the researcher is to understand the multiple social constructions of meaning and knowledge. Hence they tend to use research methods such as interviews and observation which allow them to acquire multiple perspectives. The research participants are viewed as helping to construct the 'reality' with the researchers. And, because there are multiple realities, the research questions cannot be fully established in advance of this process*" (Robson, 2002, p. 27).

Murray and Overton warn researchers who opt for interpretive research that their work is likely to be more criticized because the general perception thinks that is too far from the rigorous positivist approach. The same authors advised that interpretive research requires a strong methodology and that the researcher should be cautious in the explanation of their research design (Murray & Overton, 2003).

4.2.2 Strategy of enquiry

The research design, also called a package of methods (Laws, et al., 2003) or the strategy of inquiry (Robson, 1993; Creswell, 2007), corresponds to the general strategy that will lead the investigation. It will then lead to the planning, set-up and evaluation of several tactics known as methods (Robson, 1993, p. 38). The choice of the research design needs to fit the aim and the research objectives of the study.

Robson stereotypes the selection of research design to three models and relates them to the purpose of the research:

- *"Case studies are appropriate for exploratory work;*

- *Surveys are appropriate for descriptive studies; and*

- *Experiments are appropriate for explanatory studies." (Robson, 1993, p. 43)*

Creswell gives full descriptions of five strategies of enquiries adapted to qualitative research: ethnography, grounded theory, case studies, phenomenological research and narrative research (Creswell, 2007). Table 4.1 highlights some key aspects of the five qualitative approaches.

Characteristics	Narrative Research	Phenomenology	Grounded Theory	Ethnography	Case Study
Focus	Exploring the life of an individual	Understanding the essence of the experience	Developing a theory grounded in data from the field	Describing and interpreting a culture-sharing group	Developing an in-depth description and analysis of a case or multiple cases
Type of Problem Best Suited for Design	Needing to tell stories of individual experiences	Needing to describe the essence of a lived phenomenon	Grounding a theory in the views of participants	Describing and interpreting the shared patterns of culture of a group	Providing an in-depth understanding of a case or cases
Discipline Background	Drawing from the humanities including anthropology, literature, history, psychology, and sociology	Drawing from philosophy, psychology, and education	Drawing from sociology	Drawing from anthropology and sociology	Drawing from psychology, law, political science, medicine
Unit of Analysis	Studying one or more individuals	Studying several individuals that have shared the experience	Studying a process, action, or interaction involving many individuals	Studying a group that shares the same culture	Studying an event, a program, an activity, more than one individual

Table 4-1 Contrasting characteristics of five qualitative approaches (Creswell, 2007)

Using other criteria and other research designs, Yin (2009) suggests a model to select the appropriate research design, illustrated in the Table 4-2.

Strategy of Enquiry	Form of research question	Requires Control of Behavioural Events	Focuses on Contemporary Events?
Experiment	how, why?	yes	yes
Survey	who, what, where, how many, how much?	no	yes
Archival Analysis	who, what, where, how many, how much?	no	yes/ no
History	how, why?	no	no
Case Study	how, why?	no	yes

Table 4-2 Relevant situations for different strategy of enquiry (Yin, 2009, p. 8)

The two last tables support the selection of an appropriate strategy of enquiry. The strategy of enquiry must relate to the different elements of the research framework. The purpose of this research is to investigate the access, the use, the perceptions and the relative acceptability of shared sanitation facilities in the low-income urban context in SSA. The nature of the topic requires a level of description, and the quality of the description will lead to the "why" question and then justify the need for more exploratory researches. The description of the case should also be limited to the focus of the study and use past works and pre-existing conceptual categories. The enquiry is then predominantly exploratory rather than fully descriptive or explanatory.

The use of shared toilets is directly linked to the aspects of an urban environment; the research method must then include both the phenomenon of interest and its context. Case study through the use of several methods and several sources of information allows the understanding of different perceptions. This strategy of enquiry suits explanatory research but due to its flexibility, case study is also likely to include some descriptive elements (Robson, 2002).

However case study enquiry is regularly criticized by some researchers. The most often cited weaknesses concern the difficulty to generalize, the length of the process, and the lack or rigour (Flyvbjerg, 2006; Yin, 2009). Such weaknesses could be tackled through a careful and transparent planning of the case (ibid). The section 4.6 and section 4.7 describe how the quality of the research is ensured and how the case study is planned: from the selection of the cases to the analysis of data.

After understanding the nature of the research questions, **case study** is selected as the main strategy of inquiry.

> *"Case study is an ideal research method when the research questions insist on the 'How' and/or 'Why', and when the research needs a description and understanding of the actual social context"* (Yin, 2009, p. 18).

4.2.3 Structuring the case study

<u>Unit of analysis</u>

An essential component of the case study is the unit of analysis (Yin, 2009, pp. 30-34). The unit of analysis, understood as the definition of the "case" (ibid), should be at

the lowest level possible as during the analysis it will still be possible to aggregate the data (Bernard, 2006, p. 51). It is necessary to keep in mind the selected unit(s) of analysis during each step of the research to avoid the 'ecological fallacy'. The 'ecological fallacy' "*comes from drawing conclusions about the wrong unit of analysis*" (ibid). For example this research cannot draw conclusion about households if the data are focused on dwellers (individuals). It is necessary to draw clear temporal, spatial and other concrete barriers to define the case, and such work is time consuming and delicate (Yin, 2009). In this research, two units of analysis are selected:

- o Sanitation facility. The toilet facility is a central unit within the study question. The providers could also be considered as a distinct unit of analysis. However it is more practical and less abstract to use the toilet as a unit of analysis. The toilet is the result of providers' decisions and therefore a smaller unit of analysis than the provider.

- o Dweller. Rather than household, the dweller is selected as unit of analysis. While some data will be collected through house unit survey or during group exercises, the unit of analysis will remain the dweller. The use of dweller rather than house unit or household as a unit of analysis will also support the work of other researchers who may use the case study for further comparison (Yin, 2009). The notion of household is here difficult to apply outside the specific context and the notion of house unit is not widely used.

Multiple cases design

By the nature of the research objectives and because this research aims to bridge the gap between providers and users, the design of the case study must allow space for these two units of analysis but also for the sanitation facilities itself and for other stakeholders. The case study will be using several sub-cases in order to take into account the reality of the context. Multiple case designs have to be selected when possible because they allow analytical generalizations (Yin, 2009, p. 60). The representation of the relation between cases and context is slightly different, as shown in the Figure 4-1.
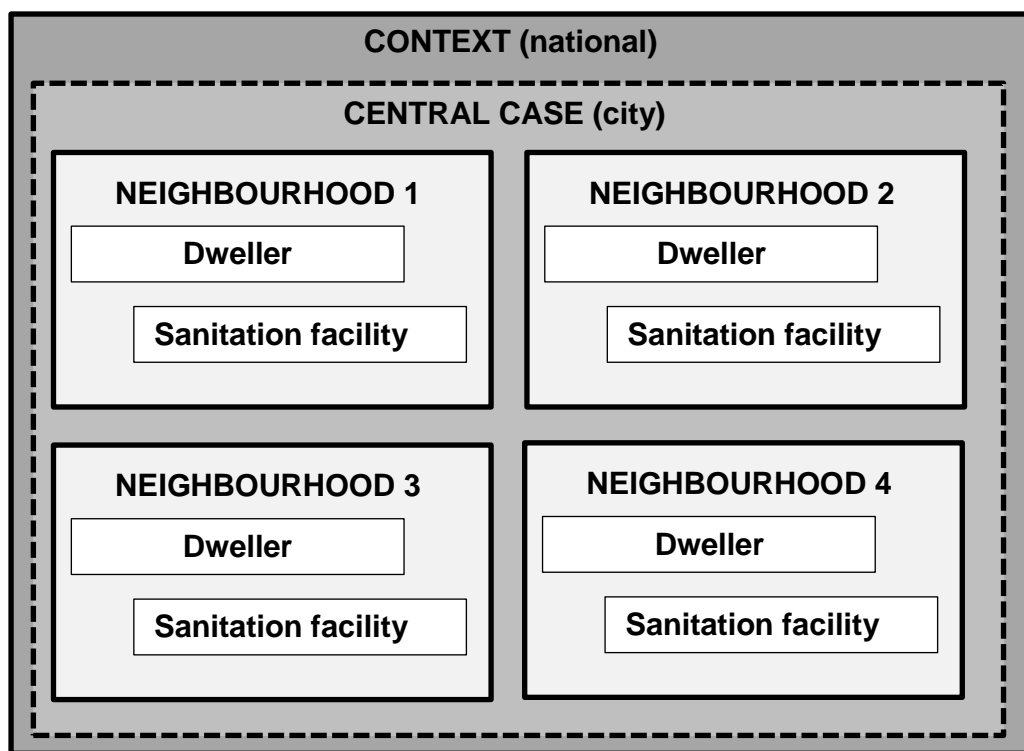
Figure 4-1 Case study design for this research based on (Yin, 2009, p. 46)

Such representation underlines the need for understanding the contexts and how they vary from one sub-case to another. It also confirms the importance in drawing borders to the different units of analysis as mentioned earlier.

4.3 Ethical considerations

The ethical dimension should not be limited to a set of constraints implying ethical approval and other official (and necessary) procedures. Sumner sees three dimensions to the ethics of development research:

1. The ethics of the development itself,
2. The ethics of the research process which covers practical procedures,
3. The ethics of the development community (the professionals, the researchers) which challenges the role of the researcher towards its community and the future implication of its findings (Sumner, 2007, p. 63).

In this research, the ethical dimension is seen as a set of guidelines encouraging the researcher to "build mutually beneficial relationships with people you meet in the field and about acting in a sensitive and respectful manner" (Scheyvens, et al., 2003, p.

139). Therefore, the ethical dimension is a first step in building the quality of the investigation and has been considered during all key stages of the research process:

> *Questions of ethics and behaviour have a direct bearing on how valid the findings are (Chambers, 2007, p. 45).*

The ethical issues are morally and practically central to the research process because the quality of the findings will depend partially on the quality of the relations with the informants or respondents (Mayoux, 2006, p. 123). This section on ethics details the notion of reciprocity, power relations, researcher effect and the ethical procedures.

<u>Reciprocity</u>

Despite the desire to do part of the research 'with' and 'for' the people, it is likely that in the short term the researcher will be the main beneficiary of the field work results. This however should not bring doubt about the legitimacy of the research (Scheyvens, et al., 2003, p. 155). However the researcher must bear in mind his responsibility towards the life of the ones is researching on (Sumner, 2007, p. 67). The process of the research, the presentation of the results, and the possible services and policy evolutions led by the research are elements given back indirectly to the local community. Similarly the process is beneficial to local people who assist the research as they gain salaries and valuable experience. Finally, the research process may be welcomed by some participants, as it is an opportunity for them to discuss issues and feel heard. The research may be a medium to amplify some issues highlighted by some participants. However such medium will depend on how the results of the research will be shared with practitioners, sanitation providers and policy makers.

<u>Researcher effect</u>

A key element of the ethics in development research is the notion of power (Scheyvens, et al., 2003; Brydon, 2006). The origin of the researcher, his education and position introduces an imbalance in power between him and the informants. Any researcher has an effect. In this research, this effect may be more extreme as the researcher is white, coming from Europe and relatively wealthy so will work in an environment where he will stand out through his appearance and through some preconceived ideas. The researcher should not reinforce these perceptions (Scheyvens, et al., 2003, p. 149). The researcher effect could be diminished through a set of methodological procedures but also through some practical elements and behaviour. Staying with a local family in the studied municipality, participation in some

local events, and use of bicycle as a daily transport are some of the actions taken by the researcher during his fieldwork. The researcher effect and its impact on the credibility of the research are discussed in the section 4.6.1.

<u>Research team</u>

The main researcher cannot work alone in an environment where he does not possess all the languages and knowledge. He needs to be supported by assistants and translators, ideally selected by him. The researcher effect may also exist between the team members and the participants. Therefore all investigators and translators involved in the research team receive training to carry out the different data collection activities. Training was ensured on the project by the main investigator together with a local research organization, TREND (Training Research and Networking for Development). The participants were briefed in order to be fully aware of the different ethical documents and of the behaviour they should have towards the participants. Equally, it is important for the main researcher to understand the power positions of the members of his team and be aware of potential influence it can have on the results.

4.3.1 Ethical procedures

Research with human participants presents some possible ethical risks that need to be identified and mitigated against. A number of tools have been produced by many organizations and this research complies with the different regulations set by the Loughborough University. The Loughborough University ethical advisory sub-committee issued clearance for the field research on 26 August 2011. The key aspects of the ethical procedures are detailed below.

<u>Informed consent</u>

Before involving the participants, they need to understand the aim of the research and the intention of the researcher. To explain the research and gain informed consent, a participant information sheet was provided, or translated and read to the participants before any sessions or tools, see appendix A1.

<u>Confidentiality</u>

Confidentiality is guaranteed to the participants, and the future use of their contribution is explained and debated if necessary.

Practically, members of the research team sign a declaration of confidentiality prior to joining the team. Answers and ideas expressed during surveys and interviews are thus expected to be kept confidential within the research team. Answers and ideas expressed during group discussions are expected to stay within the group following agreement made before the beginning of the sessions.

Prior interviews and questionnaires, participants will be assigned a code and data will be stored against this code rather than against the names of participants. The personal information on the interview and enumeration sheet (upper section) are entered onto a separate form, and a coding system will be used to link with the core section for the analysis. During the analysis and the reporting of the collected data, no references will be made to specific individual

Withdrawing

The ability of withdrawing is guaranteed and explained beforehand to any participants. During all sessions and at any time, participants will be able to ask any questions or explanations to the investigating team (male or female) in the local language or English.

Data protection

Members of the research team sign a declaration of confidentiality prior to joining the team. Answers and ideas expressed during the questionnaires, surveys and the interviews are thus expected to be kept confidential within the research team.

Answers and ideas expressed during the participatory tools are expected to stay within the group following agreement made before the beginning of the session. Ideas expressed through photographs are owned by the informants and the informants decide on which pictures can be used by the research and for which purpose. The procedure approved by the Loughborough University complies with the Data Protection Act 1998.

Paying respondents

One element concerning the ethical procedures has evolved during the fieldwork with the agreement of the ethical committee of Loughborough University. After the first participatory groups, it was difficult to gather particularly male dwellers; and several participants (male and female) complain that they will rather receive money instead of snacks and soft drinks. After additional literature review and approval from the ethical

committee, decision was made to pay five cedis (slightly more than the cost of drink and snacks) the participants to group discussions.

The payment of informants in research is a source of debate in development research together with the form it should take (Laws, et al., 2003, p. 372). Some argue that it can be a way of reducing the power differences and reward the respondents (Thompson, 1996). This is opposed to the conventional view:

> *"It is often assumed that payments will result in bias (…) the only valuable respondent is one who is willing to engage in the prescribed hierarchical relationship, which necessarily includes the donation of time for the benefit of the social sciences"(ibid).*

Still, the reality of the field, particularly in setting where the time of respondents is particularly valuable (Chambers, 2007, p. 163), challenges this idealistic view and calls for a compensation of the participants who give more than an hour to the research. Agreeing with this last statement, payments in this research were however used as little as possible to reduce the eventual bias and to match the financial constraints described next page.

4.4 Practical considerations

The nature of the topic influences the research strategy and selection of methods, and must not be neglected (Bryman, 2008). The research aimed to discuss with a diverse range of individuals, social and personal issues related to the use and the perception of toilets. The design of the different tools for collection and analysis of data were influenced by the research aim and the framework but also by several practical components: time, financial resources, researcher skills, and research location.

Time

The research was bounded by the constraints of doctoral research which limits the length of the field work. The period of the field work took place after a good preparation and must be followed by a sufficient time for analysis and writing up. The field work was costly and limited by the financial resources available

Financial resources

This research, in order to keep its independence, has been supported only by small grants from the department, rewards delivered by the Graduate School of the

University and a grant offered by SANDEC EAWAG. These grants were used to support the house unit survey and some transport costs. All others activities and staff costs were borne by the researcher's own funds and remain limited.

<u>Researchers' skills</u>

Not being a social scientist by background, the researcher developed the required skills prior to this research, for example interviewing, observation and some participatory methods such as transect walks. He has conducted social research in rural Bangladesh, conducted several project appraisals in urban Burkina Faso, Liberia and Sri Lanka. His previous research project included several weeks of fieldwork in rural Bangladesh investigating socio-cultural determinants of acceptability of urine diversion toilets, confirming his interests and knowledge on interconnections between technological interfaces and socio-cultural dimensions. Additional trainings were also received at the Loughborough University focusing on questionnaire design, selection of appropriate statistics, and analysis of quantitative and quantitative data (details of these trainings are provided in the appendix A2).

<u>Research location</u>

A large number of social science research books are not adapted to research conducted in an environment that has different cultural values and living standards. Beyond the ethical issues, the use of costly and complex technologies may not be appropriate. Some methods implying reading or writing may not be appropriate in areas with high illiteracy. Therefore the research location influenced data collection and analysis methods to be used.

<u>Assistants and enumerators</u>

The research took place in an urban setting where the local population is likely to speak diverse languages, must of them not understood by the lead researcher. To ensure the understanding of the context, the quality of the communication with the participants and some logistics and security issues, the researcher needed to be supported by individuals familiar with the context. The availability of suitable staff, their eventual salaries and the different methods have been considered to ensure minimum bias.

All tools involving the production of fixed and systematic questions needed to be carefully translated. The use of a back translation method which involves translating back to the original version was done by people being native speakers of the targeted language (Francis, et al., 2004). The pilot study specifies, in the section 4.7.6 the challenges and the procedures used to mitigate the translation issues.

4.5 Characterizing the research design

Associating the theoretical, ethical, and practical considerations, it is necessary to design adequately the research design and the procedures that will guarantee the quality of the research.

4.5.1 Qualitative and quantitative

Qualitative approach

The qualitative approach is drawn from a constructivist approach and it favours the understanding and exploration of social phenomenon through the "observation of participants' behaviour by engaging them in activities" (Creswell, 2009, p. 16). Rubin and Rubin (2005, p. 36) list three essential principles of qualitative research: research methods should be flexible, iterative and continuous. Those principles are central in the construction of this research, mostly in this context of mixed method approaches detailed in the section 4.7.2.

Investigating context, values, knowledge, and individual characteristics requires a set of qualitative enquiries. Qualitatively gathered information allows the exploration of nuances in meanings which people interpret. Information gathered in a qualitative phase can be used in the construction of questionnaires meaningful to respondents (Hansis, 1996). Qualitative methods are regularly used to assess household behaviour, including in poor urban settings (Järvelä & Rinne-Koistinen, 2005). Some of the tools used are derived from ethnology such as participant observation (Denscombe, 2007) and often investigate behaviour and social relations.

The quantitative approach is drawn from a post-positivist world view and favours the understanding of attitudes through experiments and statistical analysis (Creswell, 2009). Quantitative methods such as large-scale surveys are not always popular in development research (Mayoux, 2006). The use of surveys, generating statistics, may exclude vulnerable people because they are more difficult to reach through this method. Surveys may not be appropriate for some sensitive topics or lead to falsified answers by some respondents (Mayoux & Chambers, 2005, p. 278). In a multi-cultural context, translating complex context may be difficult through short and closed questions (Overton & van Diermen, 2003). However quantitative tools allow the researcher to demonstrate facts on a scientific basis, well understood by urban planners or engineers. In investigating sanitation practices, quantitative data can be a source of relevant information. If the reliability of international and national data is often questioned, then attendance records of community toilets can for instance provide reliable data at a local level.

4.5.2 The participatory approach

Influenced by pragmatic views, the design of the research will include both quantitative and qualitative approaches. However another dimension, the participatory approach, shapes the research' design in order to guarantee research foundations defined in the framework section. In a similar way to Wadsworth (2005), Chambers indicates that despite our best efforts, a comparatively wealthy European researcher will not be able to report all the dimensions of poverty. In an attempt to reduce these ineluctable biases, the appropriate use of participatory methods may be a suitable answer (Chambers, 1995). He estimates that qualitative, quantitative and mixed methods remain mostly extractive and argues that alternatives exist. Methods and tools can facilitate the participation of the unit of analysis in the design of the research, its collection and analysis of data.

Chambers refers to the use of participatory methods; such methods used within qualitative research have become popular over the last two decades (Patton, 2002). Researchers and professionals using participatory approaches aim to challenge the traditional top-down approach for a bottom-up one (Mikkelsen, 2005, p. 55). The words participatory together with partnership and empowerment:

"had become central concepts in the mainstreaming development discourse". (ibid, 2005, p. 56).

The participatory approach means that the research participant is not only a subject but becomes involved and active in the research. Deciding the level of participation of the unit of analysis remains particularly challenging both at philosophical and practical levels. In a pure participatory research, initiation of the research including the production of the research questions and the investigation methods shall be done by the local people (Cornwall & Jewkes, 1995).

The use of participatory approaches is encouraged by several authors and publications (Chambers, 2008; IIED, 2004), however several practitioners judge it populist and manipulative, some comparing it to a new form of tyranny (Cooke & Kothari, 2000). Mikkelsen lists and rates the criticisms (2005, p. 76):

- Lack of rigour;
- The difficulty of linking participation and popular empowerment;
- Risk of going beyond real participation and falling into a state of manipulation;
- Risk of excluding some of the stakeholders such as institutional or financial partners because they are not members of the community targeted.

Some other limits are identified, such as the difficulty in defining the concept and drawing the border of a community (Brockington & Sullivan, 2003, p. 63).

The criticisms listed above balance some of the intentions discussed by Chambers (1995) and Wadsworth (2005). The use of participatory methods is important to guarantee the ethical consideration of the researcher, to balance the research effect and to reinforce his knowledge of an unfamiliar context. However the researcher is warned about the risk of losing control of his own objectives, and he understands the need of defining the perception of participation in research.

<u>Level of participation</u>

Before deciding to what extent this research may be inspired by a participatory approach, it is necessary to describe the concept of participation itself. Based on Arnstein's work (Arnstein, 1969), several ladders of participation have been developed (Hart R. , 1992). The Table 4-3 summarizes the main aspects of the typology of participation (Pretty, 1995), also called Pretty's seven stages (Mikkelsen, 2005, p. 59).

Level of Participation	Actions Individuals and community's members	Actions Researcher
Passive	Listen	Present decisions
Informative	Answer	Extract information
Consultative	Give opinion	Listen, Analyse, Decide
Material incentives	Exchanging information or work for money or incentives	
Functional	Act	Decide
Interactive	Co-analyse	Co-analyse and decide
Self-mobilization	Analyse and decide	Support

Table 4-3 Level of participation (adapted from Mikkelsen, 2005)

This research does not pretend to empower the whole community or to be driven by the participants themselves. Such objectives are compatible neither with the research paradigm nor with the researcher's financial and technical resources. The researcher intends to use tools that will be consultative for some of them (most of the quantitative ones) and interactive for others (most of the qualitative ones). Participatory researchers have been particularly active in developing countries and some of the investigative tools they have developed are adapted to this research.

4.5.3 Associating a set of methods

The mixed methods approach relates to a pragmatic paradigm:

> "*Pragmatists argue that both quantitative and qualitative approaches have their own distinctive strengths and weaknesses and can be usefully combined to complement one another.*" (Hewson, 2006, p. 180).

A mixed methods approach has been more popular during the two last decades and used in many disciplines, from education sciences to dementia caregiving (Creswell, 2009, p. 204). Such an approach provides the researcher with a deeper and greater understanding of the context investigated; however, mixed methods require an extensive data collection, the utilization of various research skills, the ability and the resources for analysing both qualitative and quantitative data. To keep such methods realistic, it is necessary to articulate the methods in a pre-established strategy.

Mayoux (2006) calls this pre-established strategy, an integrated research process and includes the participatory approach in this process. The author notes that the

differences between the three methods often merge, particularly in research calling for a holistic view of a particular context. The approaches can be technically combined for instance by associating a participatory collection of data and its quantitative analysis. (Mayoux, 2006, p. 123). Combining a set of methods, is not considered in the literature for a specific purpose and need to be tested during a pilot study and then clearly stated before starting the main fieldwork.

Valuing the importance of the context and the perspectives of the different stakeholders, this research recognizes the need for exploring these through the use of a case study that will include different approaches, see figure 4-2.
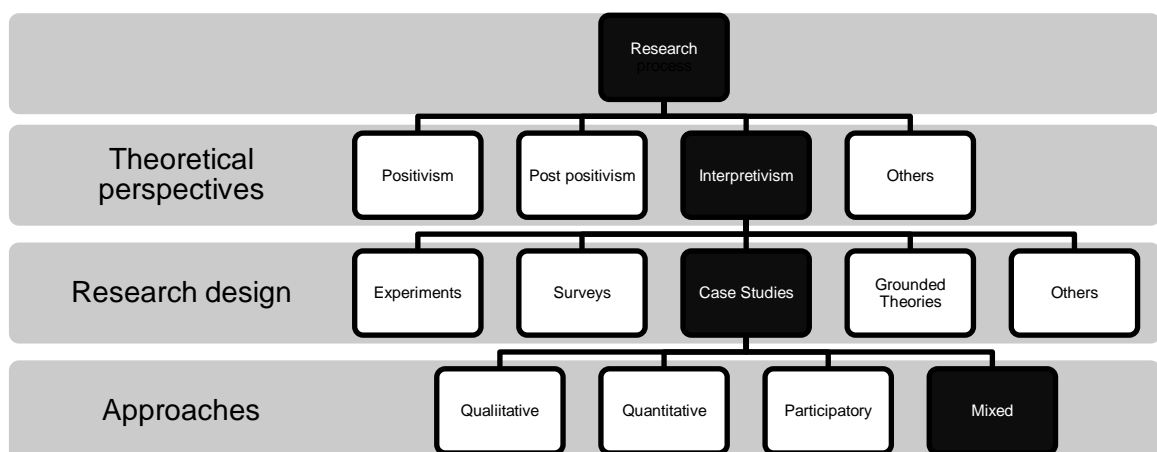
Figure 4-2 Selected research process

After defining the form of research enquiry and the approaches, the last stages in designing methodology is the selection of techniques to collect and analyse the data and the selection of actions that guarantee the quality of the research.

4.6 Ensuring the quality of the research

The choice of case study as the main research enquiry, will imply the use of different techniques, and requires the understanding of several mechanisms meant to ensure the quality of the research. As different views exist on how social research should be conducted, debates also exist concerning the criteria sets to ensure the quality of the process and of the findings. The choice of a research strategy influences the methods and the criteria chosen for assessing the quality of qualitative research. Some authors

list the analogy made by constructivist researchers (Patton, 2002, p. 546; Bryman, 2008, p. 377), as shown in the table 4-4.

Rigour (as defined in traditional social sciences)	Trustworthiness (as defined by Lincoln & Guba 1986, 1989 cited by Patton, 2002)
Internal validity	Credibility
External validity	Transferability
Reliability	Dependability
Objectivity	Confirmability

Table 4-4 Factor of quality of research in social sciences (adapted from Patton, 2002)

4.6.1 Credibility

The "credibility of qualitative inquiry is based on three distinct but related elements" (Patton, 2002, p. 552): rigorous methods, credibility of the researcher and philosophical beliefs in the value of qualitative inquiry. The philosophical beliefs and the credibility of the researcher have been described in the sections 4.2 and 4.4. Credibility is similar in many ways to what most social scientists call internal validity or qualitative validity: "Qualitative validity means that the researcher checks for the accuracy of the findings by employing certain procedures" (Creswell, 2009, p. 190).

Acknowledging the challenge of ensuring the accuracy of the research, Robson suggests instead analysing the threats to the validity. Finding and developing strategy to mitigate the threat to validity will enhance the overall validity of the research. Three major threats to validity are identified by Robson (2002, p. 172):

- Reactivity, where the research disturbs the studied context;
- Respondent bias, where the respondents do not give honest answers either because they want to please the researcher or because they fear him. Aid bias can also be mentioned here; in context where people rely partially on humanitarian aid, they will expect a large range of support from an external researcher and may change the quality of their answers;
- Researcher bias, where the researcher is not able to step back from his previous experiences, preconceived ideas and assumptions. Such will influence the nature of the questions asked or the sampling procedures.

A range of strategies are developed in the literature to answer the three major threats to validity, see table 4-5.

STRATEGY	Threats to validity		
	Reactivity	**Respondent bias**	**Researcher bias**
Prolonged involvement	Reduces threat	Increases threat	Reduces threat
Triangulation	Reduces threat	Reduces threat	Reduces threat
Peer debriefing/ support	No effect	Reduces threat	No effect
Member checking	Reduces threat	Reduces threat	Reduces threat
Negative case analysis	No effect	Reduces threat	No effect
Audit trail	No effect	Reduces threat	No effect

Table 4-5 Strategies for dealing with threats to validity (Robson, 2002, p. 174)

This research focuses on the three strategies highlighted in the previous table because they do not have significant negative impact and used together will reduce the three major threats.

Peer debriefing

The researcher does not collect and analyse the data alone. He does it within a team made up of his supervisors, academic partners and research assistants. The team is able to help the researcher in developing his tools, warn him against potential bias and can also have a therapeutic function (Robson, 2002, p. 175).

Member checking

First results and analysis are presented and discussed with the participants or a panel of participants. The researcher allows space for this feedback but need to agree before such checking on how misunderstanding and disagreements will be discussed (Robson, 2002, p. 175). The researcher will then have an insight on the perceived validity of its research (Patton, 2002, p. 560).

Triangulation

Triangulation is a popular strategy that should be divided into four kinds (Robson, 2002):

- Methodological triangulation, involving the mixing of qualitative and quantitative approaches to which can be added the participatory approach (Mayoux, 2006);

- Triangulation of sources, involving several tools to collect and analyse data;
- Observer triangulation, involving several researchers to analyse the data;
- Theory triangulation, involving the selection of several theories of investigation.

Triangulation should not necessarily provide the same results, but help the researcher to understand reasons for eventual inconsistencies in the data (Patton, 2002, p. 556). Except for the theory triangulation, the three other kinds of triangulation are used in this research:

1. The research uses mixed method approach combining qualitative and quantitative methods to collect and analyse data;
2. The research uses several tools to investigate the same data. For instance usage of toilets will be assessed through both interviews of the households and observation of the toilets;
3. Data are analysed by the main investigator but the team and colleagues participate in the analysis.

4.6.2 Transferability

Transferability refers to external validity which is seen as the potential for generalization of the research. Two generalizations have to be differentiated:

- The internal generalization is concerned with how the conclusions can be applied within the case (Robson, 2002, p. 176). The main bias at internal level will be the selection of participants and the general sampling procedures;
- The external generalization is often mentioned as a weak point of case study design, however similar comments could be made for experiments*:*

   "Case studies like experiments, are generalizable to theoretical propositions and not to populations or universes" (Yin, 2009, p. 15).

Distinction should be made between statistical generalization and analytical generalization (Robson, 2002, p. 183). Yin warns against the use of statistical analysis because the case(s) is not chosen as a sampling unit. Analytical generalization, more easily used in multiple case approaches, allows the researchers to contrast the cases and to see if the evidence drawn from each case supports a same theory (Yin, 2009, p. 38). To summarize Creswell argues that generalization is not the main value of qualitative research because, by definition, it focuses on the context (Creswell, 2009, p. 191). Generalization is possible at a later stage when researchers are using the

"collective process of knowledge accumulation in a given field" (Flyvbjerg, 2006, p. 227).

To make this future generalization possible and because qualitative researches are often based on the understanding of a specific context, it is important to provide the reader with all the relevant elements of this context (Bryman, 2008, p. 378).

4.6.3 Dependability

Dependability is seen as a parallel of reliability:

> *"The qualitative reliability indicates that the researcher's approach is consistent across different projects." (Creswell, 2009, p. 190).*

Key to reliability is rigour through the entire research process. Particular attention needs to be given during transcription of data and the elaboration and utilization of codes (Creswell, 2009). It is necessary to document the procedures of data and analysis collection in order to give to another researcher the possibility of conducting a similar study (Yin, 2009, p. 45).

4.6.4 Confirmability

The confirmability criteria is concerned with the objectivity of the researcher. The framework research states that the research will seek to combine views from the stakeholders' perspectives and views of the stakeholders in their context as it is perceived by the researcher observations.

4.7 Selecting the case and the tools

After defining the research design and the quality criteria of the investigation, the next phase is the selection of a case study location and the choice of tools that fit the context and the research objectives. To prevent some bias, as discussed earlier, and reinforce the quality of the study, the main fieldwork is supported by a pilot study validating the location of the case and the tools.

4.7.1 Case study selection

As detailed in the research framework chapter, the relations between providers, dwellers and sanitation facilities that are at the centre of this study are influenced by

several layers of contexts. Each layer brings a succession of factors influencing the three main elements of our framework. The research cannot investigate all the aspects influencing user acceptability of urban shared sanitation as it goes from international aid systems to local policies. In an experiment, it is possible to control several factors and to focus on only one element. In researching real life events, controlling variables is not possible, but it is possible to isolate some variables. It is possible to compare neighbourhoods that have common elements.

The research could have compared, as initially thought neighbourhoods in Accra and Kuala Lumpur. It would have probably revealed some differences in term of national policies and maybe users perceptions related to culture, but the lack of time and financial resources would have limited the in-depth analysis of the contexts. Therefore it was discounted. The three following sections detail the geographical selection of the study, and questions that would be answered at the three geographical levels:

- Macro-level: Which sub region? How many countries? Which country?
- Meso-level: Which cities? How many cities?
- Micro-level? Which part of the city? How many neighbourhoods?

Macro-level: Sub Saharan Africa and Ghana

Several discussions with potential partners and findings from the literature review encouraged the researcher to focus on one sub-region. Sub-Saharan Africa is an ideal place for this research. The percentage of poor urban dwellers within the whole population and the trend of users of shared sanitation are increasing in many countries of the region. There is also a need to carry out more research in urban Africa and publish it as a lot of the existing work is done by consultants and not necessarily made available to academics and the larger public (Cohen, 2006, p. 77).

Initial ideas were to compare situations in French-speaking and English-speaking African countries to analyse the differences in policies, but the financial resources were limited and some comparative studies already exist focusing on urban development projects (Bertrand, 2004) and decentralization (Dafflon & Madiès, 2013). The research is to be done in one country as it reduces some of the variables such as historical development, national institutions and policy framework, and national trends of urbanization.

The researcher made the choice to investigate shared sanitation in a development context and therefore the context of emergencies and post-emergencies are excluded. In order to benefit from the work of other academics and professionals, fieldwork was conducted in regions where NGOs, universities and research centres are active. Ghana is a stable country known for the quantity and the quality of its universities and research centres. Ghana is also a country where shared sanitation is a daily solution for more than half of the urban population. Finally Ghana is also experiencing a significant and quasi-constant urbanization since its independence.

Meso-Level: Ashaiman

The research should be conducted in a city with an increasing population and a high rate of shared facilities; It is also important that skilled human resources (students, researchers) and potential stakeholders interested in sharing results work in or close to the targeted city. Ashaiman is typically a growing city, developing near Accra which is a major urban centre with research centre and offering logistical support if needed. In contrast to some slums within Accra, Ashaiman does not seem to have suffered from too much research work.

Working in only one city reduces the variables to be investigated in detail such as the municipal structure and the role of municipal stakeholders including, civil society and traditional chiefs.

Micro-level Four neighbourhoods

As mentioned earlier, by the nature of the objectives, the research focuses on issues embedded in the local context. The case is divided into several sub-cases corresponding to neighbourhoods. The main criteria to select the neighbourhoods is the coexistence of more than two realistic sanitation options available that are accessible to the population within the selected area. More than two options available allow the comparison of potential choices for the dwellers. Other criteria are the:

- Socio-cultural heterogeneity
- Medium to high density
- Areas have borders easy identifiable by inhabitants
- Areas have an estimated population of 1000 to 3000 people and a similar size.

As confirmed later by the pilot study section, the field work is to be conducted in Ashaiman in four neighbourhoods. Starting from the initial criterion of neighbourhoods with different shared sanitation options, the researcher looked for four areas

presenting contrasts. The selection was based on transect walks in the city, and discussion and with the inhabitants highlighting differences of population density, type of housing, urban planning history, type of shared sanitation available and socio-economic characteristics.

4.7.2 Selecting the data collection tools

Based on the research questions, detailed in the framework chapter, a series of tools needed to be developed, tested during a pilot study and adapted to the local situation. To investigate sanitation issues in developing countries, many methods using several tools and serving different disciplines have been developed in the past. Those methods are at different locations within the qualitative quantitative continuum and offer different levels of participation from the community and the different stakeholders.

As for quantitative and qualitative approaches, participatory types of inquiry should not be seen as a systematic follow up of techniques but rather as a toolbox containing several instruments to be applied in relation with certain objectives. Concerned about people's views, participatory instruments can be used for assessing the sanitation situation (Tayler et al., 2003) as shown in table 4-6.

Method	Expected outputs
• Transect walk/ mapping	• Initial impression of sanitation issues and first approach of people's views
• Semi-structured interviews • Focus Group Discussions • Timelines	• Understanding the past, present and future events • Investigating specific issues within a timeframe
• Questionnaire / survey • Participatory mapping	• Appreciating the present situation including social interactions
• Sanitation ladders (ranking)	• Understanding people's preferences

Table 4-6 Expected outputs of participatory assessment adapted from (Tayler et al. 2003)

The quality of the participatory assessment will depend on the activities selected, on the expertise of the facilitators and on the selection of the participants. However, the uses of group activities may in some cases weaken the position of vulnerable groups and reduce the reliability of some information. As for other field methods, careful

planning, pilot studies and discussions with local experienced agencies are required (Mayoux, 2006; Denscombe, 2007).

Including the previously described notions of qualitative approaches, quantitative approaches and participatory dimensions, figure 4-3 suggests a classification of the collection tools within the context of sanitation research.
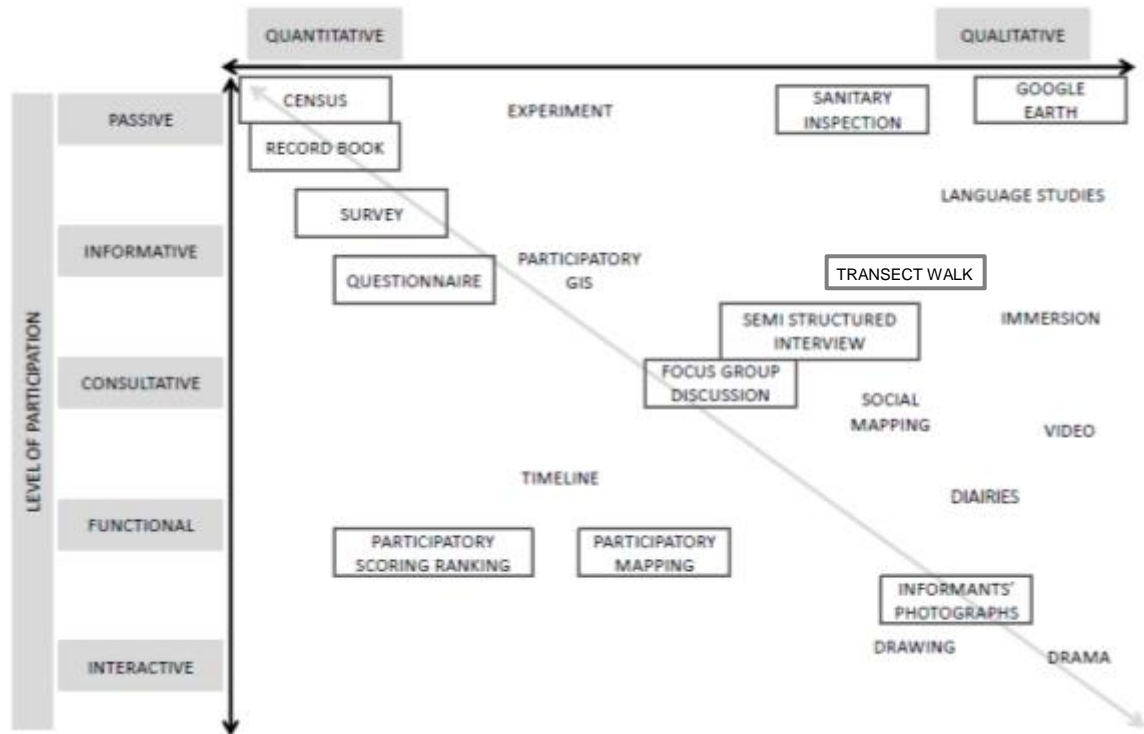
Figure 4-3 Typology of data collection tools for investigating sanitation issues

The diagonal arrow indicates the range of researcher's control in the tools and outcomes. Qualitative and interactive methods are less controlled by the researcher, but they do provide more outcomes. The challenge for the researcher, to keep control on the data, both for the collection and analysis, is to balance the amount of outcomes, their quality and his control on them. The selection of tools relates to the research objectives but also to the resources available (time, financial, human resources) and the specificity of the context. The data collection tools selected for this research (in first place for the pilot study) are outlined in the graph and described in section 4.8.

4.7.3 Non selected tools

Certain tools listed in figure 4-3 were not implemented in the field work for the following reasons:

- **Experiments** require situations where the researcher changes only one variable and keeps the control over the other variables. Reaching such stages of control in urban areas with reduced resources of time and money is unrealistic.

- **Immersion and participant observation** are used mostly in ethnology. "The methodology of participant observation focuses on the meanings of human existence as seen from the standpoint of insiders" (Jorgensen, 1989, p. 14). The insiders' point of view is a core value in this research; however, standard participant observation requires specific skills and extended resources of time.

- **Diaries** either filled by the main researcher or directly by the informants are time consuming and require regular attention Diaries provide valuable information on the daily activities and eventually on access to different services. Informant dairies are not a practical option in contexts where illiteracy rate is high.

- **Participatory GIS** is more and more used in research and in the water and sanitation sector with the increasing availability of mobile phones and adapted application. This research was limited by time and financial resources to introduce such promising tools. The participatory aspects of it require a large amount of training.

- **Drama and simulations** can provide valuable information considering the understanding of specific issues by a group, however, selection of participants, their knowledge on the issues, their involvement and honesty are difficult parameters to ensure.

4.7.4 Objectives of the pilot study

Because the research and the case study method rely on the understanding of the context and on collaboration with local partners and stakeholders, a pilot study needed to be undertaken.. Pilot studies, particularly when the strategy enquiry is a case study, are useful to refine the border of the case and the data collection methods The main objectives of this pilot study were to build methods, tools, knowledge,

relationships and planning that will be used during the main field study To reach this stage, several smaller objectives needed to be fulfilled:

- Discovering the study area including partners and stakeholders;
- Identifying two to five neighbourhoods where smaller cases will be developed;
- Meeting organizations and individuals involved in the field of sanitation in Ashaiman and in Greater Accra;
- Identifying and meeting human resources that can be available during the main study (research assistant, guide, translator);
- Test tools.

4.7.5 Methods and tools to be tested

Willis (2007, p. 241) notes that the nature of the data collected and by consequence the collection techniques may evolve during the case study. However, the researcher needs to become familiar with a set of tools and techniques. Within the participatory approach, different tools can be planned and tested during a pilot study; only some of them will be developed further for the main fieldwork. Table 4-7presents a list of tools tested during the pilot study.

Tools	Number of repetition of the tool	Total number of participants involved
Transect walk	2	2
Informant's photograph	5	5
Participatory mapping (7 participants / group)	2	14
Participatory ranking/scoring (7 participants/ group)	2	14
Household questionnaire	20	20
Semi-Structured interview with stakeholders	5	5
TOTAL		58

Table 4-7 Tools tested during the pilot study

4.7.6 Summary of results from the pilot study

<u>Selection of areas</u>

Following the criteria mentioned in section 4.7.1, the pilot study took place in Ashaiman in two neighbourhoods corresponding to two sub-cases. The neighbourhoods of Nii and Amui were selected after two transect walks across the municipality and discussions with locals. Those areas were selected because they offered two contrasted pictures within the same municipality and fulfilled the main criteria of offering different sanitation options to the dwellers. For the main study, two additional neighbourhoods were selected to continue to offer a clearer picture of the same municipality.

<u>Applying the tools in Ashaiman</u>

The pilot study was a key stage in refining the research questions and selecting the appropriate tools for collection and analysis of relevant data.

The house unit survey carried randomly in the house unit during the pilot was not adapted to the local context and the study. The number of specific cases of households within a house, as well as the number of specific houses within a neighbourhood, encouraged the separation of the household unit (or individuals) and the house units. The complexity of house arrangements within each neighbourhood showed the need for a systematic survey of the house unit in order to know accurately the number of toilet facilities. The same complexity justified the need for local enumerators and for research assistants speaking the different local languages. Training of the enumerators and back translations of the questionnaires are done in the appropriate languages (Twi, Ga, and Ewe mainly).

The different focus groups held during the pilot study showed the logistical constraints in gathering several individuals in terms of time and motivation. On the other hand it also showed the amount of relevant information coming out of such gatherings. The results from the focus group supported the construction of the different participatory exercises for the main fieldwork.

The template of the semi-structured interview for the stakeholders was relatively unchanged between the pilot and the main fieldwork, therefore results from both fieldworks were analysed in the main fieldwork.

The informants' photographs, detailed in the section 4.8.7 and done during the pilot study, provided some new information on how women viewed their environments. Such a tool required a longer training of the informants than the one provided for the pilot in order to ensure a good technical use of the camera and a good understanding of the objectives. It was also costly. The pictures and the debriefing held during the pilot were included in the findings sections as they were relevant to the understanding of the local context.

Piloting of analytical tools

The pilot study gave also the opportunity to elaborate, test and improve the analytical tools. The numbers and variety of data that could be provided by the mapping and the scoring ranking exercises were not completely understood before the pilot. The data obtained during the pilot allowed the researcher to imagine statistical tools that would be needed after the main collection: the use of spider diagrams and the analysis of covariance. Similarly the survey's results stressed the need to elaborate a more appropriate tool to analyse a large amount of data. Decisions were made to use specific software supporting quantitative analysis. The pilot study was also a key stage in solving logistic issues, making contacts, and hiring a research assistant.

Key points

The key learning points of the pilot study, that needed to be better researched during the main study, were:
- Every aspects of the town including the sanitation service offer seemed to vary from one neighbourhood to another stressing the heterogeneity of Ashaiman;
- The quality and quantity of shared facilities were linked to the decisions made by implementers, in turn related to several elements of the context. Implementers had a key role at this stage as they influence greatly the sanitation provision in the settlements. The main study will need to undertake a larger stakeholder analysis.
- The dwellers made the choice of using a facility, several facilities or no facilities. This choice was influenced by their experiences and perceptions but

also by the accessible options. The quantity, the quality and the diversity of the options available seemed to condition the choices of the dwellers.

- Choices of dwellers were clearly influenced by price but not only. Mapping showed that people do not necessary go to the cheapest toilet even if the cheapest is also the closest facility. Distance, price, comfort and safety seemed to be key determinants in the selection process of sanitation facilities.

4.8 Data collections and analysis techniques

The researcher used a range of techniques to collect data. The mixed method approaches used on this research provided evidence on the following five data sets:
  A. Perceived context (perceived by the informants and the researcher);
  B. Stakeholders;
  C. House toilets;
  D. Shared toilets (outside the house);
  E. Dwellers' perceptions.

Several tools were used to collect and analyse information that will feed the datasets and answer parts of the research questions. As suggested in previous sections, investigation tools have been developed in several disciplines to investigate issues related to sanitation and its impact on people. Following ethical, technical, practical, financial constraints, the researcher within the research design selected (case study) needed to choose the most appropriate technique of investigation.

In the following sections, each tool to be used during the field work is described, including the method for analysis and sampling. Sampling decisions were mainly supported by the work of Wilson (2002). The ordering of the tools follows the arrow described in figure 4-3 from a situation where the researcher has control on data to be collected (census, survey) to a situation where participants have a greater influence on the nature of the data collected (mapping, photographs).

4.8.1 House unit survey

In a similar way to a census, this house unit survey was administrated in all compound houses of the selected areas (definition of compound house and other units used in

this research are better detailed section 5.2.2.. Such surveys can be done with a certain level of participation from the community depending on objectives and resources available (Turkstra & Raithelhuber, 2005). Participatory enumeration was developed at large scale in urban areas in Kenya (Karanja, 2010) or Ghana to explore tenure and infrastructure issues (Farouk & Owusu, 2012; Torresi, 2012). Adversely, in an area of Accra, Pellow (2002) studied the composition of compound houses using exclusively qualitative methods and illustrated the complexity of such housing patterns and therefore some limits of the use of enumeration in such context.

a. collection

This house unit survey did not provide an accurate count and description of each household as Pellow indicated. This survey made available quantitative data to estimate the size of the populations, its density, the house crowding and the provision of toilets within the house units, see appendix B1. The house unit survey provided the basis to set a profile of the neighbourhood. Gathered data were also used to build sampling for the participatory tools.

b. sampling

All house units were surveyed. In each unit the first adult was asked to answer the short survey describing the sanitation situation in his house unit. In case of refusal, the question was asked to another adult present. Enumerators came back the next day in the case where no-one was able to respond during the first visit. While the selection of the house unit was systematic, the selection of the respondent within the house unit was random.

c. analysis

Two major types of statistical tests were used: chi square and logistic regression.
The chi square and the logistic regression were both used to measure the significance of a range of independent variables to predict the existence of toilet in the house unit. The chi square test was used with categorical independent variables (predictors) while the logistic regression was used with continuous independent variables. Details are provided in the table 4-8. Some variables were tested with the full sample of house units (432) while some others are tested with only 304 house units. These 304 units represented the multi-houses occupied not only by landlords, where the respondent gave complete information on the characteristics of the household occupying the house (ethnicity, religion).

Independent variable	Type	Test	Sample	Details
Heterogeneity of ethnicity in the house unit	Cat	χ^2	304	Multi-houses
Heterogeneity of religion in the house unit	Cat	χ^2	304	Multi-houses
Tenancy status of households in the house unit (multi-house)	Cat	χ^2	304	Multi-houses
Tenancy status of households in the house unit (all houses)	Cat	χ^2	432	All house units
Location of the house unit per area	Cat	χ^2	432	All house units
Type of house unit	Cat	χ^2	432	All house units
Number of household in the house unit	Con	LR	432	All house units
Number of habitable room in the house unit	Con	LR	432	All house units
Number of tenants households in the house unit	Con	LR	432	All house units
Crowding level in the house unit	Con	LR	432	All house units
Cat: categorical; Con: continuous; χ^2: Chi Square; LR: Logistic Regression				

Table 4-8 Selection of bivariate test for different independent variables

The chi square test tells if there is a relationship between two categorical variables:

the Pearson's chi square test compares the frequencies you observe in certain categories to the frequencies you might expect to get in these categories by chance (Field, 2009, p. 688).

Conventionally if the significance value is under 0.05, it indicates that the two categorical variables are "in some ways related" (ibid). A highly significant value is under 0.001.

The Logistic regression determines:

the impact of multiple independent variables presented simultaneously to predict membership of one or other of the two dependent variable categories (Burns & Burns, 2009, p. 569)

The logistic regression tests are then appropriate to determine the existence and the strengths amongst the two groups of variables (ibid). The threshold of 0.05 is also used to state when the groups of variables are related.

Logistic regressions were calculated and reported using methods described by Burns & Burns (2009). Chi square test and analysis of covariance (described further p 4-119) were applied following methods described by Field (2009). All statistical tests were processed using SPSS.

4.8.2 Toilets' surveys and queues observations

The toilets' surveys and observations focused only on shared toilets located outside the house units or used by dwellers not staying in the house units.

a. Collection

The sanitary inspections were conducted after the house unit surveys. All shared toilets mentioned by several respondents during the house unit survey were visited. The toilets surveys were administered by the main researcher together with a local translator. They provided visual data on the size and quality of the shared toilets, the survey report sheet is in appendix B2. The survey was mostly inspired by the Environmental Health Project (Kleinau & Pyle, 2004) but adapted to the context and to shared facilities.

b. Sampling

All shared toilets located outside the house units were surveyed once during the fieldwork. The queues were measured during morning and afternoon peak times on three different Tuesdays for all shared toilets. Because several dwellers travel on week end, a week day was selected to do the most representative observations.

c. Analysis

The limited number of shared toilets located within the research area (18) did not allow for statistical analysis. Simple comparisons were used to highlight or contrast some characteristics of a management model or of a neighbourhood. Comparisons were made with the price of service and its quality.

4.8.3 Participatory mapping

Amongst other benefits listed in the literature, participatory mapping facilitate the ownership of data, enable relations with local people, and generate a wide variety of

data in a relatively short period of time. The maps obtained are often the results of contrasted realities as described by Chambers (2008, p. 141):

"From the same area (…) the form given to a map is determined by the motivation, interests, knowledge, materials, instruments, time, care, training and social context of those who make it, by the social process of its creation, and by those who commission or facilitate it. (...) They can be complementary or they can conflict."

The participatory mapping provided a visual representation of distribution of the sanitation facilities. It was a central method in this research as it allowed the participants to discuss together their different uses of sanitation facilities. This tool was also used as a basis for the scoring of the facilities.

a. Collection

Different groups of the population drew the spatial distribution of the sanitation facilities as they perceived it. This provided information on how each group perceived their access to sanitation, which differences could exist between groups and which elements justified eventual differences. Compositions of the groups were decided after analysis of the house survey results, and are detailed in the Table 4-9.

	Nii	Oko	Amui
Landlord	6 men	7 women	7 men and
	7 women		women
Young tenant (under 30	8 women	7 women	6 women
	8 men	7 men	6 men
Old tenant (above 30)	7 men	9 women	8 women
	7 women	5 men	5 men

Table 4-9 Composition of mapping and ranking groups

The final map of each group represents the house location of each member together with the toilet facility(s) they and their families use.

b. Sampling

The sample for the participatory groups was done through quota sampling methods as detailed by Bernard (2006, p. 188). Using the results from the house unit survey and the local knowledge of the enumerators, potential participants were identified to match

the categories listed in the above table. The research team then separated the potential participants using their geographical location. In each group, it was necessary to have participants living in the different sectors of the neighbourhood to ensure the whole group experienced all shared sanitation options available in the area. In each smaller geographical area of the neighbourhood, the enumerators selected the first dwellers that were both matching the criteria and willing to participate. The quota sampling method is "biased towards people you can find easily" (Bernard, 2006, p. 188) but is appropriate in the study of cultural domains (ibid).

c. Analysis

The maps and the scoring matrix provided various information that are likely to be abstract when put together and/ or difficult to read. Fifteen maps and scoring tables put together would be of little help to draw any conclusions. Therefore maps were read in a systematic way in order to draw out facts than could be converted into clear tables. For each map drawn by the participants, the following was done:

- Counting the number of different facilities used by each participant;
- Notifying if the main toilet used was the same for the partner of each participant;
- Stating the type of toilet used as a first, second and third choice if applicable;
- Notifying if the first choice of each participant was the one closest to their house;
- Notifying if the first choice of each participant was the cheapest one available in the area (excluding open defecation);

These five steps illustrated the contrasts between groups and areas by the use of percentages and graphs. Also done in groups, the unit of analysis remained the dwellers.

4.8.4 Participatory ranking and scoring

The association of mapping and ranking scoring provided the two aspects of people's imagery identified in the section 3.2.2: designative and appraisive. Different groups of the population from the selected areas ranked and scored the different sanitation facilities of the neighbourhood using criteria that mattered to them. This informed on the users' preferences and on the determinants of those preferences.
Relevant to this research, data from mapping and scoring can be used to:

- *"Generating information on people's priorities, which compares favourably with information generated through time-consuming surveys."*

- *"For exploratory purposes to help direct further questions leading on to planning."*

- *"In concrete terms ranking and scoring may enable people to express their preferences and balance the characteristics of a 'wish'." (Mikkelsen, 2005)*

The difference between scores and ranks is that scores are absolute while ranks are relative and therefore not useful for integration across sites. If scores are obtained by a process of independently scoring each alternative, they should be good raw material for integration across sites. They also have the advantage of allowing the integration of results even if the sets of alternatives are not exactly the same in all sites.

a. Collection

The participatory scoring followed the participatory mapping and was conducted with the same group of participants. It was based on the facilities identified during the mapping. Scoring was reported through the principle of semantic differential scale (Osgood, et al., 1957; Bernard, 2006). The semantic differential scale is an exercise that elicits easily emotions and feelings (Lawson, 2001).

The target items were the toilets and they were characterized by paired adjectives scored from 1 to 7. The list of paired adjective was built following results from the pilot study and printed on a large plasticized sheet. While participants scored the toilets, they were also ranking them as they decided which toilets were for instance the cleanest and the dirtiest. Details on the protocol of mapping and scoring ranking during the fieldwork are provided in the appendix B3.

b. Sampling

The participants were the same as for the mapping exercise.

c. Analysis

The ranking exercise provided two kind of valuable information that needed to be analysed differently:

- The different types of toilets were scored by all the groups. It was then possible to see how the toilets were differently appreciated by area, gender, age, tenancy status;
- The general appreciation of the toilet for all the participants was motivated by several parameters. Statistical tools were used to determine which parameters were the most significant.

General appreciation of toilet

Each group gave seven scores to each type of toilet. The seven scores corresponded to seven paired adjectives. These scores for the different types of toilets were then illustrated through a spider diagram allowing a visual contrast between the different types of toilets.

Users determinants

The analysis of covariance (ANCOVA) highlights which parameter amongst several plays a greater role in an outcome (Field, 2009). The outcome is the results from the mapping. The mapping results are converted in score. For each group, each facility compared received a score from 0 to 100. If all the group participants went only to the type of toilet x, this type of toilet received a score of 100. If none of them went to the type of toilet z, the type z received a score of 0.

Supported by the maths unit of the university, a model based on the ANCOVA was tested to communicate the clearest trend of the scoring ranking exercise. The choice was made to rank the parameters using a pyramid. The ANCOVA was first run with all the parameters. Then the analysis was run again without the most relevant parameter of the first test, the one with the significance value closest to 0. The ANCOVA was run until the last parameters remaining did not present any significant difference.

4.8.5 Dwellers semi-structured interviews

"In semi-structured interviews, each respondent is asked a set of similar questions. (…) Semi-structured interviews occupy an interesting position along the structured-unstructured continuum. Semi-structured interviews are flexible in that the interviewer can modify the order and details of how topics are covered. This cedes some control to the respondent over how the interview goes, but, because respondents are asked more or less the

same questions, this makes possible comparisons across interviews.”
(Bernard & Ryan 2010, 29).

a. collection

The dwellers interview was addressed to an individual and gathered quantitative information on the use of a sanitation facility by the different household members and / or different households living in the same house unit. Specific focuses were given to the variation of the toilet choice over time, the different practices at intra-household level and the relations between landlords and tenants, see appendix B4. The interviews were conducted by two trained enumerators in the appropriate local language.

b. Sampling

The sampling here was purposive as the research looked for specific cases to be discussed, for instance a tenant family not able to use the toilet of their landlords or landlord sharing toilet with their tenants.

c. Analysis

The household interview was done by a local assistant in the appropriate local language. Interview grids were decided before running the interview in order to report the key information. Example of this grid is given in the appendix C7.

4.8.6 Stakeholders semi-structured interviews

a. Collection

Semi-Structured interviews targeted mostly stakeholders involved in the provision of sanitation facilities and services within the studied area (contractors, politicians, NGO' representatives, private business...). They provided a qualitative description of the local context and of the provision of sanitation facility within this context, see appendix B5. The time needed to carry out and analyse data from these interviews limited the use of this tool. Therefore the choice of the key informants was done carefully based on the knowledge of the area and on the several dimensions of the key questions to be answered. The interviews lasted between 30 minutes and one hour.

b. Sampling

The selection of the respondents was purposive, influenced by their assumed knowledge of the topic and their role and influence in the studied neighbourhood. Respondents must be knowledgeable about the topic (Rubin & Rubin, 2005, p. 64). The selection of several respondents should reflect the variety of perspectives but also illustrate a collective view of the topic (ibid, p.67).

c. Analysis

The use of coding to analyse open ended questions has several constraints:

> *"They are often time-consuming to analyse, some respondents do not answer the questions and coding decisions made by researchers can pose threats to the reliability and validity of the results". (Jackson & Trochim, 2002, p. 308)*

Maps such as mind map and concept maps are used in research to "elicit and represent knowledge held by respondents" (Meier, 2007). The mapping of interviews is an alternative to more classic coding. In this research the mind map was used only at the analysis stage. It is flexible tool to analyse qualitative data, it facilitate the capture of a holistic view representing easily central themes and minor ones (ibid).

Practically, the recordings of the interviews, obtained with consent, were listened several times. Keywords were then written down; a colour code was given based on the category of the respondents (sanitation providers, municipality representatives, NGO representatives, assembly men). The keywords were selected when they answered the central questions common to all stakeholders/ providers interviews: qualify and explain the sanitation' situation in Ashaiman. Keywords were then organized through a causality tree. At a late stage, keywords were grouped into common themes.

4.8.7 Informants' photograph

Photographs taken by users of the facilities allowed the research to access sanitation spaces from a users' point of view. This tool also provided a new medium of communication to some groups that did not wish or could not express their views through interviews. It may also have set a basis for further discussions with individuals. Photo elicitation is a research method where participants comment on

pictures instead of answering classic questions; in the case of reflective photos the informants comment their own pictures (Hurworth, 2003). Vulnerable individuals who cannot or do not wish to be part of discussion group will be the first targeted group by this tool. Such methods have been used in similar urban contexts in Accra to access sensitive subject such as homeless youth (Mizen & Ofosu-Kusi, 2006).

a. Collection

In the field, groups of two participants together took pictures of their environment during two or three days with a disposable camera. They were asked to illustrate anything positive or negative that related to their sanitation and hygiene. They were briefed on some ethical aspects, such as avoiding taking pictures of people who were not informed of the purpose of the study.

b. Sampling

Residents of houses selected randomly from aerial pictures of the neighbourhoods were asked to participate.

c. Analysis

After development of the pictures, the informants selected the pictures that they wanted to show to the researcher and kept the others for themselves. Informants explained why they took the selected pictures and gave feedback on their experiences. Pictures were sorted by content. The analysis of the pictures, as well as the collection of data, was a complete participatory process.

4.8.8 Direct observation and transect walk

Observation used as a main technique in a case study approach may provide a large understanding of the context, however, any form of observation remains time consuming (Gillham, 2000, p. 47) and requires the development of specific skills. In this research, observation was a supplementary technique. The researcher, through unstructured and informal observation, provided subjective illustration of the context. Observations were also used in a more formalized way during the toilet surveys and transect walks. Transect walks were used to select the neighbourhoods and done at the beginning of each fieldwork walking from South West to North East on day one and from North West to South East on the second day.

4.8.9 Google Earth (virtual globe)

The use of Google Earth in research is widespread in several disciplines such as geography, geology, environmental management, or health science (Stensgaard, et al., 2009). This form of mapping was in this study used as a complementary technique. It supported the selection of neighbourhoods as it provided information on housing density, street patterns, quality of the streets and quality of roofing. Used together with the house survey, it allowed the calculation of an approximate density of each surveyed neighbourhood. The pictures of Google Earth used for this research were of relative good quality and taken in June 2009.

4.8.10 Secondary data and records

Secondary data were reports from providers and local NGOs involved in the management of shared toilets. It included national census and any newspaper articles related to the research. Secondary data supported the understanding of the context, but the research needed to be careful with the analysis of these data as their validity is unknown (Overton & van Diermen, 2003, p. 42).

4.8.11 Summary of the selected tools

The Table 4-10 summarizes the advantages and constraints of the collection tools used during the fieldwork. This table is informed both by the literature and the experience acquired during the fieldwork (to be described in the chapter 6).

Tools	Input, advantages and constraints of tools
Informants' photographs	Input: Dwellers' views of sanitation and environmental concerns Adv.: Prioritizes concerns of the dwellers and facilitate discussions Con.: Requires camera training, adds ethical procedures
Transect walk	Input: Visual description of the urban characteristics Adv.: Validates potential heterogeneity of a city & support future neighbourhood selections Con.: Needs previous experiences to focus on keys elements
House unit survey	Input: detailed account of the population and sanitation facilities Adv.: Supports selection of participants (mapping groups), allow statistical description of neighbourhood, do not require highly qualified enumerators Con.: Needs several enumerators (or several days), their training, supervision and payment
Toilets surveys and queuing observations	Input: Qualitative evaluation of the sanitation provision Adv.: Allows objective comparison between toilets Con.: Access to some toilets and documentation may be difficult, snapshot evaluation that may be repeated
Participatory mapping and ranking scoring	Input: Uses and perceptions of toilets by users, relative acceptability of the toilets Adv.: Allows comparisons between the options available and the choices Con.: Needs time to prepare, realise and analyse, requires experienced group facilitators and previous knowledge of the area
Semi-structured interviews	Input: Detailed perceptions of a range of stakeholders Adv.: Allows details and additional questions Con.: Analysis is time consuming. Selection of appropriate respondents delicate
Adv.: advantages; Con.: Constraints	

Table 4-10 Advantages and constraints of tools used in the research

All the tools used in this research have contributed to give a clear description of the layers of context and bring perspectives from relevant stakeholders including the

dwellers. The section 7.5.2 will advise which tools may be used in similar research in a more constraint timescale.

4.9 Structuring the data

The Table 4-11 summarizes the collection tools used during the fieldwork.

Tools	Quantity	Neighbourhood
Transect walk **(pilot and main study)**	4 transect walks	All Ashaiman
Informant's photograph **(pilot study)**	4 groups 8 participants	Amui, Nii
House unit survey	432 house units covering 2914 households	Amui, Laka, Nii, Oko
Toilet survey	18 shared toilets	Amui, Laka, Nii, Oko
Queuing observation	15 shared toilets	Amui, Nii, Oko
Participatory mapping and **ranking scoring**	16 groups 110 participants	Amui, Nii, Oko
Dwellers semi-structured **interview**	27 dwellers	Amui, Nii, Oko
Stakeholders semi-structured **interview**	11 stakeholders	All Ashaiman

Table 4-11 Tools used during the fieldwork

The tools to provide information on different data sets are illustrated below in the figure 4-4.

Context	Data set A Perceived context	Data set B Stakeholders
•Literature •Observation •Semi-structured interview	•Observation •Informant photograph •Transect walk	•Observation •Semi-structured interview

Data set C House toilets	Data set D Shared toilets	Data set E Dwellers perceptions
•Observation •House unit survey •Household interview	•Observation •Toilet survey •Household interview	•Participatory mapping and scoring •Household interview

Figure 4-4 From tools to data sets

The data set will be described in the coming chapter and then triangulated in the chapter 7 in order to address the research objectives.

4.10 Chapter summary

The methodology section describes the progressive construction of collection and analysis tools based on the willingness to match the characteristics of the research aim, the quality and the resources of the researcher and the constraints of the field work. This methodology is built around a clear understanding of the ethical limits and research bias that exist when dealing with the investigation of intimate, social, political and economic elements in an environment different to the one known by the researcher and by some of the readers. Therefore the way of collecting and analysing data must offer double vision: the views of the users and stakeholders who are active members of a dynamic environment and the vision of the researcher who has a limited initial knowledge of this environment but can develop an understanding of broad issues.

Rather than opposing these visions, the research aims to superpose the levels of information. The data, separated in five data sets, are collected and analysed through two combined continuum: from quantitative method to qualitative and from objective through subjective methods. Therefore the information is triangulated at different stages: the methods used to collect the data, the type of data, and the source of data.

5 Contexts of the research

5.1 Chapter outline

This chapter describes the context of the research based on elements provided by the literature and key informants. The analysis of the local context is done at three levels: macro, meso and micro. The chapter is organized into five sections:

5.2 Macro-context: the urbanization of Ghana and Accra. This section summarizes the recent history of urbanization in Ghana in general, and in the Greater Accra in particular. It then detailed the challenges related to this urbanization and presents the role of the government.

5.3 Sanitation in the greater Accra Region. This section lists the different toilets technologies existing in the Accra region, and then looks at their different management models. Then it describes the institutional and political decisions and that may influence sanitation provision in the area. It includes the analysis of policy documents such at the revised sanitation policy published in 2010.

5.4 Meso-context: the specificities of Ashaiman. This section presents the municipality of Ashaiman through its recent history and compares its main features with the ones of Accra.

5.5 Sanitation in Ashaiman. This section describes how shared sanitation facilities are provided in Ashaiman, particularly describing the role of the municipality. The section is essentially based on secondary data and local newspaper articles.

5.6 Micro-context: Elements of heterogeneity in Ashaiman. This section explains the elements of heterogeneity between certain neighbourhoods of Ashaiman and presents the key features of the four neighbourhoods selected for the fieldwork.

5.2 Macro-context: the urbanization of Ghana and Accra

5.2.1 Recent history of Accra's urbanization

The fieldwork took place in Ashaiman, a town located in Ghana, in the Greater Accra Region. Ghana is made of 10 regions. One of the smallest but most populated is the Greater Accra Region. This region was initially divided in to three districts: Accra Metropolitan Area, Tema Municipal Area and Ga district. Since a reform in 2008 it has been divided into 10 districts: two metropolitan districts (Accra and Tema), six municipal districts (among them Ashaiman and Adenta) and two ordinary districts, see figure 5.1.
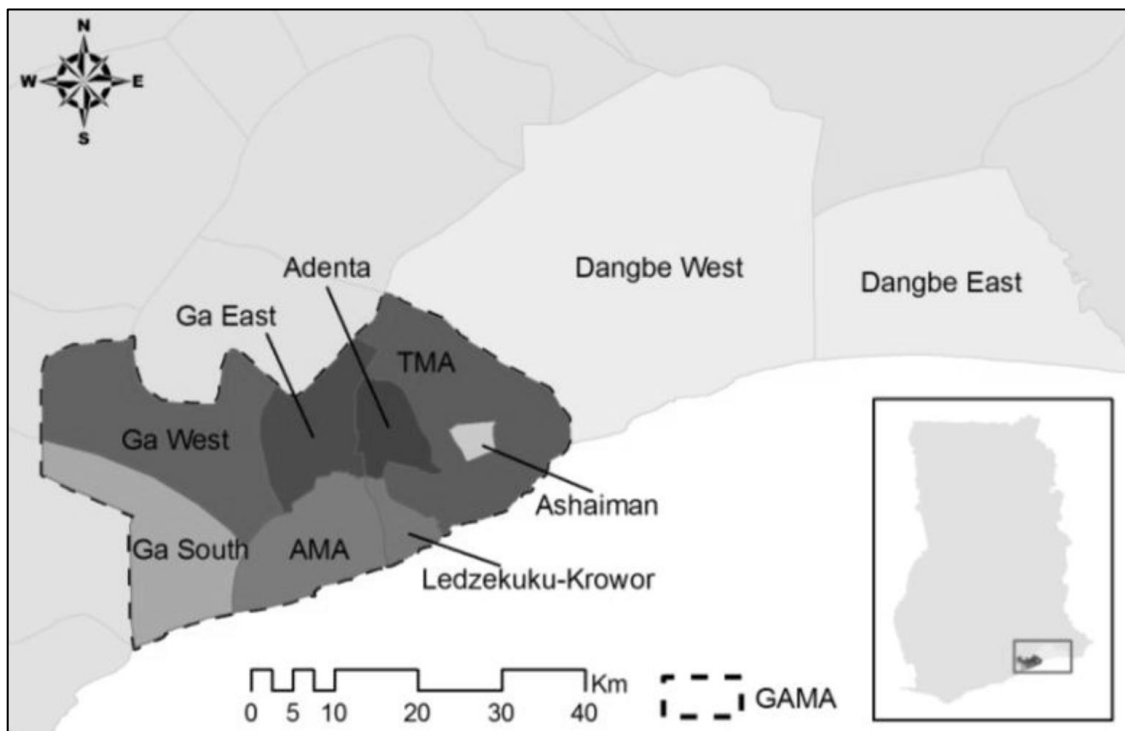
Figure 5-1 Districts of the Greater Accra Region (Adank, et al., 2011, p. 4)

The population of Ghana, estimated at 24.6 million inhabitants in 2010, follows a process of urbanization; 51% of the population was characterized as urban against 43% in 2000 (GSS, 2012), see Table 5-1.

	Total population					Annual population growth rate		
	1960	1970	1984	2000	2010	1960-1970	1970-1984	1984-2000
% urban population	23%	29%	32%	43%	51%			
Urban Ghana				8,283,491	12,551,341	4.7	3.3	4.6
Accra Metropolitan	338.396	624,091	969,195	1,658,937	1,848,614	5	3.1	3.4
Tema	27,127	102,431	190,917	298,432	402,637	14	3.6	2.2
Ashaiman		22,549	50,918	150,312	190,972	21.5	5.8	6.8

Table 5-1 Population for selected urban areas (adapted from GSS 2005 & 2012)

Ghana is characterized by a great diversity of languages, religion and ethnic groups with over 50 languages counted in the country and many of the population speaking more than two local languages. In Accra, Ewe and Twi, the language from the North and Ga, the indigenous language, are the predominant ones. A majority of the population is Christian but approximately 20% are Muslim. This diversity at the national level exists within the municipalities following the different migration patterns (Agyei-Mensah & Owusu, 2010, p. 503).

The magnitude of the migration and the characteristics of the migrants have been of different nature through the recent history of Ghana:

- Between 1948 and 1960 half of the population growth was attributed to Ghanaian rural migrants, the other half completed by migrants from West Africa and natural increase of the urban population (Ardayfio-Schandorf, 2012)
- Until 1970, towns in Ghana grew significantly benefiting from industrialization and infrastructure development (GSS, 2005). The creation of a large port in Tema explains the massive growth of population in Tema and neighbouring Ashaiman (Owusu T. , 1999).
- From 1970 to 1984, the pace of urbanization slowed down due to the economic (structural adjustment programmes) and political situation (succession of presidents) of the country, migration out of Ghana was then massive (GSS, 2005). The period also witnessed the migration from well-established urban centres to more unplanned and cheapest settlement favourable to the development of informal activities (Owusu, 1999, p. 240).
- After 1984, the urban population growth boomed again benefiting from an economic recovery (ibid).

- During the last decade, the high growth rates of the largest cities in Ghana is explained by a migration rural-urban but also more recently by a migration from small towns to larger urban centres (ibid).

The urbanization process and its social and economic results have not been homogeneous in Greater Accra since the first migrations waves (Pellow, 2002; Owusu & Agyei-Mensah, 2011). Medium and high class residents occupied some central areas of Accra, the ones initially inhabited by expatriates during the colonial time. During that period, these were the only areas covered by a form of urban planning. The urbanization was not formally controlled in other parts of Accra (Yankson & Gough, 1999).

Figure 5-2 shows the migration process in the Greater Accra Region. The population settled first in and on the edge of the two main cities: Accra, the capital city and administrative heart of the country and Tema, an important commercial centre. Progressively and due to the saturation of these two large cities and the lack of available and affordable housing, migrants settled around indigenous villages. Villages became peri-urban areas and were later classified as urban areas.
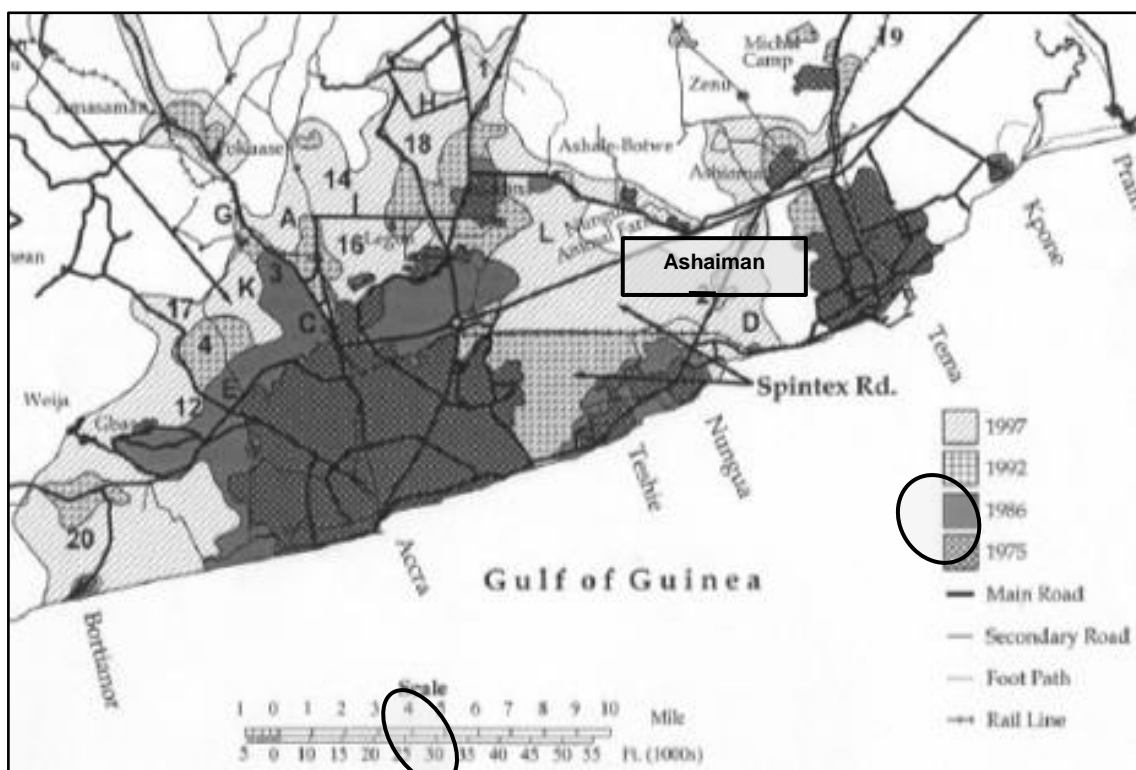
Figure 5-2 Accra's Urban Expansion, 1975 – 2000 (adapted from Yeboah 2003)

Since the colonial period, the expansion of Accra has suffered from a lack of planning (Larbi, 1996; Yeboah, 2003). This expansion has been done on a large geographical area, from the business centre to a far periphery benefiting from an administrative inaction (Grant, 2009, p. 5). Ghana is a country with a lack of tradition of physical planning and with an ineffective urban environment management system (Yankson & Gough, 1999, p. 90). Lack of updated urban development policies, the employment of unskilled urban planners, and lack of appropriate funding are some of the reasons explaining a '*laissez faire*' type of development (UN-HABITAT, 2004, p. 22).

Two others factors are essential to understand the specific characteristics of urbanization in Greater Accra: the land ownership and the housing challenges.

5.2.2   Land ownership and housing

Land ownership

In Ghana, two lands markets coexist: the modern and the traditional. The superposition of these models, particularly in Accra, led to a non-functional management of the land (Kasanga & Kotey, 2001, p. 22). Similarly, the absence of adequate information on land titles, and the large number of laws related to land ownership make difficult and often expensive any process of land acquisition (UN-HABITAT, 2004). As a result, only 32% of the households in Greater Accra are owner occupiers of their house (GSS, 2012).

Defining house and household in Ghanaian context

The definiton of the different housing and tenancy arrangements are difficult to be demarcated, particularly in the urban Ghana context and therefore interpretation of the terms may change from one author to another. It is essential for the data collection and its analysis to define some key terms, and to use them with consistence, without encouraging ambiguity (Tipple, et al., 1994, p. 447).

To avoid ambiguity, a **house** in the West African context can be considered as equivalent to a plot, as it can accommodate a number of dwellings (ibid). A plot is the unit used by urban planners to denote the geographical boundaries of land occupancy units (Scott, 2011, p. 5).

In this research we define a **house unit** as the collection of dwellings occupying a single plot, having for instance one electricity meter. A house unit can be home to

several households, families. In Ashaiman, a house unit can be a compound house, a self-contained house, a kiosk or a container:

- A **compound house**, sometimes called a multi-family house or a multi house, is a dwelling lived in by more than 2 households (in some cases over 20 households).The dwelling is typically built around a central courtyard.
- A **self-contained house** occupies a whole plot and usually accommodates one family and close relatives only.
- **Kiosks and containers** are small wooden or metallic structures containing one or sometimes two rooms. They normally start off being used as a shop, then gradually take on a residential purpose as well as a commercial one (UN-HABITAT, 2004, p. 6).

The **dwelling** is defined as "the unit of accomodation occupied by a single household" (Tipple, et al., 1994, p. 447). However household remains a difficult term to define as it is probably the most context specific one. For Tipple et al. **household** is probably not an appropriate word in the context of urban Ghana. There does not seem to be a direct equivalent in the local languages. However because household is a common unit used in most of urban planning and social research, the term needs to be used as long as it is clearly defined for the author, the research team and the respondents. During the fieldwork, household was often translated as *abusua* in Twi, *fome* in Ewe or *weku* in Ga which are closer to the western notion of family. Household, as used in this research corresponds to a group of individual sharing the same dwelling and cooking arrangements, in line with the definition used by the demographic and health surveys (DHS) (Ayad et al. 1997).

In terms of urban planning, ' **room'** is seen as the most sensible unit of analysis as it is "less variable than the dwelling or the house" (Tipple, et al., 1994, p. 447). It is however not always easy to define the notion of a habitable room. Habitable room is in this research labelled as a room where people sleep. The disposition of rooms and households within a compound house may take complex forms, see Figure 5-3.
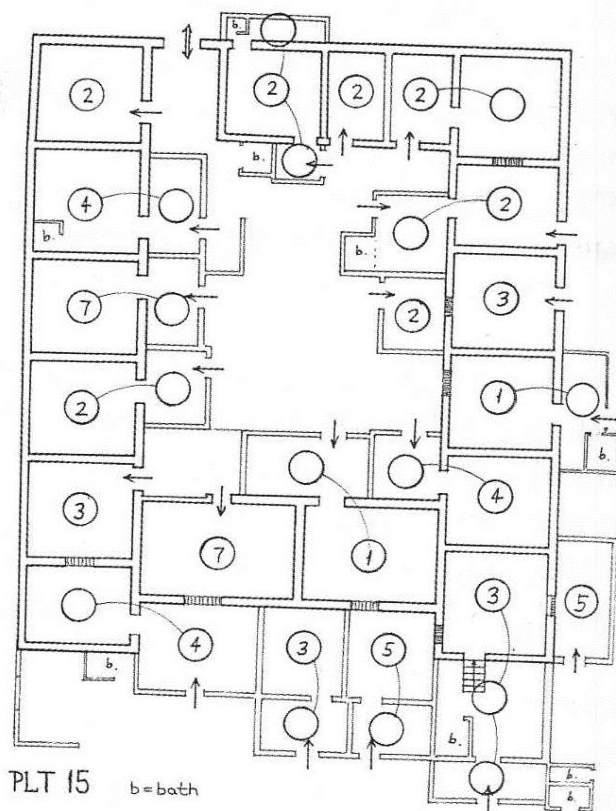
Plot 15 includes:
- 35 rooms
- 20 dwellings or households
- 64 residents

- 7 households occupy 1 room
- 11 households occupy 2 rooms
- 2 households occupy 3 rooms

- 3,2 people/ household
- 1,8 people/ room

PLT 15   b=bath

Figure 5-3 Disposition of a compound house in Kumasi (adapted from Hauberg, 2003, pp. 130, 134)

Mostly in the case of compound house, tenancy is a common practice; a UNHCR publication in 2001 counts ten different tenancy arrangements for the urban poor (Gough & Yankson, 2011). In urban Ghana, four major groups of house occupiers may be identified according; to recent literature: landlord, tenants, free renters and caretakers.

Landlords are the owners of the house. A landlord may occupy the house or live in another location. Some houses can have more than one identified landlord, for instance in the case of two children inheriting the house and sharing it with their respective families and eventually tenants. **Tenants** rent a certain number of rooms and pay rent, monthly or annually, to the landlord. **Free renters** (Bertrand, 2003, p. 78) or **sharers** (Gough & Yankson, 2011) are allowed to live for free in a part of the house with the house owner or with some tenants. The **caretakers** represent the interests of the owner of a compound house, they occupy part of the house for free and are in charge of collecting the rents. They act as a link between tenants and absent landlord and ensure the general well-functioning of the house unit (Gough &

Yankson, 2011). They are often geographically or family related to the owners (Bertrand, 2003, p. 81).

The arrangements that exist between the tenants, caretakers or free renters and the landlords are often tacit and many specific cases make their typology difficult. For ease of the data collection data, only the categories of landlords and tenants were used. Caretakers were associated with the landlord's category and free renters with the tenants' category.

Housing challenges

Several studies about housing in Ghanaian cities underline that housing provision does not cope with the pace of urbanization (Konadu-Agyemang, 2001; GSS, 2005; Gough & Yankson, 2011). The shortage of house provision combined with the constant migration has resulted in the rise of house prices and overcrowding of compound houses (Konadu-Agyemang, 2001). The poorest groups face huge challenges to find affordable housing which has resulted in the development of the different forms of tenancy described above (Gough & Yankson, 2011, p. 794). One unexpected form of housing is the development of new forms of housing such as kiosk and containers used now for sleeping purposes (GSS, 2005). Another consequence of the high demand for housing is the conversion of toilets rooms into rooms to be rented out (Adank, et al., 2011, p. 57).

Compound houses remain the major form of housing in Greater Accra, representing 55% of the housing stock in the 2010 census (GSS, 2012). This specific housing, popular in both urban and rural Ghana has led to specific management of the common rooms such at the courtyard and bathroom and kitchen when existing (McGranahan, et al., 2001). These areas where different households "cooperate" in their house unit, are qualified as "semi private" (Pellow, 2001, p. 73; Afram & Korboe, 2009).

5.2.3 Social and health consequences of urbanization

The history of migration and the uncontrolled urbanization have influenced the distribution of migrants in Accra (Grant, 2009; Pellow, 2001, p. 63). But, not minimizing the role of ethnic segregation, it seems that socio-economic circumstances are the main drivers of spatial distribution of the population (Agyei-Mensah & Owusu, 2010). Compound housing is an illustration of the blending of traditional culture and rural patterns with the constraints of urbanization, such as lack of space and mixing of ethnic groups (Afram & Korboe, 2009; Arslan, 2011).

Beyond the formation of a social melting pot, urbanization has dramatic social and health consequences. Accra's residents suffer from environmental health problems "due mainly to the low development of infrastructure to displace the environmental burden away from the household sphere" (McGranahan, et al., 2001, p. 83). However the impact of urbanization on health is felt differently in Accra depending on the neighbourhood location and on the wealth of the inhabitants.

A research of intra-urban differentials towards environmental risk in Accra used a typology of sectors based on the density of the land and on the socio-economic characteristics of their inhabitants. The typology included eight types of sector such as rural fringe, high density low class sector or high density indigenous sector (Benneh, et al., 1993; Songsore & McGranaham, 1995). The research analysed the access to infrastructure and services, the health risks associated to housing and other environmental consequences of urbanization through different socio-economic variables. The research conducted in the early nineties demonstrated for example the relationship between prevalence of childhood diarrhoea and housing areas and also underlined the economic burden of paying for services, often of bad quality (Benneh, et al., 1993). Similar research was conducted in 2001, using maps to locate the environmentally deprived areas. Almost all areas identified as environmentally deprived areas were low-class areas (Songsore, et al., 2006). Other studies in Accra confirm that wealthier households have better access to water supply and sanitation, and in turn have a better protection against several diseases such as diarrhoea (Boadi & Kuitunen, 2005).

5.2.4 The role of government and urbanization

The government of Ghana, in its policy framework reports, highlights some obstacles to urban development in the country (GoG, 2010, pp. 175-183). Some of the points follow:

- The absence of a human settlement policy, ineffective and inefficient land use planning and implementation, weak enforcement of planning and building regulations;
- Inadequate human and institutional capacities for land use planning, non-existence of a comprehensive urban development policy;

- Limited urban infrastructure to support development in a planned controlled manner;

The same report, recognizing the inadequate access to urban services for many dwellers, lists the obstacles for the development of housing, water and sanitation:

- Cumbersome and insecure land acquisition;
- Proliferation of slums, weak enforcement of planning law, weak legal framework on slum development and slum upgrading and prevention, susceptibility and lack of appropriate land and regulatory framework to address the needs of the urban poor. Unclear mandate of local authorities to facilitate housing provision;
- Weak sector coordination due to the fragmentation of sector approaches and procedures;
- Weak institutional capacities;
- Inadequate funding.

The policy framework report answers each of the above points by providing policy objectives and a long list of strategic points. Counting on progress in manufacturing, modernized agriculture and sustainable exploitation of natural resources, the planning commission prioritizes five areas: agriculture, infrastructure, water and sanitation, health, education (GoG, 2010, p. 5). There is however in this report no detailed action plan.

Many infrastructure implementations are financed and managed by international donors. The World Bank has, for instance, intervened for the upgrade of urban settlements in Ghana since 1985. They supported a succession of programmes with intervention is some sectors of the major town of Ghana including Tema and Ashaiman, with for instance the Priority Works Project and the Urban 2 Project. According to them they moved from a top-down approach to projects with participatory planning and design (World Bank, 2002). Their project called Urban Environmental Sanitation Project (UESP) ran from 1997 to 2004 and the UESP 2 started in 2005. The project aims to support the construction of drainage channels, public and school toilets, improve solid waste management and reinforce institutional capacities (World Bank, 2012).

<u>Institutional framework</u>

The Government of Ghana, through an initial law in 1988, decided to decentralize some of its power to local assemblies in order "to bring governance and decision-making to the doorsteps of the people" (Boachie-Danquah, 2011, p. 82). One of the key features of the decentralization program reformed in 1993 was the creation of metropolitan, municipal and district assemblies. Their creation and their multiplication from 65 initially to 170 today was justified by the will to "ensure grassroots participation in the decision making process" (Koranteng, 2011, p. 74). The ten regions of Ghana delegated about 87 functions to these assemblies going from the general improvement of human settlements to public safety (Owusu & Afutu-Kotey, 2010, p. 7). Under these assemblies, zonal councils are created and led by elected members. A description of the chart and main responsibilities of the assemblies and their zonal councils based on the work of the Commonwealth Secretariat (Koranteng, 2011) is in appendix D.

A World Bank report about Ghanaian cities suggested that following decentralization movements, new municipal assemblies had difficulties to cope with their new responsibilities and the pace of urbanization (World Bank, 2002). Despite the existing policies, the central government is reluctant to delegate resources to local government, and local government gives little resources to assembly members which complicates the participation of all dwellers in the political decision process (Crawford, 2009, p. 74). The difficulty of the assembly to satisfy the needs of the urban dwellers due to inadequate training, insufficient funding and lack of clear guidance have induced the increasing involvement of the civil society (Gough & Yankson, 2001, p. 129; Owusu & Afutu-Kotey, 2010). The civil society could manifest itself through working together or influencing the assembly members of their areas. They can perform in a similar way with the traditional chiefs. These chiefs are owners of a large percentage of the land and are powerful pressure groups. Some inhabitants by-pass both the traditional chiefs and the assembly members and get heard through NGOS or CBOs. All these models are found in Accra and interact together; each neighbourhood has a different form of civil society representation influenced by their local history (Gough & Yankson, 2001, p. 140).

5.3 Sanitation in the greater Accra Region

As discussed in the previous sections, urbanization has several serious consequences on the environment and therefore on health and well-being of the urban population. Sanitation is a central component in the relation between anthropogenic environment and potential risk to human health, and such risks are amplified in large cities and their surroundings.

The sanitation policy revised in 2010 defines the aim of environmental sanitation:

> *"Developing and maintaining a clean, safe and pleasant physical and natural environment in all human settlements, to promote the socio-cultural, economic, and physical well-being of all sections of the population." (MLGRD, 2010)*

The policy includes many components in its definition of environmental sanitation from solid wastes to disposal of the dead or food hygiene (ibid). This research acknowledges all the dimensions of sanitation as listed above but focuses on the collection and management of human wastes.

5.3.1 Type of toilet facilities in Greater Accra

The 2010 census delivered new figures on distribution of toilet facilities in the Greater Accra Region. It looked at the type of technology of the toilet per existing house (dwelling) unit. It also looked at who were the users of these toilets. Figure 5-4 shows that the predominant technological model was the water closet, however only 58% of the house units had a toilet facility of some sort.
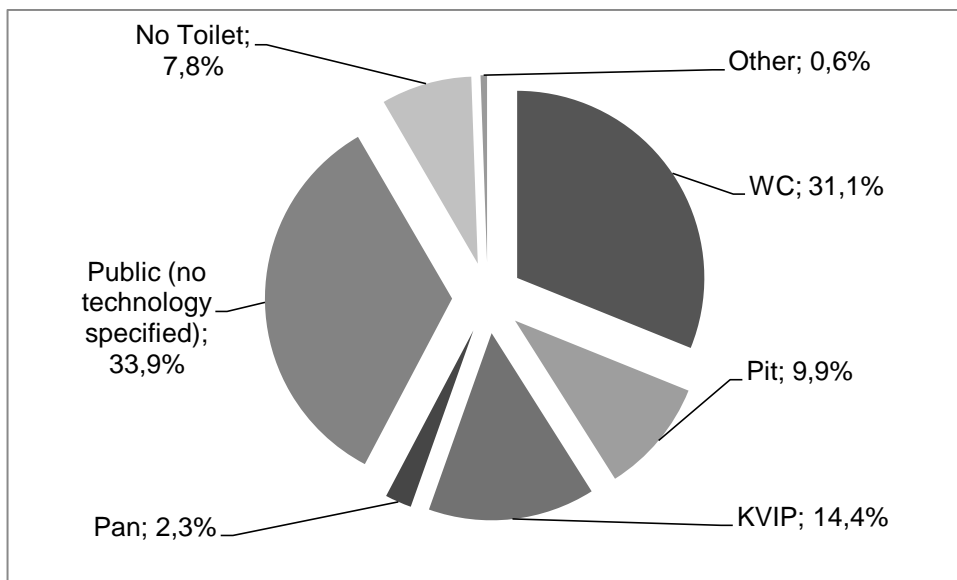
Figure 5-4 Sanitation technology in the Greater Accra Region (adapted from GSS, 2012)

Figure 5-5 shows that in only 23% of the house units in the Greater Accra, households had access to a toilet facility for themselves alone. A third of the house units had toilets with a shared use with different households.
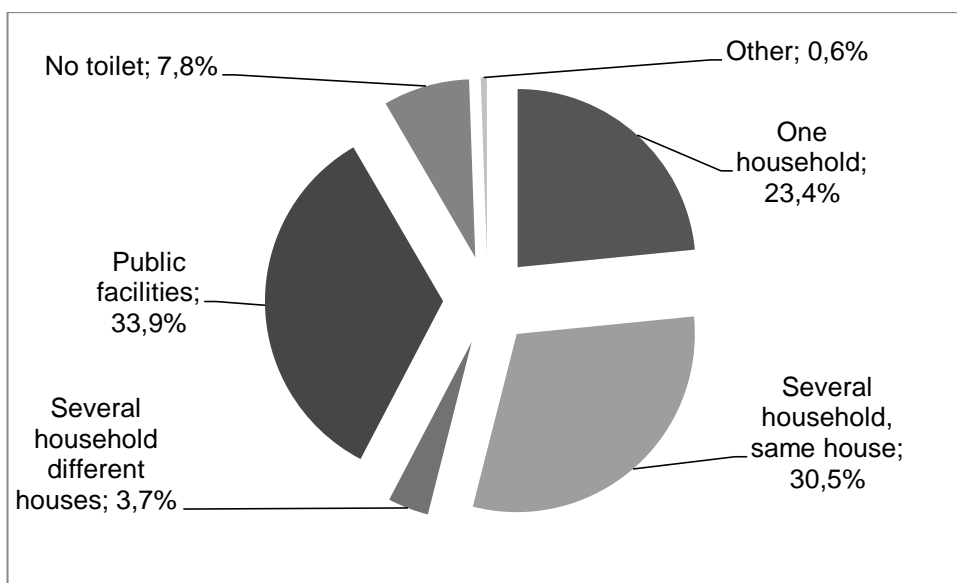
Figure 5-5 Sanitation arrangement in the Greater Accra Region (adapted from GSS, 2012)

These two figures give an overview about a region mostly urban, containing more than a million house units.

A study based on a survey of 960 households in Accra highlights the relation between level of income and access to sanitation (Boadi & Kuitunen, 2005). Other researches on sanitation and livelihood that have a smaller geographical focus provided similar conclusions. Provision of sanitation facilities is better in middle and high-class areas (Owusu & Afutu-Kotey, 2010).

Provision of toilets in low-class areas such as Old Fadama and Sukura (Osumanu, et al, 2010), or Sabon Zongo (Owusu, 2010) do not cope with the urbanization pace. The few public toilets are often over used and badly maintained which creates an unhygienic environment (MLGRD, 2003) and encourages some residents to use alternative methods such as open defecation. Beyond the user interface, the transport and treatment of human excreta is a major challenges in Accra, discussed in details by Adank et al. (2011, p. 55).

The most complete description of sanitation practices, rather than facilities, in urban Ghana is given by an anthropologist following a fieldwork in Sabon Zongo a neighbourhood of Accra:

> *In Sabon Zongo, there is a handful of flush toilets. There are also compounds with pan toilets and some with KVIPs (Kumasi Ventilated Improved Pit Latrines). But the vast majority depend upon the public toilets (latrines) of which there are four sets, one for men and women, respectively, at each location. In 2000, the cost of relieving oneself at a public toilet was 100 cedis (…), and at the new, cleaner private toilet built next to one set behind the Gaskiya Cinema, the cost was 200 cedis. At each of the public toilets, there is a person on duty 24 hours per day. He or she collects the toilet fees and sells toilet paper (newspaper) to those who want it.*
>
> *The toilets are for defecation only; residents urinate in their shower rooms (and children and grown men also use the gutters, as is the case throughout Accra). Children begin using the public toilets when they are as young as four; initially they are taken by an adult, but even at age five; there are those who go alone. (Pellow, 2001, p. 68)*

Another anthropologist, Sjaak van der Geest produced several contributions to the understanding of human excreta management in rural and urban Ghana. The

contributions moved from describing the perception of human waste by the Ghanaians (Van der Geest, 2002) to a larger analysis of the stakeholders involved in the management of excreta (Van der Geest & Obirih-Opareh, 2008). Academics such as van der Geest realized the necessity to look beyond the users to understand sanitation practices and the importance of local governance for the question of infrastructure and services. The next section shows how academics have witnessed the development of sanitation facilities in urban Ghana and the important role played by the national and local governments.

5.3.2 Toilet provision and governance

Governance is a key element for the appropriate management of human waste as this management is affected by the "blurring of boundaries and responsibilities" of defecation practices and by "the importance of self-governing networks of actors" ((van der Geest & Obirih-Opareh, 2008) citing (Stoker, 1998)). Van der Geest and Obirih-Opareh identified three types of stakeholders involved in toilet services: the users, the providers and the policy makers. According to their conclusions, only the providers seemed to be active to make changes. Benefiting from privatization of public facilities, only entrepreneurs try to provide facilities while the users of public toilet are not motivated to act by themselves and place responsibilities on the authorities. Taboo, lack of finances and a form of discrimination towards lower clases may explain a lack of involvement of the Ghanaians authorities (Van der Geest & Obirih-Opareh, 2008).

Public toilets, understood as any commercial toilet blocks, play a major role in human waste management in Accra and Ghanaian towns. Three quarters of the urban Ghanaians rely on shared facilities (WHO & UNICEF, 2012); 85% of them share facilities with six or more households which is the highest national figure in the world (UNICEF & WHO, 2010). Public toilets are an important feature in urban Ghana as they are an alternative to open defecation in the low-income settlements and "serve the interest of public health" (Ayee & Crook, 2003). The importance of public toilets is also seen through the recent history, detailed in the Table 5-2.

Period	Management model	Issues
Colonial period – 1980s	• Public toilet managed by municipal governments. • Free of charge	The low political priority given to sanitation and the high turnover of the local government led to toilets poorly built and maintained.
1982 – 1989	• Public toilet run by the Committees for the Defence of the Revolution • "Minimal" fee for use	Improvement of facilities during the first years until the money collected started to be misused by some of the committees
1989 – 1990s	• Public toilet managed by district assemblies.	Metropolitan assemblies do not support enough (financially) their district assemblies and the toilets are poorly maintained
1990s – 2000	Franchising of public toilet in Kumasi (1992) and Accra (1997)	• Construction of new blocks • Non-transparent attribution of the contract and unclear use of the fees collection leading to "toilet wars"

Table 5-2 History of public toilet in urban Ghana (based on Bertrand, 2002; Ayee & Crook, 2003; Freeman, 2010)

The historical heritage, the expansion of urban areas and the new privatization policy have contributed to the appearance of different models of "public" and shared toilets. Cities in Ghana are characterized by the juxtaposition of different models:

- In Kumasi, people may rely on toilets owned by the municipality but managed by the assembly members, on facilities run by the Sub-Metropolitan Districts (SMDs) and facilities run by Private Franchisees under Build, Operate and Transfer (BOT) contract (Caplan, 2010)
- In Old Fadama, a low-income neighbourhood of Accra, the population relies on toilets built and managed by individuals on a commercial basis (Osumanu, et al. , 2010)
- In New Takoradi, some public toilets are owned by the municipality but their management is franchised to private individuals. A toilet block is also owned and managed by a sort of community based organization supported by an international organization (ibid).
- In Sukura, there are toilet blocks franchised by Accra Metropolitan Assembly and toilets built and managed by individuals on a commercial basis (ibid). The

same patterns are described in Sabon Zongo, a large neighbourhood of Accra (Owusu G. , 2010, p. 153).

Based on the opinion of 722 users located in Accra, Kumasi and Tema, a study compared the different models of management of public toilets. Results showed that overall "pure commercial private operated" blocks are better appraised than toilets managed by "politicians/ pseudo-private sector operators and the public sector" (Awortwi, 2006, p. 235). Similar observations are made by Osumanu et al. (2010) in Sukura.

The decentralization policy introduced in 1989 changed the rules and the responsibilities role in term of public infrastructure and service provision. This policy was applied progressively in the different districts and sometimes slowed down by the creation of new districts (1993 and 2008). This decentralisation came together with the introduction of the private sector and progressively of the civil society under different forms of partnership (MLGRD, 2003). Several papers analyse in detail the different partnership models from 1985 to 2002, looking specifically at the waste management services (Ayee & Crook, 2003; Fobil, et al., 2008).

The private public partnership demonstrated positive impacts during the first decade of its implementation, translated in the construction of new toilets blocks and in a general improvement of the maintenance. However the sustainability of such a model is questioned by several researchers particularly in term of financial management and concerning the role played by the customers. Four points are particularly detailed here:

- The financial mechanisms between the central government and the assemblies in charge of the public toilets, but also between those assemblies and the private sector, are not transparent (Fobil, et al., 2008; Owusu & Afutu-Kotey, 2010). Examples of corruptions are given in details for Kumasi and Accra in an article appropriately called "*toilet war*" (Ayee & Crook, 2003) and also for Ashaiman and some areas around Tema (Bertrand, 2002).
- Similarly, some of the candidate companies to take over the management of the facilities are owned by assembly members or other political actors which may lead to some conflict of interests (Osumanu, et al., 2010, p. 8).

- Then, the quality of the selection of the private partners, and the monitoring of their activities by an often poorly skilled and poorly supported assembly staff is also questioned (Fobil, et al., 2008; Owusu & Afutu-Kotey, 2010)

- Finally the involvement of the civil society and of the direct users of the facility in the management decisions remained very low despite the initial intention of decentralization which was to better serve the local needs (Ayee & Crook, 2003; Owusu & Afutu-Kotey, 2010). Community involvement is presented as a potential alternative for balancing the power of private providers and authorities, however the community group may be manipulated by assembly members and political groups (Ayee & Crook, 2003, p. 26)

Today and through the recent urban history of Ghana, public toilets play an important role to offer a sanitation service to certain populations but they are also a secure source of revenue and a political tool (Bertrand, 2002; Obeng-Odoom, 2011; Ayee & Crook, 2003). The success stories in term of solid waste management but also liquid waste management are mainly visible in middle and high income areas (Obeng-Odoom, 2011).

5.3.3 National sanitation policy

In line with the Millennium Development Goal 7, the national development planning and the New Partnership for Africa's Development (NEPAD), the sanitation policy underlines the importance of sanitation issues as affecting all aspects of human development (MLGRD, 2010, p. 5). The government is also concerned by the economic dimension of the issues. Some estimates mention US$290 million per year lost due to poor sanitation, which is equivalent to 1.6% of the national GDP (WSP, 2012). One objective of the sanitation policy was to determine the functions of all stakeholders concerning sanitation decisions and actions.

The Ministry of Local Government and Rural Development (MLGRD) coordinates at the national level the different actions managed at the local level by the metropolitan, municipal, and district assemblies. This ministry issues the major guidelines and policy concerning urban sanitation, such as the guideline for the provision, operation and maintenance of public toilets and the sanitation national policies. The first sanitation policy in 1999, and its revised version issued in 2010 covered all aspects of sanitation.

The section focusing on excreta management recommends the following to the district/ municipal assemblies:

- Apply the building codes for the construction of domestic toilets
- Encourage the provision of public toilets in business areas and public transport terminals
- Promote construction and use of household toilet in residential areas
- "shall transfer management and maintenance of all public toilets to the private sector, either by franchising existing facilities or granting concessions for the construction and operation of new ones" (MLGRD, 2010, p. 36).

5.3.4 Roles of municipal assemblies

A direct consequence of the sanitation policy is the obligation for the assemblies to submit a Municipal Environmental Sanitation Strategy and Action Plan (MESSAP). The distribution of roles is also done at the assembly level. In the municipal assembly such as Ashaiman, four actors within assembly have clear functions concerning sanitation (Agbeve, 2012):

- **Planning Department:**
  o Facilitate the preparation and implementation of sanitation plans including provision of toilet facilities;
  o Monitoring of sanitation plan implementation and the inspection of the facility.
- **Waste Management Department:**
  o Ensuring that the city is clean and all wastes (both solid and liquid) generated are properly and timely disposed of;
  o Inspection and provision of sanitary facilities;
  o Advising on waste prevention and management issues.
- **Environmental Health Management:**
  o Education on improved sanitation and hygiene practices;
  o Routine inspection of the sanitary facilities and the enforcement of sanitation bye-laws.
- **Assembly Members:**
  o Identification of and reporting and lobbying for the provision of sanitation needs in general of his/her area;
  o Mobilization of community for social interaction;

o Ensuring of best sanitation practices and/or maintenance of the various toilet facilities.

Despite the sanitation policies and the decentralization efforts, most of the municipal authorities do not seem to provide the adequate infrastructure and services (Owusu & Afutu-Kotey, 2010). The number of institutional actors and the lack of coherence in their actions have resulted into an unclear implementation, monitoring and evaluation of sanitation activities at local and national levels (Larbi E. , 2006; Nkansah, 2009, p. 125; Caplan, 2010). While the sanitation policy issued in 1999 showed a political concern about sanitation, this political will was less obvious when it concerned the implementation of the policy (Salifu, et al., 2005). Then the improvement of the sanitation situation was too often the result of stand-alone projects rather than the outcomes of a global implementation strategy (ibid). Additionally, the features of the Ghanaian urbanization reinforce this situation.

5.3.5 Encouraging in-house toilets

The objectives of the sanitation policy do not seem to include completely the reality of the situation in the high density low-income settlements. For example:

> *Public toilets are meant for visitors to the city and not for the residents. (…)*
> *Public toilets have become permanent features for many residents in Accra*
> *as places to ease themselves (Van der Geest & Obirih-Opareh, 2008, p.*
> *209).*

The sanitation policy discourages the use of public toilets in residential areas but dwellers do not have other alternatives. The promotion of household toilet construction seems quite unrealistic in some settlements. In Kumasi, several initiatives between 1998 and 2002 have failed to provide in-house toilets to the poorest households due to the following:

- Lack of space(Oduro-Kwarteng, et al., 2009) ;
- Low income of the target population despite subsidies supported by the government (ibid);
- Lack of awareness of the subsidies (ibid)
- The large number of public toilets in Ghana used as an excuse by the landlord for not providing in-house toilets (ibid) confirmed elsewhere in the country (Addai, 2009).

Despite the evident technical and financial difficulties to provide house sanitation in all houses, the national policies and the municipal laws made progressively compulsory the provision of house toilets for all landlords.

In 2011, the metropolitan assembly of Accra and the municipal assembly of Ashaiman decided to prosecute landlords who do not provides toilet for their tenants (Effah, 2010; Agbeve, 2012). In Kumasi a similar decision was taken by the assembly in 2012 (KMA, 2012). The enforcement capacity of the different assemblies may be questioned but at the date of this research no cases of hearings were reported. Another sanitation resolution not always enforced in the field is the ban of bucket toilets (pan latrines) by 2010 in Accra (Acheampong E. , 2010). The bucket toilet systems was adapted to some high density neighbourhoods and appreciated by some dwellers (Jenkins & Scott, 2007, p. 2439) but the collection and treatment dimension was often problematic, judged unethical and unhygienic by many (Acheampong E. , 2010) and explain why the system was banned. Still, thousands of these facilities were in used in the Accra area (GWJN, 2010, p. 16; Adank, et al., 2011, p. 58).

These two examples confirm that while new regulation may result in better sanitation practices, their enforcement is challenged by the lack of skilled staff and the nature of the unplanned settlements (Adank, et al., 2011, p. 67).

5.4 Meso-context: the specificities of Ashaiman

5.4.1 History of Ashaiman

Ashaiman is historically a satellite town of Tema (Owusu, 1999, p.244). In the 1950s, Tema, lying 30 km east of Accra, developed as a main industrial port. The land around Tema was bought by the Government from traditional owners, with the Tema Development Corporation (TDC) taking charge for planning the port and the new city. The TDC was a state owned enterprise founded to develop Tema and to implement government housing policies (Arku, 2009).

Initially, Ashaiman was seen as a temporary settlement to accommodate workers employed in the construction of Tema, but as the number of migrants increased, the temporary houses became permanent. The officials of Tema were forced to relax housing regulations (Kirchherr, 1968) and to accept "unauthorized" settlements. The western part of what became Ashaiman was included in the initial plan of the TDC, so by the 1960s Ashaiman was shaped by two different forms of development:

- The western part of Ashaiman was provided with roads, lighting and public toilets. Housing plots and streets were laid out following a grid pattern.
- The eastern part saw farmers and traditional owners renting out some of their land to migrant workers. Housing construction did not follow any regulations or city plans (Owusu, 1999, p.245), resulting in very dense settlements. About the development of this eastern part of Ashaiman, Peil wrote that:

It is a notable slum, hidden behind the motorway but detracting from the planned splendour of Tema. From time to time there are plans to replace it with government housing making it another Tema 'community'. So far, government resources have been inadequate to replace a town of the present size and until a decision is finally reached, the unplanned settlement is causing no trouble and can safely be ignored (Peil, 1976, p. 164).

In the 1970s and 1980s, the formal development managed by the TDC slowed down as a result of political and economic events at national level. Between 1956 and 1976 the TDC had constructed only 30% of the houses initially planned, and by 1985 only 11 of 19 planned residential communities had been completed (Owusu T. , 1999), causing housing prices to increase significantly in Tema. This led to rapid growth in the whole of Ashaiman, where housing was cheaper. Peil's comment in 1976 about the eastern part of Ashaiman became true for the whole city, as the government focused its investment on central Tema. In describing the growth of Ashaiman between 1950 and 1990, Owusu concluded that:

Local and national governments did not just turn a blind eye to the developments in the settlement and allow it to gain political legitimation, [sic]….but they created the settlement and, subsequently allowed squatting in it to become widespread (Owusu, 1999, p.247).

The housing and other physical developments of Ashaiman were not only the result of actions by the TDC and national government. TDC was not active in the largest part of Ashaiman and, contrary to Accra and Tema, the housing expanded due to a lack of regulations and under the influence of different actors (Yeboah, 2003). Major industrial companies investing in Tema decided to build flats for their workers in Ashaiman (Konings, 1978), although the extent of construction was probably marginal compared to the current housing stock. Most houses were built by individuals, initially indigenous

farmers and the wealthier employees working in Tema. State-owned enterprises like the TDC provided housing within the formal sector for the upper classes. Housing for the lower classes was provided by the informal sector, mostly through self-build (Arku, 2009).

The traditional leaders and indigenous families also played a key role in the development of Ashaiman through:

> *Ashaiman falls within the TDC acquisition but the area has been developed and continues to be developed by the chief, elders and developers without seeking any authority from TDC. (Kasanga et al. 1996:71)*

O'Connor observed that the limited impact of formal town planning in many African cities is influenced:

> *"a very large extent by the decisions of a few foreign firms and thousands of local individual families rather than by officials of any town planning department". (O'Connor, 1983, p.237)*

The development of Ashaiman appears to have followed this approach. Ashaiman's population has grown from 20,000 in 1970 to over 200,000 in 2010 and continues to expand. In 2008, Ashaiman was recognized as a municipal assembly, known as AshMA (Ashaiman Municipal Assembly). There are 17 electoral areas in ASHMA and 25 Assembly members. Out of this number, 17 are elected and the rest are appointees giving a total of 25 plus the chief executive and the Member of Parliament. Ashaiman has a medium term development plan which is more of a policy document.

5.4.2 Compared features with the Greater Accra

As discussed in the methodology, Ashaiman was chosen for the field work because it was a town in expansion, offering different forms of access to sanitation where different usage patterns could be observed and studied. Ashaiman had some specific features, often related to its history but also shared common points with other urban centres in Ghana. Descriptive analysis of the population living in the surveyed areas of Ashaiman and in the Greater Accra in the Table 5-3, show the features that both areas have in common. The ethnic distribution of the population and their religion was not rigorously the same but presented a similar heterogeneity. The types of housing

also have some similarities but the number of compound houses is greater in the four surveyed areas of Ashaiman.

Type of area Name of area		Surveyed Ashaiman (4 areas) 2011	Greater Accra GLSS 5 (2005)
House unit analysed		432	
Household		2914	
Estimated density (pop/ ha)		490	170
Mean number of people per room		2,6	2,1
Type of house unit	Compound	82%	55%
	Single	9%	8,5%
	Kiosk/ container	8%	4%
Ethnicity of households	Akan	23%	39%
	Ga/ Adangbe	22%	37%
	Ewe	33%	14%
	Hausa/ Dagomba	18%	5%
	Other	4%	5%
Religion	Christian	76%	82%
	Muslim	21%	11%
	Other	2%	7%
Household headed by women		10%	35%

Table 5-3 Demographic characteristics of Ashaiman and Greater Accra

The density of Ashaiman may be difficult to compare with the Greater Accra as some areas in Accra are not inhabited, such as airport or green spaces. But given the fact that there are very few double storeys in Ashaiman, the estimated density remains very high even compared to other urban settlements in West Africa. It is explained by the density of the housing, the number of families per compound house and the number of people per room. In many cases, one room of a compound house was occupied by a single migrant worker. When he was joined by his wife and his family, the migrant worker was often not able to rent more rooms (Peil & Sada, 1984, p. 286).

5.4.3 Urban planning

The unplanned natures of most of the settlements and the lack of housing regulations, amongst other factors, have produced a heterogeneous urban sprawl. Many short texts and newspaper articles gathered mainly on the web illustrate the difficulty to detail accurately demographic and political data of Ashaiman.

The figures of 150 000 inhabitants announced by the 2000 census have been contested by some. Toressi announced 340 000 inhabitants estimating that 90% of those are living in slums according to the UN Habitat criteria (Torresi, 2012). Similarly the population contests the 2000 census as for them it largely underestimated the real numbers of inhabitants in Ashaiman and according to a local NGO, 20 people arrive every day in Ashaiman (DPUUCL, 2005).

As in other metropolitan and municipal assemblies (Owusu & Afutu-Kotey, 2010), the new assembly of Ashaiman is regularly accused of corruption and the inhabitants have expressed their frustration concerning the lack of infrastructure improvements (Abubakar, 2012). Contestations about land ownership, some of them brought to justice court, are recurrent in Ashaiman. They typically involve the TDC being accused of selling land that was originally owned by traditional leaders (Adzigodi, 2012).

Despite isolated actions from NGOs or UN agencies (UN-HABITAT, 2011) at this date there is no known holistic plan for the urban development of Ashaiman. The urban planning office in Ashaiman is still limited in staff compared to the size of the municipality and manages different issues such as planning itself, building, transport and infrastructure.

5.5 Sanitation in Ashaiman

The urban planning office, the waste management department and the environment health management are the three departments involved at municipal level in the sanitation improvement (detailed in the section 5.3.4). They all seem to be understaffed and to lack technical and financial resources. The source of revenue for the sanitation management comes from three main sources: the District Assembly Common Fund (DACF), the Assembly's Internally Generated Fund (IGF) and from Donor Partners and NGOs. With the funds and the staff available the municipality should fulfil the role stated by the sanitation policy.

5.5.1 Ashaiman's MESSAP

In line with this policy, in 2009 the municipality of Ashaiman issued a MESSAP for the period 2010/2015. This action plan attempts first to count the sanitation facilities: 169 so-called public toilets which include 24 owned by the municipality and 145 privately owned, 3332 individual toilets and 208 school toilets and other toilets located in restaurants and other businesses (AshMA, 2009). Very little is said about the quality or the management of these facilities. The second part is supposed to include objectives for the coming years and lines of action but does not include concrete decisions and financial indications. The report in its form and content underline the lack of human resources and allocated funds. The responsibility for future action to be taken is also not clearly defined in the report within and outside the municipal assembly. The report attempts to underline the differences in sanitation provision from one area to another but failed to provide clear numbers which can be partially explained by the outdated census at the time of the report publication. Nor does the report provide relevant financial information concerning the revenues and expenses related to sanitation provision.

Municipality fees
The municipal assembly communicated the fees for the exploitation of commercial toilets (water closets and aqua privies) and the price per visit for the municipally owned toilets, reported in Table 5-4.

Description		Approved fees (GHC)		DURATION
Water closet	(10 seater & above)	40	40	Per annum
	(5-9 seater)	26	26	Per annum
	(Up to 4 seater)	13	13	Per annum
Aqua Privy	(10 seater & above)	26	26	Per annum
	(5-9 seater)	15	15	Per annum
	(Up to 4 seater)	9	9	Per annum
Public toilet (WC)		0,01	0,03	Per visit
Public toilet (other)		**0,05**	**0,1**	Per visit

Table 5-4 Fee fixing by AshMA for the year 2011

The table made official the new price for the municipally owned toilets (called there "public toilet") but the interviewed municipal officer was not able to justify this increase arguing that it has been decided at a higher level. The fees for the private toilets remained unchanged between 2010 and 2011.

5.5.2 Political management of Ashaiman's shared toilets

The political management of the municipally owned toilets was detailed in a consultancy report released by a local agency for the benefit of a project managed by the NGO TREND, the municipality and financed by the African Development Bank. This report described the political management as follows:

> "The management of public – owned latrines has been shrouded with much controversy. As a result of the high patronage of the places of convenience by residents, managing existing facilities has become lucrative business ventures and functionaries of the two major political parties in the country have resorted to forceful takeover actions in order to run them. Public toilets within the Ashaiman municipality became a subject of controversy between supporters of the New Patriotic Party (NPP) and the National Democratic Congress (NDC) in January 2009 when the latter assumed office. (…)

> Currently the management and operation of the toilets are by supporters of the NDC. There is no revenue – sharing arrangement between the Municipal Assembly and the operators. It came to light that one operator made attempts to lodge some funds with the Municipal Assembly but was rejected. It was, however, revealed by an official of the Assembly that the takeover was illegal and receipt of that money was tantamount to endorsing an illegality. Officials of the Assembly indicated their averment to the case at the High Court and would patiently wait for the outcome of judgment of the case.

> The toilet seizure has distorted the smooth management of the facilities with negative effects on revenue generation and O&M. Inspection and enforcement responsibilities (…) in respect of these public toilets have been very low. (Maple Consult, 2011, p. 42)

The same report insisted on the lack of accountability and transparency, mostly at the municipality level. Books of records, report of inspections and finance reports either did not exist or were not made available to the consultant and general public (ibid, p. 67). Newspaper (online) articles described also some of the political tensions around the management of municipally owned toilets. For instance, in 2012 one Ashaiman pressure group contested the management of public toilets by the municipality, accusing the ruling party of corruption through the running of the toilet facilities (Abubakar, 2012). Similar demonstrations were reported in 2009 (Madorgyz, 2009)

5.5.3 Use of toilets in Ashaiman

The Maple consult report (2011) also aimed to provide data on the state and the use of water and sanitation facilities in the whole of Ashaiman and compile information from different areas mostly using household survey conducted quite simultaneously to this doctorate research. The methodology, sampled area and objectives of both researches were different but because such research was still rare in Ashaiman some elements need to be highlighted from this consultancy report. Bearing in mind that the report aggregated results from poor but also middle income areas of Ashaiman, the following are highlighted:

- 83% of the respondents reported using shared toilet facilities
- 90% of people sharing toilets outside their house unit reported queuing, 43% reported queuing for more than 10 minutes.
- Cleanliness seemed to be the major concern for the users of shared toilet facilities, as shown in the Table 5-5.

Issues related to the usage of facilities	Frequency
Offensive odour, urine and faecal matter, flies & maggots	212
Offensive odour and defecation on floor by children	32
Untidy and unpleasant to use, unhygienic	105
Not friendly to the aged/ squatting is a problem	6
Close too early	2
Facility too far from residence	1
No separate bath for male and female	2
Pit gets too full making facility usage uncomfortable	7
Water & soap not provided at facility	2
Offensive cigarette smell	2
Total	371

Table 5-5 Reported issues related to the usage of facilities (Maple Consult, 2011, p. 24)

Most of the issues pointed out in the above table will be discussed in the section 6.6.

5.6 Micro-context: Elements of heterogeneity in Ashaiman

This section aims to highlight the differences between the four selected neighbourhoods. The different neighbourhoods were selected after transect walk, observation of map and Google earth, and preliminary data collected during the pilot study. The transect walks were carried out during the first two days of the pilot study and of the main study. Through two random walks of three hours, the researcher felt strong differences between different sectors of the town. Differences of sanitation facilities, size of the streets, quality and type of housing pointed out the heterogeneity of Ashaiman.

5.6.1 Selection of different sectors

Differences in urban planning in Ashaiman are linked to the history of its expansion which influenced on street patterns, housing structures and also sanitation provisions. The impression of heterogeneity felt during the transect walks was reinforced by informal discussions, secondary literature and the use of Google Earth. An aerial image indicated several distinct development patterns in Ashaiman, as shown in Figure 5-6.

Three distinctive patterns of urban development, found within the centre of Ashaiman can be described as follows:

1. To the West, the TDC planned area is characterized by a grid layout of roads and housing plots.

2. The oldest houses, located in the centre of the town near the market, form the indigenous area of Ashaiman. Several extensions to houses and the absence of initial planning have resulted in streets and plots having an irregular pattern, with consequently a very high density of housing.

3. The more recently developed East and North areas, where expansion is still occurring, are the spontaneous areas. They are characterized by areas of high density housing, with density progressively decreasing from the centre towards the edge of Ashaiman.
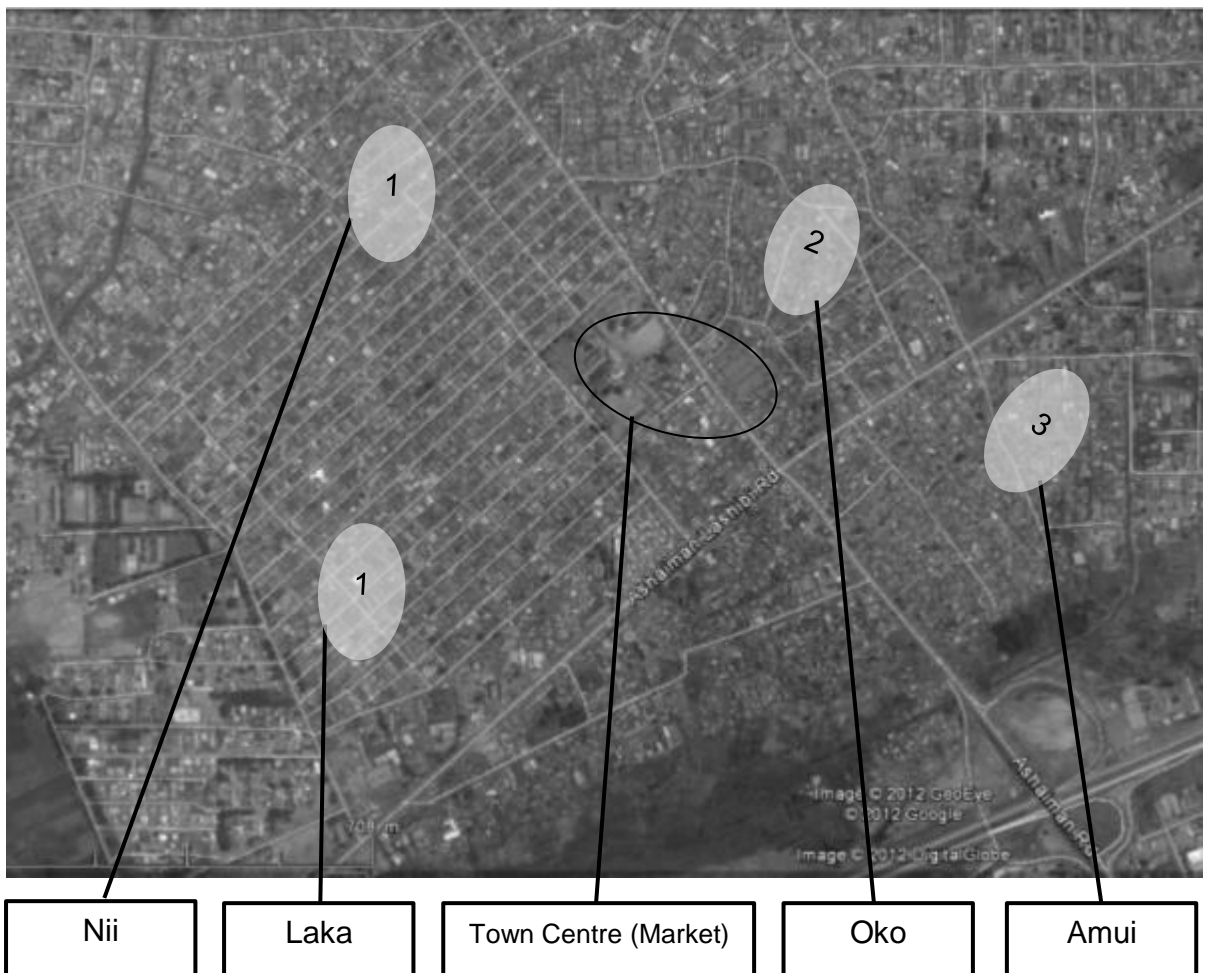
Figure 5-6 Aerial view of the four surveyed areas in Ashaiman (Google Earth 2012)

5.6.2 Characteristics of selected sectors

From the four neighbourhoods selected for the fieldwork, Laka and Nii are part of the planned area, Oko is located in the middle of the indigenous area and Amui includes different density levels within the spontaneous area[1].

The urban planning, recent history, migration movement and ownership of the land have shaped differently the neighbourhoods influencing the nature of housing and the socio-economic characteristics of the population, 5.4.1. The characteristics of population, including ethnicity, are based on the survey of 432 house units, see section 4.8.1 Supported by pictures of the neighbourhoods and housing in the appendix E, the different sectors are described below.

<u>The planned settlements</u>

Nii and Laka are two parts of the planned Ashaiman, located on the west side of the main road. The streets pattern and the domination of compound houses confirm their similar history. However their population density and the composition of the population present some contrasts confirmed by a supposed better income level in Laka. Quality of housing, average renting price of a room, quality of roads suggest that this area is slightly better-off.

<u>The indigenous settlement</u>

Oko, located in the centre of Ashaiman, was the first built area in Ashaiman. This is confirmed by the high proportion of Ga population in this sector, as the Ga is the largest ethnic group based initially from this region of Ghana. Oko is on the East side of the road and was not bought by the TDC. The area was mostly managed by traditional chiefs. During the development of the TDC land and housing, traditional habitants of Oko started to rent out cheap space and build extra rooms for migrants without conscious planning. This has led to a high density settlement with narrow and often unpaved streets. Most of the houses are very old, completed by wooden kiosks and containers.

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[1] The four neighbourhoods refer to geographical areas smaller than the zonal council they belong too. Their name given in this research is a convenient simplification of their formal name.

Amui has a much less densely populated area than Oko and Nii, but this density is not homogeneous. Amui is an area developed recently compared to the others, without any formal planning. The west side of Amui closer to the centre of the town has the highest density similar to Oko. The eastern side is occupied by larger houses with large courtyard and small garden. The proportion of houses occupied by landlords only is greater than in Oko and Nii. Based on discussions with residents, monthly room rental is significantly more expensive in Amui than in the three other areas.

Type of areas		Planned	Planned	Indigenous	Spontaneous	Cumulated areas
Name (short) of area		LAKA	NII	OKO	AMUI	
House unit surveyed		113	115	99	111	438
House unit analysed		112	115	96	109	432
Household		682	860	679	693	2914
Estimated population		1808	2218	1893	2188	8107
Estimated area (ha)		4,4	3,6	2,8	5,7	16,5
Estimated density (pop/ ha)		410	620	680	380	490
Type of house unit	N	112	115	96	109	432
	Compound	87%	92%	74%	72%	82%
	Single	9%	7%	6%	12%	9%
	Kiosk/	4%	-	18%	14%	8%
Tenancy status of house unit' households	N	112	115	96	109	432
	Landlord	11%	5%	4%	22%	11%
	Tenant only	38%	46%	54%	29%	41%
	Landlord &	51%	49%	41%	49%	47%
Number of households per house unit	N	112	115	96	109	432
	1 hh	13%	5%	23%	30%	18%
	2 to 5 hh	29%	23%	26%	20%	24%
	6 to 10 hh	51%	56%	28%	26%	40%
	Over 10 hh	7%	16%	23%	24%	17%
Ethnicity of households	N	682	860	679	693	2914
	Akan	28%	33%	13%	14%	23%
	Ga	21%	16%	42%	12%	22%
	Ewe	41%	23%	27%	43%	33%
	Hausa	7%	24%	16%	26%	18%
	Other	2%	4%	3%	5%	4%
Household headed by women		9%	6%	14%	12%	10%

Table 5-6 Demographic characteristics of four neighbourhoods in Ashaiman

5.7 Chapter summary

The key elements of this chapter are:

- The policy decisions, their application by the different stakeholders, the historical construction of the various residential areas, have shaped the urban patterns, the housing and the public infrastructure available in the Greater Accra and in Ashaiman.

- Similarly the political and economic events have during the last 50 years influenced the migration movements and have an effect on the distribution of the population in term of socio-economic status.

- At the macro-level, different sanitation policies had been implemented but they are for most of them poorly applied at the local level. Some of the policy decisions are not reflecting the reality of the field.

- The lack of governance and appropriate resources at the municipal level are pointed out to explain the limited changes in terms of sanitation coverage and access to toilet facilities during the last decades.

- The lack of housing, the reportedly difficult access to land, the structure of the compound house, the relationships between the landlord and tenants, but also the historical handling of excreta management in the country, explain the low access to in-house toilets.

6 Presentation of the results

6.1 Chapter outline

This chapter describes the results of the different methods used during the field work. Specific aspects treated during the pilot are also described. The results are presented by data set:

6.2 Data set A: perceived context. This section analyses the context as it is described by different observation methods.

6.3 Data set B: providers and stakeholders. This section focuses on how individuals, private bodies and governments provide sanitation facilities and services. It looks at what are the incentives and the constraints of the different providers and how they perceive the future.

6.4 Data set C: house toilets and house units. This section looks at the demographic characteristics of the neighbourhood through the description of the house units. It then focuses on the reasons for some house units to have a functioning toilet in their premises.

6.5 Data set D: shared toilets. This section describes all structures serving more than one house unit and used by people from the surveyed neighbourhood. It associates qualitative and quantitative data.

6.6 Data set E: dwellers' practices and their determinants. This section analyses the users' practices. It looks in detail at which facilities are used by which individual and the variations in usages. It then describes and analyses the determinants of choice, looking also at how the personal triggers for individuals selecting a toilet are combined with the local factors.

6.2 Data set A: perceived context

6.2.1 Indirect observation, informants photographs

Four groups took pictures of sanitation issues in Amui and Nii. Informants were asked to take pictures of sanitation and hygiene issues in their neighbourhood. Very few pictures showed toilet facilities, see table 6-1. During debriefing with the informants, they explained that it was not easy to take pictures of toilet facilities as they did not want to be seen by the attendants. They felt that it was important to take pictures of the whole environment and not only the toilet. Some pictures taken into the toilet did not work; some technical issues such as the misuse of the flash and the lack of training explained that.

Group	A	B	C	D	Total
Composition	2 ladies	2 ladies	2 ladies	2 ladies	
Location	Amui	Amui	Nii	Nii	
Pictures delivered by the lab	22	13	15	20	
Pictures released by participants	20	11	12	20	*62*
Drainage and channel pictures	11	8	2	4	*40%*
Drainage and solid waste picture	3	1	5	10	*30%*
Solid waste picture	1		3	1	*8%*
Toilet pictures	2	1	2	5	*16%*
Others pictures	3	1	0	0	*6%*

Table 6-1 Sorting of informant's photographs

The debriefing held with each pair of women after seeing the pictures revealed that participants were very concerned by diseases and food and their relation with poor sanitation. Pictures showed often that food was prepared close to dirty areas or drains with stagnant water and wastes.

<u>Photographs in Amui</u>

The participants in Amui were living in flood-prone areas and their pictures focused on the poor drainage system and the accumulation of wastes that can have serious consequences on flooding. Participants openly discussed the issues of open defecation and plastic bags that are spread in some fields behind their houses, see figure 6-1.

| Open defecation field | Drain close to market stall |
| Women going to church | Solid wastes in drains |
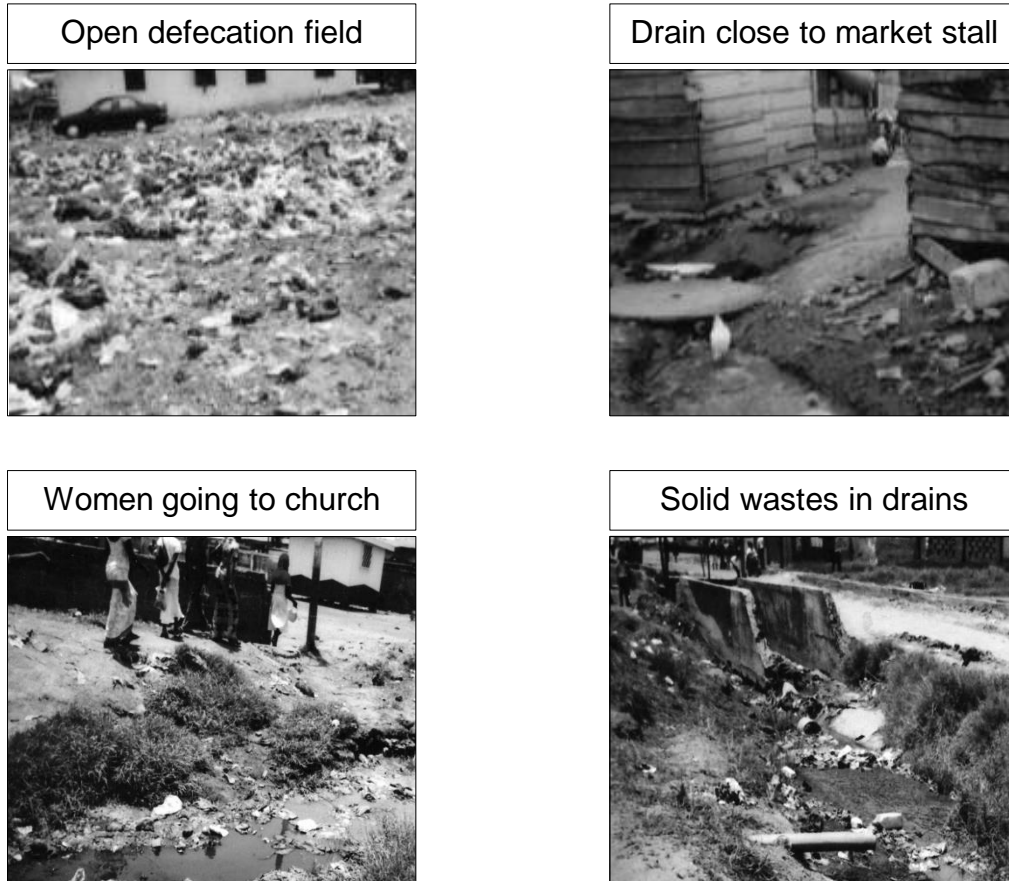
Figure 6-1 Informants' photographs taken in Amui

Photographs in Nii

In Nii, a group of women illustrated the lack of management and cleaning in municipally owned toilets. Both pairs of women in Nii focused on children practising open defecation, plastic bags and faeces in drains and dirty water coming from private showers. The participants talked about the responsibility for cleaning drains, problems when open drains were between two houses as both houses would refuse to do the cleaning, see figure 6-2. Bad odours giving nausea both in toilets and along drains were also mentioned several times.

Dirty cubicle and full pit	Drain by a public shower

Child open defecating	Drain and narrow path
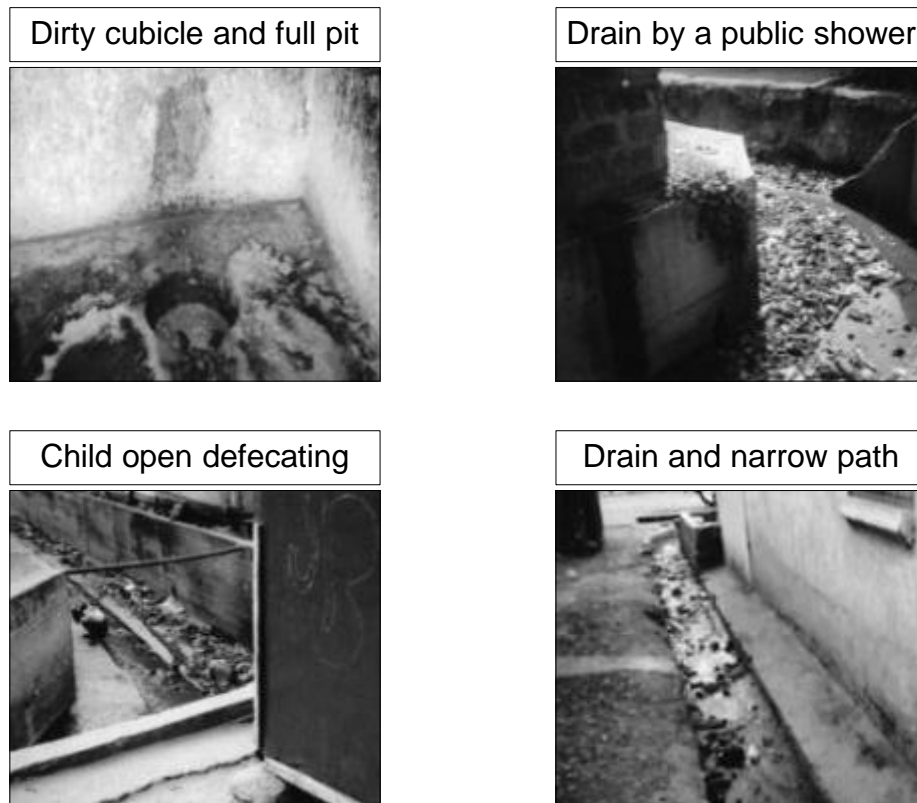
Figure 6-2 Informants' photographs taken in Nii

6.2.2 Direct observation

Acknowledging the different bias related the direct observation, particularly in the case of observation of sanitation practices, as discussed in the section 4.8.8; some points still deserved to be mentioned here. During the several weeks in the field, the following were observed:

- At any time of the day, very few children were observed using communal toilet
- Children massively used gutter and large open channel in the Nii and Amui area.
- Potties were often emptied into plastic bags ending in the solid waste; some of them were poured out in gutters.
- Several areas were characterized by many "take way" (local name of flying toilets) thrown on the soil, in dumping areas or in open channels. It was difficult to qualify and quantify this practice. Some observation suggested the important role played by defecation into plastic bags. Two days after a communal cleaning of the gutters in Nii area, a large number of "defecation bags" were observed in the gutter.

- In the neighbourhood toilets, the money was collected by family members of the owner; children were also collecting fees.
- Several locals reported witnessing the use of bucket toilets in some areas of Ashaiman despite the legislation. However no functional bucket toilet was observed in the surveyed areas.

The above observations focus on the quality and on the use of the different sanitation facilities in the whole of Ashaiman. Unstructured interviews and observations also provided noteworthy elements concerning the local governance, and the interactions between providers, local governments and dwellers.

Ashaiman is a newly constituted municipal assembly; different employees in the assembly explain the difficulty in conducting their work. In the environmental office, it is not unusual to see five or six employees waiting their turn to use one of the two available computers. The same five or six employees share one office and two desks. An appointee assembly member explains that several documents such as propriety tittles are still in Tema and that the hand over period between the two administrations is not clearly stated. Employees complain about the lack of resources. Wages are not attractive and best elements are likely to work for the private sector or larger assembly such as Accra who may provide a better working environment.

6.2.3 Key findings of data set A

The key findings of the data set A, perceived context, are:

- Ashaiman has for many Accra's dwellers and internet articles the reputation of an insecure and filthy town (Selby, 2009). The perceived reality of Ashaiman by its inhabitants is more contrasted, and varied from one individual to another.
- The heterogeneity of Ashaiman is obvious during transect walks and the situation of the environment varied significantly from one sector to another. Housing conditions, number and type of toilets available, patterns of the streets, quality of the pavement and drainage change quickly from one neighbourhood to another.
- In the literature, Ashaiman has long been presented as a satellite of Tema. But a part of the dwellers naturally differentiate themselves from the mother town Tema and welcomed the creation of the independent municipal assembly which was integrated into the wider decentralization context in Ghana.

- The new status of Ashaiman as a municipality does not seem to provide any improvement in daily life of inhabitants concerning environment issues.

- Drainage, solid waste management, food hygiene, smell and poor general sanitation are important concerns for the dwellers. Young children do not seem to use or to benefit from appropriate facilities. Open defecation and defecation in plastic bags thrown in the open are wide practices in some parts of the town.

- The local government do not seem, from personal observation and at the time of the study, able to tackle these issues due to a lack of resources (financial, technical, human) rather than a lack of personal will or commitment.

6.3 Data set B: providers and other stakeholders

This data set is split in to two main parts. The sections 6.3.1 to 6.3.9 describe the sanitation situation in Ashaiman perceived by the providers and other key stakeholders. The sections 6.3.10 and 6.3.11 describe the roles played by those stakeholders based on the analysis of the interviews.

6.3.1 Mapping sanitation situation viewed by some key stakeholders

The stakeholders such as members of the municipal assembly, assembly men and NGO representatives shared their knowledge of Ashaiman and their personal explanation and feeling about the sanitation situation. The owner and managers of commercial toilets also expressed the specifics of managing toilet business in Ashaiman. The list of the interviewees (11) is detailed in the table 6-2.

Cat	Function	Date	Time
AshMA	Assembly deputy planner officer	Mar 2011	25 min
	Assembly Environmental officer	Mar 2011	30 min
Assembly men	Government appointee	Oct 2011	35 min
	Assembly man for Asensu zonal council (Nii)	Nov 2011	20 min
	Assembly man for Tettey NKPA zonal council (Laka)	Nov 2011	20 min
Private sanitation providers	Commercial toilet Manager	Apr 2011	40 min
		Apr 2011	20 min
		Nov 2011	20 min
		Nov 2011	20 min
NGOs	Program manager for SAFI SANA	Nov 2011	50 min
	Secretary for the Federation of urban poor	Nov 2011	50 min
AshMA franchisees	Two individuals managing two AshMA toilets were identified, interview planned but despite several attempts the interviewer never met them.		

Table 6-2 List of semi-structured interviews with stakeholders

The interview guideline was designed to provide elements to confirm and explain the lack of appropriate sanitation in Ashaiman (Appendix B5). To facilitate the overview of stakeholders' opinions, the interviews were examined through selection of keywords and mapped (see methodology section 4.8.6). To do so, a code colour identified the category of the interviewee yielding the keywords. Keywords were then organized through a causality tree, shown in a simplified form in the figure 6-3 ; and in a larger and coloured version in appendix C1. Finally, keywords were grouped into common themes that structure the present chapter.
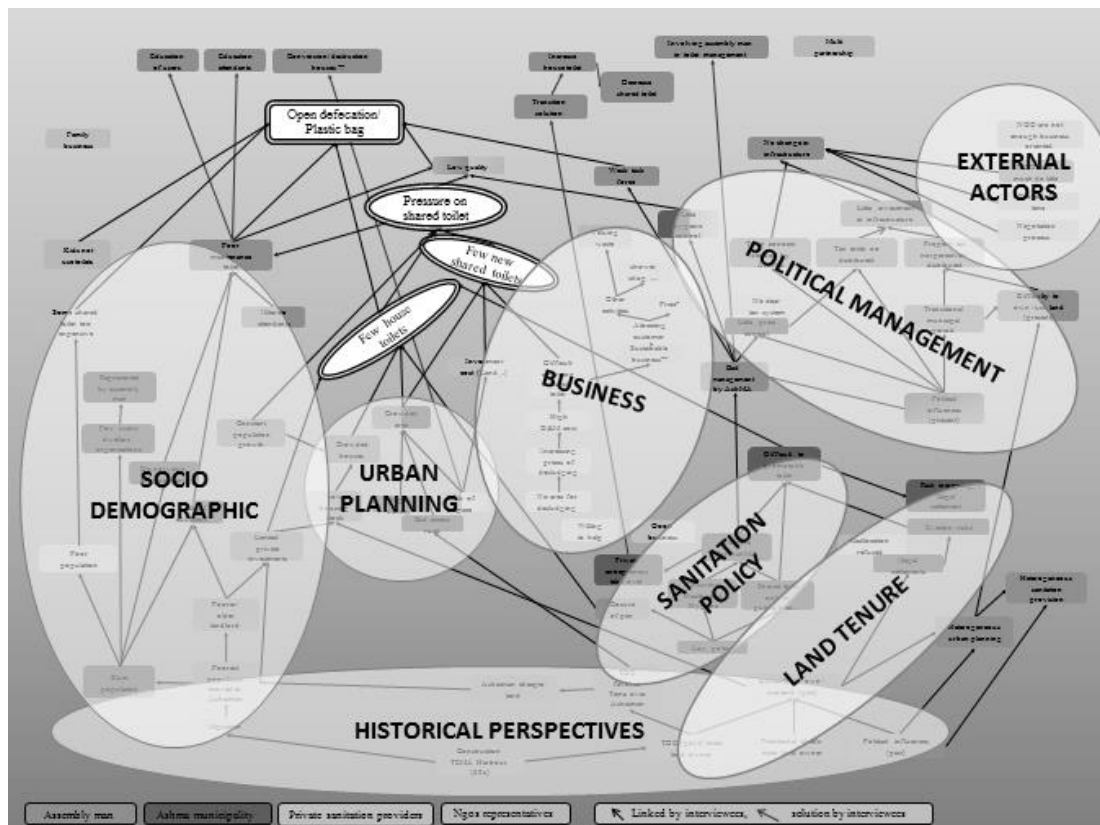
Figure 6-3 Mapping the stakeholders interview, complete picture

6.3.2 Historical perspectives

The historical perspectives were mostly described by one assembly member, appointed by the government, see Figure 6-4.
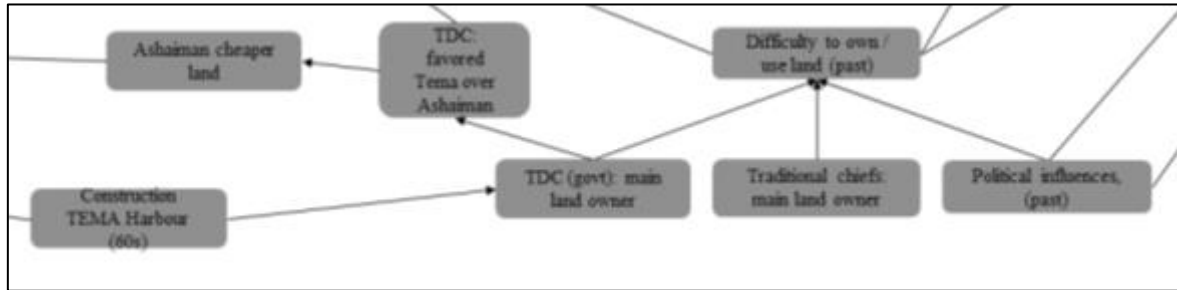
Figure 6-4 Mapping stakeholders interviews, the historical perspectives

This assembly member was involved in the different land issues of Ashaiman. The land situation was the result of political decisions, economic decisions and migration movements that have happened since 1960. These different elements described in section 5.4.1 together with the land ownership structure had consequences on the sanitation provision. The East of Ashaiman (which includes Nii and Laka) was developed by the TDC roughly between 1960 and 1980. The TDC planned the construction of public toilet blocks. Those blocks, according to the assembly representative were not seen, at that time, as a main sanitation facility for the dwellers but to serve visitors and the houses that were yet to be provided with house toilets. The provision of a public toilet in the East of Ashaiman was not homogeneous and was driven by the political influences of the different neighbourhood representatives. The different political changes that happened in the 80s however slowed down the work of TDC and at the same time the compound house became more crowded. Construction of public toilets and house toilets importantly slowed down.

There was less to say for the indigenous area on the west side of the main Ashaiman road. Soon after the beginning of the Tema workers migration, the area became crowded without any road design and toilets were not provided in any house. At this time, people were using fields around Ashaiman. The progressive extension of the urban area led to the removal of the "defecation" fields around the indigenous area. A few public toilets were built in the premises of the market nearby the Oko area, supported later by private initiatives.

6.3.3   Land ownership

Land tenure has a particular history in Ashaiman where a struggle for land has taken place since the appearance of the Tema Development Corporation (TDC), see figure 6-5.
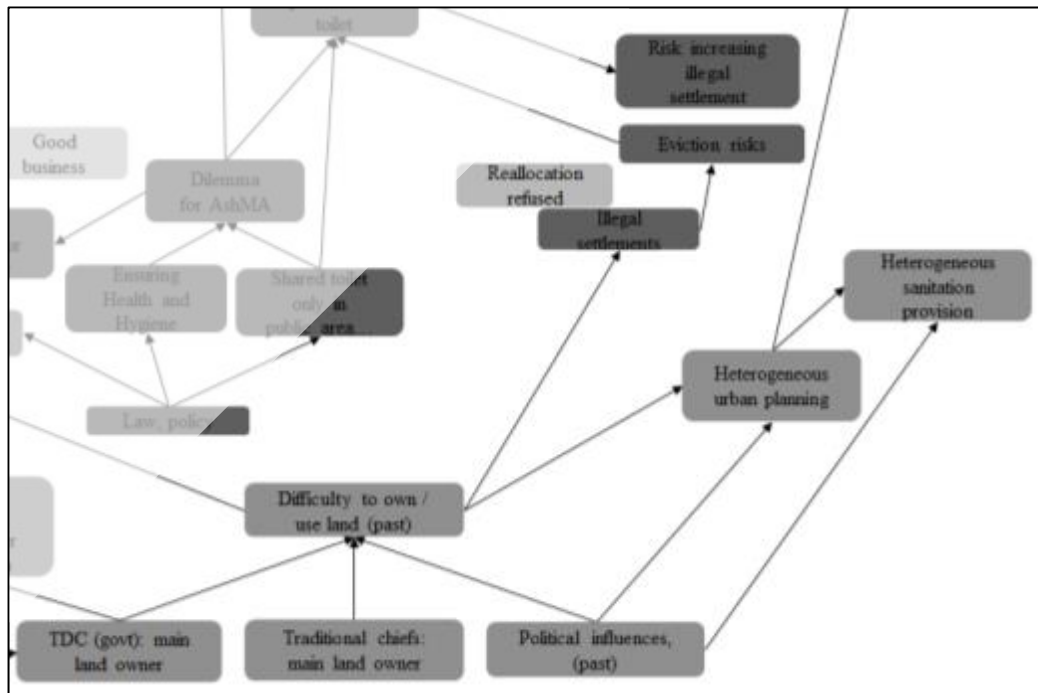
Figure 6-5 Mapping stakeholders interview, land and tenure

The government allocated land to the TDC in order to build the Tema harbour together with the housing estates for the workers and their families. Different politics of reallocation of land took place in Tema and Ashaiman between the TDC and the traditional power. A representative of the Ashaiman municipality pointed out the difficulty of municipal transition. Since Ashaiman became a municipality in 2008, the TDC should have handed this responsibility to the municipality, but the length of the transitional period was not agreed and at the time of the interview Ashaiman municipality did not have all the authority and documents to manage the land issues.

A representative from the municipality and from a NGO also mentioned that a large part of the population was living on illegal settlements. The NGO representative explained that many of them feared eviction and were not ready to invest in their building while the municipality explained that they cannot start a program promoting a mid-term solution, such as house toilets in illegal settlements.

6.3.4 Application of national sanitation policy

The Ashaiman municipality was pressured by the national policy and the local situation, see figure 6-6.

Figure 6-6 Mapping stakeholders interviews, the application of national sanitation policy

The government of Ghana recently took substantial decisions concerning shared sanitation. As mentioned in section 5.3.3 shared facilities have to be limited to public areas. A planning officer listed the reasons for having low sanitation coverage in Ashaiman: high density, lack of space and lack of access roads. The planning officer pointed out the different barriers to house toilets and explained the dilemma they have to deal with:

> *"Since the government banned pan latrines, most of the inhabitants rely on public latrines, open defecation or plastic bags (wrap & throw or locally called 'take away'). The position of the assembly is difficult as the government decided that public toilets should only serve public areas such as markets and stations. But due to nature of the space, it is difficult to encourage individual toilets, or even one toilet for 3 families as in the middle term people should be evicted from this area. At the same time the assembly has to ensure the health and hygiene of its population, but developing more public toilets will encourage people to stay around."*

6.3.5 Political management

During their interviews, two representatives from the assembly and three assembly men questioned the political accountability of the municipal leaders and the difficult management of the budget allocated to sanitation, see figure 6-7.
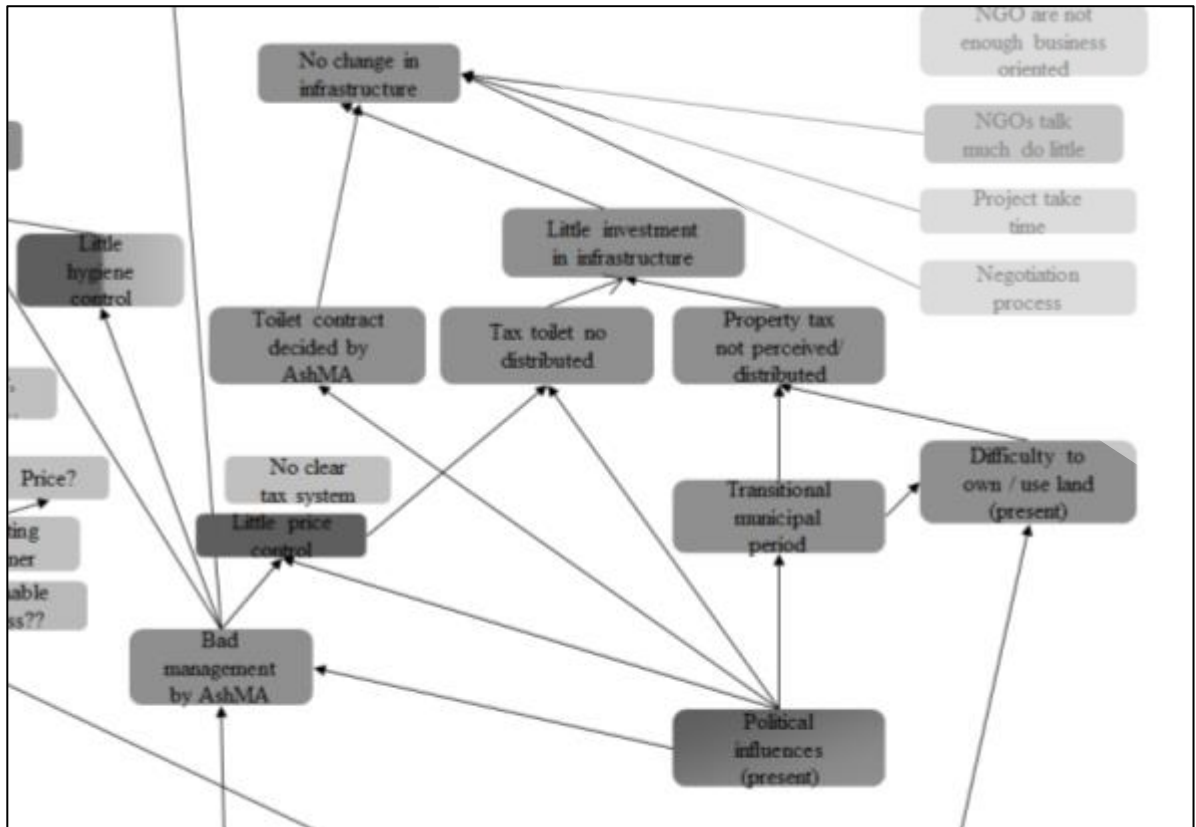
Figure 6-7 Mapping stakeholders interviews, the political management

Two levels of mismanagement were pointed out: the existence of political power influencing the sanitation provision and the unclear taxing system and hygiene control of the commercial toilets. One of the sanitation providers explained that he did not pay taxes to the municipality, except for the water, while another owner of toilet blocks responded that he did pay some. This last provider was not able or not willing to provide details on the amount paid. Three providers declared that the environmental department visited the toilet blocks without being able to specify the frequency of visits.

The three assembly men held a similar position insisting on the absence or unexplained distribution of the taxes perceived as coming from sanitation facilities. An

assembly man explained similar difficulty with the perception of perceiving property taxes:

Property rate is paid to the Assembly. If the land is TDC land, you pay ground rate to TDC. Part of the ground rate is supposed to be given by TDC to the traditional chief but this does not happen. That is why there is always confusion.

He added later that the transitional period between Tema and Ashaiman was not clearly stated and therefore it was unclear to him who perceived what. When asked if the tax system was not clearly stated in the law, the assembly man whispered:

"Well…. Political influences."

One of the assembly men described the situation in one of the municipally owned toilets located in his area:

"The one owned by AshMA is managed by a man. Every month they give money to the assembly. But as at now they are not giving money. They give it to a traditional chief."

A planning officer from the municipal assembly agreed that the assembly itself had no influence on the price control of the municipally owned toilets. Two interviewed assembly men thought that they should be involved in the management of at least the municipally owned toilets located in their area. They considered that the actual model was not appropriate. The unclear tax system and the political influences led to an unseen investment in sanitation or other infrastructure.

6.3.6 Sanitation entrepreneurship in Ashaiman

Focusing on the providers of the toilets blocks, private ones and managers of municipally owned toilets need to be differentiated. A planner officer at the municipality described the management of municipally owned toilet:

The management of public toilet is given to contractors following tendering procedures. During the process, interested individuals or companies make an offer in term of service provided and suggest a percentage of their benefits they will give to the assembly. Contractors/managers are then in charge of providing cleaning and maintenance as well as an attendant.

By contrast, to set up a toilet business, private owners, after acquisition of the land, need an approval from the planning office and the environmental department of the municipality. Despite several attempts with two managers of municipally owned toilets, the meeting did not take place as the managers continually postponed the interview and were living out of Ashaiman. Therefore the four owners/managers interviewed during the fieldwork were the ones who operated private toilet blocks.

A planning officer admitted that private owners of toilet blocks were key players in providing sanitation in Ashaiman. Despite the fact that shared sanitation should by law take place only in market or station areas, the services provided by private owners served a large part of the population. When asked about the situation of these providers towards the law, the planning officer answered:

> *Commercial toilet is not viewed by the assembly as a long term solution but as a transition one. People will progressively have access to private sanitation and gradually the market for commercial blocks will decrease and such business will have to close.*

Motivations for owners of commercial toilets blocks were of a different nature. Toilet owners and managers listed source of motivations:

- Sanitation is a good business as many households do not have a toilet at home;
- Providing sanitation at a low cost allows entrepreneurs to help the community;
- Some small providers built a toilet for their personal use and opened it later to the community, aware of the economic potential.

There was no hierarchy drawn in this list of factors, it changed from one individual to another. A sanitation provider recognized that a shared toilet was too expensive for some families but he cannot jeopardize his business. It seemed to him that the balance between running his own business and helping the community may be difficult to find. Some entrepreneurs owned several facilities, and not only in Ashaiman. These various motivations are balanced by different barriers, see figure 6-8.
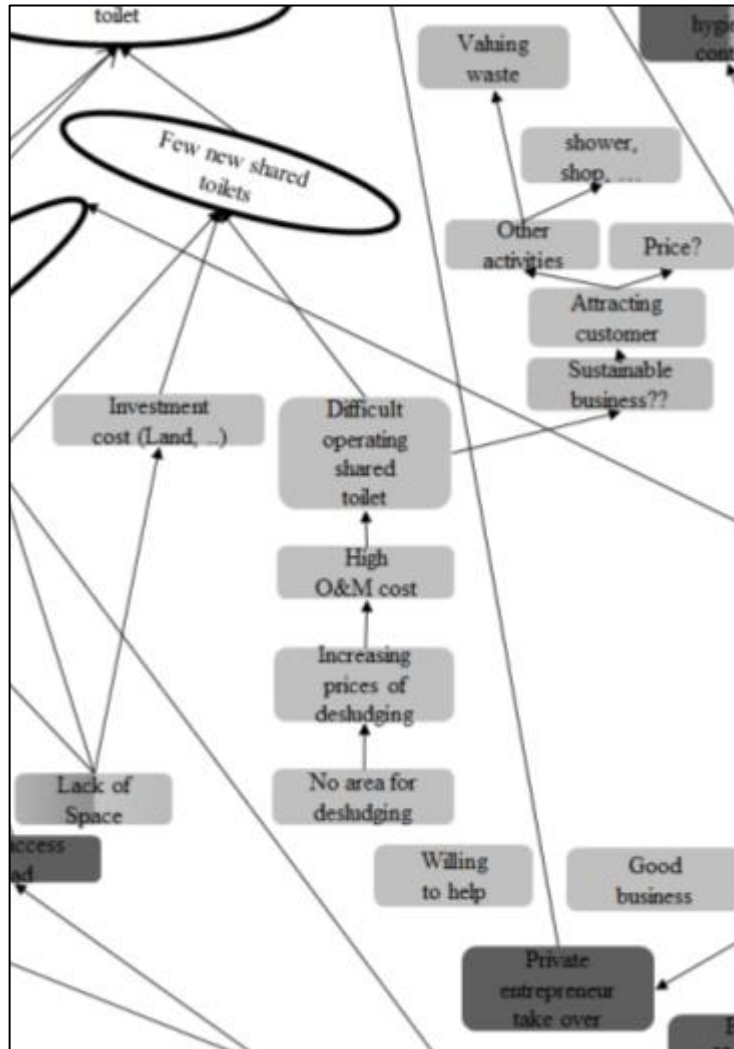
Figure 6-8 Mapping stakeholders interviews, the sanitation business

The first barrier to construction of sanitation facilities was the availability of land. The four interviewed sanitation providers had available space in their family plot which allowed them to start the business without too high investment cost.

The biggest difficulty mentioned by three of them was the increasing cost of desludging. This increase was caused by the cost of fuel, associated with the diminution of available area for the disposal of sludge. Desludging trucks gradually increased the cost of transport. A provider of commercial toilets describes the following:

> "They come every 3 or 4 months. The car comes three times. One time is 1,200 000 cedis (to be checked, probably 120 cedis). And they will come three times so 3,600 000 in total. According to the number of people (customers), it may be more desluging."

Reducing operation and maintenance costs and diversifying the services were challenges shared by the toilet block managers. One of them showed proudly his own water borehole allowing him to clean his toilet and provide shower services at low-cost. Some providers sold hygiene products, rented chairs or sold clothes. One of the toilet block providers offered a very low price (10 pesewas) which was similar to the municipally owned toilet. He explained that his business was new and he wished to attract customers but he will have to increase the price in a near future. Attracting customers was an important dimension for entrepreneurship investing in toilet blocks.

6.3.7 Technical and urban parameters

All stakeholders agreed that the urban context was a major barrier in providing adequate sanitation facilities. The list they provided included crowded houses, low housing stock, population growth, crowded areas, poor access roads and high density, see figure 6-9. All stakeholders pointed out lack of space and crowded areas as key barriers to provision of house sanitation.
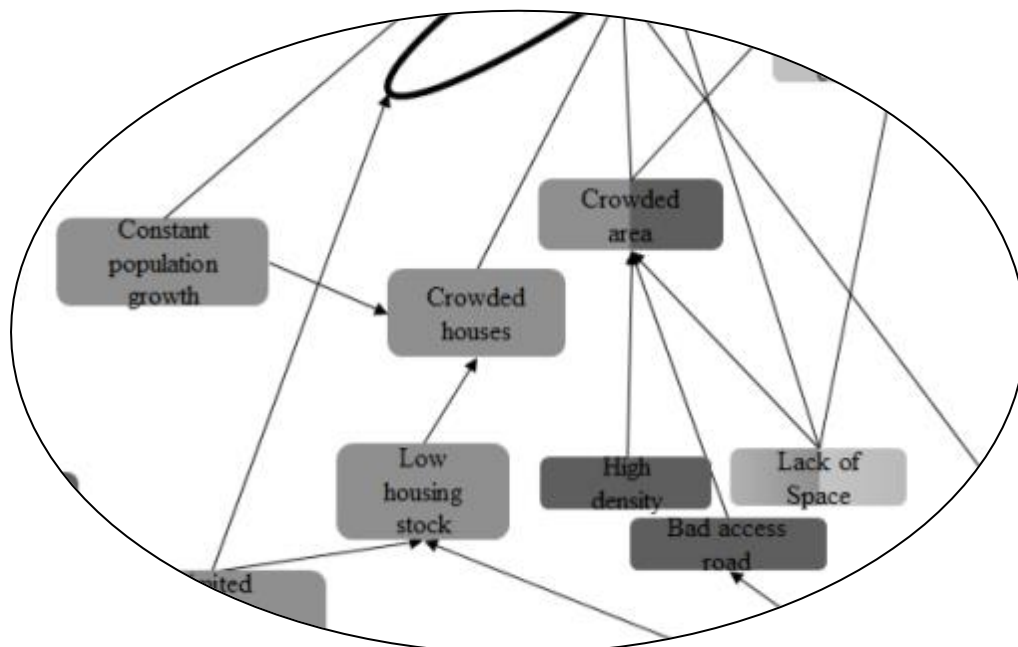
Figure 6-9 Mapping the stakeholders interviews, the urban parameters

Most of them mentioned the difficulty of developing new toilet blocks or sewage systems due to the current density of the building and the difficulty to buy new land. Some of them discuss the necessity of destroying houses for implementing new toilets.

6.3.8 Characteristics of population

The assembly members explained that the population in their area were poor but were also becoming poorer, see in figure 6-10. In Laka, many landlords lived in their house and rented out part of it. They were not rich landlords. Their house was their only asset but most of these landlords were old without income and could not invest in their building. One assembly member observed that the quality of the houses in his area has decreased. Investing in toilet was not possible for this category of landlord who could not maintain their house properly.
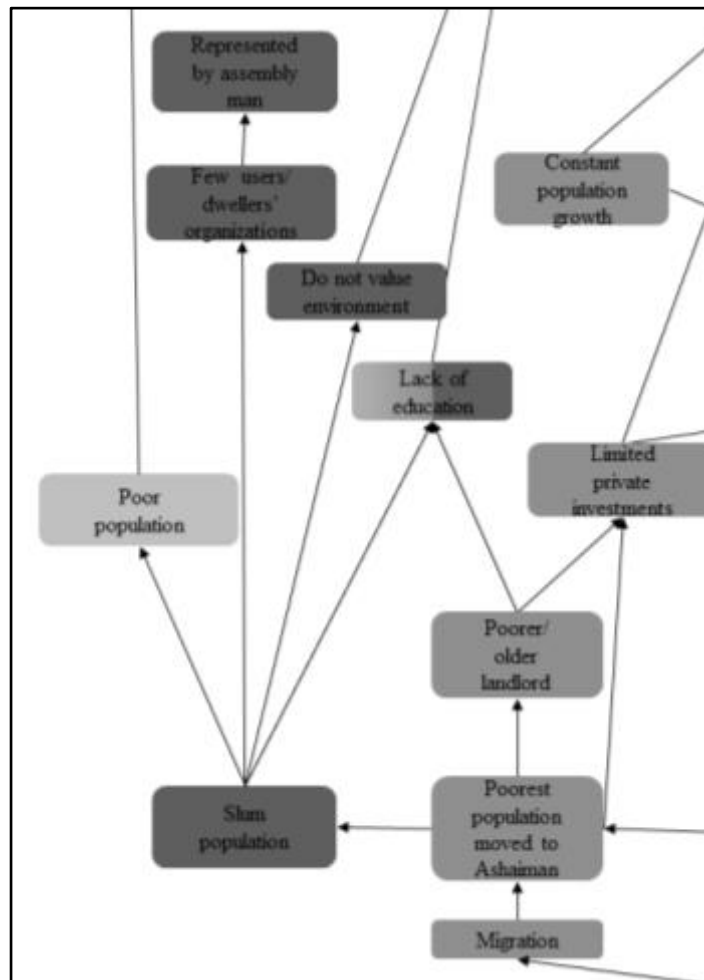
Figure 6-10 Mapping the stakeholders interviews, the characteristics of population

Two assembly members also pointed out that attendants of toilets blocks are often illiterate and unskilled. They cannot educate the users. A representative from the assembly explained that the population in some of the areas have a lack of education and they do not value the environment. They are not encouraged to used toilets.

There were also a low number of dwellers' organizations addressing their issues; they did not seem to gather formally.

6.3.9 Role played by external actors

One assembly man repeated several times during the interview his frustration towards NGOs and researchers who regularly do assessment but do not provide new services:

> *"NGOs talk a lot and do little".*

A representative from the Assembly explained that the dwellers could complain about sanitation through their assembly members but she was not aware of any organizations supporting dwellers concerning excreta management. An NGO representative explained the difficulty of developing a suitable programme in areas such as Ashaiman. Due to the urban nature of the project and the issues of land ownership most of projects have to go through a long negotiation process with a multitude of stakeholders having different interests. Therefore the project takes a long time from their conception to realisation and goes the frustration of the population representatives

Two initiatives led by outside organizations stand out:
- The Ghana federation of the urban poor has with other partners implemented a cooperative housing for 31 families (PD, 2013). The building includes a commercial toilet blocks. The toilet block, located on the edge of Amui, is managed as any other commercial toilet and costs are similar to others in the sector. Users do not identify this block differently than any other privately owned toilet.
- Safi Sana is a non-profit raising fund organization working with local partners and local government. The organization uses an ecological sanitation system and values waste to improve sanitation in part of greater Accra. One of their pilot projects includes the construction of a public toilet in Ashaiman. The public toilet, managed by a local NGO, was inaugurated after the completion of this research' fieldwork and was not located in a surveyed neighbourhood.

The representative of Safi Sana argued that NGOs could not succeed in setting up sanitation enterprises in this context if they were to follow traditional approaches. They needed to adopt a business approach, and most important they needed to value as

many aspects as possible of the sanitation chain. Valuing wastes was a key to developing sustainable sanitation enterprise. In this case, they set up an alternative model in partnership with the municipality for acquisition of the land and some private stakeholders.

6.3.10 Description of sanitation providers

This section focuses essentially on individuals and organizations providing shared sanitation to the residential areas. Most of the individuals and organizations involved in sanitation services in Ashaiman focused on the provision and management of shared facilities rather than on the construction of in-house toilets. Due to the low number of house toilets, the shared toilets played a central role for the daily provision of sanitation. This was an appealing opportunity for many actors who were motivated to enter the market and then to keep control on certain of these facilities.

<u>The municipal assembly</u>

The assembly is in charge of applying the sanitation policy. As stated previously, the Ashaiman municipality could not comply with the national policy (encouraging the development of in-house toilets and limiting the shared toilets for transient populations) and needed to rely on the network of shared toilets. The municipality owned 24 shared toilets and supervises 145 private commercials toilets. Interviewees, reports and observation highlighted the ambiguous role played by the municipality as AshMA is both a regulator and a provider of facilities.

Concerning the toilets owned by the municipality, there were no formal contracts issued with the franchisees. According to the silence of some interviewees, informal discussions with dwellers and secondary literature, a majority of these toilets were managed by groups associated with the political party in power in the municipality. Facing difficulties to meet the managers of these municipally owned toilets (see section 6.3.1, it was then not possible to confirm this information.

Most of the toilets owned by the municipally were poorly maintained. The municipality had not build toilet blocks recently (the owned blocks were mostly built in the 70s or 80s by the TDC) and the municipality had not recently invested in new sanitation infrastructure. However several individuals within the assembly explained their motivation to improve the sanitation situation in the city. They themselves stressed the lack of resources (no computer, lack of office space and chairs, lack of vehicles, bad

power supply) and stated that because Ashaiman was a new municipality long ignored by Tema (the previous municipality), the assembly needed time to address such issues.

<u>Franchisee (under ownership of AshMA)</u>

Franchisees are individuals or organizations selected by the Assembly to manage one of the 24 publically owned shared toilets. According to the national guideline for the provision of public toilets (MLGRD, 2003), franchisees are meant to play the role of the manager and operator of the facility on behalf of the assembly. In Ashaiman the observations of the franchised toilets and the feedback from the users confirmed that these toilets were poorly maintained, questioning the motivations of the franchisees. Without the existence of formal contract and the refusals of the franchisees to meet the researcher, it was difficult to even identify who were the franchisees.

<u>Private provider/operator (BOO)</u>

The private providers are individuals who own and manage toilets on a commercial basis under a BOO system (Build, Operate, Own). As in the case of Sukura (Osumanu, et al. 2010), the owners of some of the blocks were businessmen who owned similar type of facilities in other municipality of the Tema and Accra region. Some of the owners of the largest blocks were not based in Ashaiman and hired attendants to run their business. Some individuals ran smaller blocks often together with a shower and a water supply business, in some cases offering some other services such as soap selling or chair renting (see section 6.5.5 and appendix C3). The smaller blocks may be run with the participation of the whole family. While the main motivation for all the providers was economic some of them explained their need to support the community by providing sanitation facilities at an accessible price. It was however difficult to keep a low price as cost of desludging and daily operation (cleaning product, hiring of staffs) was continually increasing.

Providers had limited contacts with the assembly; they were rarely visited by environmental officers and explained about paying an annual tax.

Providers finally explained that in some areas it was particularly difficult to construct shared sanitation blocks as the land was particularly expensive and it might require the destruction of existing houses, discussed in section 6.3.7. Then they needed to find a plot accessible by truck for the monthly desludging of their septic tanks. These

elements seemed to limit the creation of business to the richest individuals or to the ones already owning enough land in an appropriate location.

Informal provider/operator

They are identified in this thesis as the owners of the neighbour shared toilets, who provide paid access to their cubicles. They have no relations with the municipality, and their number is difficult to estimate. For most of the ones interviewed in the assessed area, they initially built a toilet for their usage before commercializing its access to the residential and transient population. They were not recognized by the municipality as commercial toilets and therefore did not pay annual taxes.

The toilets were made of only one or two cubicles and informal providers could not expect large profits. The activity was seen by these informal providers as an additional source of revenue; and the toilets were in many cases run by children of the house who collected the fees.

6.3.11 Descriptions of other stakeholders roles

These other sets of stakeholders were not directly building or managing commercial toilets but they were involved in sanitation provision, often playing a role between the providers and the dwellers.

Assembly members

Most of assembly members are elected by their zonal council while some of them are appointed by the government. The assembly members represent the dwellers at the assembly level where they discuss and vote municipal decisions.

During interviews, the assembly members criticised the politics of the assembly towards sanitation, mostly complaining that they were not enough involved in the management of the shared toilets. However it was reported during the fieldwork that some assembly members were implicated in the management of the municipally owned toilets. Some assembly members also owned some commercial toilets; these practices are reported in other towns in Ghana such as Medina (Agyei et al., 2011) or Kumasi (Caplan, 2010). The assembly members are supposed to report to the assembly the complaints on the sanitation management they receive from the dwellers living in their zonal council. Therefore the roles of some of them became conflicting as they were at the time of the research both providers and regulators of the service.

Community and Civil Society Organizations

Some reports describe Civil Society Organizations (CSOs) in Ashaiman as having an important role in supporting sanitation programmes (Acheampong A. , nd; Maple Consult, 2011). These reports took elements from the whole Ashaiman and included both human and solid waste. Adversely, this study found that community groups had a very limited role concerning excreta management; as for instance none of the surveyed sanitation blocks were managed by CBOs.

The cleaning of the neighbourhood organized annually or bi-annually by some assembly members and some youth organizations confirmed the existence of community feeling and the will of impacting the environment. But these initiatives did not have a long time lasting impact. While some community groups may have been willing to be involved in sanitation provision, so far they did not had the capacity to undertake significant activities and they have not received support from local government.

Landlord owning toilets

The landlords owning toilets were not considered as providers of shared toilets with a commercial purpose. These landlords following different arrangements with their tenants; some shared a block with them or some build a second cubicle for their tenants. In some cases, they excluded their tenants from using the toilet existing in the house unit. It has been reported that some house owners share their toilet with neighbours or large family in exchange for other services but not necessarily money and not in the pay per use system.

Traditional leaders

While traditional leaders are normally not involved in the management of shared toilets, an interviewee explained that some traditional leaders managed AshMA toilet blocks, see section 6.3.5. While there was limited evidence to characterize the overall role of traditional leaders in sanitation provision they remained powerful stakeholders in most of the areas of Ashaiman. As identified by Gough and Yankson (2001) they can be an important link between the dwellers and they different sanitation providers including in the municipality. As important land owners, the traditional leaders were also involved in land disputes which may happen during the acquisition of land for the construction of new facilities.

6.3.12 Key findings of data set B

The key findings of data set B, providers and stakeholders, are illustrated by the thematic map. The thematic map (section 6.3.1) illustrates the diversity of aspects mentioned by the actors. The four types of stakeholders interviewed had their own areas of interest and concern. They did not necessarily point out the same reasons to explain the sanitation situation. But overall, their different point of views can be summarized around the following points:

- Historical perspectives conditioned the differences of planning, population heterogeneity and sanitation difference in the surveyed area of Ashaiman. Similarly, land struggle between TDC, the municipality and the traditional chiefs continued to slow down some infrastructures.

- The sanitation national policy that recommended the use of shared toilets only by transient population and in market areas could not be applied by the municipality. The representative mostly pointed out that shared sanitation must also serve the residential areas as it is the only realistic option.

- The municipal assembly did not recently invest in sanitation infrastructure; it lacked financial resources or misuses them.

- Management of some toilet blocks was not transparent, the taxing system and the hygiene control of the different toilets were not clearly documented. Some toilets managers refused to be interviewed and some did not discuss in detail attendance or revenue figures.

- Business and profit were the greatest motivation to implement and manage toilet blocks. Personal use and helping the community were secondary motivations. Availability of land, investment cost and the continuing increasing of O&M costs were the greatest constraints to the development of activities.

- The economic situation of most of the landlords made investment in sanitation, but also in their housing, difficult. Lack of education was cited to explain the lack of maintenance of some toilet blocks.

- In the surveyed areas, NGOS in particular and civil society in general seemed to play minor roles. Interviewed stakeholders hardly mentioned them, or negatively when they did.

- Representatives from NGOs underlined the difficulty of setting projects in such social and physical environment as it required long and regular discussions with stakeholders having different economic and politic agendas.

6.4 Data set C: in-house toilets and house units;

While this research is mainly investigating the use of shared toilets located outside a house unit, it is necessary to understand the sanitation arrangement or the absence of arrangements within the house unit.

This data set aims to quantify the existing house toilets in the four surveyed areas, to identify the functioning facilities as well as those closed down and to determine how many households have regular access to a house toilet. Using house surveys, observations and interviews, this data set gives an historical perspective on the provision of toilets in house units. Finally different statistical tests explain which key factors may explain the absence of toilet facilities within the house units.

All 432 house units in the four neighbourhoods have been surveyed; descriptive statistical elements are in appendix C2. As explained in the methodology section, in each house unit the information was provided by the first adult living in the unit met by the interviewer. Some elements such as the exact number of residents or the ethnicity of each households of the house unit relied on the memory of the respondents. Results were in that case presented as estimated population and estimated density. Information such as the number of households living in the house and the toilet situation were more easily checked by the interviewer (through counting of the doors into the courtyard for instance). Three types of house unit were identified in this research in relation with sanitation:

- A house with toilet is understood as a house unit having a functional toilet in their premises for the use of the whole or a part of the habitants living in that collection of dwellings.
- A house unit where a toilet was previously in the house unit but is now closed down, or replaced by a shower or another room.
- A house which never had any toilets.

6.4.1 History of the house unit toilet provision

In the selected areas, 20% of the house units had non-functional toilets in their premises, either closed down or converted. The details per house unit explaining the reasons for closing down were not requested during the survey as a large proportion of the respondents had recently moved into their house (less than 5 years) and did not

necessarily witness the close down. However observation, interviews and surveys provided four main reasons to explain the different closures:

- Ban of bucket toilets

- Bad management and misuse of bucket toilets (before the ban)

- Regular flooding of pits

- Bad daily management and operation of toilet by tenants and landlord

Urban planning, housing structure and social status had shaped the selected neighbourhoods in different ways and influenced the presence of toilets in the house unit, see figure 6-11.
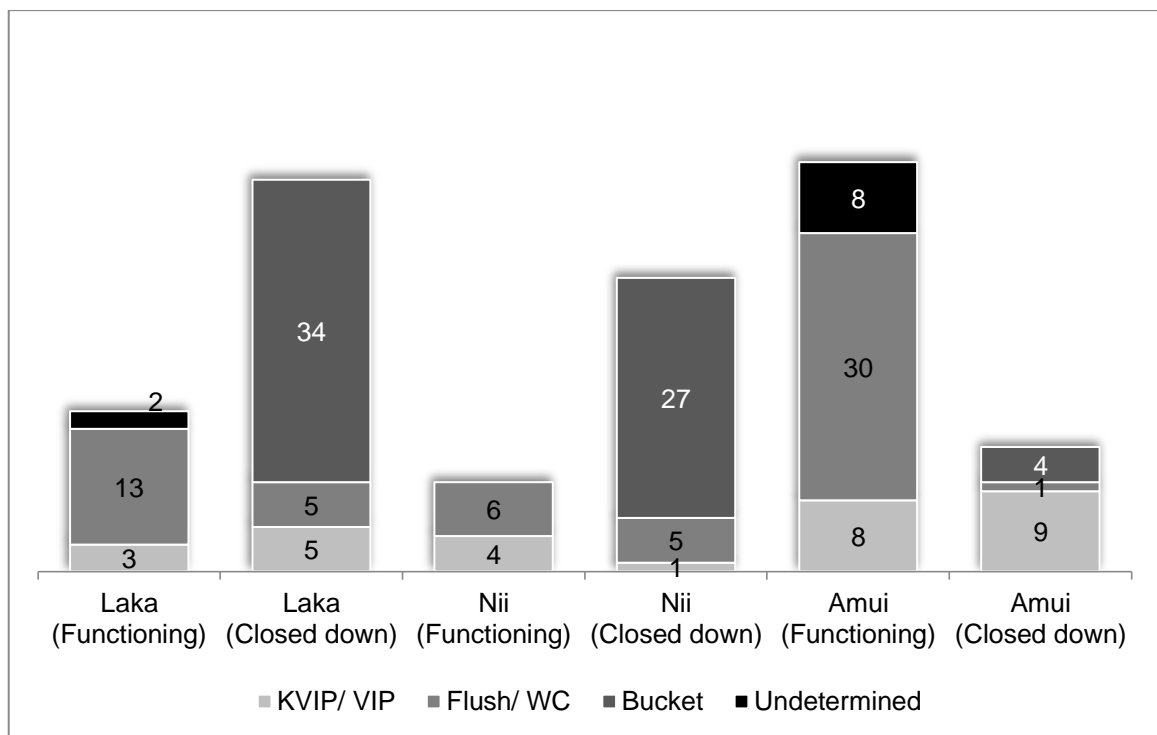
Figure 6-11 Technology types of closed down and functioning toilets

The previous figure provided two types of information. Out of the 91 identified closed down toilets, 65 were bucket toilets. Only in Amui was the number of functioning toilets greater than the number of toilets closed down. The three types of neighbourhoods had different contexts explaining their toilet provision.

In the planned areas of Nii and Laka, one third of the house units had a toilet in the past but now relied on facilities located outside the unit. Most of these toilets were built simultaneously with their compound house. In a compound house, two smaller

rooms were typically planned to be a bathroom and toilet, with the majority of toilets comprising a bucket toilet (called 'pan latrines' in Ghana). Today 8% of houses unit in Nii and 14% in Laka have a functioning toilet in the house unit. This figure is explained by the following:

- Pan latrines had been "actively discouraged" in Ghana since 2010, in line with the National Environmental Sanitation Policy (MLGRD, 2010). Such toilets were officially no longer in use in Ashaiman at the time of the research.
- Before being banned, some pan latrines had already been closed down, as their management was proving to be problematic for the house owner. Compound houses, initially inhabited by a single family and their close relatives, came under pressure from the rapidly growing population. As compound houses became multi-family dwellings (Gough & Yankson, 2011), the opportunity grew for owners to reduce their living costs by renting out additional rooms to accommodate more inhabitants. This increased the challenges of managing the shared toilet facility.
- None of the houses surveyed had recently built a toilet.

In the spontaneous area of Amui, out of the 12 house units with closed down toilets, only four of them were bucket latrines, the others were VIP (Ventilated Improved Pit) toilets. The South-Eastern part of Amui regularly flooded and inhabitants faced problems as their on-site latrines became inundated with flood water. In Amui, 23% of houses had a functional toilet on their premises at the time of the fieldwork. Most of these houses were located to the East, where there was more space available to build a toilet. Landlords in this area typically owned larger plots of land which implied that the households were supposedly wealthier and more able to afford the investment costs.

In the indigenous area of Oko, most houses had never had a toilet which explains why this area was not included in the table. The houses were some of the oldest in Ashaiman and as in the past their inhabitants practised open defecation in a nearby field, no room was dedicated to be a toilet. The pace of urban expansion, several house extensions and the increasing pressure on the number of rooms for rent, left little space for building toilets or bathrooms. Some of the men consulted in the study explained that until recently they would practise open defecation, as the surrounding

areas were not built-up. Today however they did not have the space for such practice and instead used the shared toilet facilities in Oko.

A large proportion of these closed down toilets were left empty. Some were used as storage rooms and fewer were converted into rental rooms or bathrooms. Contrasts also existed there between neighbourhoods, see figure 6-12.
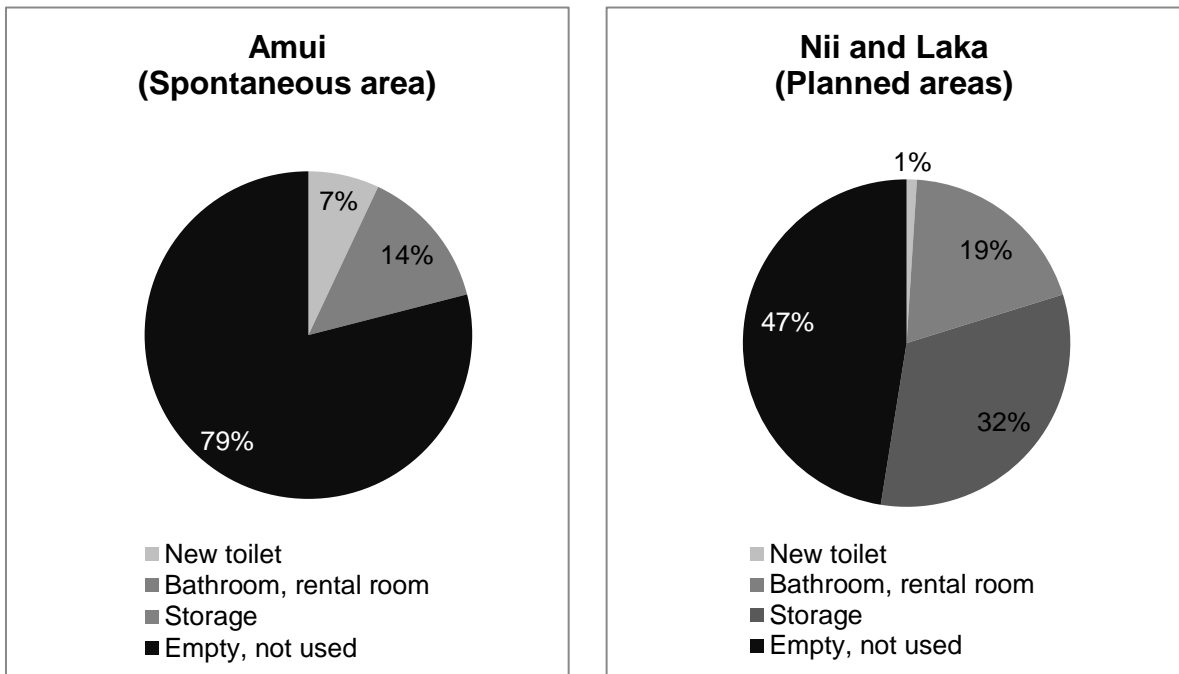
Figure 6-12 Conversion of closed down toilets

Most of the closed down toilets in Amui were left empty because pits were flooded and because the pressure on the land was less intense. In the planned area, more toilets were converted into bathrooms, rental rooms and into storage rooms. Almost none of the toilets in all areas had been upgraded to new forms of sanitation. The pan toilet was in some way adapted to these dense urban environments. Upgrading the pan to a system with a septic tank for instance requires enough space to dig a tank and is viable only if the tank can be regularly desludged. It may be easier for the landlord to change the function of the old toilet and to encourage his tenants to use public facilities (Addai, 2009).

In the area of Laka, Nii and Oko, most of the toilets seemed to date from the construction of the house and no recent building of house toilets has been observed. Recent closure of many toilets and little construction of new toilets resulted in a diminution of the number of house toilets in the sample. This was in contrast to the

picture in Amui, a less densely populated area, where some toilets had been built during the five last years.

6.4.2 Actual stock of house unit toilet

Out of the 432 house units surveyed, 12% had at least one functioning toilet in their premises and 20% had one toilet in the past but now closed down. These two numbers varied in the four neighbourhoods, see figure 6-13.
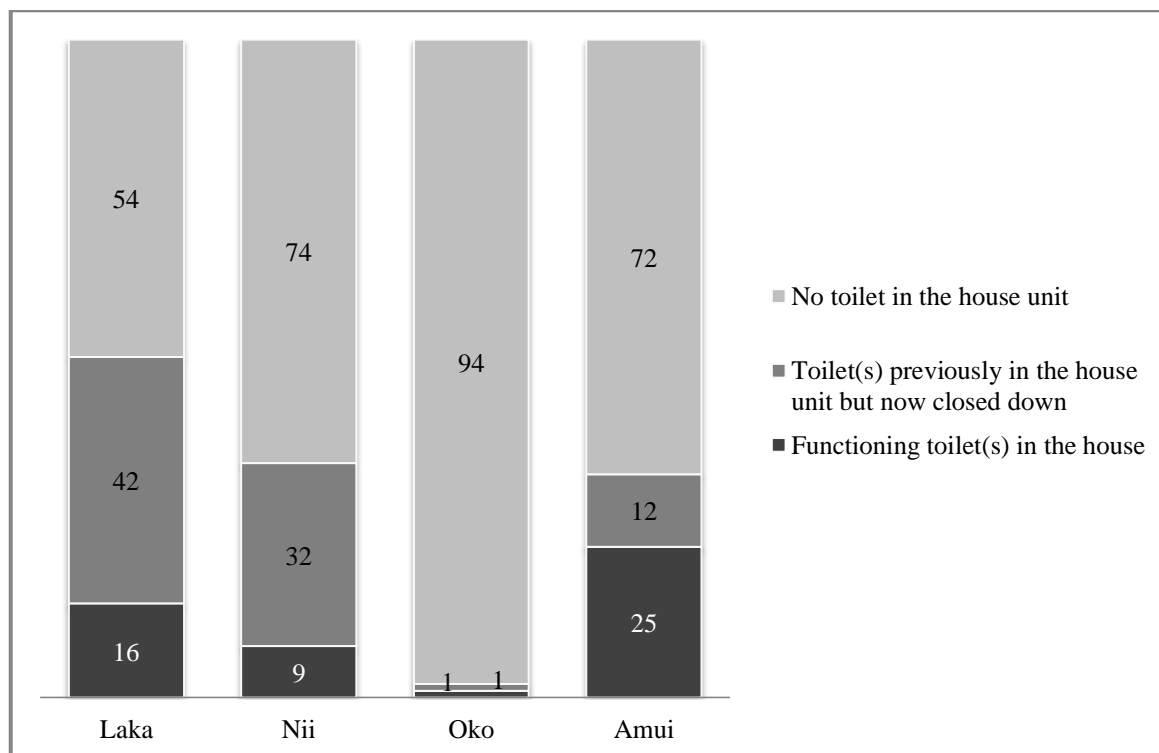
Figure 6-13 Sanitation facilities in the house unit of the four neighbourhoods

Oko, the indigenous area, was the oldest built area in town and was built on an ad hoc basis. Toilets were not included in the house construction and people mostly practised open defecation. In Laka and Nii, the two planned settlements, the figures were similar. Most of the houses were compound houses and half of them seemed to have been built with a toilet. The proportion of toilets closed down was very high in these two areas. Amui, the most recently built area, was the one better served by in-house sanitation.

In the 432 house units surveyed (and results analysed), 75 toilets were counted, built in 51 house units, as detailed in the table 6-3. Three quarters of the toilets were reckoned to be water closets and the remainder was VIP or KVIP toilets.

Type of area Name of area	Planned LAKA	Planned NII	Indige- nous OKO	Sponta- neous AMUI	Sum of four areas
House units analysed	112	115	96	109	432
House units with functional toilet	16	9	1	25	51
1 toilet in the house	14	8	1	11	34
2 toilets in the house	2	1		9	12
3 toilets in the house				5	5
Percentage of house units with at least one toilet	14%	8%	1%	23%	12%

Table 6-3 Distribution of the house unit toilets in the four neighbourhoods

6.4.3 Access to house unit toilets

The previous sections showed that only 12% of houses of our sample (51 out of 432 house units) had a toilet which should benefit 8% of the residents (the full population of these 51 houses). The study of each house unit having a functioning toilet showed that the use of the facilities could be restricted to certain members of the unit, see figure 6-14.
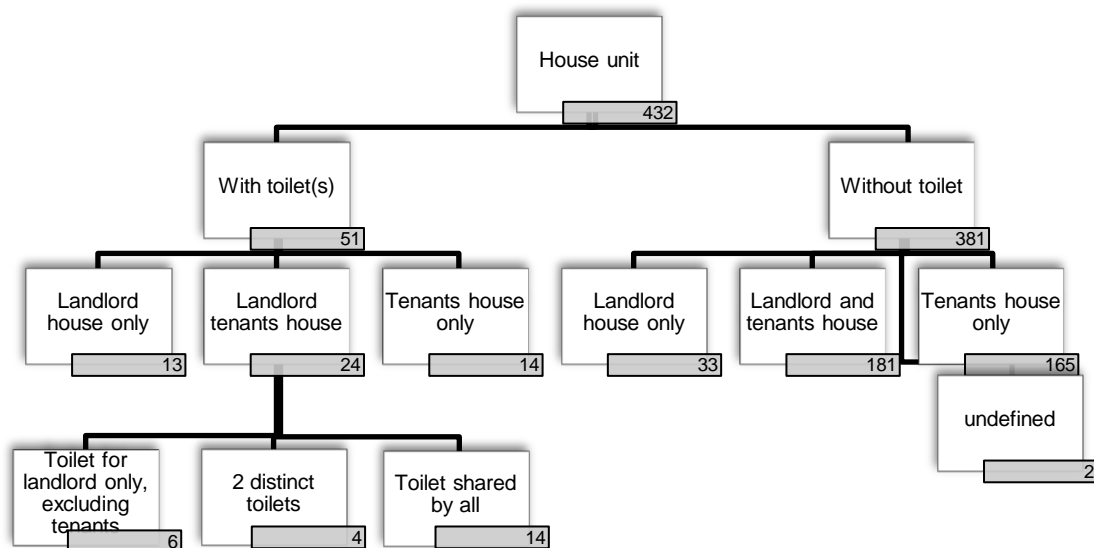
Figure 6-14 Access to house toilet for the 432 house units analysed

In some house units shared between tenants and landlord, the toilet was for the use of the landlord only (six cases out of the 24 cases where landlords and tenants were sharing a house unit with a toilet). In four house units there was a toilet for the landlord and his relatives and another facility for the tenants. There was a disparity between landlord household and tenant household concerning the access to the house unit toilet, see table 6-4.

	Number house unit	Landlord Household	Tenant household	Total household
Total number households	432	340	2572	2912
House with toilet(s)	51	43	156	199
House without toilet	381	297	2416	2713
Household with access to house toilet	_	43	119	162
Household without access to house toilet	_	297	2453	2750
Percentage of households without access to house toilet	_	87,3%	95,4%	94,5%

Table 6-4 Tenancy and access to house unit toilet

The landlord households were more likely to have access to house sanitation than their tenants. Arrangements between tenants and landlords to use an eventual toilet in the house unit differed from one case to another as discussed in the next section.

6.4.4 Management of house unit toilet

Short household interviews detailed in section 6.6.5, provided information on the daily management and general maintenance of the house toilets shared by several households. The study did not focus on house toilets in house units with only one household. A tenant described the management of a house unit toilet:

"We have a toilet in the house (1 seater WC) All the tenants use it. There are 10 rooms. Outsiders do not use it with us. We do not pay to use it. When it gets full, we pay for emptying. We divide the cost by 10. Sometimes, we queue for the facility. It is fine. We clean it ourselves so it is neat. Cleaning is done on a daily basis, every morning…"

A landlord having three toilets made the following description:

> *"The flush toilet is used by my family and me. The tenants use the KVIP.
> Tenants do not pay to use the facility."*

Another landlord described the management of his house toilet:

> "*We only pay for emptying when it is full. We are three different families in
> this house. Recently when we had to empty it, we shared the money to be
> paid depending on the number of people in each household. I as a
> landlady paid 60 cedis, another person paid 40 cedis and the third paid 20
> cedis because her husband is not around and she lives here alone. The
> total was 120 cedis for emptying. Each household is responsible for
> cleaning the bathroom and toilet once a week."*

One woman in Nii during an informal discussion in spring 2011 explained that in her
compound house of seven families there were two toilets. One was used exclusively
by the landlord; the other one was to be shared amongst the six tenants. Since the
heavy rain events in June 2010, the cesspit of the tenant's toilet was full and tenants
relied on public and commercial toilets. The landlord continued to use his toilet.
Several days later, the same woman informed the researcher that the landlord had
opened the toilet again for the tenants. The six tenants' families were sharing their
toilet, and will share the cost of desludging.

6.4.5 Factors explaining the presence of house unit with toilets

The literature review and pilot study showed that many factors may influence the
presence of a functional toilet in a house unit. Some of them were not easy to
investigate while using a house unit survey:

- Physical aspects of the house location such as flooded area, poor access for
  the sewage truck
- Economic status of the households in the house unit. The potential high
  number of households in one house unit and their possible heterogeneity in
  terms of income and economic status made these aspects too complex to
  include in a house unit survey. Other methods used in this research will
  approach this factor. However many studies in the greater Accra area highlight
  the relation between economic status and access to sanitation facilities
  (Songsore & McGranaham, 1995; Boadi & Kuitunen, 2005).

The house unit survey analysed the data using chi square test or regression test depending on their nature. The following types of data were collected and analysed:

a) Different neighbourhood (all house unit)

b) Type of house units (all house units)

c) Tenancy situation in all houses

d) Tenancy situation in multi-house

e) Ethnicity of house unit

f) Religion of house unit

g) Number of habitable room per house

h) Number of households in the house unit

i) Crowding of house

The quantitative data obtained by the house unit survey provide statistical information on some of the potential factors listed above. Different statistical tests described in the section 4.8.1 analyse these information.

a. Different neighbourhood (all house unit)

The micro-context includes the local history, the characteristics of the population and some geographical parameters, detailed in the appendix C2. This micro-context was therefore likely to influence the presence of a functional toilet in a house unit. The significance value in table 6-5 clearly indicated the importance of the neighbourhood in the likelihood of having a toilet in the compound house.

	Toilet(s) in house unit		No toilet in house unit		Total	
	Count	%	Count	%	Count	%
Laka	16	14.3%	96	85.7%	112	100%
Nii	9	7.8%	106	92.2%	115	100%
Oko	1	1%	95	99%	96	100%
Amui	25	22.9%	84	77.1	109	100%
Total	51	11.8%	381	88.2%	432	100%
	χ^2 value		Degree of Freedom		Significance value	
	26.063		3		<0.001	

Table 6-5 Correlation between house toilet and neighbourhood

The percentage of house units with toilets showed the differences between areas. Oko was barely equipped with any house sanitation. The situation of Amui with 23% of the houses having a toilet in their premises contrasted with the 12% for the average of the four areas.

b. Type of house units (all house units)

The provision of toilet in the house unit was well contrasted between the self-contained house, and the other types of houses including compound houses, containers and kiosks. In a self-contained house it was likely that one or two of the households living there was a landlord occupier. The values in the table 6-6 show that the type of house unit was a significant variable.

	Toilet(s) in house unit		No toilet in house unit		Total	
	Count	%	Count	%	Count	%
Compound house	33	9.3%	320	90.7%	353	100%
Self-Contained	16	43.2%	21	56.8%	37	100%
Other	2	4.8%	40	95.2%	42	100%
Total	51	11.8%	381	88.2%	432	100%
χ^2 value			Degree of Freedom		Significance value	
39.170			3		<0.001	

Table 6-6 Correlation between house toilet and type of house unit

c. Tenancy situation in all houses

In the following chi square test, all houses of the sample (432) were included. When including all type of house units and all tenancy situations, the significance value was nearing zero admitting a high influence, see table 6-7.

	Toilet(s) in house unit		No toilet in house unit		Total	
	Count	%	Count	%	Count	%
Landlords only	13	28.3%	33	71.7%	46	100%
Tenants only	14	7.8%	165	92.2%	179	100%
Landlords and Tenants	24	11.6%	183	88.4%	207	100%
Total	51	11.8%	381	88.2%	432	100%
χ^2 Value			Degree of Freedom		Significance value	
14.701			2		<0.001	

Table 6-7 Correlation between house toilet and tenancy in all houses

The tenancy situation of the house unit influenced the likelihood of having a toilet in the house unit, a landlord household living alone being more likely to have a toilet in their house.

d. <u>Tenancy situation in multi-house</u>

The chi square test compared two types of multi-house, the ones with a landlord occupier among the tenants and the ones with tenants only. Within the sample, the presence of the landlord amongst the tenants may have a slight influence on the probability of having a toilet in a multi-house, as shown by the value 0.089 in the table 6-8.

	Toilet(s) in house unit		No toilet in house unit		Total	
	Count	%	Count	%	Count	%
Tenants only	8	6,2%	121	93,8%	129	100%
Landlord and Tenants	21	12%	154	88%	247	100%
Total	29	9,5%	275	90,5%	304	100%
χ^2 value			Degree of Freedom		Significance value	
2,893			1		0,089	

Table 6-8 Correlation between house toilet and tenancy of multi-houses

e. <u>Ethnicity of house unit</u>

It some of the literature, it is assumed that households living in compound houses gathered themselves following certain connections, for instance ethnicity or economic

(Owusu, 1999, p. 236). However in the sample, less than 20% of the multi-houses were inhabited by households with the same ethnicity. The heterogeneity of ethnicity in the households was not statistically-speaking significant when explaining the presence of a functioning toilet. The significance value was not inferior to 0.05 but was 0.075 which is a borderline value, see table 6-9.

	Toilet(s) in house unit		No toilet in house unit		Total	
	Count	%	Count	%	Count	%
Same ethnicity of households	9	15.8%	48	84.2%	57	100%
Different ethnicity of households	20	8.1%	227	91.9%	247	100%
Total	29	9.5%	275	90.5%	304	100%
	χ^2 Value		Degree of Freedom		Significance value	
	3.176		1		0.075	

Table 6-9 Correlation between house toilet and ethnicity

In multi-houses, the ethnic composition of the house may have influence on the provision of toilet. House units shared by people with the same ethnic background were more likely to have a toilet in their house; but houses with the same ethnicity were also likely to be those with low numbers of households.

f. Religion of house unit

As with ethnicity, it may be assumed that dwellers gather by religion and the potential influence of this factor was questioned. In the sample, approximately half of the house units were shared by households having the same religion. The heterogeneity of religion in the multi-house did not seem to be a factor explaining the presence of a functioning toilet in the house unit, see the significance value in the table 6-10.

	Toilet(s) in house unit		No toilet in house unit		Total	
	Count	%	Count	%	Count	%
Same religion of households	16	9.5%	152	90.5%	168	100%
Different religion of households	13	9.6%	123	90.4%	136	100%
Total	29	9.5%	275	90.5%	304	100%
	χ^2 value		Degree of Freedom		Significance value	
	0		1		0.992	

Table 6-10 Correlation between house toilet and religion

g. <u>Number of households in the house unit</u>

After the six chi square tests, three logistic regression analyses were conducted. The number of households per house unit, the number of rooms per house unit and the crowding rate of the house units were separately used as predictors.

The first test, using the number of households per house unit as a predictor was statistically significant, indicating that the predictors reliably distinguished between the house units with toilet and those without (χ^2 = 26,167, p<0,001 with df=1).

The logistic regression test provided probability figures that allowed the drawing of a graph picturing the probability of having a functioning toilet in the house unit when the number of households in this unit was increasing, see figure 6-15. While there was only a 10% probability of having a functioning toilet in a house unit with five households, the probability was divided by two when there were ten households in the house unit.
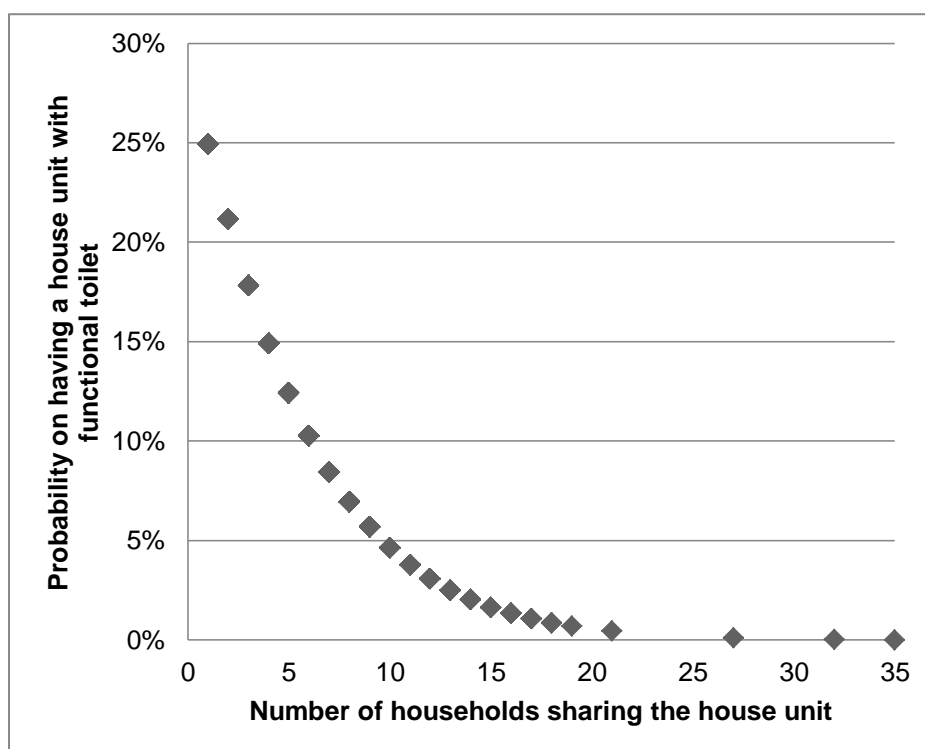
Figure 6-15 Correlation between house toilet and number of households per housing unit

Table 6-11 supports the reading of figure 6-15 and highlights the low likelihood of having a house unit toilet when there are more than 5 households sharing a house unit.

Number of households per house unit	Total number of house units	House unit with at least 1 toilet	
1	76	17	(22%)
2 to 5	106	21	(20%)
6 to 10	176	11	(10%)
Over 10	74	2	(3%)

Table 6-11 Number of households per house unit and in-house toilet

It is also possible to show the regression at neighbourhood level, excluding Oko where there was only one house toilet, see figure 6-16.
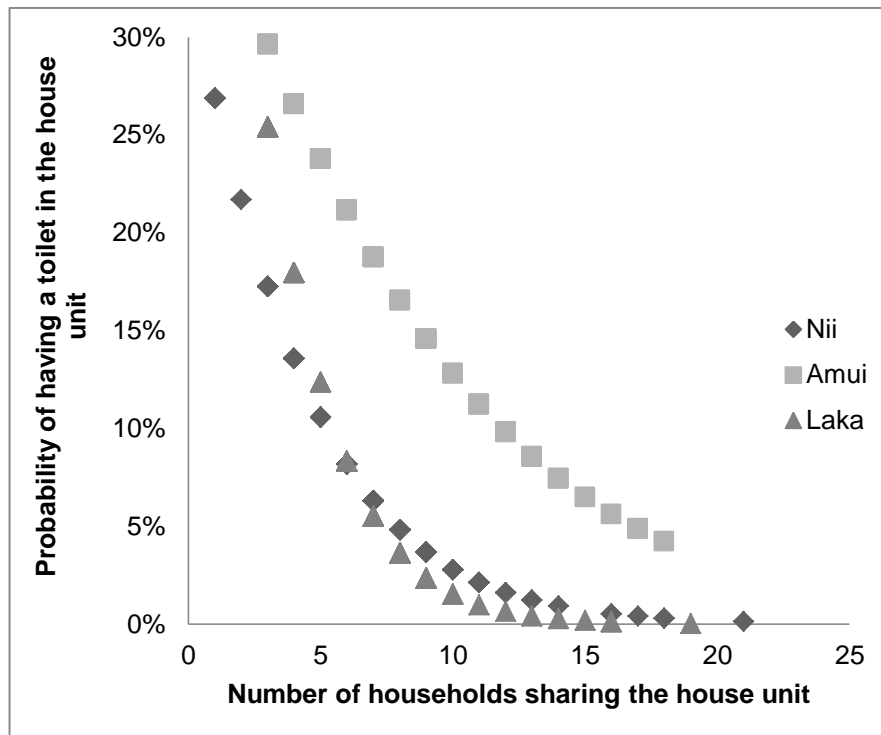
Figure 6-16 Correlation between house toilet and number of households per housing unit in three neighbourhoods

For a same number of households sharing a house unit, it was more likely to have a house unit with functional toilet in Amui, even if all figures were still given fewer than 30% of chances.

h. <u>Number of habitable room per house</u>

The test, using the number of habitable rooms per house unit as a predictor is statistically significant, indicating that the predictors reliably distinguished between the house units with toilet and those without (χ^2 = 6,164, p=0,013 with df=1).

i. <u>Crowding of house</u>

Logistic regression was also applied to the crowding of house unit. The crowding rate was here obtained by dividing the estimated population of each house unit (estimation by the house survey respondent) by their number of habitable rooms. The test, using the crowding rate of house unit as a predictor is statistically significant, indicating that the predictors reliably distinguished between the house unit with toilet and those without (χ^2 = 9,423, p=0,002 with df=1). In a house unit with more than three people per room there was less than 10 % probability of having a functional toilet in the house unit, see figure 6-17.
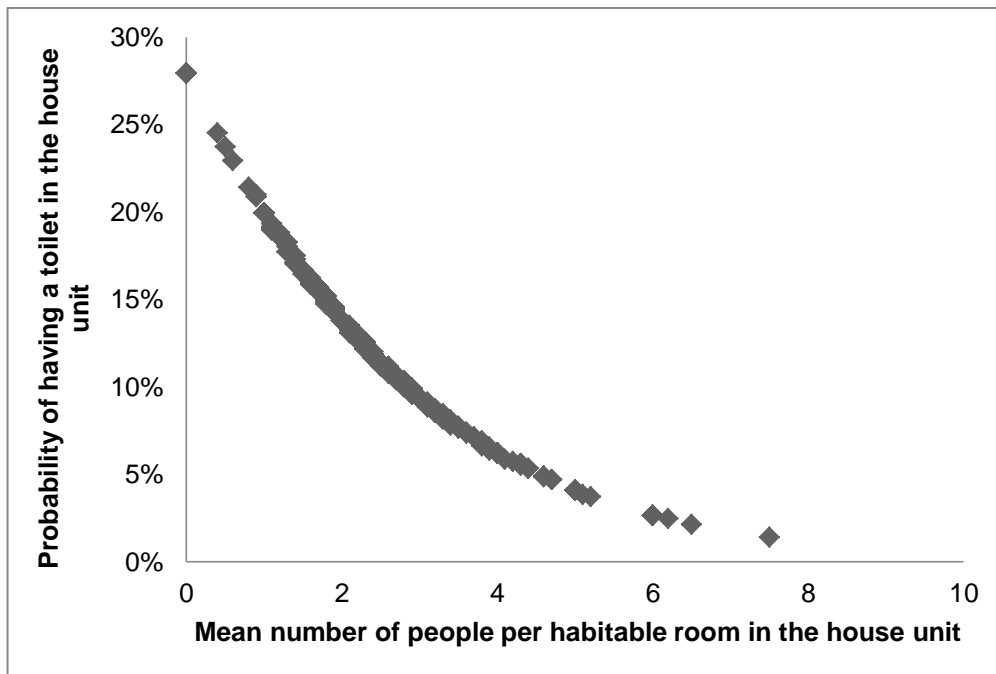
Figure 6-17 Correlation between house toilet and crowding of house units

The poorest households supposedly lived in the cheapest and most crowded houses, with often one household occupying one room. Densities of the settlement, level of income and population characteristics are other potential factors and were also likely to be correlated to the number of households per room and the crowding of the house.

Multicollinearity

More than one variable influenced the probability of having a toilet in the house. It was however difficult to measure the influence of each variable on the final outcome, because most of these variables were interrelated. Crowding, number of households and type of house unit had a significant impact on the potential existence of a toilet in a house unit. But these parameters influenced each other. A test of multicollinearity (Field 2010 p297) confirmed that in that research there was dependency between two variables: the number of habitable rooms and the number of households per house unit see table 6-12. A value of tolerance under 0,1 indicates this dependency (ibid).

Variable	Collinearity statistics	
	Tolerance	VIF
Type of house unit	,633	1,581
Habitable rooms in the house unit	,056	18,000
Households in the house unit	,053	18,850
Tenancy nature of occupants	,656	1,525
Mean size of household in the house unit	,388	2,574
Crowding per room in the house unit	,624	1,603
Ethnicity of house unit	,597	1,676
Religion in the house unit	,897	1,115

Table 6-12 Multicollinearity test with toilet in the house as dependent variable

As indicated by Field, one of the variables could be removed in order to build a more accurate model, but this will remain unsatisfactory as there was no statistical ground for omitting one variable over another. This section did not aim to elaborate a prediction model (predicting the existence of a toilet in a house unit) but to identify variables that may be part of such model.

A combination of variables

The existence of a functioning toilet in a house could not be explained by one or two factors alone. It was a combination of factors, listed in table 6-13 that could help to predict the sanitation situation in a house unit. However the statistical modelling of its prediction will be weak as all the factors used in the model are interrelated.

	Variable	Stat test	Sample size
Probably not influential (p>0,1)	Heterogeneity of religion in the house unit	χ^2	304
Slightly influential (0,05<p<0,1)	Heterogeneity of ethnicity in the house unit	χ^2	304
	Tenancy status of households in the multi-house	χ^2	304
Probably influential (0,002<p<0,05)	Number of habitable rooms in the house unit	LR	432
	Mean number of crowded rooms per house unit	LR	432
Probably highly influential (p<0,001)	Tenancy status of households in the house unit	χ^2	432
	Location of the house unit per area	χ^2	432
	Type of house unit	χ^2	432
	Number of households in the house unit	LR	432

Table 6-13 Influence of nine variables on the existence of a functional toilet in a house unit

The likelihood of having a toilet in the house unit was smaller in a house unit with ethnically heterogeneous occupant but this heterogeneity was more likely when the number of households in the house unit increased. The self-contained house was often occupied by a landlord only and was more likely to have a functioning toilet; this related closely together with the number of households, type of house, tenancy status and also neighbourhood, as this type of housing is more likely to be found in Amui.

This section highlighted some of the factors explaining the existence of functioning toilets in a house unit. The recent history of Ashaiman explained some of these factors particularly when looking at the number of the toilets closed down during the last years.

6.4.6 Number of households per house toilet

There are several ways to describe the access to sanitation. Section 6.4.5 has shown that the number of households per house unit is a central factor. The table 6-14 includes the number of users per toilet and the relation between users.

		Landlords	Tenants	Total
Private	count	23	10	33
	%	6.8%	0.4%	1.1%
Shared 2 to 5 hh	count	14	69	83
	%	4.1%	2.7%	2.9%
Shared >5 hh defined	count	6	40	46
	%	1.8%	1.6%	1.6%
Shared >5 hh undefined	count	297	2453	2750
	%	87.4%	95.4%	94.4%
Total	count	340	2572	2912

Table 6-14 Tenancy and number of households per house toilet

6.4.7 Key findings of data set C

The key findings of data set C, house toilets and house units are:

- The construction of toilets in the house units had been influenced by urban planning histories. Their presence depended first on the existing type of houses. The type and quality of houses changed from one neighbourhood to another. The numbers of occupants, percentages of house with landlords occupiers, ethnic and religious composition of houses varied similarly.

- The closures of toilets had been influenced by new environmental policies, natural constraints, and bad management of toilets at house level. Out of the 432 house units surveyed, 20% had a toilet in the past.

- Due to economic and physical factors, there had been very little construction of house toilets during the recent years. The number of house toilets has decreased during the last decade in the surveyed area and they mostly served self-contained houses or multi-houses with low numbers of households.

- 12% of house units had a functional toilet in their premises, 6% of the population had access to a house toilet

- 95% of the tenants did not have access to house toilets and 87% of the landlords.

- The key factors explaining the existence of a functioning toilet in a house unit were:
  - Tenancy status of households in the house unit (more likely to have a house toilet when the landlord occupy the house)
  - Location of the house unit per area (significant disparity from one neighbourhood to another)

- Type of house unit (more likely to have a house toilet in a self-contained house)
- Number of households in the house unit (more likely to have a house toilet in a house unit with a low number of tenants)

- All the elements previously listed were other proofs of the heterogeneity of Ashaiman when comparing the four selected neighbourhoods.

- Combining the decrease of house toilets with the increase of population (26% between the census of 2000 and 2010), the number of people relying on shared toilets outside the house, or on alternative methods such as plastic bag or open defecation, had significantly increased.

6.5 Data set D: shared toilets

This data set describes the shared toilet, focusing on all toilet facilities located outside the house units. After describing the type of facilities available in Ashaiman, the section compares the number of people sharing in-house toilets and the number of people sharing toilets outside the house units. The location of the different types of toilets is then discussed. Observation of toilet queues and sanitary survey provide information on the frequentation and quality of the different facilities.

6.5.1 Type of facility

The term 'shared toilet' generally refers to a large public toilet block. Based on the different management models, price per use, design and level of formalization, shared toilets can exist in a variety of forms (Schaub-Jones et al, 2006). In the case of Ashaiman, a simplified typology of those that exist was identified, see table 6-15.

Type of facility	Cat.	Description (applied to the local context of Ashaiman)
Private household toilet	**In-house toilet** (defined households)	Toilet serving a single household and located in the house. The only type that is not shared by more than one household.
House unit toilet		Toilet serving a number of households living in the same house unit. Arrangements are made for cleaning the toilet and desludging (emptying) it.
Neighbour Toilet	**Shared toilet** (undefined households)	Toilet owned by an individual, often with one or two cubicles, available for use by close neighbours. But the customer base may vary from one day to another. Price per use varies from 15 to 30 pesewas. Most of these facilities are not declared to the Municipality, so the owner does not pay taxes.
Commercial toilet		Toilet blocks (privately financed) typically comprising more than 10 cubicles, with segregation between men and women. The operator pays taxes to AshMA and the price per use varies from 10 to 35 pesewas. These toilet are managed under the BOO system.
AshMA toilet		Toilet block built by the Government and franchised to an individual or group of individuals to operate. The toilet blocks are segregated male/ female, comprise more than 10 cubicles, with the price per use averaging out at 10 pesewas. The toilets are in theory managed under a franchise system where the franchisee runs the facility under the supervision of the municipality.
10 pesewas = 0,05 US$		

Table 6-15 Type of shared toilets in Ashaiman

The shared toilets located in Ashaiman serve two types of population. The blocks located close to the bus stations and markets serve mostly the transient population while most of the shared blocks are dispersed in the town and served the residential population. This research focuses on the shared toilets targeting the residential population. Pictures of different types of toilets are in appendix F.

6.5.2 Comparative quantitative use of sanitation facilities

Table 6-16 shows the number of households accessing toilets in their house unit and suggests a theoretical number of household sharing one in-house toilet cubicle.

		Laka	Nii	Oko	Amui
Total household	Count	681	860	678	693
Household with access to in-house toilet	Count	48	25	1	88
	%	7%	3%	0.2%	13%
Number of in house toilet cubicles	Count	18	10	1	46
Household per in-house toilet cubicle (mean)	Ratio	2.7	2.5	1	1,9

Table 6-16 Mean number of households sharing in-house toilet cubicles

Table 6-17, shows a theoretical number of household sharing shared toilet cubicles in each neighbourhood. The figures are based on the surveyed number of people having no access to a house toilet and the number of cubicles counted in each shared toilet facility of the four studied neighbourhoods.

		Laka	Nii	Oko	Amui
Household with no access to house sanitation	Count	633	835	677	605
	%	93%	97%	99%	87%
Number of cubicles in shared toilet	Count	36	59	79	34
Household per cubicle (mean)	Ratio	17.6	14.2	8.6	17.8
Difference between hh/ cubicle in shared toilets and in in-house toilets	Ratio	6.51 =17.6 /2.7	5.68 =14.2 /2.5	8.6 =8.6 /1	9.36 =17.8 /1.9

Table 6-17 Mean number of households sharing shared toilets cubicles

The last line of table 6-17 compares the theoretical number of household per house unit cubicle with the theoretical number of household per shared toilet cubicle. Shared toilets cubicles were between six and nine times potentially more used than the in-house toilet cubicles.

The figures of household per cubicle were not exact but can be used as estimation. They were imperfect because:

- A percentage of people without in-house toilets relied on open defecation and on the use of plastic bag. These practices were difficult to quantify as they are not systematic and practised by only some members of the households.

- Some people relied on shared toilets that were not covered by the study. Some people may for instance stop at other blocks on their way to work or use work facilities.

- Conversely some shared toilets were used by people that did not belong to the sampled area. It was rather difficult to define a specific catchment for a shared toilet. Two blocks in Oko were for instance located near the market, and the number of people per seat should therefore be increased.

- Some shared toilets in the sampled area were more visited than others because they were cheaper or cleaner.

The six to nine times ratio mentioned above is therefore imperfect but large enough to suggest consequences on the access, queuing time, and maintenance of the toilet shared by undefined households.

6.5.3 Distribution of shared toilets

Identifying the actual distribution of a range of available toilets can improve understanding of the influence of both urban planning and residents' preferences in the use of specific models of shared toilets. In the case of Ashaiman, the number of shared toilet blocks and the total number of cubicles (or seats) available are indicated for each area of the study in figure 6-18 and in figure 6-19.

Shared toilets: No. of blocks

Total: 6
Total: 5
Total: 4
Total: 3

Laka: 3 (AshMA)
Nii: 3 (Commercial), 1 (AshMA)
Oko: 1 (Neighbour), 3 (Commercial), 1 (AshMA)
Amui: 4 (Neighbour), 2 (AshMA)

■ Neighbour   ■ Commercial   ■ AshMA

Figure 6-18 Number of shared toilets in the four neighbourhoods

Shared toilets: No. of cubicles

Total: 79
Total: 59
Total: 36
Total: 34

Laka: 36 (AshMA)
Nii: 47 (Commercial), 12 (AshMA)
Oko: 6 (Neighbour), 57 (Commercial), 16 (AshMA)
Amui: 10 (Neighbour), 24 (AshMA)

■ Neighbour   ■ Commercial   ■ AshMA
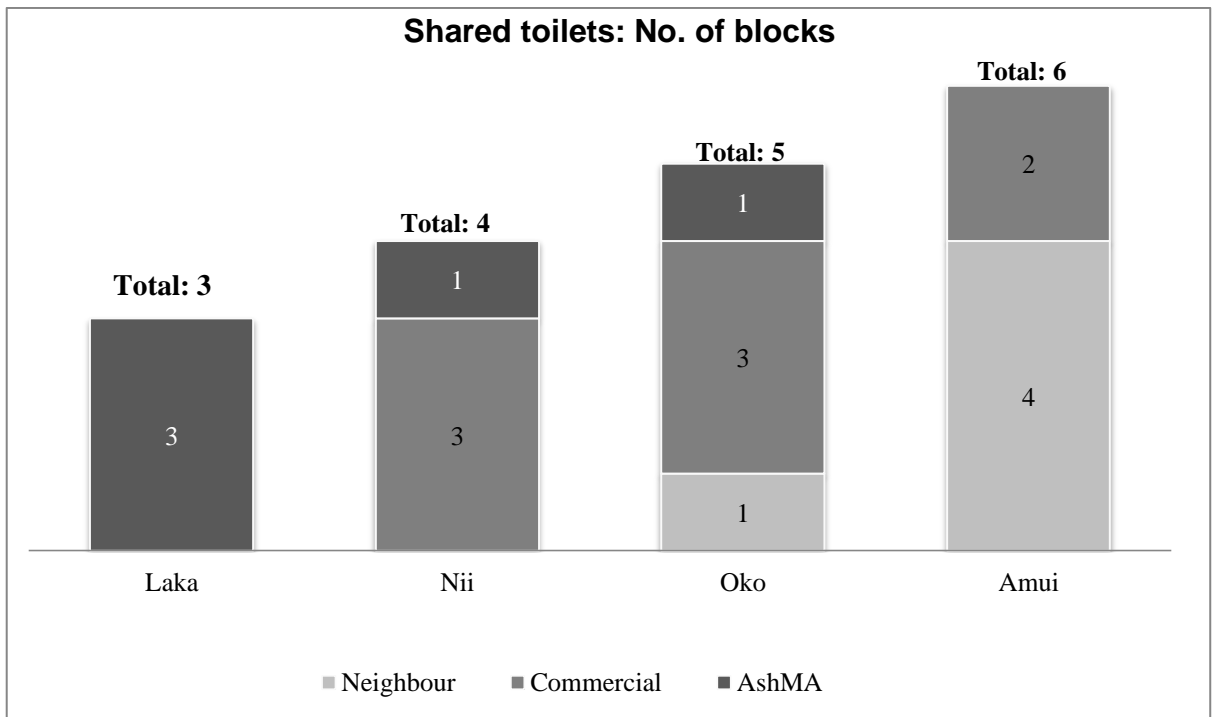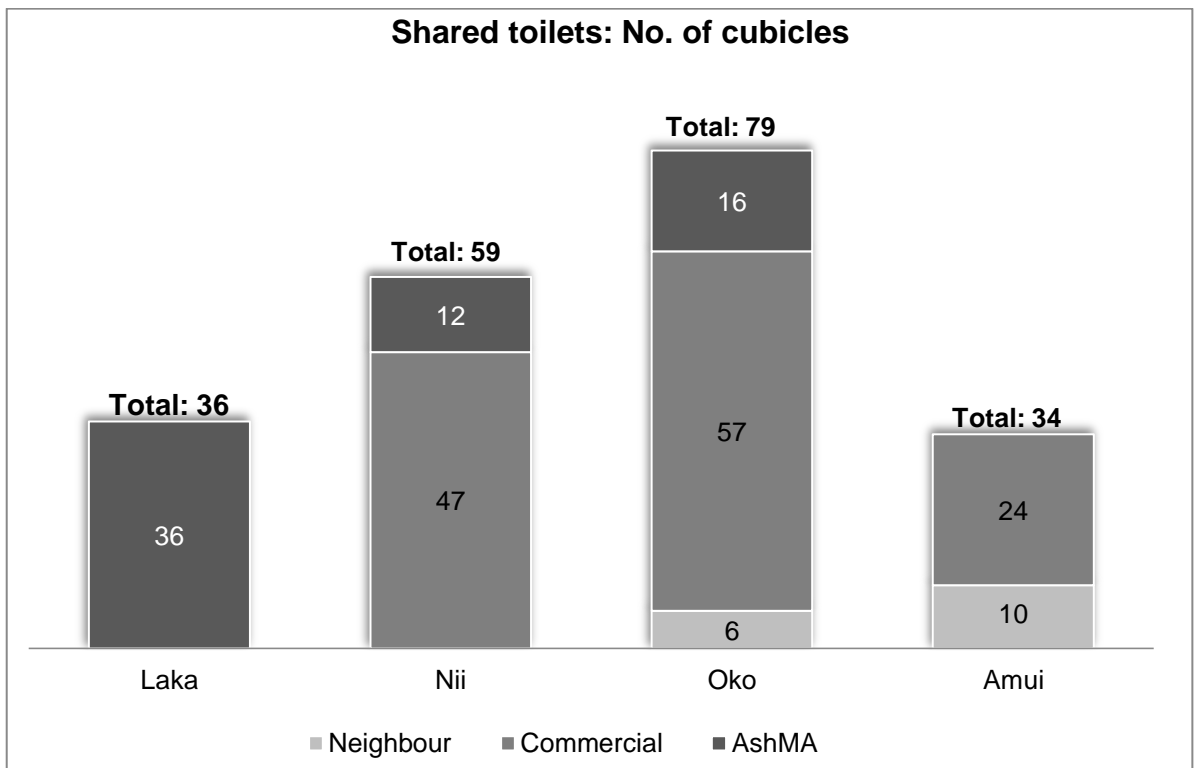
Figure 6-19 Number of shared cubicles in the four neighbourhoods

The shared toilets were unequally distributed in the different neighbourhoods in terms of model of facility, number of toilets and number of cubicles. The distribution of types

of shared toilet in each area may be explained, at least partially, by the local history of the neighbourhood:

- In Laka and Nii, representative of the planned sector, TDC developed the area in the 1960s and 1970s providing scattered public toilets. Most of these facilities are still working today despite a lack of appropriate maintenance and timeworn building. In Nii, three private commercial blocks have been built between 2000 and 2010. Their construction was possible because the land owners had free space in their compound or because they destroyed an existing house to build a large toilet block.

- In Oko, the indigenous area, the presence of the market had motivated the creation of several public toilets. The commercial toilets have been built progressively while the population was increasing in and around the neighbourhood. Some land bordering the neighbourhood of Oko was empty a long time and used as open defecation fields. The elimination of this free space has led for the need of new sanitation infrastructure.

- In Amui, the spontaneous area, there were a greater number of smaller toilets. The East side of the neighbourhood is occupied by wealthier dwellers, often landlords, and they have both the space and the resources to build a toilet for themselves or several cubicles to commercialize their usages.

To summarize, the dwellers have different options but the range of options differed from one sector to another. Similarly their spatial distribution within a neighbourhood is also uneven, see figure 6-20.
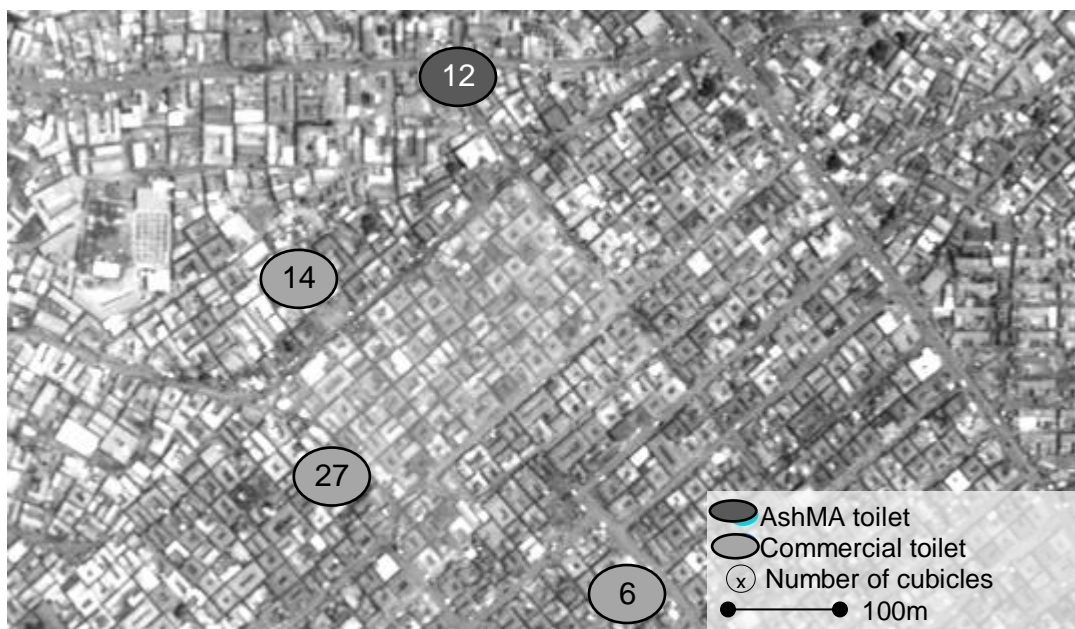
Figure 6-20 Distribution of shared toilets in Nii neighbourhood

The population located in the East side of the Nii neighbourhood were not served in the same way as the West population. There was no coordination between providers or no regulation by the authorities to ensure an even coverage of the area. The location of the toilets in a neighbourhood depends on access roads and available land. Except in Amui, all shared toilets surveyed were located close to the larger road, probably to facilitate the emptying of the septic tanks or pits

6.5.4 Queuing at the shared toilets

The initial research design included the users' tallies of the shared toilets. Some owners of commercial toilets refused to provide information on the number of users per day, fearing that the results would be used to raise taxes. A proxy method was used in order to compare the popularity of the different toilets.

Facing the refusal of some toilet managers to share their attendance list, an alternative tool was constructed. Enumerators living in the area were asked to count the number of people queuing in front of each shared toilet during peak times in the morning and afternoon. This tool contradicts some aspects of the participatory approach of this research. It is however an answer to the lack of transparency given by a minority of the toilet managers. The tools were presented to the local leader of each area for their approval and approval was also made by the Loughborough University Ethical Committee.

During three consecutive Tuesday mornings and evenings at peak times, the number of users queuing in front of each facility was counted every 30 minutes. Observations of toilet queues were done in 15 toilets in three neighbourhoods. Gathering results from the 15 toilets, the peak was at 6 am, as shown in the figure 6-21. Toilets were mostly used by men and women; less than 20% of the users were children[2] during morning and evening peak times

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[2] Enumerators classify as child any individual queuing who subjectively looks like being under 14 years old.
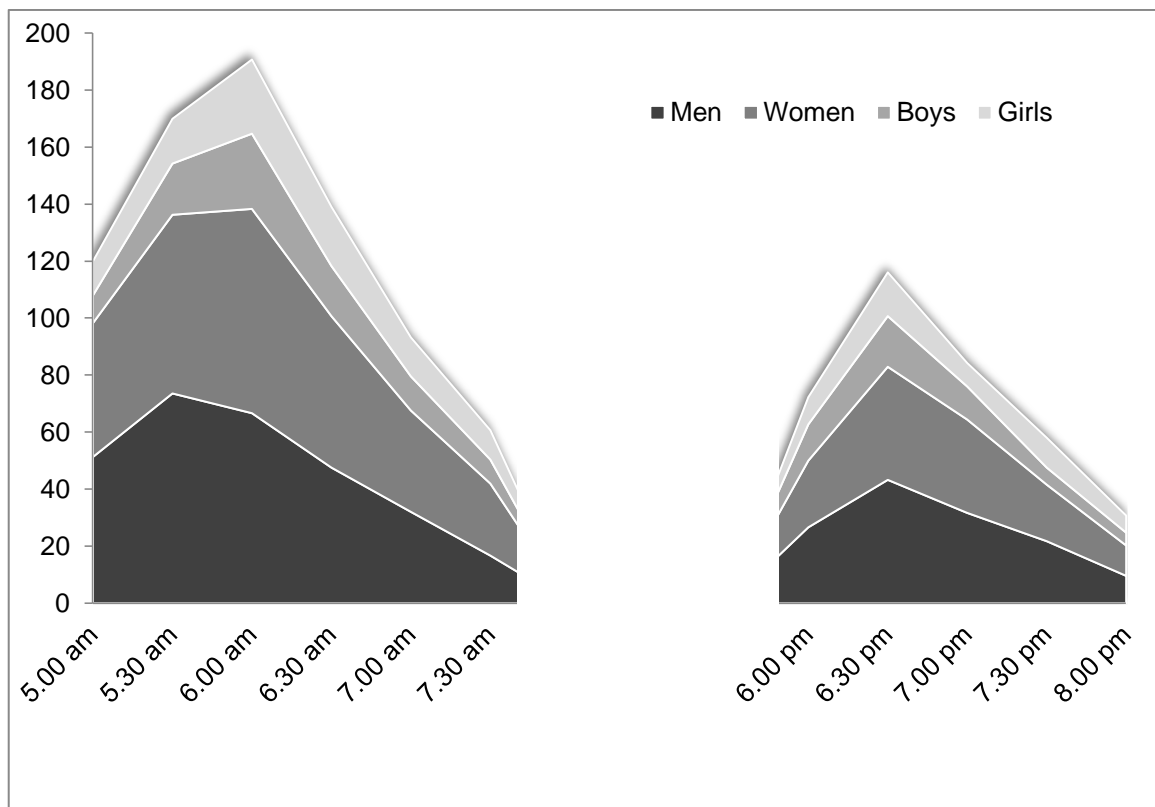
Figure 6-21 Number of users queuing at morning peak time (15 toilets)

Observations were done during three consecutive Tuesdays, except in Nii where the first observation was done on a Wednesday, due to rain events. Table 6-18 shows the cumulative number of users queuing during peak hours.

		AMUI	OKO	NII
Tuesday 1 **Little rain**	am	205	302	
	pm	168	62	
	total	373	364	
Wednesday 1 **Heavy rain**				61
				63
				124
Tuesday 2 **No rain**	am	214	290	444
	pm	97	179	125
	total	311	469	569
Tuesday 3 **No rain**	am	221	217	367
	pm	157	106	127
	total	368	323	494

Table 6-18 Number of shared toilet users queuing during peak hours

The number in the previous table can just be used to compare the three selected days. The shared toilets were less visited at peak times during the first Wednesday, the rainy one. The change in sanitation practice during rainy event was confirmed during informal interview, however the very low number of users measured on day 1 at Nii might be explained by the extreme severity of the rain events (UNEP / OCHA, 2011).

For each toilet, the length of the queue varied from one to 18 people standing in the same queue. Dividing the number of people queuing by the number of cubicles in the selected toilet gave a relative number of people queuing at peak times. The relative numbers of user per toilet and per cubicle at peak times differed from one toilet model to another, table 6-19.

TYPOLOGY TOILET (N° TOILET : N° SEAT)	Users queuing at 6 am (mean)	Users / toilet	Users / cubicles
AshMA (3 : 28)	35	17	1.25
COMMERCIAL (7: 116)	106	15	0.9
NEIGHBOUR (5 : 16)	39	8	2.4
TOTAL (15 : 160)	180	12	1.125

Table 6-19 Ratio of users per cubicle and toilet during morning peak times

The neighbour toilets were the most visited ones relative to their number of cubicles. Unstructured observation and interviews estimated the time of queuing between two and 15 minutes during peak hours depending on the facilities and areas. As most of the commercial and municipally owned toilets (AshMA) offered the same number of cubicles for men and women, queues were often longer for the women during peak times as they theoretically spent on average more time in the cubicle (George, 2008, p. 142).

6.5.5 Sanitary survey of facility

Eighteen shared facilities were surveyed. The toilets selected were distributed in the four areas and corresponded to the facilities mentioned during the house unit survey as being regularly used by the residents.

A table summarizing the toilet survey is in appendix C3. Out of the 18 shared toilets surveyed:

- Five were AshMA toilets owned by the municipality, five were private commercial and eight were neighbour commercial toilets;
- Seven were built during the last five years, seven were more than 20 years old;
- In seven of them there were visible faeces on the wall or on the seat at the moment of the survey;
- In seven of the facilities, there were no doors or no lockable doors in the cubicle;
- Almost all toilets had lights at night and have an attendant during opening hours;
- Six toilets gave a reduced price for children;
- Five toilets had functioning hand washing facilities.

It could be assumed that cleanliness and overall quality of the toilet facilities was at least partially correlated with the cost per use. Using an arbitrary scale of overall quality based on the sanitary survey, the quality of the eighteen toilets was compared with their lowest price and their management model, see table 6-20.

Cost per use in pesewas	Observed quality of sanitation facility				
	0 (Bad)	1	2	3	4 (Good)
10	O	L	N L	L	
15				A	N
20	O O O			N N A A	O A A A

To convert the sanitary survey in a quality scale from 0 to 4, the following is applied: 1 point if there is no faecal matter on the wall, 1 point if there is no faecal matter observed 30 cm under the hole, 1 point when there is lockable door in the cubicle, 1 point when there is working hand washing facility.

Location of toilet : A: Amui, L: Laka, N: Nii; O: Oko	● ASHMA Toilet	● Commercial Toilet	○ Neighbour Toilet

10 pesewas = 0,05 US$

Table 6-20 Relation between quality and price of shared toilets in the four neighbourhoods

A correlation seemed to exist between the observed quality of the toilets and the cost per use. More expensive toilets appeared to offer a service of better quality, but some elements contested this correlation:

- Four toilets out of the five identified in Oko showed a very poor quality, and this poor quality was independent of the price or the management model;

- All the AshMA toilets offered the lowest price but the overall observed quality varied from zero to three;

- The commercial toilets and the neighbour toilets were the most expensive ones, and except for some located in Oko they had the highest quality score.

These elements are based on observation made at a specific time and more information needs to be gathered from the dwellers point of views as discussed in the data set E.

6.5.6 Key findings of data set D

The key findings of the data set D, shared toilets, are:

- Shared toilets cubicles were between six and nine times potentially more used than the in-house toilet cubicles.

- The shared toilets outside the house were used by a large number of non-identified users and were separated into three distinct levels of management: municipally owned toilets, commercially owned and managed toilets and neighbour toilets informally managed.

- Base on sanitary surveys, the toilets offering the best quality were the ones privately managed.

- There was a correlation between the quality of the toilet and the pay per use price which related to the management model of the toilet. The correlation seemed to vary from one area to another. The type of management and their location had consequences on price, and overall quality of the service.

- The distribution and quantity of toilets in each sampled area was uneven and did not follow any structured plan. From a geographical perspective, the dwellers were not equally served by the available facilities.

- Most of shared toilets had a queuing peak time in the early morning, queuing could take up to 15 min.

- Overall few children were observed using the shared toilets.

6.6 Data set E: dwellers practices and determinants of use


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┌────────┐  ┌────────┐  ┌────────┐  ┌────────┐
│Mapping │  │Reporting│  │ Scoring │  │  User  │
│        │  │ usage   │  │motivation│  │determinants│
└────────┘  └────────┘  └────────┘  └────────┘
```
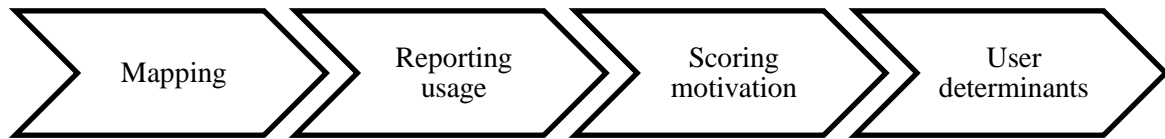
Figure 6-22 Steps to elaborate data base F

Investigating the practice and the users' determinants of the population of Ashaiman is done through participatory methods, see figure 6-22. This section describes results obtained from scoring, ranking and mapping exercises held in three neighbourhoods: Nii, Oko, Amui.

6.6.1 Mapping the usage of sanitation facilities

Section 4.8.3 described some aspects of mapping. In the field, mapping and other participatory exercises were conducted amongst 110 participants gathered in 16 groups. Most of them (105) did not have a toilet in the house and use shared toilets or open defecation. The resources available (translator, time, money) were limited and the participants, particularly the men, willing to participate were sometimes difficult to gather. The work was then focused on three areas: Nii, Oko and Amui. Fewer different models of toilets were present in Laka, therefore the focus was made on the other three areas.

In practice, participants were given indications to draw the boundaries of the neighbourhood, then they were asked to position their houses and discuss with the other participants the position of the facilities that they were using. They were also asked to locate the toilet that the members of their family were using and indicate which facility they were using the most. The square symbolises the house, the triangle symbolises the toilet, and a colour code colour symbolises the type of shared toilet, see figure 6-23 and appendixes B3 and C5.
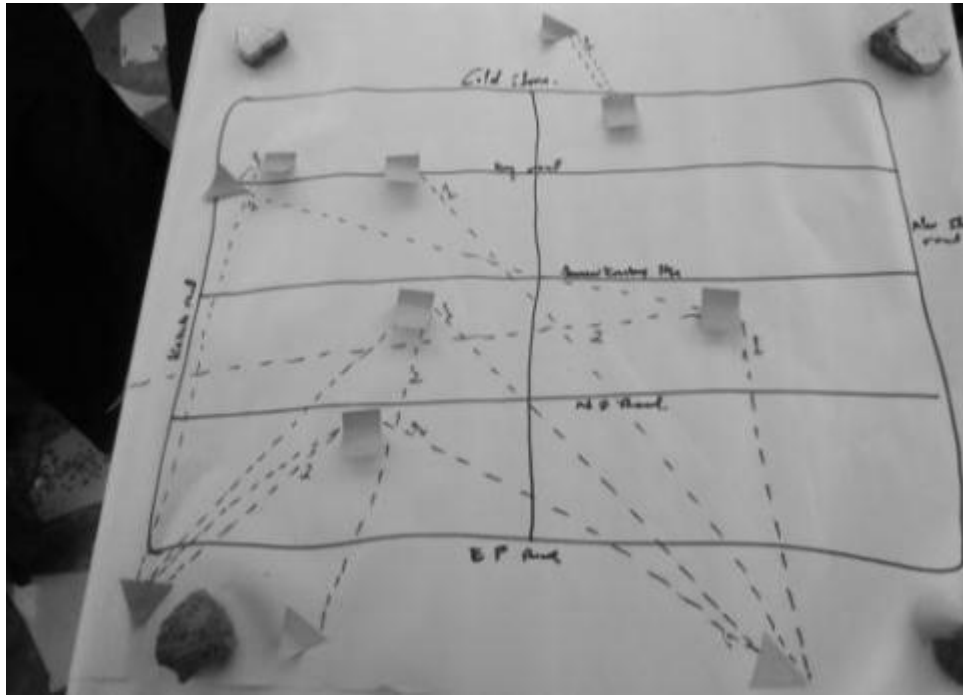
Figure 6-23 Map of sanitation facilities drawn by a group of young male tenants in Amui

The participatory map above shows that the six participants used three different types of shared toilets. Some participants used more than a toilet, and some did not use the same facility as their husband/ wife. It finally showed that often the participants did not use the closest shared toilet. Some other maps are added in the appendix C5 to show the spread of results. The result from the mapping is converted into numerical data in the next section.

6.6.2 Selection of sanitation facilities

Half of the participants not having a toilet at home used the same shared facilities. Men, more than women, were regularly using two facilities (63% of men compared to 42% of women). Intra-household differences were also highlighted by the mapping of facilities as 39% of the participants with wife or husband, recognized that they used different facilities from their partners, see table 6-21.

	Total	Men	Wom	LL	Ten	<30 old	>30 old
Participants not using in-house toilet	105	43	56	24	81	42	39
Use only 1 facility	53	16	33	16	37	18	19
	50%	37%	59%	67%	46%	43%	49%
Use 2 facilities	50	27	21	8	42	22	20
	48%	63%	38%	33%	52%	52%	51%
Use 3 facilities	2	0	2	0	2	2	0
	2%	0%	4%	0%	2%	5%	0%
Use different from spouse	28	13	12	6	22	10	12
	39%	48%	31%	33%	41%	45%	38%

Table 6-21 Personal and intra-household variations in the choice of sanitation facilities.

It seems from the table that men were more likely than women to use two facilities; this observation was similar for tenants as compared to landlords. Age of the participants did not provide any significant differences. It was noted that people did not specify how much they used the other facilities compared to their main choice. Focusing on their own practices, participants indicated the type of facility they visited most often, the results are summarised in the figure 6-24.

Figure 6-24 Main choice of sanitation facilities for 105 group participants

Amongst the sample of 105 participants, a greater percentage of men used the municipally owned toilet (AshMA) compared to women. The two age categories in the graph did not show any difference, except for the fact that a slightly greater percentage of the youngest were practising open defecation.

Finally differences per area were more apparent, which was explained by the different distribution of types of toilet in the three neighbourhoods. Open defecation was easier to practise in Amui as it was close to a large open field located between the city and the high way. Similarly there was no AshMA toilet in the Amui area. The respondents did not always use as their main choice the cheapest or the closest option, see table 6-22.

	Total	Men	Wom	LL	Ten	<30 old	>30 old
Participants not using in-house toilets	105	43	56	24	81	42	39
Main option used is the closest	65	24	35	18	47	24	23
	62%	56%	63%	75%	58%	57%	59%
Main option used is the cheapest	56	27	23	10	46	24	22
	53%	63%	41%	42%	57%	57%	56%

Table 6-22 Individual choice of main sanitation facility

The researcher identified the cheapest and the closest option based on the reading of the map. Similar comparison was more difficult with the cleanest option as deciding on cleanliness level is subjective. Landlord compared to tenants and women compared to men are less likely to use the cheapest sanitation option in the area. The data here focused on sanitation facilities and excluded the practice of open defecation and use of plastic bags. The same data, but distributed per area, show in the table 6-23 variations of the results between the three neighbourhoods.

	Amui	Oko	Nii
Participants not using in-house toilets	29 /32	35 /35	41 /43
Main option used is the closest in the area	17	20	28
	59%	57%	68%
Main option used is the cheapest in the area	29	19	8
	N/A	54%	20%

Table 6-23 Personal main choice of sanitation facilities for three neighbourhoods

In Amui, different types of shared toilet were available but they were all offering the same price. The municipally owned toilet used by some respondents was cheaper but located outside the area and not accessible for most of the population, therefore this cheap option was not included in the calculation.

Conversely, a municipally owned toilet was located on the border of the Nii area. This toilet was also offering the cheapest rate but was favoured by few users which explained the low percentage of people using the cheapest option in Nii. Concerning the distance, the figures were more similar between the three neighbourhoods.

6.6.3 Scoring and ranking the facilities

All the facilities used by at least one of the participants were ranked by the group. The system used to rank the parameters was inspired by the semantic differential scale detailed in the section 4.8. The parameters were selected after focus group discussions held during the pilot study, the lists are displayed in the appendix C4. The parameters listed by the different groups were gathered into different thematic categories and the most often cited were represented by the seven selected pairs of adjectives.

The parameters kept for the exercise were explained as follows to the participants:

- Dirty/ clean: The concept of cleanliness referred to the visual aspects of the toilets but also to the health and hygiene risks associated with these visual conditions such as the presence of maggots or faecal matter on the wall. Dwellers were also aware of the frequency and quality of maintenance in the toilet they used.

- Far/ Close: The distance concept referred more generally to the time to access to the toilet which included the travel time and the queuing time. It appeared during the exercise that some groups did not appreciate this parameter as it was initially explained.

- Expensive/ cheap: The price was here understood as a ratio between the cost of service and the quality of service offered.

- Unsafe/ safe: The safety related in most cases to the access to the facility: light at night, size of the street, risk of violence in the area.

- Private/ non-private: The privacy related to the specific features of the cubicles such as the existence of door and locks.

- <u>Smell/ no smell:</u> The smell referred to the odour in and around the toilet but also to smoking practised in certain cubicles
- <u>Unpleasant/ pleasant:</u> This parameter related to the general feeling while using the facility.

Answering challenges in developing a semantic differential scale in a foreign language, the words to be used were translated into local languages after discussions with different native speakers, see table 6-24.

English	Twi	Ga	Ewe	Literal Translation (Ewe to English
Dirty	Ayε fi	Mudzi	E ʄo di	It is dirty
Clean	Nwann / εhɔ εte	Ewo mudzi	E kɔ	It is clean
Far	εkwan ware	E dzeke	E didi	It is far
Close	εbεn	Gbee dzeke	Me didi o	It is not far
Expensive	Ne bɔɔ εyε den	E dzalawa	E xɔ asi	It is expensive
Cheap	εyε fo	E ye fow	Me xɔ asi o	It is not expensive
Unsafe	εhɔ εyε hu	Gbeyei	vɔvɔ le eŋu	It is dangerous
Safe	εhɔ εnyε hu	E be gbeyei	vɔvɔ me le eŋu o	It is not dangerous
No privacy	Obi bεtumi ahu wo	Ohe kashie	Mele bebe ʄe o	It is not in a hidden place
Privacy	Obi ntumi nhu wo	Mo ko le oniamli	Ele bebe ʄe	It is in a hidden place
Smelly	εbɔn	Fu dzei	E ʋε na	It is smelling
No smell	εmmɔn	Edzee fu	Me ʋε na o	It does not smell
Unpleasant	εhɔ nyε kama	Nyage m)	Me nya kpɔ o	It is not nice/beautiful
Pleasant	εhɔ yε kama	E dzei) nnma	E nya kpɔ	It is nice/ beautiful

Table 6-24 List of determinants in local language, phonetic

Sixteen matrices were obtained, one for each group. As illustrated by figure 6-25, the matrices were the results of both a ranking and a scoring exercise; coloured versions are in the appendix C6.
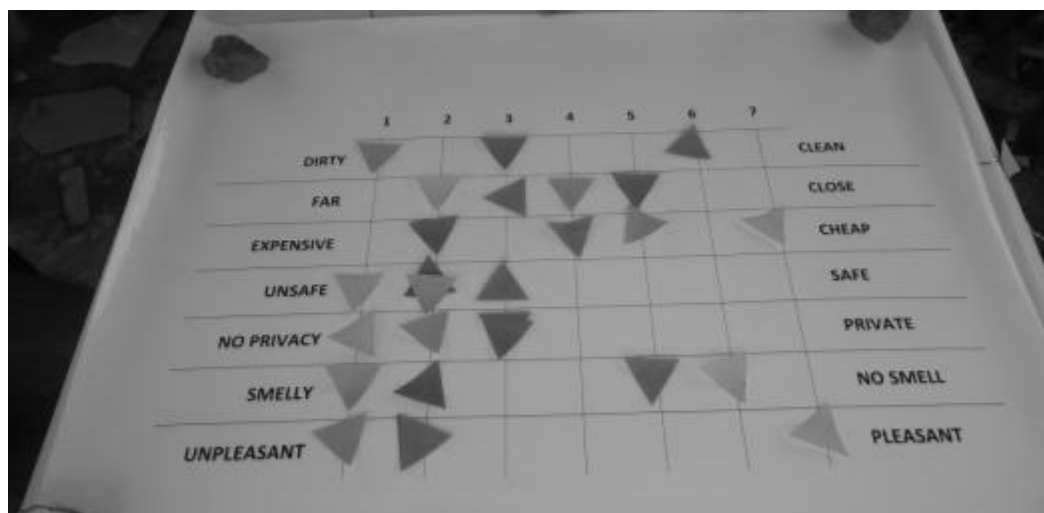
Figure 6-25 Ranking of facilities by a group of young male tenants in Amui

All groups presented different evaluations of the toilets and it was not realistic to show all sixteen spider diagrams. Alternatively ranking facilities based on a set of parameters can be visualised through a spider diagram. Figure 6-26 was obtained through the median of the score given by the different groups.
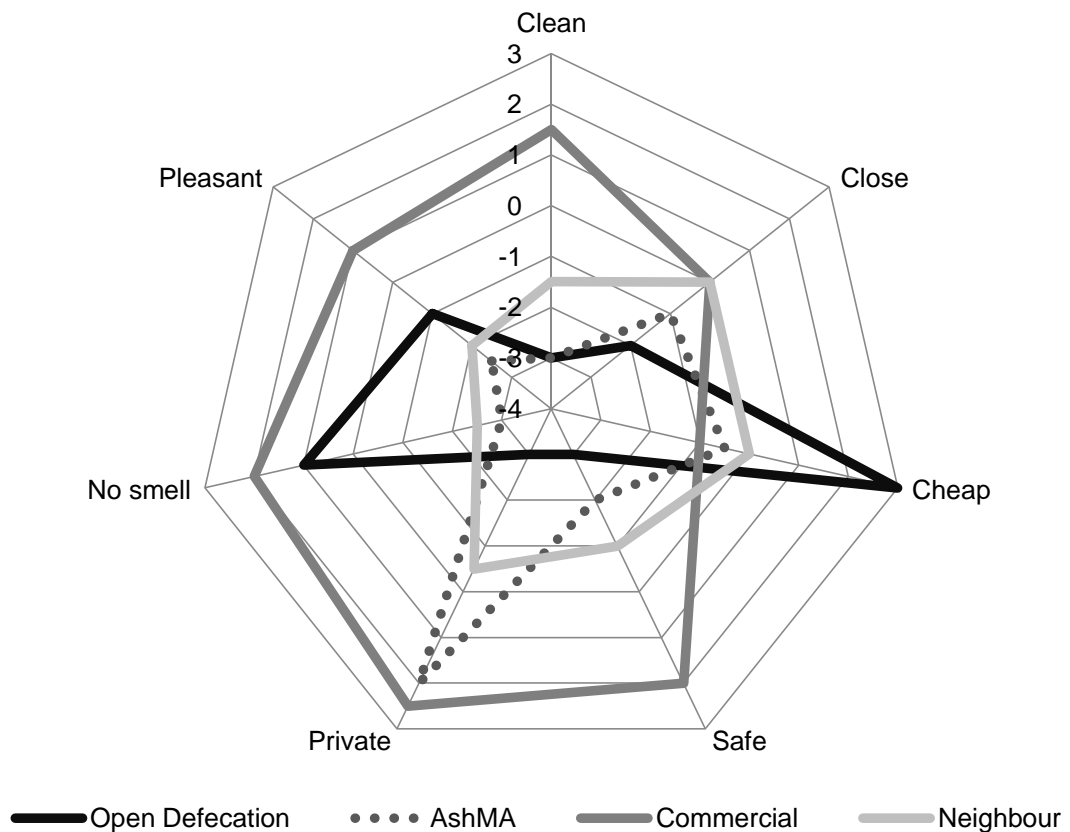
Figure 6-26 Appreciation of type of sanitation facilities (median values)

The spider diagram illustrated an average of results from several groups who did not benefit from the same spatial distribution and toilets offered. It gave indications on which toilet model was favoured by the users:

- Open defecation was valued for its affordability and the relative absence of smell;
- Commercial toilet model was highly graded by the majority of the participants on all dimensions except for the affordability;
- The municipal model was out all of the different models the most poorly rated for smell and cleanliness;
- The neighbour toilet model was poorly rate in all dimensions but always scored better than the municipal model, except for the privacy.

It appeared that on average the commercial model was the one most appreciated by the population but not necessarily the one most used due to its higher price. Open defecation was seen as a better option than municipal or neighbour toilet when it concerned smell and affordability.

Similar work was done to illustrate difference of perceptions from one group to another, see figure 6-27.
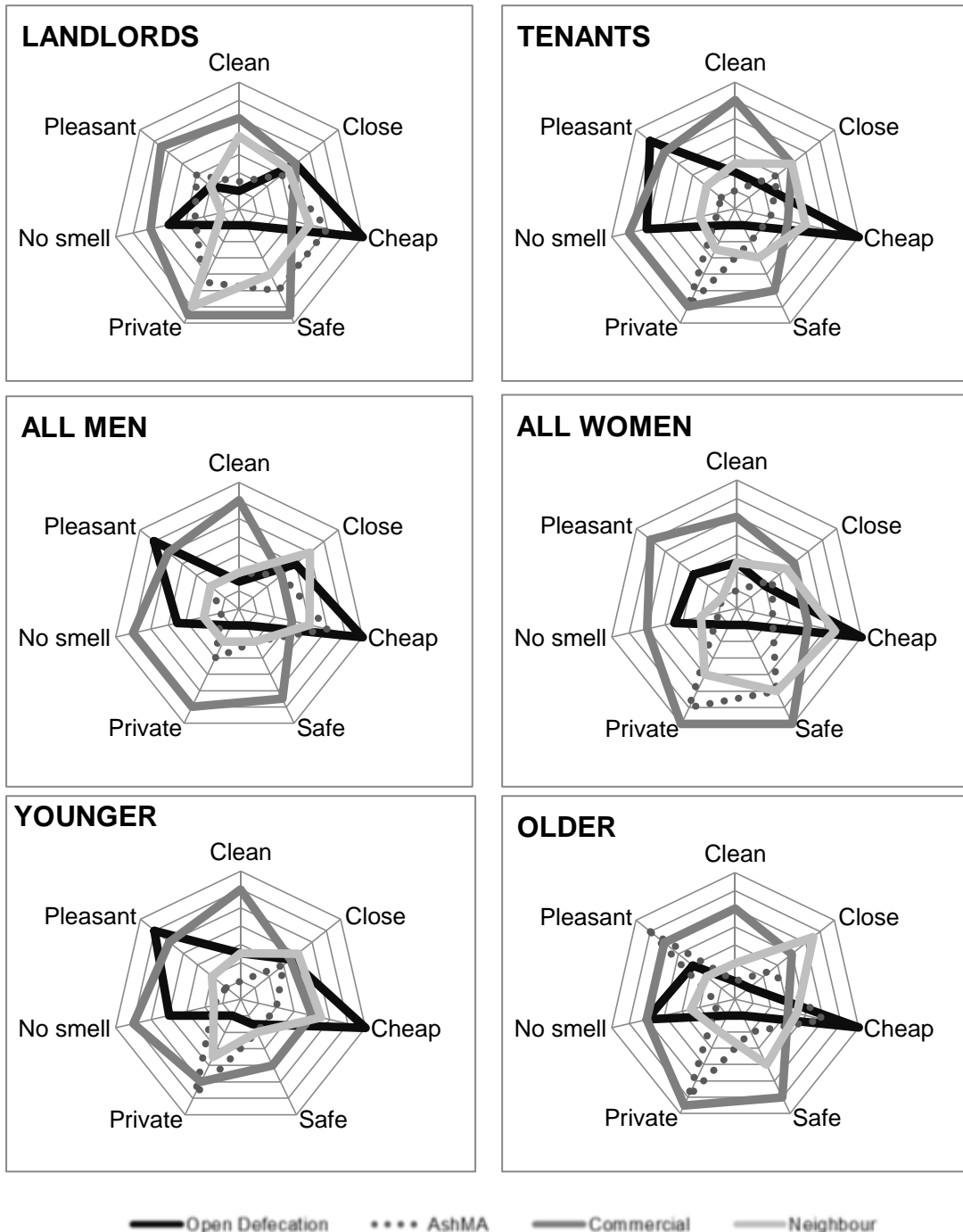
Figure 6-27 Appreciation of sanitation facilities by group of dwellers (median values)

Amongst different groups, open defecation was approached differently. If all groups considered it as the cheapest option, it was rated as the most pleasant and one of the less smelly options by the men, the youngest and the tenants. All the groups agreed on rating the commercial toilet as the best model, except for the price that they all rated low. The appreciations of the cleanliness of the different models of toilets are similar to the one made during the toilets surveys which implies that users and external observation has here led to similar conclusions.

The use of spider diagrams highlighted the appreciation of the facility itself. However, it remained difficult to identify the parameters that would encourage the use of one toilet over another and to measure their respective weights.

6.6.4 Ranking determinants

Some statistical tools can be used to analyse the significance of the different parameters rather than the outcome only (the appreciation of the toilet). The analysis of covariance (ANCOVA) can illustrate which of the six parameters had the greatest influence on the final choice of the dwellers. To run such analysis in order to compare results from different groups, it was important to set a common ground to the data. The results from the mapping were translated into scoring as detailed in the methodology chapter, section 4.8.4. Then the usage score of the different toilets in each group was compared with the mark given to the toilets and those for each parameter. To summarize, it corresponds to the statistical comparison of the reported usages expressed during the mapping and the reported preferences expressed in the ranking scoring matrices.

	Ancova with 1 variable	Ancova with price and a second variable	Ancova with price, cleanliness and a third variable	Ancova with price, cleanliness, pleasantness and a fourth variable	Ancova with price, cleanliness, pleasantness, safety and a fifth variable
Price	0,014				
Cleanliness	0,025	0,022			
Pleasantness	0,246	0,081	0,267		
Privacy	0,023	0,198	0,418	0,516	
Safety	0,039	0,172	0,528	0,653	0,979
Smell	0,274	0,081	0,601	0,991	0,970
Distance	0,484	0,536	0,663	0,794	0,735

Table 6-25 Significance value for several ANCOVA organized with a forward selection

The statistical procedure reported in the table 6-25 is described in the section 4.8.4. The analysis of covariance shows the importance of the price and the cleanliness of the facilities in the final choice of the dwellers. Unfortunately due to the size of the sample, it was not possible to produce such graph for smaller dwellers groups (gender, age, location). Pleasantness and privacy were also significant determinants.

6.6.5 Contrasted usage of sanitation facilities

To better appreciate the difference of perceptions between the dwellers, semi-structured interviews were held with household representatives in the three sectors of Nii, Oko and Amui (27 interviewees, see table 6-26). The sample used was mostly purposive in order to gather data from different cases based on two main criteria: the tenancy status and the presence of a toilet in the compound.

Area	Tenancy	Living in house unit with toilet	Number of interviewees
Nii	Landlord	Yes	2
		No	1
	Tenant	Yes	1
		No	3
Oko	Landlord	No	1
	Tenant		6
Amui	Landlord	Yes	3
		No	4
	Tenant	Yes	3
		No	3

Table 6-26 Characteristics of dwellers participating to semi-structured interviews

<u>Question 1: Which facility(ies) are you and your household members using? What motivates your choices?</u>

The toilet selected by the respondents depended on the location of their house and on the sanitation offered in the area. But without focusing on the facilities itself, different elements of the interviews suggested the dynamics of toilet' selection within the household. A majority of interviewees not having a toilet in their house reported using mostly one facility (12 out of 18 cases). Some dwellers recognized using different public toilets:

"we do not have a particular one we use".

For households not having toilet access in their house unit, men, women and children may have different practices. For instance, a woman tenant explained that:

"the latrine I use is cleaner than where my husband goes."

In Nii, there was the case of a house with toilet where the facility was used by only one member:

"I am the only one using the WC because we are having problems with water in the septic tank. It gets full very fast. I am crippled and cannot go outside to use the public ones. The others all use public toilets."

Concerning the children, the three respondants talking about young children described the following:

"for those who have little babies, they cannot take them to the public toilet so we pour it into the gutter",

"my children shit in polyethylene bags to be disposed of in rubbish"

"children are young and do not use it" (talking about a toilet block).

There was no mention of seasonal difference due to the rainy season for instance. Some respondants mentioned the situation at night pointing to the lack of light and security:

"In our present situation, late at night, if you have to go to the toilet, you have to get someone to accompany you. If you don't get anyone, it means you have to use the gutter."

Question 2: Was the sanitation the same in the past? If not, how has it evolved?

In Ashaiman, the interviewees did not have similar background ranging from those living in the city for two years to those being born there. However a majority of the 27 respondents have been staying in their neighbourhood for more than five years. The participants observed the change in the number and quality of toilets in their area and measured its impact on their practice, see table 6-27.

	Nii	Oko	Amui	Total
Same sanitation situation and same practices	4		9	13
Same facilities, new practices		3		3
New facilities, new practices	3	4	3	10
No answers / no comments			1	1

Table 6-27 Evolution of number of toilets and respondent practices

The change of facilities created by the building of new toilets, shared or not, happened mostly during the five last years. The change of practice was of a different nature: from open defecation to public toilet, from a public toilet to another shared toilet or from a public toilet to a recently built private toilet. Changes of practice were motivated by the building of a new facility cleaner or located closer. In some case, there were no new facilities but people changed their habits as their main toilet was spoilt or became dirtier than in the past.

In Amui, it seemed that the number of facilities had increased. An interviewee noticed that in the past, toilet issues were more serious as people were practising flying toilets. A tenant who benefited recently from a toilet in the house revealed that her family was practising open defecation in the past.

Another dweller summarized the evolution of toilets in Nii:

> "At first when there were no facilities, the queue at the government facility
> was long; but now that the privates ones have been opened, it is better"
> (private has to be understood as commercial ones as opposed to the
> municipally owned ones).

Question 3: Are you satisfied with your toilet situation? If not who should provide better service? What are the main reasons for not having the level of services you expect?

The table 6-28 summarizes the satisfaction with the sanitation arrangements of 27 respondents. Most of respondents, even for some having access to an in-house toilet, were dissatisfied with the sanitation arrangements.

Type of interviewees	Number of interviewees	Satisfied with current sanitation situation		
		Yes	No	No opinion
Landlord with house unit toilet	5	2	3	-
Landlord without house unit toilet	6	3	3	-
Tenant with house unit toilet	4	1	2	1
Tenant without house unit toilet	12	5	6	1

Table 6-28 Level of sanitation satisfaction of the respondants

The words used to describe the sanitation facilities (without prompting from the interviewer) are counted, see figure 6-28. This word count justified the dissatisfaction feeling.
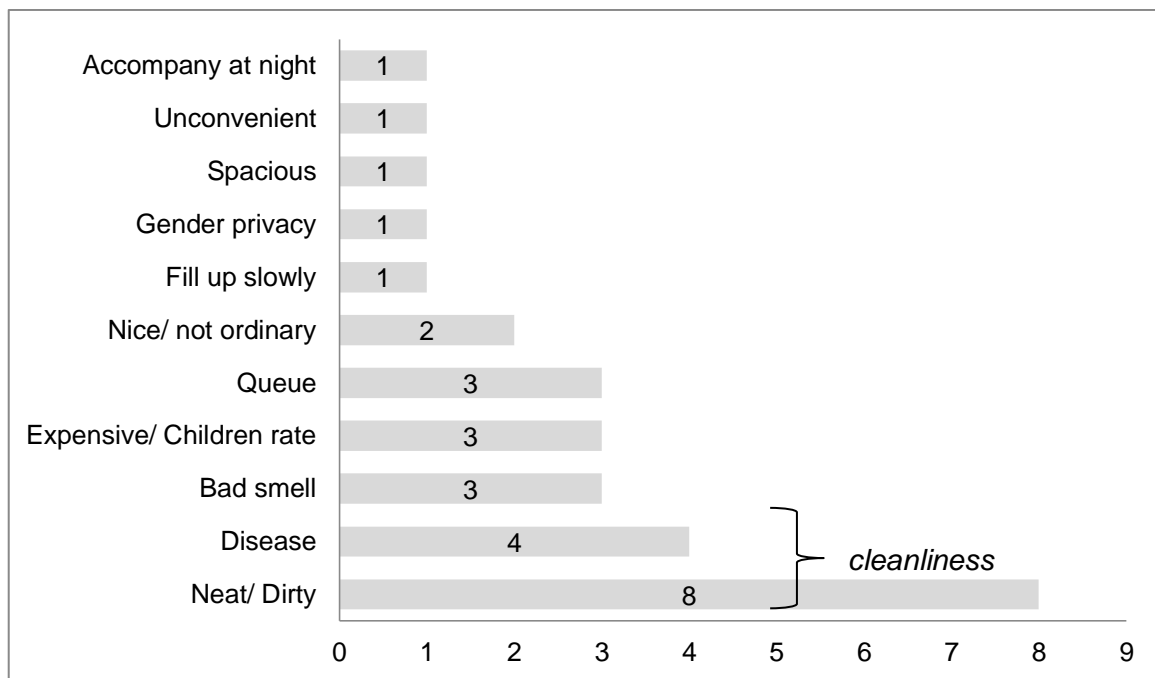
Figure 6-28 Dissatisfaction scores, word count

Cleanliness, hygiene and health were the elements most cited by the respondents. Elements figuring the notion of safety, comfort and distance were cited only once or twice. The choice made by some dwellers was the result of a balance between different constraints, distance versus cleanliness in the following case:

> *"I go there because it is close to me as I carry a small child. It is not neat though."*

Acknowledging the high rate of dissatisfaction, respondents were then asked to explain why the sanitation facilities were not adequate for them. Landlord respondents and tenant respondents identified different responsibilities and they were not agreeing on who was responsible for the present situation.

Landlords often pointed out the government and some of their representatives as being mainly responsible for the low quality of sanitation.
For instance a landlord couple explained that:

> *"The government, companies, individuals could put up toilet"*

Another landlord representative expressed certain tiredness toward the issue:

> *"I do not know who should provide toilets because we have done our best to get* toilet"

Tenants put the responsibility on the government and on their landlords. Some of them however indicated that it was not easy to bring up the topic with their landlord.

A tenant pointed out the politicians:

"Government is the one to make us have better facilities and also the assembly member; or else we will vote for someone else next time."

A male tenant described his relation to his landlord:

"the landlord should provide WC. However, we have not complained to him/her thinking if we talk too much, s/he might throw us out of the house. S/he therefore thinks we are satisfied with the facility."

Together with the different responsibilities of individual and authorities, the respondents listed some of the reasons explaining the lack of satisfactory sanitation services in the neighbourhoods:

- The lack of available land and space to build toilet both public and private;
- Lack of money:

"the house is my mother's one but we do not have money to build one toilet for the house";

- Waterlogged areas;
- The lack of law making compulsory the building of toilet before renting out rooms.

6.6.6 Key findings of data set E

The key findings of data set E, dwellers practice and determinants of use are:

- Practices varied at individual levels. 50% of the 105 group participant using shared toilet used only one facility. Most of the other half used two facilities.
- Main facilities used varied significantly between men and women. 39% of the participants' partners used different toilets. Quite similar practices were observed between landlord and tenants and between young and old.
- In terms of determinants, two of them remained essential: price and cleanliness.
- People did not necessarily use the cheapest or closest facilities. Based on map reading, 62% of the group participants used the closest option and 53% the cheapest option available.
- Based on options available and on the users' determinant, people valued the various model of toilets differently. The diversity of options and personal

levels.

- Open defecation was also used and valued differently by the participants.
- Commercial facilities received the best scoring by all groups; they only scored very low on the price. The municipally owned toilets were poorly rated in term of quality but praised for their affordability. Users faced a dilemma of affordability / cleanliness.
- Some dwellers described a change of practices during the last 5 years due to a deterioration of the facility they were using or due to the building of new facilities.
- Most of dwellers pointed to landlords and local government as being responsible for the sanitation situation. Access to house toilets was not the main priority of dwellers; drainage and solid waste were other important concerns.

6.7 Chapter summary

This chapter has presented the results of five months of field work in four neighbourhoods of Ashaiman. The results were presented by data sets. Each data set focused on key elements of the research framework and was backed up by specific data collection and data analysis methods.

- The data set A gave details on the micro-context based on observation from the researchers and informants. Heterogeneity of neighbourhoods in terms of infrastructure, sanitation facilities and socio-economic characteristics was observed. Most of the areas were characterized by a lack of private and public sanitation facilities but also by a general lack of infrastructure (solid wastes collection, paved road and drainage). Sanitation did not appear to be the only concern of the inhabitants of Ashaiman.
- The data set B, illustrated the different interests of the sanitation providers and other key stakeholders. Overall, they underlined the lack of accountability and responsibility taken by the local government. They pointed out the difficulties accessing land and findings the investment cost to justify the lack of both in-house and shared toilets.
- The data set C explained how the urban planning and other historical developments had influenced differently the housing and the number of in-house toilets in four neighbourhoods. Overall the number of house toilets was very low and still decreasing while the population increased regularly. The number of people

relying on shared toilets outside the house or on alternative methods such as plastic bags or open defecation had significantly increased.

- The data set D listed the different management models of the shared toilets found in the surveyed areas. It detailed the correlation between the price paid per use of a facility and its observed quality. The shared toilets were also unevenly distributed in the surveyed neighbourhood giving different ranges of options available to the dwellers.

- The data set E showed the variations of toilet uses from one neighbourhood to another, within a neighbourhood, within a household and also at individual levels. These variations depended often on how dwellers address the dilemma between cleanliness and affordability when they selected a toilet facility.

7 Discussion of results

7.1 Chapter outline

The results chapter offers a detailed description of different elements explaining the existing challenges toward the provision of sanitation in Ashaiman. Elements in the previous chapter are presented as data sets. This section triangulates the information gathered either by more than one collection method or by the same method but from different sources. This section uses the initial framework, as shown again below in figure 7-1 and details the three central elements and looks at how they interact together and within the micro, meso and macro-levels of the context.
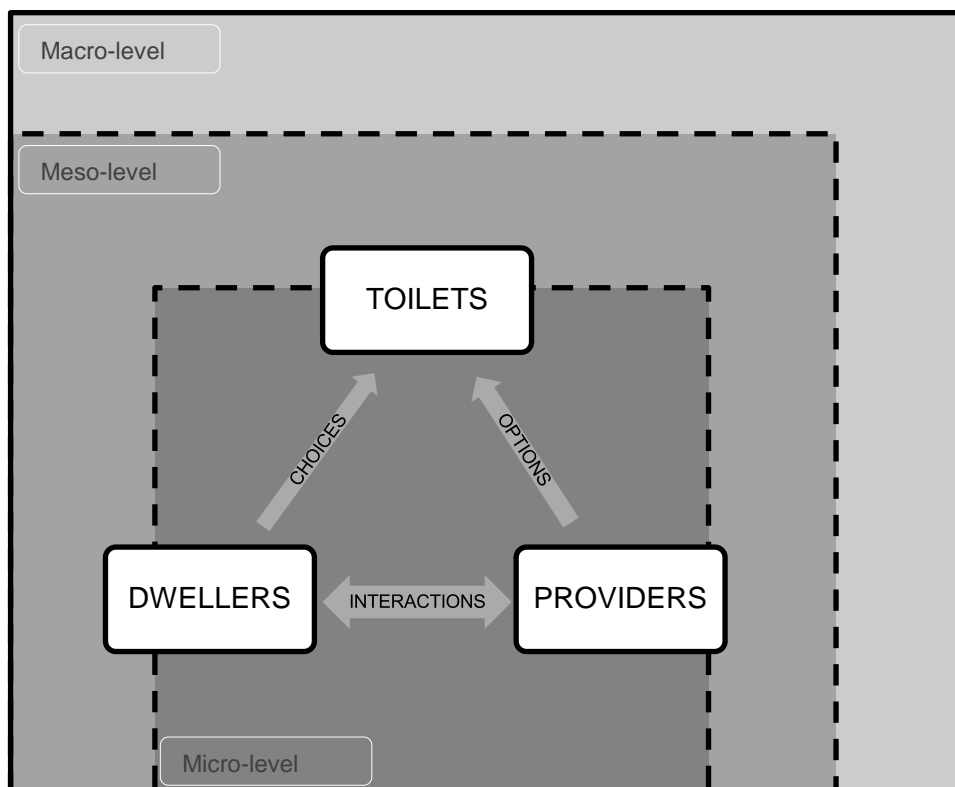
Figure 7-1 Simplified research framework

The chapter is organized into four sections:

7.2 Aggregating the results. This section looks essentially at the three elements of the micro-context. Based on the different results and on their triangulation, it describes shortage of sanitation facilities, the relationships between the different

stakeholders and looks at how and why dwellers make toilet choices given the options they get.

7.3 Scenario of changes. This section analyses the reasons for the status quo situation in terms of sanitation provision and analyses how change can happen at municipal level. It describes the potential positive role in a near future of the local government, private entrepreneurs, NGOs and landlords. Before describing three potential scenarios, the section details how the local governance can be improved and how it conditions any further improvements.

7.4 The larger picture. This section enlarges the analyses and integrates other elements of urban planning, housing regulation and national policies.

7.5 Approaching dwellers' acceptability of shared toilets. This section revises the initial research framework and selects some key tools of data collection to support shorter studies investigating the acceptability and viability of shared toilets in urban context.

7.2 Aggregating the results

The results sections are articulated around the different methods used to collect data, moving from objective data to more subjective ones giving opportunities for triangulation. Reflecting back to the simplified framework see section 3.3, the discussion of the results is separated into three main groups:

1. the available toilet facilities, looking at the lack of house toilets and the different models of shared toilets;
2. the mechanics of relations between the different sanitation stakeholders;
3. the practices and the perceptions of the dwellers.

The most significant elements from the different data sets are used to triangulate information and qualify the three main groups as illustrated in figure 7-2 below.
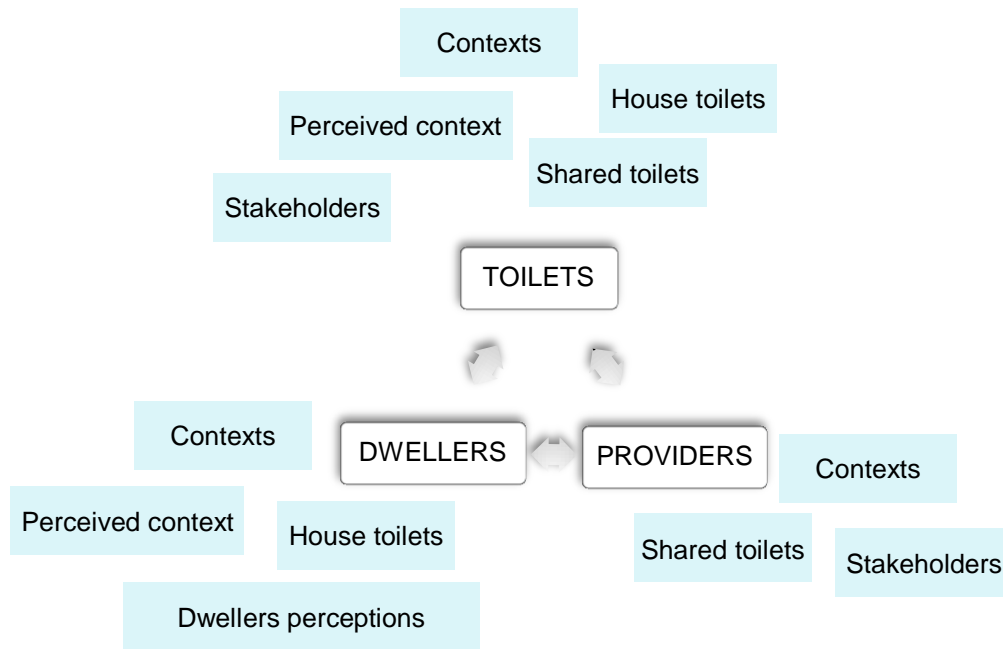
Figure 7-2 From data sets to analysis of framework's components

The aggregation section finally addresses research objective four and discusses the acceptability and the viability of the sanitation models in Ashaiman.

7.2.1 Lack of house toilets

Three types of neighbourhood

Three different types of area in central Ashaiman have been identified in this research:

- Indigenous, represented by the surveyed area of Oko
- Planned, represented by the surveyed areas of Nii and Laka
- Spontaneous, represented by the surveyed area of Amui

Part of the same municipality, the four selected neighbourhoods have their own profile in term of population, housing features and urban and patterns. These differences are the result of different land management by the TDC and the traditional owners.

The different data sets demonstrate how the housing and street patterns together with the socio-economic characteristics have an impact on the provision of both individual and shared toilets. Due to an absence of concerted initial planning and the addition of unstructured house extensions to satisfy substantial migration, there are very few house units with functioning toilets in the high density neighbourhood.

Different statistical tests showed in section 6.4.5 that there is a correlation between having a functioning toilet in a house unit and:

- the tenancy status of household in the house unit;
- the location of the house unit (neighbourhood);
- the type of house unit;
- the number of households in the house unit.

To give an example, a self-contained house located in a less densely populated area providing a home for two families, including a landlord occupier, is very likely to have a toilet compared to a crowded compound house of nine tenant families located the indigenous area. The economic status of the families was not directly measured as it implied additional collection tools and additional resources. But through observations and interviews, it appears that better off families are more likely to live in larger houses shared by a lower number of households and in less densely populated areas.

It is also confirmed that having a toilet in his/her house unit does not guarantee access to it. Some landlords restrict the access to the house unit toilet to their own family excluding tenants. Similar findings were found in Dakar (Scott, 2011, p. 115). Over the total sample, 95% of the tenants do not have access to house toilets and 87% of the landlords. A study notes that only 10% of the landlords in the Greater Accra provide sanitation facilities in their compound (Yankson, 2012, p. 175). The tenants have little control over the sanitation infrastructure of their house in Ghana (Jenkins & Scott, 2007, p. 2439). The section 6.6.5 indicates that in Ashaiman tenants have difficulty to complain about sanitation issues to their landlords.

Adding the population growth of 26% during the 10 last years in Ashaiman and the reported increase of housing density, the situation is not following a trend of improvement. In all studied neighbourhoods a large part of the population relies on shared sanitation or alternative solutions such as defecation in bags or open defecation. This situation is reinforced by the low number of newly built house toilets.

Construction of house unit toilet

The construction of house toilets in Ashaiman is the result of private initiatives (landlords) only. The number of house toilets is decreasing in the most densely populated area of Ashaiman, as shown in section 6.4.2, and the construction of private toilets is concentrated on the newly built area on the peripheries of the town.

The construction of house toilets is limited due to physical, economic, technical and political aspects.

- The rapid and often unplanned development of Ashaiman has led to an urban space characterized by dense housing, dominated by multi-house units with a lack of space in most of the existing houses. There is no sewage system and in many areas there is a difficult access to some houses which complicates the construction of septic tanks and their regular emptying. These elements described by the providers in 6.3.7 explain the technical difficulties to set individual sanitation facilities.

- The landlords, mostly when they do not occupy their house, have no great incentive to build toilets and the tenants are not necessarily organized to pressure their landlords. Tenants are often too happy to secure a house and do not make the toilet as a priority. A research investigating relations between tenure security and access to sanitation in Dakar recognized that increased risk of evictions by the land owner or the landlord, correlate with worse sanitation (Scott, 2011, p. 117).

- Finally, there are no financial or technical incentives from the local government to support the construction of house toilets. A representative from AshMA Municipality explained that they do not have the resources to encourage private sanitation. Similarly, a richer and longer established town such as Kumasi municipality faces the same dilemma and have to put their greatest effort in the supply of shared / public toilets (Hayward 2012).

7.2.2 The different models of shared toilets

The shared toilets outside the house are used by a large number of undefined users and are separated into three distinct levels of management:

- Toilet blocks owned by the assembly and managed by a private entity under a franchise system. The overall management of this type of structure is non-transparent as the nature of the franchisee is not clearly communicated. According to newspaper articles and respondents, most of the toilets owned by the municipality are managed by the political party in power. These blocks offer the cheapest access (10 pesewas) but they are old and poorly maintained. 24 blocks of this type are located in Ashaiman. They represent 31% of the shared cubicles available in the four neighbourhoods surveyed by this research.

- Private commercial blocks are owned and managed by private entrepreneurs who sometimes own several of them, not only in Ashaiman. Their size, cleanliness and price vary (from 15 to 35 pesewas). Over 140 toilets of this type are identified by the municipality. The typical management model used for this category of toilet is the BOO system (Build, Own, Operate) (MLGRD, 2003, p. 10). They represent 61% of the shared cubicles available in the four neighbourhoods surveyed by this research.

- Informal neighbour toilet. In some areas less densely populated areas, some toilet owners (1 or 2 cubicles) offer access to their family toilets for a price varying from 15 to 20 pesewas and with different levels of cleanliness. They are not declared to the municipality and cannot be seen as a main economic activity but probably as a good extra income. They represent 8% of the shared cubicles available in the four neighbourhoods surveyed by this research and their total number in Ashaiman is unknown.

These models of shared toilets are distributed differently between and within the four neighbourhoods as discussed in the section 6.5.3. Due to the heterogeneity of Ashaiman described in section 5.6, the distribution and quantity of toilets in each sampled area is uneven. Some houses can have potential access to three different shared toilets within a radius of 100 metres while another house in the same neighbourhood will be 250 metres distant from the closest toilet. Distance is only one component of the equation, as the closest facilities may not be the cheapest, cleanest or the ones fitting the preferences of the dwellers. In Ashaiman, the location of shared toilets does not follow any structured plan at the municipal level and is in the hands of the providers.

7.2.3 Mechanics of sanitation provision

The different identified stakeholders interact together through decisions and financial flows. The different articles and field observation confirm that a toilet war took place in Ashaiman as in other Ghanaian cities (Ayee & Crook, 2003). These conflicts over the management of toilets may be explained by two dimensions:

- Some stakeholders are both providers and regulators of services and their relations are not transparent and accountable;

- There are several differences between the providers' relationships described by the different policies and the reality observed in the field.

Figure 7-3 is inspired by a study investigating the Kumasi public toilets (Caplan, 2010) and adapted to the findings in Ashaiman.
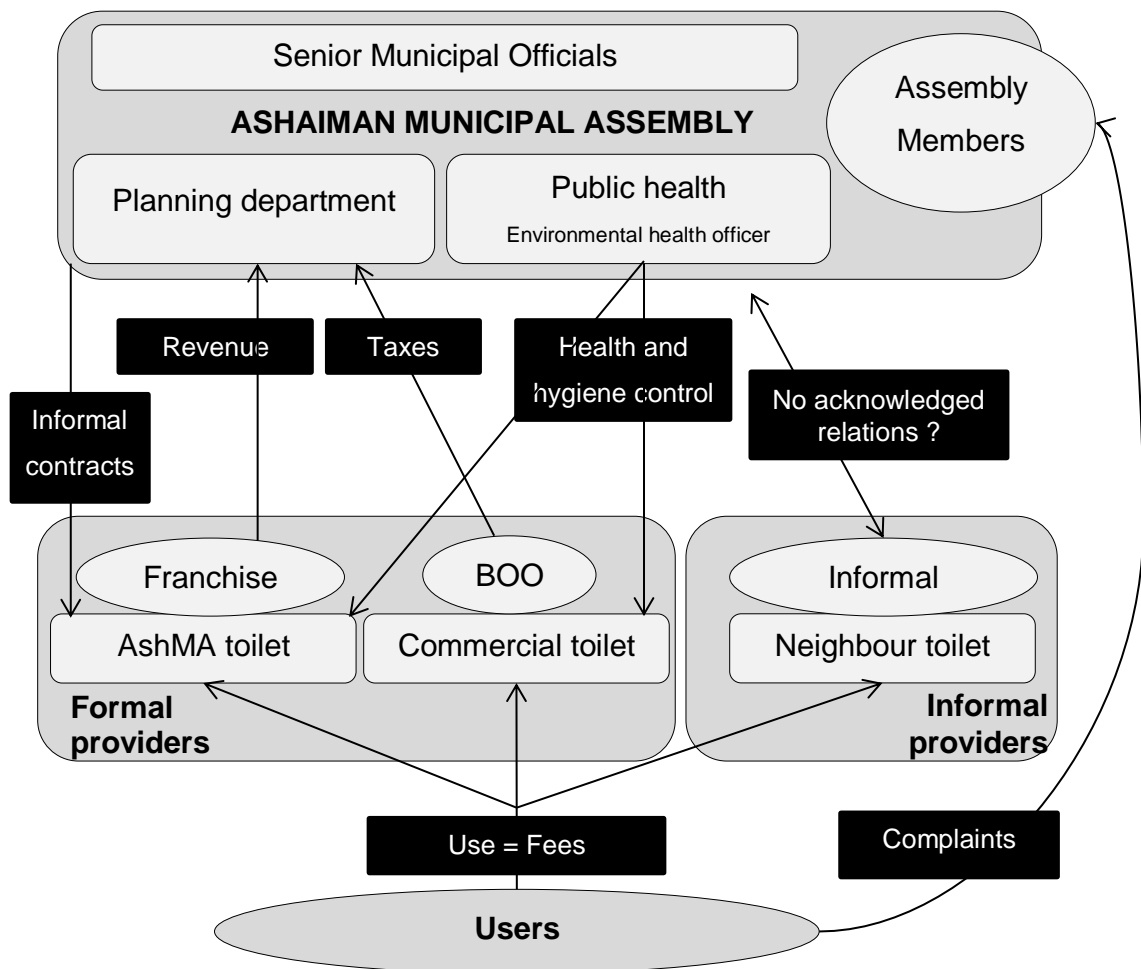
Figure 7-3 Local accountability relationships for shared toilets in Ashaiman

The different relationships, in black boxes in the figure, are not accountable to other stakeholders and citizens:

- In the case of the formal providers, there is no formal contract between the municipality and the franchisee. It is not clear to the citizen how the revenues from the exploitation of the municipally owned toilets are used.
- The hygiene controls practised by the assembly on the commercial toilets are not systematic and not documented, neither is the reporting of taxes.
- The assembly pretends to be unaware of the informal neighbour toilets.

Most of the relationships described in the figures are not in accordance with the different national policies. The comparison between the national guidelines and the

situation found in Ashaiman highlight the disparities. It also underlines the difficulty for many actors to respect the national policies due to the particularities of the context not always acknowledged by the central government. Table 7-1 summarizes the key disparities.

Stakeholders	Roles described by the Ghanaian sanitation policies and guidelines	Findings from Ashaiman
Municipal Assembly	Develop Municipal Environmental Sanitation Strategies and Action Plans (MESSAP).	There is a MESSAP in Ashaiman for the period 2010/2015.
	Regulate technologies for domestic toilets by legislation and application of the building code.	Legislation on landlords who must provide toilet to tenants.
	Promote the construction and use of household toilets.	Focus only on better provision through shared toilets.
	Transfer management and maintenance of all public toilets to the private sector.	Non transparent contract and procedure.
	Fixing of user fees in consultation with franchisees.	Recent fees increase not justified by AshMA.
	Enact appropriate sanitary legislation and empower relevant officers to perform their functions effectively.	Low enforcement of the legislation, under-resourced staff.
	Undertake regular inspections to ensure that hygienic conditions are conducive to the users' good health.	Under-resourced staff.
Franchisees	Operate the facility in accordance with the guidelines and the bye-laws of the assembly.	No updated document available at AshMA.
	Provision of properly trained personnel in adequate numbers for the execution of all the O&M tasks.	Under-skilled staff in many facilities.
	Upkeep of records and other documents to ensure reasonable transparency and accountability.	No updated document available at AshMA.
	Co-operate with the Assembly to facilitate inspection and verification.	
	Pay regularly franchise fees due to the assembly.	Procedures and details not communicated.
Assembly members	Monitor construction, operation and maintenance activities and the accountability of user fees collected at the public toilets.	Some assembly members are directly involved in the management of toilets.
	Oversee hygiene conditions of shared toilets.	
	Receive complaints from users and follow-up	Communicate and express interest on sanitation issues.
CBOs and NGOs	Mobilize stakeholders for educational and information forums.	Not observed in the surveyed areas.
	Mobilize various groups to undertake clean-up exercises.	Observed in two areas
In grey, the roles that are not fulfilled by the stakeholders according to the findings.		

Table 7-1 Roles of stakeholders: difference between policies and findings

Lack of accountability

The last table and the last figures highlight a lack of accountability that is not specific to Ashaiman. In Accra and Takoradi, the lack of accountability and the lack of appropriate funds given by the central government to local assemblies explained the difficulty to improve sanitation infrastructure (Osumanu et al., 2010). It is also for many researchers an important failure of the decentralization politics seen in other African examples. Devas & Grant make the distinction between three levels of accountability:

- *"horizontal accountability of local government officials to elected representatives;*

- *downward accountability of elected representatives (and officials) to local citizens; and*

- *upward accountability of local governments to central government"* *(Devas & Grant, 2003, p. 310).*

Another level of accountability can be added based on the findings from the figure 7-3:

- accountability between local government and sanitation service providers, (e.g. through contracts, supporting the development of new facilities and regulation).

The four levels are relevant to the sanitation situation in Ashaiman. According to the assembly members the horizontal accountability is imperfect as they do not, for example, know the nature of the contract between the municipality and the franchisee. The downward accountability is also failing as the citizens know little about the role of AshMA in the supply of sanitation services. And the mechanisms of upward accountability are not known and seem to be biased by political interferences. As Devas & Grant have demonstrated, the lack of accountability here is reinforced by the absence of transparent information. Ashaiman citizens have little information about budget procedures, contracts, and management models, therefore they know little about how the municipality tackles sanitation issues and they cannot address informed question to the political leaders.

Limit to implementation of new shared toilets

Compared with the number of house toilets and observing the length of the queues at peak time, the supply of shared toilet does not meet the demand. However the relatively low number of new toilets creation during the last year, supposes that the constraints are greater than the business opportunity and demands.

Land ownership and initial investment are essential elements in the provision of sanitation blocks. Technical challenges such as the need for accessible road for desludging need also to be considered. Out of the 18 surveyed toilets, seven of them have been built during the five last years. These toilets where either built by businessmen having the financial and political connections to access land and funds or by individuals owning their land and building a small structure often in the less densely populated areas. Both type of providers and the specific features of the neighbourhood influence the likelihood of seeing the development of new toilets.

One aspect, that the research did not cover, concerns the facility to implement a new business in areas controlled by other service providers. For example in Laka all the surveyed shared toilets were toilets owned by the municipality, there were no identified private initiatives. According to the assembly man, the three Ashma toilets were covering the area's need and new facilities were not necessary. It could be questioned if a private initiative will not be viable or if is discouraged by possible political pressure. This question of liberty to invest and set up business is also valid in the sector dominated only by the large private commercial blocks. These large blocks can be viable only if a large part of the population do not benefit from home (or low distance from their home) toilets. Therefore the reactions of private providers towards the building of new facilities may be questioned and need to be further researched.

7.2.4 The dwellers: sanitation practices

Understanding how dwellers use the different available sanitation facilities in their neighbourhood requires the assessment of the toilet's uses by the different type of dwellers but also their motivation to use the different models of shared toilets.

<u>Use of the different models</u>

In the sample of 105 participants mapping their selection of shared toilets, 20% use primarily the toilets owned by the municipality (AshMA), while a majority, 40%, use commercial toilets. This confirms similar studies in urban Ghana, described in section 5.3.1, stating that privately owned toilets are more popular. The participatory ranking indicates that dwellers value the price of the AshMA toilet compared to other options. Inversely, the private commercial toilets are valued for their privacy, cleanliness, reduced smell and safety but badly rated concerning the cost.

The toilet surveys confirm the perception of the dwellers as they indicate that the AshMA toilets are the ones offering the best access price although most of them are of poor quality, characterized by old buildings and poorly maintained. Observation supports the views that on average commercial toilets are better maintained, and seem to offer better services than the average municipal toilet. The multiplication of commercial blocks has created a competition between the different shared toilets which has led in many cases to an improvement of the service quality. This competition and improvement of services is also observed in Accra (Van der Geest & Obirih-Opareh, 2008, p. 214). A representative of the municipality considers that some of the commercial toilets are real success stories despite the fact that national policy discourages their use in residential areas.

Overall a correlation between the quality of the toilets and their management model, and therefore their price, is observed. But while dwellers use commercial toilets first, their choice is probably not influenced by the type of management model itself but by the consequences of this model. The users are more interested by the price, the cleanliness and the overall quality of the service rather than by the identity of the owner and manager and their financial mechanisms. Similar findings and comments are made in India comparing municipal, community and Sulabh toilets (Biran, et al., 2011, p. 8). Separating variables such as management model, price, users' determinants, distance to the toilets, and socio-economic characteristics of the users of a specific toilet is not feasible for the user's point of view.

Variations of practices

The different models of shared toilets and open defecation are used and valued differently by the individuals based on social and geographical factors. Practices and perceptions related to sanitation vary at four distinct levels: the municipality, the neighbourhood, the household and the individual.

At municipality level

The physical and house characteristics also influence the distribution of the population in the four surveyed neighbourhoods. Some areas recently built such as the East side of Amui gather a richer population. Older areas are characterized by a poor population with a high percentage of them living in overcrowded multi houses.

These physical and socio-economic characteristics influence the nature and the activities of the sanitation providers present in the different areas. The number of

house toilets but also the quantity and quality of shared toilets vary significantly from one neighbourhood to another. Some areas are essentially served by poorly managed but relatively cheap facilities while others are served by more expensive toilets often of better quality.

At the neighbourhood level

The map of Nii (figure 6-20) illustrates that within a neighbourhood the range of options varies. Depending on the location of the house and on the characteristics of the dwellers, individuals living in the West of an area may have twice as many available options than those living in the East.

At the household level

40% of the married respondents did not use the same shared facilities as their partners. The variations of practices within a house unit are explained by the determinants of each individual that may be influenced by their gender, age, physical capacities, working places, incomes, beliefs and past experiences. Each dweller makes a choice based on the options available in the neighbourhood and on his set of determinants. The possible combinations between the options available and the personal determinants can therefore be different from one individual to another, even within the same household.

At individual level

Half of the interviewed people regularly use two or three toilets (or open defecation). They change their means of excreta disposal depending on the time of the day (night time), or on the length of the queues. While most dwellers have a preferred or particular toilet that they use, several base their choice on opportunity rather than preference. Dwellers also change their practices over a longer period of time depending on the new facilities built and on the evolution of the existing facilities. The recent availability of a cheaper toilet or the decreasing cleanliness of a toilet stimulates changes of practice. Dwellers are not necessary bound to a toilet facility but are opportunists, looking for the facilities that match best the relation cleanliness / affordability.

Variations of practices based on type of dwellers

The research identifies different type of dwellers. The sex, age and tenancy status together with the neighbourhood characteristic have consequences on sanitation

practices. Main facilities used vary significantly from one area to another but also between men and women. Half of the interviewed men are using open defecation and municipally owned toilet while only 30% of the women used these types of facilities preferring commercial toilets. Landlords / tenants and younger/ older adults have similar practices to each other.

Landlord occupiers

Eighty seven per cent of the landlords do not have access to house unit toilets and rely on shared sanitation facilities.

There are quite similar practices between landlords who do not have house toilets and tenants. Assembly men report that some of the landlords are not better off than their tenants, which partly explains why they do not invest in house toilets and why many houses are poorly maintained, losing value. However 42% of the landlords use the cheapest option available against 57% for the tenants which may indicate that landlords can afford more expensive toilets, probably of better quality.

Tenants

Tenants rely on the landlords to provide them with house unit toilets. The stressed housing market does not make the tenants able to put pressure on their landlords, as they are afraid of being evicted by their landlords. Therefore 95% of the tenants rely on the shared facilities. Interviewed tenants consider that both their landlords and the government should be the ones providing adequate sanitation facilities. The determinants of toilet usage of the tenants vary depending on their gender and neighbourhood.

Men

Men value price and pleasantness when selecting shared sanitation facilities. In Amui a majority of them, and almost all the youngest men, rely often or only on open defecation. They judge it convenient while the male population in Oko regrets that they do not have area for open defecation anymore. Women report that their husbands use cheaper toilets, often less clean: 63% of the men use the cheapest option available against 41% for the women. Men express more concern about the quality and the safety of sanitation for their partner than for themselves.

Women

Few women confess to regularly using open defecation in Amui. But several of them, particularly in Nii, explain that at night they prefer using the gutter rather than going

alone to the shared toilets for security reasons. Cleanliness is an essential determinant for the women. They often talk about the heat coming from the pit which they associate to a higher risk of disease. They prefer pour-flush toilets but pit latrines are, in some neighbourhoods, closest and cheapest. Women are also concerned by the practice of their children explaining that the small ones cannot use the shared toilets.

Children and vulnerable groups

Very few children seem to use the shared toilets. During the morning and evening peak time, 20 % of the users are children. Observations confirm that young children rely on open defecation. Some parents of infants confirm that they dispose of the faeces of their children in shared toilets if they are allowed to by the managers. Others explain about disposing of the faeces together with the solid waste. Most of the shared toilets do not seem to be child friendly, despite some offering reduced prices for children. Biran et al. note in their study in India that even child friendly toilets are not significantly visited by the children and they suggest that parents do not have time to accompany them or that child faeces are perceived to be less harmless and that open defecation of children is socially more acceptable (Biran, et al., 2011, p. 8).

The case of an old woman using a dirty and non-functional toilet in her house because she could not get to the shared toilets is reported. Toilet surveys indicate that very few shared toilets offer support to elderly and disabled. Design of the facilities within the cubicle and their access discourage some vulnerable groups, which excludes them from any sanitation services.

7.2.5 The dwellers: sanitation perceptions

The variations of practices observed at the four geographical levels are influenced by the options available. Almost all individuals are five minutes walking distance from a minimum of three different accessible shared toilets and/or open defecation areas. However, the nature of these options varies from one place to another influencing the range of the choice for the individuals. For the same reasons, preferences and practices vary with the time.

Certain categories of the population can express their preferences only for the lower order of options available and accessible. Some individuals in Ashaiman can only choose between an expensive toilet block and open defecation while some others

people can only choose from two cheap but dirty toilets. The choice is restricted by the options available.

<u>Users-based Determinants</u>

The preferences are applied amongst a range of available and accessible options. These preferences are influenced by the complexity of the context and by the users' determinants. The research identified six determinants that are differently appreciated by the users:

Price

It is found that 40% of the group participants do not use the cheapest option as a first choice. While affordability is an essential determinant, users are not always ready to use the cheapest option. The cheapest toilet may be too far, too dirty or too busy.

Cleanliness and smell

In many other studies, cleanliness is presented as a central determinant explaining the preferences of users of shared toilets (Schouten & Mathenge, 2010; Biran, et al., 2011). In both the participatory groups and individual interviews, the cleanliness appears as one of the central determinants for the surveyed population of Ashaiman. Overall the users value most of the commercial toilets because they are clean and regularly maintained. However, many dwellers queue in front of old, large and poorly maintained toilet blocks. Dwellers rate their cleanliness poorly but cannot afford their preferred choice.

A study in Kampala that focuses on the cleanliness of shared toilets explains that toilets shared by less than five households are certainly better maintained. It also shows that the perceived cleanliness by the users matches the observed cleanliness by the research team (Günther, et al., 2012). This seems to infer that users are appropriate stakeholders to assess their facilities. Similar findings are made in Ashaiman where the researcher's observations match expressed perceptions of the users, as shown in section 6.6.3.

Related to cleanliness, smell is an important determinant often mentioned in the literature (Jenkins & Curtis, 2005; Tumwebaze, et al., 2012). Some dwellers, mostly men prefer relying on open defecation due to the bad smell in shared toilets.

Pleasantness

Pleasantness may include some aspects of the cleanliness but it also includes aspects such as the technology used and the convenience within the cubicle. In term of technology used, people clearly express their preference for water closet types of toilet. They seem to dislike traditional pits as they can see the faeces. They find it unhealthy (increasing risk of diseases) and unsafe for children.

Privacy

Privacy is often mentioned as a limit to the shared toilet compared to household toilets. In Ashaiman, this aspect does not appear strongly. In most of the surveyed shared toilets, there are identified cubicles for men and women often with two different entrances. In the toilets made of less than three cubicles (all of them being neighbour shared toilets), privacy is poorly rated. People seem to have less privacy concerns when they share with a larger number of users.

Distance

Access to a service is largely influenced by its spatial proximity (Tukahirwa, et al., 2011, p. 583), mostly in the case of sanitation. However, the notion of distance has brought some confusion for the participants between the time to reach the toilet and the queuing time. In future studies these two elements must be identified separately. While the time to go and queue to the toilet is mentioned in some household interviews it does not appear as a strong element in the participatory groups. Distance remains quite spatial specific as it depends on the house location of the dwellers and therefore distance to a type of toilet varies significantly within a same neighbourhood.

Concerning the distance to access the toilet, an elasticity curve is likely to exist in a similar way to findings for the fetching distance of water in rural area (Cairncross & Feachem, 1993, p. 53). Dwellers are ready to select any facility within a certain distance but are likely to exclude any options beyond a certain threshold yet to be determined. In Ashaiman and based on the mapping, very few dwellers rely on facilities located outside the neighbourhood which is a radius of approximately 400m. Conversely, the mapping indicates that 40% do not use the closest options available. Queuing, cheaper and better options available explain that proportion. Dwellers my change their practices from one day to another depending on the qeueing at peak time, but their choice remains in their neighourhood.

In one case, physical distance plays a particular role. Long distance from open defecation sites incites the male population in the more densely populated area to use the cheaper toilets instead of practising open defecation as they did in the past. This supports findings from the Bhopal studies (Biran, et al. 2011, p. 7).

Safety

Within the safety determinant, lighting of the facilities but also of the access road appear to be important feature in Ashaiman as in other studies (ibid, p. 8). At night several users prefer to use open defecation or plastic bags.

<u>Combination of determinants</u>

For each type of shared toilets, users value one or two key determinants. People value municipally owned toilets because they are cheap, the neighbours toilet because they are cheap and close and open defecation because it is cheap, pleasant and not smelly. Dwellers favour overall commercial toilets on most of the criteria but rank them very poorly on the affordability criterion.

The pyramid in figure 7-4 was constructed based primarily on the ANCOVA results described in the section 6.6.4 and supported by the dwellers semi-structured interviews.
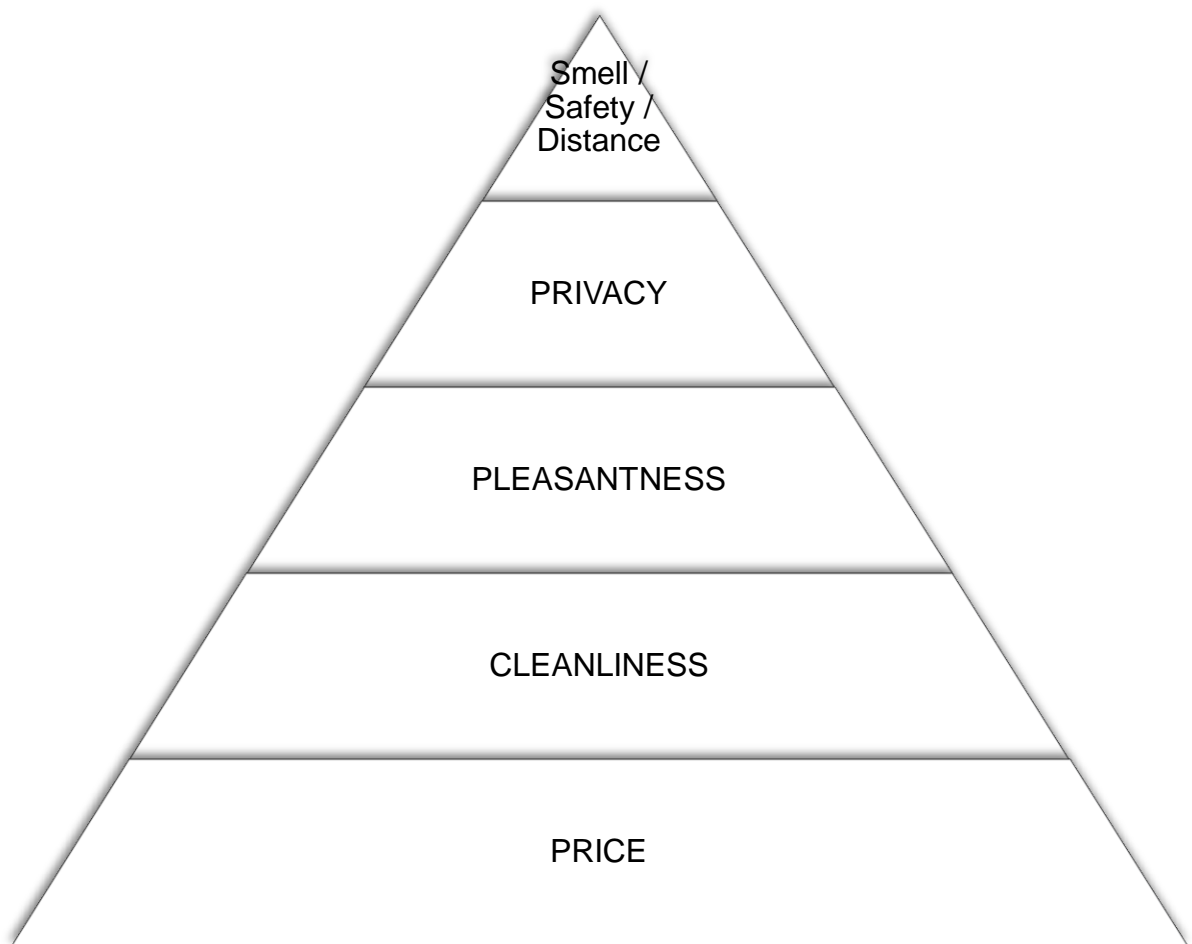
Figure 7-4 Hierarchy of shared toilet determinants

When looking at the correlation between the ways dwellers value the type of toilets and their reported use of the toilets, two essential determinants are used to select their facilities. As illustrated by the pyramid, price and cleanliness stand out in the hierarchy of toilets determinants. Dwellers want clean and affordable toilets.

The two major models available in the surveyed areas, the municipally owned and the commercial toilets are typically at the end of the cleanliness and affordability continuum. To oversimplify, which distorts the truth, the dilemma of the dwellers is to choose cheap and dirty toilets against expensive, clean and pleasant ones. The most important determinants for the dwellers are often counteracted by the reality of the field.

General impression towards sanitation

While most of dwellers wish to have access to house sanitation soon they are conscious of the existing challenges and often appear fatalistic. They suffer from the burden of going outside to use the toilet and more importantly by the cost of it, but

they are also concerned by many other environmental challenges. Drainage, flooding, smells and solid waste management are essential issues for most of the interviewed women which is partially confirmed by the informant's pictures in the section 6.2.1.

Dwellers do not express a strong voice concerning sanitation facilities. The chance for them to get heard relies essentially on the capacity of the community organizations or on the work done by their assembly members. They are also poorly informed about the regulations and the roles of the different stakeholders as explained in section 7.2.3.

Concerning the toilets the dwellers use, they make the choice based on the options available and do not have the resources to increase the number of options. Dwellers are not involved directly in the management of shared toilets, except for the rare individuals who have their own facilities or who can share with their landlords. Most of the dwellers expect that the changes will come from their landlords or from the local government.

7.2.6 Dwellers' Acceptability and JMP figures

The research in Ashaiman identifies the following toilet models as acceptable for the dwellers, based on the options available:

- Large shared blocks, privately owned and managed, well maintained but relatively expensive compared to other options
- Large shared blocks, publicly owned, poorly maintained but very cheap compared to other options
- Small blocks, close to the house with an uncertain level of cleanliness and average price compared to other options
- Open defecation in an open field or in a gutter

The difficulty is that these options are appreciated differently by various segments of the population and depends on the circumstances. None of the existing options are totally satisfactory for most of the dwellers but the options complement each other. The option that will be accepted by all does not exist in Ashaiman because so far there is no model that guarantees both a clean toilet and an affordable service. Dwellers have to accept a compromise between the desired levels of cleanliness and affordability for any of the options currently available. The level of cleanliness and

affordability they accept is relative, depending on the other available options. They select the one that suits best their preferences and their constraints of the moment. Based on the JMP definition and other monitoring standards, 99 % of the population of the surveyed Ashaiman do not used improved sanitation facilities, as most of them are shared. On-going debates suggest that toilets shared by less than five households could be counted as improved. In some other urban contexts, majority of the population share toilets with known, defined and a limited number of households. The majority of the dwellers in Ashaiman share toilet cubicles with more than five undefined households while a majority of dwellers in Kampala share with an average of six defined households (Tumwebazeet al., 2012). Using cleanliness as a key indicator, the Kampala study explores the relation between the number of users (household/ cubicle) and the level of acceptability, concluding that:

> *"Toilet facilities shared by no more than four households in urban slums can be considered as acceptable or improved, and international standards reconsidered accordingly"* (Günther, et al., 2012, p. 3).

Even if international standards evolve and include the toilets shared by up to five households, more than 94% of the population Ashaiman (surveyed areas) will continue to use unimproved facilities.

7.2.7 Viable form of sanitation in Ashaiman

The fourth objective of this research focuses on the viability of the different shared sanitation models. The viability of toilets in Ashaiman could be defined as the combined acceptability of a facility by both the dwellers and the providers.

There are as yet no clean and cheap toilets, as desired by the dwellers because it is not viable for the providers given the current constraints of Ashaiman context. A sanitation facility acceptable for the providers should guarantee a sufficient profit which requires the balance between maintenance and fees. The lack of accountability and transparency of the different providers also means that currently it is not possible to investigate the profits. It is then difficult to work out how the constraints of both dwellers and providers can be simultaneously reduced.

A viable form of sanitation must be acceptable to both parties but also protect the health of the users at the point of use, be economically sustainable, fitting in the institutional context, and socially adapted in the sense that they should guarantee

access to all different social groups. Finally, the systems should also be environmentally viable, where the collection, transport, disposal, and treatment of excreta do not cause diseases at the household, neighbourhood and larger levels.

The different models in Ashaiman are so far not socially viable, as they do not benefit all. Similarly all forms of shared toilets surveyed do not seem to be economically viable. And overall, there are many dwellers that do not benefit from any form of toilet. All stakeholders involved in sanitation have different interests and constraints and in Ashaiman there is currently no system to address the concerns of all. The next section looks at scenarios of changes to address the combined issues of acceptability, viability and sustainability of sanitation services and infrastructures.

7.3 Scenarios of change

The morphological structure of the city is built from the interplay of different dynamics, offering an extra level of complexity to these systems. As Holland (1995, p. 1) suggests "a city's coherence is somehow imposed on a perpetual flux of people and structures". From Holland's words one can identify two different kinds of fluxes: the flux of people and the flux (or change) of structures. The ever-changing nature of cities, however, seems to require both interpretations for a better understanding. Not only it is necessary to understand the complex nature of each one of these fluxes, but it also seems to be necessary to understand the connections (or interactions) between these complex layers that together produce the emergent structure of urban space. (Barros & Sobreira, 2002, p. 2)

The quote above encourages the research to connect together the different elements already analysed. It is then necessary to progressively move the analysis to different layers of context. While section 7.2 details each component of the simplified framework (toilets, dwellers, sanitation provider), the coming section will see how these elements may interact in a near future.

The numbers of shared toilets has increased during the last years but not sufficiently to keep pace with population growth in Ashaiman. The providers implement facilities only in locations where the development of viable business is guaranteed, ignoring some other areas. The sanitation market is therefore imperfect, partly controlled by

the most powerful providers. By consequence, some dwellers have restricted choices of facilities, choices that do not always match their preferences. However dwellers are not, or cannot, be directly involved in sanitation provision. Then the local government, squeezed between national policies, lack of funds and the reality of the field, has conflicting positions of provider and regulator. Ashaiman as a new municipality has not yet provided solutions to the sanitation crisis and NGOs and CBOs have a limited geographical action.

The analysis of the results using the simplified research framework highlights a relatively static situation at the neighbourhood level. This section analyses how these elements interact and can positively influence each other.

The research demonstrates that the dwellers, who in the long term want to have access to house toilets, need, in a shorter term, better sanitation options to choose from. The notion of better options can be answered by the quantity of toilets, the diversity of toilet models accessible, the increase of the standards or any combination of the previous. Such evolution in Ashaiman happens slowly and only in certain areas. It is almost only the result of private initiatives, well off individuals who have an easier access to land and can develop sanitation blocks but it does not answer any overall plans. However some findings associated with similar researches conducted in urban Ghana and similar contexts put the light on some market interventions and scenarios for change.

Three scenarios of change can be analysed. Before detailing them, the section shows how accountability and governance can be improved in order to facilitate future changes. Then based on the simplified framework, three scenarios are presented:

1. Scenario A analyses how the larger blocks, that today serve the largest part of the Ashaiman population, can be improved to offer a better service to the dwellers. It looks at what could be the role of government and private providers in such situation.

2. Scenario B investigates how private providers could develop new models of shared facilities giving better options to the dwellers and matching the users determinants previously analysed. It focuses on the idea that a greater number of smaller facilities may be an ideal alternative to a few large toilet blocks.

3. Scenario C looks at how dwellers themselves can reconsider their choices by changing their relation towards sanitation facilities. It mainly investigates how the landlord can become responsible for sanitation provision for his tenants.

7.3.1 Enhancing governance and relationships

The findings section highlights the ambiguous but also central role played by the local government. The decentralization politics reinforced during the last decade in Ghana has put the newly created municipality of Ashaiman as a key stakeholder in the provision of sanitation. The previous chapter stressed the contrasted role played by AshMA, because the municipality is both a regulator and an implementer of sanitation facilities. Municipally owned toilet blocks are privately managed but under unknown terms and the local governments are accused by different sources of using toilet blocks to finance political actions. Overall and despite the existence of a municipal action plan, there have been few improvements. Within the municipal assembly staff, amongst assembly members and traditional leaders and amongst tenants and landlords, many think that the local government bears the main responsibility for the actual status quo. However the nature of the future involvement of the municipality in sanitation provision depends on the following issues:

- In the context of decentralization, does the central government provide enough resources to the municipality to fulfil its sanitation roles as defined in the sanitation policies?
- Should AshMA be responsible for the management of municipally owned toilet blocks; should they build new ones and contract them out?
- Should the municipality be essentially a regulator of the services?
- What should be the role of the assembly members and of the traditional leaders?

The role of the local government appears essential in the future improvement of the service. There is a clear disparity between the sanitation reality faced by Ashaiman municipality, the different sanitation policies giving considerable responsibilities to the municipalities and the funds of these municipalities. To address these issues, the research, based on the identified level of accountability discussed in section 7.2.3 suggests four possibilities that may be combined:

1. Change of policies and relation between local and central government;
2. Better control of the local governance and relation between dwellers and local governance;
3. Partnership between central government and other organizations;
4. Better accountability relationships between local government and the toilet service providers.

<u>Change of policy</u>

Without accessing the detailed revenue and resources of the municipality, the observation of the material resources and the number of staff contrasted with the size of Ashaiman and the magnitude of the sanitation service needed. The literature identifies the lack of funds given by the central government and the bad management of the revenues from taxes and toilet exploitation as key explanations. The lack of upward accountability questions who is responsible for the sanitation provision despite the sanitation policies. The roles and resources of both local and central government need to be clearly stated in both national policies and municipal action plans.

<u>Better local governance</u>

A shift in the role played by the assembly is probably in the hands of the municipal leaders. For instance, it is reported that In Kumasi changes in sanitation management at political level is instigated by two political figures who occupy central roles in the waste department (Hayward, 2013). In Ashaiman, some individuals working for AshMA clearly express their motivations to bring about changes at municipal level but have been frustrated by the lack of resources and political will at the upper level. Are the motivations of some workers within the municipality slowed down by actions of some other staff, some assembly members and pressure from action groups? Similar questions are raised in Kumasi, where it is asked how the "professional staff can overcome the patronage relations between politicians and contractors" (Caplan, 2010, p. 9).

The action of the assembly regarding service provided should be appreciated by the dwellers / electors, but they need to receive the appropriate information. The key role of the Assembly members is to ensure good communication amongst the dwellers and the municipality.

The change of political motivation at the municipal level also needs the involvement of the assembly members. In Kumasi, most of the assembly members manage a public toilet and then become "players and referees at the same time" (Caplan, 2010, p. 11). This complicates the privatization of some of the Kumasi shared blocks (ibid). In Ashaiman and Kumasi, the assembly members do not receive financial compensation for their work and some of them see the management of toilets as a legitimate way to gain money.

In Ashaiman, the role of some assembly members was reported to be compromised by their political adhesion (Bertrand, 2003); today in certain neighbourhoods their roles remain ambiguous when it comes to their involvement in sanitation activities as described in section 6.3.11. This goes against their role of service regulation as shown previously in the table 7-1. Roles and actions of the assembly members need to be transparent towards the local government, and towards the dwellers who are also the electors.

Partnership

Decentralization politics together with the sanitation policies has encouraged the development of new sanitation providers. It seems that in Ashaiman at least, the users themselves, and often the NGOs and CBOs, have been in the last years excluded from the process. Similar pattern is observed elsewhere in Africa (Tukahirwa, et al., 2012, p. 2). However same authors argue that sanitation improvement (solid waste and excreta) requires "modernised mixtures" associating western systems and local practices through an optimisation of the technology, the management arrangement, the stakeholders involvement and the supporting policy (ibid). A dimension of this mixture is the importance of the institutional pluralism that calls for the collaboration of different types of stakeholders (private, government, civil society) using the strengths and assets of each.

This pluralism of actors has some limits in the poorest urban settlements (ibid). Private actors for instance, will not intervene in the most challenging environments. In Ashaiman, they focus on areas that they perceive to be more profitable. Therefore, NGOs and CBOs tend to play a greater role in low-income urban settlements as other actors have fewer incentives to intervene (ibid).

However actions of NGOs and CBOs also have some limitations in Ashaiman, detailed in section 6.3.11. One of them is the diversity of population and the lack of community spirit compared to some other areas in the country. For many dwellers, Ashaiman is a dormitory town. They come from other parts of Ghana and they work elsewhere in Tema or Accra, they may not all be willing to spend money and energy in improving living conditions at neighbourhood level. There is also a great ethnic diversity and large numbers of the population are often changing houses or neighbourhoods within Ashaiman.

<u>Better accountability relationships between local government and providers</u>

Maybe by consequence, models of toilets managed directly by community groups are not spread in Ashaiman but the involvement of NGO/ CBO may not necessarily be done through implementation of facilities.

In Kotei, near Kumasi in Ghana, a community management committee (CMC) contracted out the management of the toilet block to the sub metropolitan council:

> *"The CMC members are nominated by traditional leaders, opinion leaders, women's groups, the youth club and the District Assembly representative for the area." (WSUP, 2012, p. 6)*

WSUP who has supported similar projects in Kenya and Mozambique (initially in the water supply sector) considers that delegated management can be successful when the following are found:

- Well defined contractual management
- Service provider is close to the customers
- Systems are financially sustainable at affordable prices
- Financial incentives to improve performance
- Regulatory and policy regime is supportive

Most of these conditions are not present in Ashaiman, where different levels of accountability need to be restored. Finally, the positive role of both private and NGO/ CBO participation cannot be guaranteed before the local government is able and willing to regulate the service and apply the different national policies encouraging these participations (Tukahirwa, et al., 2010, p. 12).

Another dimension is the low influence observed of the NGOs and CBOs on the local government concerning sanitation. However, an NGO (TREND) has recently played a role of service regulator supporting the local government in liaising the management of certain municipally owned toilets. The NGO rehabilitates some of the municipally owned toilets and through a tripartite partnership, franchises the management of the toilets to a private group or individual after a tendering process. The role of the NGO is to restore transparency in the process. The municipality is still the owner of the facility, but its relation with the franchisee is clearer. The involvement of an intermediary such as TREND may have positive outcomes as they can restore some of the accountability relations between the stakeholders as illustrated in the figure 7-5.
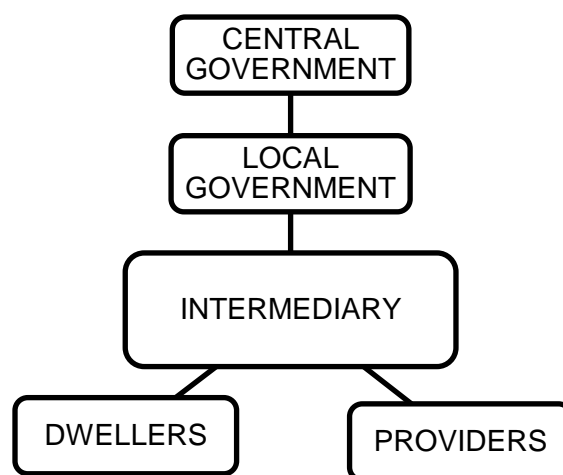
Figure 7-5 : Wider accountability relationships for shared toilet management

As the project is under development, it is not possible to assess the results and consequences of such collaboration. Such approach brings capacities that the government were lacking. Several examples, from South East Asia have proven the benefits of collaboration between NGOs and government if the roles are well distributed and understood (Sansom K. , 2011).

7.3.2 Scenario A, Improving and developing large toilets blocks

Most of the large private blocks are appreciated by the dwellers and are the first type of facilities used, particularly by the women. Private businessmen have an interest in sanitation and some of them make significant profits given the fact that they own several facilities, sometimes in different cities. A large toilet block is supposedly the most profitable model of sanitation for these businessmen.

While these large structures seem to satisfy both providers and dwellers they also exclude some stakeholders. Large toilet blocks are businesses, and in order to guarantee profit, providers implement the blocks only in areas where land is available, no other large providers are present and in locations close to large roads to facilitate desludging. Very high density areas with little land available or expensive land may not be served by such structures. Populations in these areas may not have access to such facilities. Similarly the poorest households, but also children and disabled people, often cannot use these facilities as their access is physically or economically not possible.

Then some providers who would like to implement such facilities may be stopped by larger providers who have the financial and eventually political and traditional power to control the market. The market is imperfect and the freedom of entrepreneurship not always guaranteed which leads to a form of sanitation 'cartel' in some micro areas. This confined market reduces the business competition which could have positive effects on both the quality of the service and its price. This partly explains why not all large toilet blocks offer a high level of cleanliness.

To summarize, the sanitation market is distorted, does not encourage the competition and the large toilet blocks do not benefit all. There is a need to regulate the market, favour the competition but also encourage the implementation of facilities in the most unserved areas.

The role of the local government may be to guarantee that all areas are served by an adequate and diverse set of options. A first step could be mapping the existing facilities, listing their management, and identifying the areas unserved. Such actions are now encouraged in Kumasi (Hayward, 2013). The municipality should then encourage providers to develop facilities in these areas, as land is often the first limiting factor to the development of new businesses (Yankson & Kala, 2008, p. 46). This can be done for example through the allocation of free land or by reducing taxes.

The intervention of more and new providers may challenge the existing facilities and have consequences on price and quality of the service as witnessed in Ashaiman, section 7.2.4. The competition between providers "results in the selection of the fittest providers" (Collignon & Vézina, 2000, p. 58). In India, the Mumbai slum sanitation

programme led to the building of sanitation blocks and their management was given to both business groups and CBOs, as discussed in the section 2.5.7. CBOs are the most likely to implement facilities in most unserved areas but such a scenario requires good municipal governance and several CBOs to be involved in sanitation sector. These two conditions are not fulfilled in Ashaiman. Further support, as intended by Trend, described in the previous section, may enable the government to develop sanitation blocks with lower prices for the poorest. But further research will be need here in a near future.

Any facilities, privately or municipally owned, need to apply a minimum price to be viable. But this minimum price is likely to remain too high for a segment of the population. A system of subsidies may need to be defined for being able to serve the poorest. Such a system needs specific researches that should guarantee the viability of the shared sanitation block, not distort the whole market and ensure that the poorest can access a form of sanitation.

Finally the quality of the services needs to be improved. The standard of these toilet blocks can be improved through natural business competition but also through the law (Rothschild, 1999). The government may set several quality standards; some of them already exist in the national texts, but such standards also need the means to control their application, as shown in section 5.3.2. This again requires better governance and the coordination of different departments including for instance the health officers who were, in Ashaiman, marginalized due to lack of resources.

Summary of scenario A

The large toilet blocks fail today to reach certain geographical areas, the population of these areas, poorest households, and some other vulnerable population. The local government should regulate the market and ensure that there is a real competition between the providers. They should also encourage providers to implement their structure in unserved areas and support access to these facilities for the vulnerable groups. Despite improving the balance between price and quality of the services, some groups such as the disabled and elderly are likely to remain unserved by these blocks due to distance and access issues.

7.3.3 Scenario B, Developing smaller toilet blocks

In providing smaller blocks there are two possibilities:

- Providing toilets in each compound house which will serve the whole house unit. This solution requires the active participation of landlords and is debated in the scenario C.
- Providing commercial blocks of only a few cubicles but more numerous and more dispersed, for example a toilet of 4 cubicles for a housing block (approx.. 20 houses units). This scenario excludes landlord involvement and focuses on facilities provided by private entrepreneurs or public organizations.

Smaller structures may be more acceptable than large toilet blocks as they may be closer to the house, shared by fewer people, and shared by people who know each other (smaller users' catchment). They are for some researchers desirable but their economic viability is also questioned.

Biran et al. (2011) encourage the development of smaller structures, open 24 hours, as they guarantee a better access and a better use. Research in Kampala highlights the correlation between cleanliness and number of households sharing the toilets. It shows mostly that toilets shared by less than five households are cleaner from both the users' point of view and the researcher's observation. The same research however does not show a clear trend for toilets shared by more than 10 households. There are no identified studies comparing for example, cleanliness of a toilet shared by 50 households and a toilet shared by 200 households.

Success of commercial toilets amongst the population is achieved by their cleanliness. They are clean because there is a good maintenance system and the financial possibility of having an attendant at all times. Such O&M cost is conditioned by a sufficient number of customers and having smaller blocks will reduce the customer base and make the hiring of a permanent attendant difficult. Issues of land and competition with larger blocks owned by more powerful providers may also limit the viability of such blocks. They need the support of the local government but probably also support from local organizations. However and again, there are limited cases of proven success of medium size shared facilities in Africa.

There is a reported example of a medium structure model that is reported to be viable in Maputo (WSUP, 2011a). Toilet blocks, supported by the municipality for the capital costs and the land acquisition, serve between 15 and 60 households. The households form a user group and set their rules for the operation and maintenance, often on a rota basis. The project, still young, advises for future control of the tariff by the municipality and a form of control of the maintenance arrangements (ibid). The struggle for land and low community feeling in Ashaiman, together with the lack of evident successes of similar projects in other locations do not advocate for a transfer of this example to Ashaiman.

Summary of scenario B

Small toilet blocks will be implemented in several locations to provide facilities used by fewer households and closer to the individuals. Apart from the case of landlord involvement, there are very few managerial models of small/ medium size shared facilities in Africa. The economic viability of such facilities is not proven as the customer base does not guarantee sufficient profit to hire an attendant for the cleaning. And there is some limit to the principle of cleaning on a rota basis.

7.3.4 Scenario C, Enabling the landlords to become a sanitation providers

Another scenario is the development of a toilet in a house unit shared amongst house unit members. There are examples of toilets shared by more than five or 10 households that seem to provide satisfactory services in some African cities (for instance in Mukuru (Peal et al., 2010) and Kampala (Winsor Consult LTD, 2011)). The viability of such a system is supported by some CSOs and/ or landlords who ensure the overall management responsibility. The Mukuru case shows that community prefers the scenario C (toilet at house unit level with landlord involvement) rather than scenario B (a medium size toilet block), see details in section 2.5.7. However, the two projects mentioned as examples have been recently implemented and further reports are needed to see their evolution after a few years.

Projects encouraging landlord toilets via simplified sewerage, tested in middle class areas, have so far had little success in some areas of Ghana (Osumanu, et al., 2010, p. 8). This is due to the difficulty of making the tenants or different household agree on the sharing of the costs (ibid). The landlords do not want to bear the cost of toilets alone. There are also the issues of absentee landlords and a rapid turnover of tenants

in some house units. It is difficult to reach the landlords and to set a discussion to form an agreement between landlord and tenants.

It remains that the in-house toilet is probably the best option to provide sanitation for the disabled, elderly and children. To increase the number of house units with functioning toilet facilities there are two strategies that can be combined: persuasion and compulsion (Schaub-Jones, 2009, p. 5) or in other words carrot and stick (Mara, et al., 2010, p. 5).

Compulsion

There are national policies relayed at municipal level that ask the landlord to provide sanitation facilities to their tenants before renting out, mentioned in the section 5.3.3. These policies seem to be inefficient and this is largely due to the lack of political will and the lack of enforcement capacities of the municipalities (Adank, et al., 2011, p. 67). It is suggested that due to the technical difficulties of implementing sanitation in some high density areas, enforcement should focus on newly built areas (ibid).

Persuasion

Sanitation marketing is an option to encourage the provision of toilets. But it has several limits in an environment like Ashaiman. Sanitation marketing is probably inefficient for tenants sharing a house without the presence of a landlord (Jenkins & Scott, 2007, p. 2439). The landlord is the one deciding and investing on sanitation but may not be interested in making the investment, mostly because he does not live there. Some studies infer that having a house with a toilet may not be a significant investment for the landlord as people do not see sanitation as a key priority and will not accept an increased rent on this purpose (Schaub-Jones, 2009).

Building a toilet is only one dimension of the sanitation in the house unit. The daily management of the facilities amongst the households and the cost sharing of the desludging are other important dimensions. Poor management of toilets has led to their closure on the past in Ashaiman. The number of tenants sharing a toilet even in a single house unit is well correlated with cleanliness and maintenance as shown in the section 6.4.5 and in the Kampala study (Günther, et al., 2012).

Desludging arrangements may also discourage some toilet investments. Providing sewerage system and offering reduced cost of connection may be an opportunity for the landlords, but it will require the active support of the local government and external funding. Success of the toilet models in Mukuru may also be explained by the available sewerage system.

Summary of scenario C

Toilets managed by the landlord and located in or very close to the house unit are naturally the most appreciated options for the dwellers. However technical challenges and low motivation of landlords make this scenario hypothetical in Ashaiman at the moment. An association of compulsion and persuasion measures supported by improved governance at municipal level and external funding may develop such solutions in certain neighbourhood, more likely the ones less densely populated.

7.3.5 Summarizing the three scenarios

All scenarios discussed above could be sustainably developed only when the local government becomes accountable to the citizens, the civil society organizations become involved and eventually supported, and the activities of local entrepreneurs encouraged and supported by appropriate legislation. Application of policies and enforcement of the law are other tools and objectives that support any future scenarios.

A way to appreciate these three scenarios is to see how they can evolve from one to another and how they fit in different local contexts. Figure 7-6 connects the three scenarios around the dwellers dilemma: cleanliness / price. The graphs are indicative and intend to show the general relations between the users' main concern (affordability, cleanliness) and the type of sanitation facilities available. They do not consider the capital cost. These graphs may be used as mind maps to facilitate future discussions for providers and other stakeholders at the macro-level.
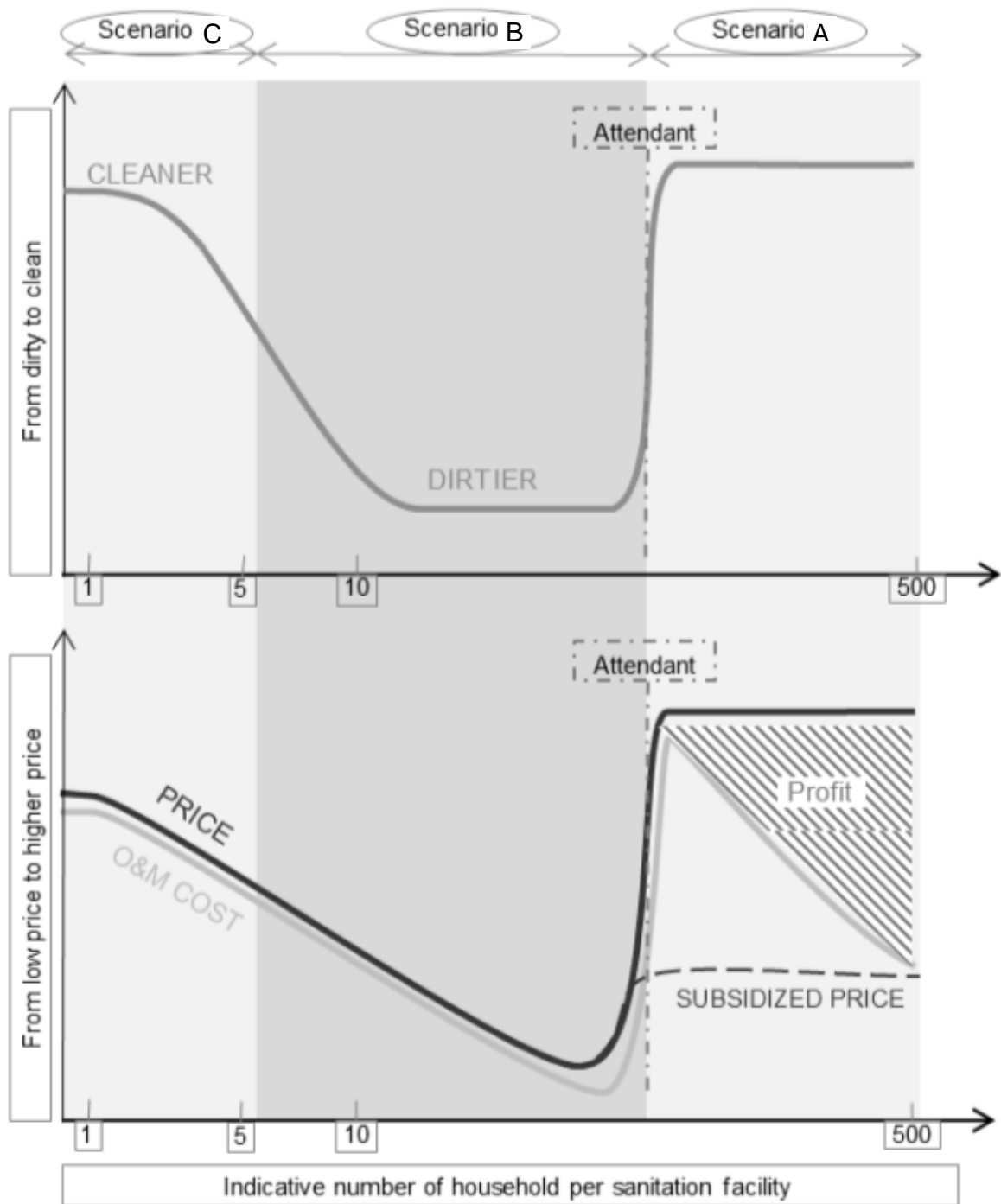
Figure 7-6 Simplified relationship between number of users/ toilets, cleanliness and price

The cleanliness, cost and prices curves are indicative and reflect a tendency based on both findings of the research and literature. Therefore there are unanswered dimensions in the graph:

- The influence of the management model on the cleanliness curve. The municipality own toilets in Ashaiman are poorly rated in term of cleanliness despite having an attendant full time. There is also a variation of perceived and

observed cleanliness in the privately run toilets. Depending on the landlord arrangement, the cleanliness of toilet shared by more than five or 10 households may be cleaner than indicated in the curve.

- There is little available data indicating the number of households needed to guarantee viability of a toilet block, and it is not possible to relate the viability of having an attendant with an exact number of households. There are no studies indicating the lowest number of cubicles and customers to justify an attendant.

- The graphs will also be influenced by the physical constraints and the technologies available. The existence of sewerage systems or the cost of desludging will affect the O&M costs in different ways

- A subsidized price in the toilet blocks may have two effects. It will (as illustrated in the figure) reduce the pay per use price for the poorest. It may also allow the hiring of an attendant for a smaller structure having a lower number of customers.

- The cleanliness curve may have a different pattern under scenario B and C if the toilets are managed under a landlord agreement. Similarly, the figures are very dependent on the idea of financing the cost of the attendant in public access toilets, but this can be overcome in landlord managed toilets with access restricted to tenants.

The figure can integrate other dimensions: distance, level of access, convenience, privacy:

- Distance and level of access are dimensions that can be added together with the indicative number of households per facility (the x axis). The distance to the toilet is increasing with the number of people sharing. The sharing of a toilet by 2 to 5 households is likely to happen at the house unit level while sharing with 100 households happens in communal facilities that can be 100 metres away from the habitation.

- The graph shows the cleanliness curve as it is the most researched one in the literature and stands out for our research. But from the results it seems that convenience and privacy follow a similar pattern.

Finally, some social dimensions are not present in this graph. While subsidizes may facilitate access for the poorest of the poor, some vulnerable populations will remain excluded from communal facilities. Scenario A, and probably B as well, are not likely

to facilitate the access to sanitation facilities for children, elderly and disabled. Questions of opening hours need also to be further investigated.

Two of the three scenarios seem to fit with the local context and important expectations of both the dwellers and the stakeholders:

- Large toilets blocks with an improved quality (and eventually subsidized for the poorest) managed by the private providers or franchisee and with the regulation of an accountable government
- Toilet in the house unit under the responsibility of the landlord

As suggested elsewhere (Norman & Pedley, 2011, p. 101), large toilet blocks and landlord toilets (supported by a collection system) are options that can be combined. As detailed in the next section, the selection of one of these scenarios or combinations should be based on the mid and long term vision but also integrate the heterogeneity of the city and the development of other infrastructure.

7.4 The larger picture

Improvements to sanitation infrastructure in Ashaiman must not only be of concern to the developing sanitation services only, but also be the affair of urban planners:

> *"The absence of adequate sanitation services has adverse impacts on the health and hygiene status of Ashaiman but also on its reputation and ability to attract economic investment. Conversely, the extent of urban planning influences the range of options available for the provision of toilet facilities and the effective management of human waste." (Mazeau, et al., 2012)*

Any large investment for sanitation should be planned with a long term perspective, integrating with the plans of other sectors (roads, power, housing, etc.). Sanitation improvement plans should also account for the heterogeneity of Ashaiman's neighbourhoods, with the selection of options reflecting the level of urban development. For example, if the construction of landlord toilets is to be supported with the introduction of simplified sewerage, it will be necessary to consider the street patterns in the layout of the sewerage network. Large toilet blocks connected to septic tanks need to be accessible for desludging trucks and must account for access by road.

Certain solutions will not be appropriate for all neighbourhoods. For example, simplified sewerage should not be designed without considering future plans to upgrade the road network, demolish or develop housing. Upgrading toilet blocks to connect to septic tanks may not be a suitable option in a middle-income area with medium density housing, where dwellers have the intention to invest in individual toilets, or share toilets with their immediate neighbours.

These two examples illustrate the idea that sanitation has to be thought through together with other urban dimensions. The research framework shows the relation between the sanitation situation and a range of other dimensions such as housing, legislation, planning, and regulation. In England in the second half of the nineteenth century, housing regulation was a main driver that indirectly changed the sanitation perspectives. The improvement of sanitary condition in London is the result of an engineering action (development of the sewerage) combined with the development of different regulation such as the 1844 Metropolitan Buildings Act (Fisher, et al., 2006). While the situation in Ashaiman and other developing countries is different today, it seems clear that changes in sanitation should be thought through alongside other sectors.

Strong resources and political motivation are also necessary at the municipal level to coordinate efforts from the different department concerned. And so far, coordination of action at the assembly level has often been pointed out as ones of the weaknesses of decentralization. The future success all depends on restored governance that will enable different stakeholders to compete in the sanitation market and offer innovative solutions. Better governance associated with a better diffusion of information will facilitate the better mobilization and management of financial resources.

These two scenarios also illustrate the challenges of monitoring sanitation at the global level discussed in section 2.4.4. The large toilet blocks scenario corresponds to the adequate sanitation as defined by the UN Habitat. The scenario of in-house toilet shared by a limited number of users (the tenants of the house units) corresponds to a potential future definition of improved sanitation by the JMP(UNICEF & WHO, 2010).

7.5 Approaching dwellers' acceptability of shared toilets

This research brings some new approaches to the understanding of the dynamics that exist between the different stakeholders concerning sanitation services in urban areas. Some aspects of the framework and methodology need to be revisited or highlighted in order to be valued and can be reused in similar research or assessment.

7.5.1 Revisiting the research framework

The research framework, presented in section 3.3.3 does acknowledge the superposition of context but it also puts sanitation at the centre. The new framework, shown below in figure 7-7 highlights the important role played by the different levels of government but also by other stakeholders willing and able to support the local governance.
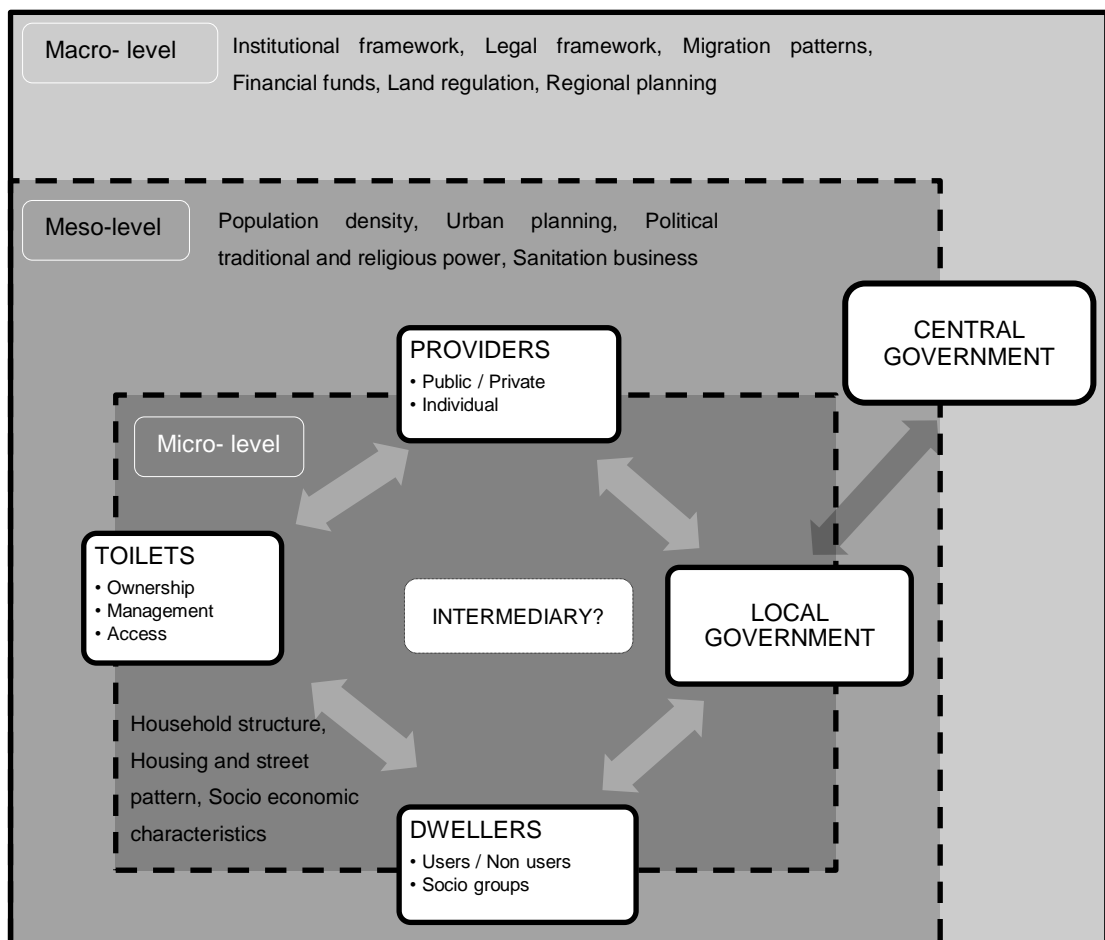
Figure 7-7 Revisited research framework

These other stakeholders can be intermediaries between the providers, the government and the dwellers to ensure better local governance. This local governance is needed for the development of infrastructure, sanitation included. The revisited framework continues to show the different levels of context. The levels of context are not only geographical dimensions but also decision levels and time horizons. They contain different focuses for stakeholders involved in the improvement of sanitation services:

- At micro-level, cleanliness and cost are key issues. Cleanliness may be improved through better design and through better management systems. Cost depends on the management system, external investment for capital costs and role played by subsidies. Different decisions are made during the day and from day to day.

- At meso-level, services need to be regulated. This requires good governance systems and clear role allocation for different stakeholders. The sanitation markets need to be regulated to facilitate innovation, improvement of the service quality and price competition. Support can also be provided in terms of the organizational development of the municipality, plus intermediary roles to support contracting and transparency and to address the preferences of the dwellers. Decisions are made on an annual basis (e.g. setting budgets).

- At macro-level, sanitation scenarios need to be integrated in the mid and long term together with other infrastructure development plans. They also need to follow and to be supported by the central government. Decisions and actions take place over years.

7.5.2 Selecting key tools

Previous works investigating shared sanitation have failed to provide a holistic view of the sanitation facilities of an area (section 2.5.7). The tools used in other research, such as willingness to pay or household surveys, often do not allow such a holistic approach as they:

- do not acknowledge all the options available;
- do not conduct a combined analysis of both the dwellers' and providers' realities;
- often have a rigid format that excludes the reporting of complex dweller choices such as multi-uses of facilities;

- focus on household level, not investigating intra-household differences.

By combining methods, the present research allows a better understanding of the relations between options given by the providers and choices made by the dwellers. Such results were obtained after a total of five months of fieldwork, combining tools described previously in the section 4.8. As some of the methods are time consuming and others resources demanding, they cannot be all used, for instance, in a short evaluation.

A selection of the most appropriate tools may support similar research in situations where time and resources are valued differently (e.g. shorter assessment). To assess if a model of a shared toilet is an acceptable sanitation solution it is necessary to understand the characteristics of the neighbourhood as this conditions the relations between users and other stakeholders. As shown by this research, the users' acceptability of a toilet depends on strong determinants such as price and cleanliness but also on the options available, which condition choices.

Four key steps supported by some tools can then be identified:

1. Identify the characteristics of the neighbourhood, their relation with the city and their influence on sanitation:

   Such identification can initially be done through a **transect walk** in order to capture diversity of existing infrastructure and services, socio-economic characteristics and housing and urban planning features.

2. Understand stakeholder relationships:

   This can be done through **stakeholder analysis using some interviews** that highlight the perceptions of different stakeholders group. The use of mind maps can be used to elicit, analyse and present the key knowledge and opinions of the respondents.

3. Capturing options available to dwellers:

   It is necessary to map the facilities, including their size, type of management and information on their quality. Users are the ones who know best the options available. This research and work in Kampala (Günther et al, 2012) suggest that consumer perceptions of toilet cleanliness can be reasonably accurate. Participatory methods, to be adapted to the context, are ideal tools. **Participatory mapping** is particularly recommended as it provides information on options, choices but also spatial distribution and eventually intra-household differences.

4. <u>Balancing options and choice: to support implementers and planners future actions</u>

The idea of relative acceptability associates an understanding of the context with the relation options and choices. The research used participatory methods to assess the key users' determinants. By associating mapping and ranking exercises, valuable information is provided on this relative acceptability and on potential future scenarios. The tools such as **participatory scoring and ranking** exercises may be adapted, using for instance a likert scale, but they must incorporate all options used by the dwellers.

8 Conclusion of the thesis

In an urban environment characterized by a lack of in-house sanitation, two other systems are likely to co-exist to cater for defecation needs. The first one is the existence of unregulated and individual practices such as defecation in the open or in plastic bags. The second is the development of shared toilets for both transient and residential populations. In the absence of (firm and enforced) regulations a range of shared toilet models can appear. Individuals and organizations driven by different motives and supported by different resources develop their own systems. Populations have to choose which shared facilities they use or if they practise open defecation.

The research approach used in this thesis focused on understanding users' perceptions contrasted with the providers' perspective in order to understand which form of shared sanitation can best serve the dwellers in a given context.

This research looked in detail how different individuals and organizations have provided an existing and unstructured network of shared facilities in four neighbourhoods of Ashaiman, Ghana. Surveying more than 400 house units representing over 8000 residents and conducting over 40 participatory exercises and 38 interviews with a range of stakeholders, the research has particularly investigated how the dwellers select a toilet facility when they face a limited number of options.

This chapter is divided into five main sections:

7.1 General issues. This section highlights some observations made during this thesis that, whilst not addressing the research objectives directly, but provides valuable reflections for researchers and practitioners.

7.2 Fulfilment of the research objectives. This section responds to each research objective.

7.3 Key findings. This section presents four key findings directly related to the aim and objectives of this research.

7.4 Contribution and implications of the research. This section suggests how this research can stimulate or improve their perceptions of shared sanitation in urban context for a wide range of professionals.

7.5 The way forward. The last section is a personal appreciation of the research reflecting on the future of urban sanitation.

8.1 General issues

Before detailing the key findings of the aim and research objectives of this research, the process has highlighted two issues that fall beyond its initial scope. These relate to aspects of municipal governance that greatly influence sanitation provision:

1. **It is difficult to decentralize both responsibilities and resources;**
2. **Sanitation provision illustrates a lack of municipal accountability and communication.**

It is difficult to decentralize both responsibilities and resources

Ashaiman is an example of decentralisation in process as it only became a municipality in 2008. Decentralisation is promoted as a way of empowering dwellers. In the case of sanitation in Ashaiman, no significant progress has been made since the new legal status. Decentralization may have even been counterproductive, as the skills and resources that Tema Municipality had, have been diluted and Ashaiman Municipal Assembly (AshMA) does not yet benefit from viable resources and staff.

Another dilemma is the national policy discouraging the implementation of shared toilets while those shared toilets appear to be currently the only viable economic and technical solution in Ashaiman. AshMA does not have the financial and human resources to implement such a policy recommendation.

In addition, local government plays a dual role of provider and regulator and faces several dilemmas. There is a need for transparent regulation of the sanitation services but the ownership of toilet is also a source of revenue.

Sanitation provision illustrates a lack of communication and accountability

Communication between the main stakeholders is not encouraged. The relationships between providers and dwellers are unclear:

- The toilet providers are not easily identified;
- The dwellers are not necessarily aware of the conditions of management of the toilet they use;
- Some stakeholders such as assembly members, municipal assembly or traditional leaders occupy the contradictory roles of both providers and regulators of services

The dwellers themselves do not seem to place sanitation provision as a major issue and do not show any strong form of organization to tackle this issue. However,

sanitation remains a contentious issue in municipal debate. It is often used as an example of dysfunction in the municipal government by some groups of the population. They relate it to other issues such as urban planning and infrastructure management. Looking at sanitation in Ashaiman is a way of investigating the larger issues of accountability and governance.

8.2 Fulfilment of the research objectives

The aim of the research was to determine which models of shared facilities were acceptable sanitation solutions for urban dwellers, within the local context. A secondary aim was to suggest guidance to assess the acceptability of shared sanitation facilities. These two aims were addressed by fulfilling five research objectives.

8.2.1 Objective 1, approaches of toilet providers

The high demand for shared sanitation, due to the low number of house unit toilets has created a financial incentive for the implementation and management of toilet blocks. However this sanitation market is not necessarily open to new comers due to political, economic and physical barriers. Characterized by an unfair competition, the market is imperfect which results in a service to the dwellers that rarely offers sufficient quality, quantity and affordability simultaneously.

8.2.2 Objective 2, availability of toilet facilities

Due to physical, social and economic factors, the surveyed areas are very poorly served by in-house toilet. 99% of the population of the surveyed Ashaiman do not used an improved sanitation facility according to the JMP, 95% of the population surveyed rely on open defecation or on toilet shared by more than five households. Shared toilets have taken over the sanitation function. However there is a whole range of shared toilets characterized by different sizes, management models, prices and levels of cleanliness. Their distribution in the city and in the neighbourhoods is influenced by physical conditions but also by political and economic factors. This results in uneven sanitation services for the population. Given their location and socio-economic status, dwellers of a same neighbourhood are facing a diverse but often

limited number of accessible options. The limited options the dwellers have to choose from may not satisfy their initial preferences.

8.2.3 Objective 3, usage and acceptability of the toilets

While dwellers in different neighbourhoods and different households use different facilities, the two main users' determinants are price and cleanliness. Dwellers facing limited options in which they have limited influence face a dilemma between affordable dirty facilities and cleaner but more expensive toilets. Such a dilemma is more pronounced in some neighbourhoods and as such differently addressed by the dwellers in each context. This results into variations of uses between neighbourhood, at intra household level and at individual level. Men and women have for example different perceptions and practices.

8.2.4 Objective 4, potentially viable forms of shared sanitation

Viable sanitation serves the interests of both providers and dwellers. The perfect model has not been found in Ashaiman. While dwellers prefer and mostly use the privately owned and managed facilities, they also raise affordability issues. Such facilities do not guarantee regular use for all. Dwellers rely on other facilities or open defecation when they cannot afford it. Children, elderly, disabled and the poorest may never access these shared toilets located outside their house unit.

Two models of sanitation can be adapted to the Ashaiman context. Large sanitation blocks, are suitable in high density areas whilst landlord toilets may be suitable in middle income areas in house units shared by a relative low number of tenants. It is however necessary to consider these forms of facilities within the whole sanitation chain including the issues of faecal sludge management. Both solutions need to be supported by strong institutional mechanisms and adapted to the general development of the urban planning.

8.2.5 Objective 5, approach for assessing acceptability of shared toilets

Researching urban shared sanitation cannot be done without integrating motives, constraints and approaches of certain key stakeholders: users and non-users, providers, different levels of government, civil society, and any traditional or other pressure groups. Investigating the diversity of stakeholders shall be done with series of complementary tools addressed to different audience. This approach

acknowledging the level of contexts and their interaction should support the analysis of the options provided and the relative choice made by the dwellers.

8.3 Key findings

Addressing the general aim, there are four key findings in this research, those being:

1. **The heterogeneity of urban planning and housing influences any sanitation developments;**
2. **Some models of shared sanitation offer an adequate transitional solution;**
3. **Cleanliness and price are major determinants for users of shared toilets;**
4. **Approaching acceptability of shared sanitation requires an understanding of the existing options, choices and interactions of stakeholders.**

The heterogeneity of urban planning and housing influences any sanitation developments

The case of Ashaiman, reinforces current urban planning literature through underlining the heterogeneity of municipal areas categorised as 'slums'. Behind the municipality, or its reputation, there is a variety of neighbourhoods that have experienced different histories of urban development and require different solutions. This is illustrated by the particularities of compound housing associated with an unforeseen population growth which has led to a decrease in the number of toilets per dwellers.

The Ashaiman case shows particularly how options available to poor urban residents can differ markedly from one apparent similar area to another. They may provide a range of service levels but yet overall remain unsatisfactory for many. In densely built-up areas, the scope for individual initiative is reduced, with action primarily reserved for wealthy individuals and land owners. The balance between land ownership, street patterns, forms of housing, the potential customer-base for toilet facilities and user preferences are expressed differently in the surveyed neighbourhoods. The heterogeneity of Ashaiman should be another reminder to policy makers, planners and practitioners alike that sanitation solutions have to be considered not only in relation to the needs of the city or neighbourhood, but also with good understanding and consideration of the technical and socio-economic issues at the micro-level, such as affects a street, house unit or individuals.

Some models of shared sanitation offer an adequate transitional solution.

Literature shows that shared sanitation can be acknowledged has a temporary (Biran, et al., 2011, p. 8) or transitional (Schaub-Jones, et al., 2006) solution: large sanitation blocks providing first steps on the ladder, followed by toilet shared by defined households then private toilets. Stakeholders in Ashaiman and in other Ghanaian cities are unable to implement the policy as it currently stands and have to adapt to the current situation by improving and facilitating the use of shared toilets. Once shared toilets are acknowledged as a mid-term solution in most of the Ashaiman neighbourhoods, it is then important to assess which type of shared facilities will better play this function and be acceptable for the users. The three scenarios discussed in this thesis section 7.3.5 show that such ambitions require a mixture of approaches and that sanitation needs be integrated into urban planning decisions. This integration involves a better understanding of the sanitation challenges and potential solutions by urban planners and local authorities. It also requires sanitation policies better adapted to the meso and micro-contexts.

Some models of shared sanitation can be considered as adequate given the particular context and its likely evolution. The different models have their legitimacy at different stages of urban development. Large sanitation blocks, offering adapted or subsidized price to the poorest, may provide sanitation to many even if the overall quality is not of high standard. Once everyone has access to a level of sanitation, the challenges is to assist dwellers to access better shared sanitation and finally individual sanitation.

Cleanliness and price are key determinants for users of shared toilets

The research provides previously uncollected data on the variation of use of shared toilets at neighbourhood, household and individual level. The variation of use is influenced largely by two determinants, namely cleanliness and price. Given the toilet options available, these determinants are often mutually exclusive and are a dilemma for the users. Groups of the population answer this dilemma differently based on their preferences, social constraints and financial possibilities.

Approaching acceptability of shared sanitation requires an understanding of the existing options, choices and interactions of stakeholders

Unlike reviewed cases in the literature, this research analysed the relations between the dwellers 'choice and the sanitation options available. The major challenge in identifying which facilities are acceptable for dwellers is that the characteristics of both the toilet facilities and the dwellers (and its environment) are dynamic and evolving.

Today in Ashaiman, facilities that are optimum to both dwellers and providers are the results of a market negotiation where providers may have adjusted their price and profit and where dwellers must reconsider their expectations. Introducing acceptability studies and wider debates between the different stakeholders will lead to an improvement of the new facilities provided. All stakeholders could discuss acceptability of a set of possible options, acknowledging their different interests and constraints. Such discussions would also be based on the identification of the existing sanitation offer as the options that are still available today are likely to be viable for future consideration. The notion of improved facilities may then not only be in the hands of the institutions but also in the hands of local providers and dwellers who understand better what the optimal solutions could be in a given context.

8.4 Contribution and implications of the work

This research presents in details the different sanitation facilities existing in a low-income and high density urban area. Unlike most exiting work, it associates a detailed analysis of the different layers of contexts, the constraint and interests of all stakeholders involved in the provision of toilets and the actions and perceptions of the dwellers.

8.4.1 Contribution to knowledge

The place of shared sanitation in the literature is minor which does not reflect the actual role played by this form of facility for millions of urban dwellers. Most of the researches focusing on the topic come from consultancy report or student research that focus on a specific project and do not necessarily acknowledge all options available. This thesis has expanded the available literature on urban shared sanitation by providing a holistic description of the management and use of toilets facilities in low-income and high density urban areas, contrasting perspectives from dwellers, providers and other stakeholders.

While the research has addressed specific objectives in section 8.2, findings have also provided evidence for some aspects previously speculated and not necessarily backed up by the existing literature:

- Compound housing initially designed to house few related households are now crowded and few of them have functioning toilets used by all the occupiers. Technology and policy models do not address this particular setting representing half of the housing model in the Greater Accra.

- The survey of 432 house units in Ashaiman shows the correlation between the likelihood of not having a toilet in the house unit and the increasing number of households living in this house unit. This correlation is likely to be reinforced by related factors such as the type of housing, level of overcrowding and the socio-economic characteristics of the occupants.

- While there is overall a correlation between the quality of the toilets and their management model and therefore their price, the dwellers are not influenced by the management model of the toilets. The dwellers essentially consider the cleanliness and the price of the shared facilities as the basis to choose between the available options.

- There are inter-household differences when it comes to the selection of sanitation facilities in a neighbourhood but also intra_household differences. 40% of the married respondents, participating in the sanitation mapping did not use the same shared facilities as their spouses. This underlines the needs to reconsider the household as the smallest unit of analysis.

  There are also variations of use at individual level; half of the respondents claim to regularly use more than one sanitation facility. They may alternate between a shared toilet and open defecation or between two and more different shared toilets. This infers that some dwellers make opportunistic choices rather than choices based on habits.

Finally, the contribution to research methodology, detailed in the section 6.5, focuses on the necessity to consider dwellers' preferences and choices for sanitation together with the understanding of the option available and accessible. This implies the use of tools that assess the specific features of the context and the perceptions of both the dwellers and the providers.

8.4.2 Implication of findings

The implications of findings and their corresponding recommendations are listed in table 8-1 and addressed to a range of stakeholders.

Audience	Implications of findings	Recommendations
Dwellers/ Users	• Dwellers preferences are not clearly included in the decisions makings of both sanitation providers and local government.	• Reinforce the downward accountability and getting heard through pressuring their assembly members and other representatives (CBOs, traditional leaders…).
Providers	• The divide between cleanliness and price of toilets exclude many dwellers from shared toilets. • More dwellers can become customers if the gap is bridged between clean toilet and affordable ones.	• Adopt designs that facilitate the cleaning, reduce the operation costs and include vulnerable groups.
Local government	• Lack and misuse of financial and human resource led to low enforcement of sanitation laws and low social mobilisation. • Lack of regulation of sanitation providers. • Lack of confidence from dwellers and providers.	• Identify motivated staff and providing them with appropriate resources. • Improve the different levels of accountability though communicating political decisions and budgets. • Develop a realistic MESSAP and gain support from central government and funding agencies.
Policy makers	• Differences between the national policy and the local reality and between the roles transferred and the resources transferred by the central government have led to impossible challenges for the local government.	• Recognize the range of sanitation solutions including the different shared models. • Adapting the policy to the particular urban contexts.
CSOs, NGOs, CBOs	• There is lack of communication and transparency between the stakeholders that NGOs may be able to remedy.	• Support dwellers in getting their voice heard • Support the local government by acting as an intermediary between the different stakeholders. • Provide additional resources to local government (e.g. capacity building).
Planners	• Heterogeneity of the urban areas and their mid-term evolution is not recognized. • Role of shared toilets and the potential positive impact of the different existing	• Associate sanitation scenarios with other dimension of urban infrastructures. • Integrate realistic sanitation scenarios into mid-term and long

	models are not recognized. • Two mid-term sanitation scenarios can be considered and adapted to the heterogeneous urban areas.	term urban planning for each area of the municipality.
Academics	• The variations of use of shared toilets within the household or for individuals are not investigated. There is a lack of holistic description associating providers and dwellers perspectives. • Shared sanitation includes several models that may have different applications and implications. • Urban sanitation research must consider other urban parameters and be located within a wider context.	• Develop other holistic descriptions of sanitation in high density low-income areas. • Use clear typology and terminology to facilitate future meta-analysis of shared sanitation studies. • Support urban planning decisions by suggesting model of shared toilets adapted to particular urban context.

Table 8-1 Implication of findings for different audience

Looking at the larger goal of improving urban sanitation, this research suggests that sanitation should not only be seen as an aim on itself but as a means of achieving greater urban access to services together with other infrastructures development.

8.4.3 Areas for future research

The research has mainly focused on the analysis of sanitation provision at micro-levels within a limited timeframe. Similar research may be conducted at the same micro-level again to explore variability of the results in the longer term. Studies conducted in future will bring relevant findings on the influence of rainy seasons, and of the impacts of change of governments, introduction of new stakeholders (NGOs or new businesses), or enforcement of legislation on the use of toilets facilities.

Some findings of this research need to be investigated at larger levels. The variation of uses and user' determinants at individual's level can be looked within different socio-economic groups but also across different cities. Further replications of this type of research in poor urban settlements, can enable better insights into why current poor sanitation services are prevalent, with a view to developing better improvement strategies that can make best use of key stakeholders including primarily the providers and the users.

Slightly beyond the initial scopes of the research and its particular context, several highlighted issues need to be further researched but not necessarily by sanitation expert as some of them include strong economic and politic dimensions.

Relation cleanliness and number of households

More evidence is needed to improve the relation curve between the number of users and the cleanliness. Such a curve should include the influences of management models. In parallel there is a need to bridge the gap between cleanliness and affordability, two key users' determinants in Ashaiman. Research that focus on innovative design to facilitate and reduce the cost of maintenance, cleanliness and operation has to be encouraged.

Cartel of sanitation entrepreneurs

Lack of accountability, fear of taxes, political implications are elements that complicate the understanding of the motivations and constraints of the different shared toilets providers. Further research should determine how the profits are made and used by the private providers. Are the private providers organised under a cartel pattern that discourages the implementation of new businesses? And do they benefit from political connections? While there are several sources inducing control on the shared toilets market, the evidence is limited. Specific research carried by appropriate academics needs to be carried out.

Cost benefit analysis of sanitation scenarios

Researching the profitability of sanitation facilities is an important step in determining the cost benefits of different sanitation scenarios. The two major scenarios identified in this thesis, the large sanitation blocks and the shared toilets managed under landlord responsibility, not only present different technical challenges, but also various costs and benefits monetary as well as social and environmental. Studies comparing the cost and benefits of these two solutions in different urban contexts are needed to provide better guidance to urban planners.

Political and traditional power

This research has also highlighted the importance of local government roles and the need for better governance. The role of related stakeholders such as assembly members and traditional leaders needs to be investigated. Traditional leaders play a central role for many land acquisitions and they are often important opinion leaders for

many inhabitants of Ashaiman. In some surveyed areas they seemed to have opaque relations with some sanitation providers and with assembly members. Are traditional leaders and assembly members in the Ashaiman context an impediment to better sanitation services or will they provide support for change? Such a question is not limited to sanitation but concerns several other aspects of infrastructure provision and services.

Children's sanitation

Several studies observe that most of children's excreta end up in the open, but the scale of this issue is not appreciated. In Ashaiman the reduced tariffs are not sufficiently inciting parents to bring their children to shared toilets, resulting in most of the children defecating in open channels. Given the percentage of young people in developing countries should the management of children's excreta become a priority?

8.5 The way forward

Who is responsible for sanitation? Beyond national policies, it needs to be decided at the municipal level who is responsible for sanitation and to consider the role of each stakeholder across the full sanitation chain. The current sanitation policy offers a framework too rigid to work in heterogeneous areas such as Ashaiman. The policy needs to be adapted to both municipal, neighbourhood and perhaps even individual levels. Such work needs to be done in an appropriate institutional environment supported by resources and motivated staff with capacity and skills. There is also a need for a long-term vision supported by the establishment of sanitation scenarios, including appropriate shared sanitation options, drawn together with population projections and other infrastructure and urban planning developments.

The nature of toilet usage is largely influenced by the physical and political characteristics of the urban environment. It is possible to predict that in the future all houses in Ashaiman will have at least a toilet per house. It is however irresponsible to give a date to that scenario. Changes do not only depend on the technical and economic challenges. Sanitation changes in Ashaiman, as in any other towns, depend on greater dynamics such as urban planning, housing provision and political governance.

This thesis invites the professional to go beyond the classic divide between private and shared sanitation. Whilst the local governments and academics, debate what is the threshold for the maximum number of households sharing an improved toilet, urban dwellers need to go to the loo. International monitoring programmes are set to stimulate countries to achieve sanitation coverage for the majority of the population on rather high standards. Whist a lot of effort may successfully bring the middle income classes from sharing a public toilet to individual facilities; the poorest segment of population is still excluded.

Shared sanitation remains the only alternative to open defecation for people not having toilet in their house and living in a challenging urban environment. Adopting a mixture of appropriate shared sanitation models is a key step to provide some form of sanitation for all rather than a high standard sanitation for some. Despite international considerations, public toilets and toilets shared at neighbourhood level are first steps toward better sanitation and a step away from open defecation.

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10 Appendices

Appendix A   **Ethical and practical considerations**

Appendix A1   Participant Information Sheet

Appendix A2   Training record of the main researcher

Appendix B   **Tools for data collection**

Appendix B1   House unit survey report sheet

Appendix B2   Toilet survey report sheet

Appendix B3   Protocol for the participatory exercises

Appendix B4   Dwellers semi-structured interviews report sheet

Appendix B5   Stakeholders semi-structured interviews report sheet

Appendix C   **Detailed results from field work**

Appendix C1   Mapping stakeholders' interviews

Appendix C2   House unit survey results

Appendix C3   Toilet survey results

Appendix C4   Users' determinants listed during the pilot study

Appendix C5   Additional maps from participatory mapping

Appendix C6   Coloured version of participatory ranking / scoring

Appendix C7   Representative transcripts from dwellers interviews

Appendix D   **Local Government Structure**

Appendix E   **Photos of surveyed areas**

Appendix F   **Photos of toilet facilities**

Appendix A1: Participant Information Sheet

Participant Information Sheet

User's acceptability of Shared Sanitation facilities in low-income urban areas, Focus on Sub-Saharan Africa – Main study in Ashaiman, Ghana.

Research conducted by:
Adrien Mazeau, Ph.D. Scholar,
WEDC, Loughborough University UK
////

Under the direct supervision of:
Kevin Sansom and Brian Reed,
WEDC, Loughborough University
/////

What is the purpose of the study?
This research takes place in Ashaiman between September and November 2011, and aims to improve the quality of sanitation services. It focuses on the understanding of use of shared toilets. The research collect information from inhabitants of Ashaiman and the different organizations involved in locally in field of sanitation. This field study aims to understand how users and implementers perceive shared sanitation facilities in Ashaiman.

Who is doing this research and why?
This research is conducted by Adrien Mazeau under the supervision of Kevin Sansom and Brian Reed, lecturers at Loughborough University and support of the Ghanaian organization TREND. This research is part of a Ph.D. project.

Are there any exclusion criteria?
Each participant is between 18 and 60 years and lives or works in Ashaiman.

Once I take part, can I change my mind?
If at any time, before, during or after the sessions you wish to withdraw from the study please contact the main investigator. You can leave the session at any time, for any reason and you will not be asked to explain your reasons.

Will I be required to attend any sessions and where will these be?
All sessions are organized in your neighbourhood. Extra training sessions are required only in the case of informant's photograph (see next point).

How long will it take?

	Tools	Maximum time for each tool
1	Semi-Structured interview with stakeholders	One hour
2	Informant's photograph	Two times 30 minutes training and 2 days with the cameras.
3	Enumeration	20 min
4	Participatory mapping and scoring	90 minutes
5	Dwellers semi-structured interview	30 minutes

Some participants may be asked to participate in a second tool, but they can refuse. Selected participant will have the choice to the number of tools they want to be involved in.

Who should I send the questionnaire back to?
Facilitator or investigator from the research team will collect the data during the sessions.

What will I be asked to do?
Details of what is expected from you are described on the following table; you are invited to participate in the tool ticked.

	Tools	Details for participants
1	Semi-Structured interview with stakeholders	Answer questions about shared sanitation facilities during a maximum time of one hour.
2	Informant's photograph	Take photograph of sanitation facilities. 30 minute training including ethical information will be provided. 30 minutes debriefing will also be organized after the printing of the Photographs. You keep the camera for two days, before you hand it over to the facilitator to print the pictures.
3	Enumeration	Answer 10 questions about your house or compound house and the existent sanitation facilities (20 min).
4	Participatory mapping and scoring	Participants in a group of 6 to 8 people draw a map of the sanitation facilities and score those facilities (90 minutes).
5	Dwellers semi-structured interview	A member of the household (male or female) will answer a semi-structured interview of 10 questions and lasting between 30 minutes and an hour.

What personal information will be required from me?
Information required concern only use, access and perception of sanitation and water supply facilities. Some questions will also focus on socio cultural characteristics of the households.

Are there any risks in participating?
No risks identified.
If participating to this study causes you any stress, you can withdraw at any time but you can also ask for specific debriefing and specific information to the research team.

Will my taking part in this study be kept confidential?
Answers and ideas expressed during the different sessions are kept confidential within the research team. Confidentially agreement will be made by participants of participatory focus group.
Ideas expressed through photographs are owned by the informants and the informants decide on which picture can be used by the research and for which purpose.
During the analysis and the reporting of the collected data, no references will be made to specific individual.
Questionnaires, audio recording, different transcripts will be destroyed within four years after completion of the study. Data will be stored in the computer of the main investigator and controlled by him.

What will happen to the results of the study?
A session will be organized one week before the end of the project to present initial results to the neighbourhood. Results will only be presented at the neighbourhood level and participants will not be referred to by name.

What do I get for participating?
Initial results of the study are shared with participants. The original map, the graphic sanitation ladders, drawings and photographs are given to the participants. The research team will take a copy of these elements for further analysis.
.
Participation in this study is not rewarded with any form of payment. *(Amendment made later on)*

I have some more questions who should I contact?
Adrien Mazeau, Ph.D. Scholar,
Tel /////

What if I am not happy with how the research was conducted?
Contact the local partner:
TREND
Tel: /////

The University has a policy relating to Research Misconduct and Whistle Blowing which is available online at http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing(2).htm. Please ensure that this link is included on the Participant Information Sheet.

10-320

Appendix A2: Training record of the main researcher

Start Date	Hrs Studied	Sessions	Course Title
2010, Jan 12th	5 Hrs	1	Postgraduate Research Students Induction
2010, Jan 21st	2.5 Hrs	1	Finding Resources for your Literature Review and Beyond
2010, Feb 16th	2 Hrs	1	Citation Searching
2010, Mar 2nd	3 Hrs	1	Getting the Most out of Supervision
2010, Mar 10th	1 Hrs	1	Poster Competition for PGRs - Rules Clinic
2010, Mar 16th	15.25 Hrs	2	The Effective Researcher
2010, Mar 23rd	3 Hrs	1	Ethical Thinking in Research
2010, Mar 23rd	2 Hrs	1	Poster Competition - Design Clinic
2010, May 7th	8 Hrs	1	Poster Competition for PGRs
2010, Jun 10th	2.5 Hrs	1	Tools for Creative Thinking
2011, Feb 14th	3 Hrs	1	Report Writing
2011, Feb 22nd	2.5 Hrs	1	Conference Presentation Skills - Part A
2011, Feb 23rd	2 Hrs	1	Questionnaire Design
2011, Feb 25th	6 Hrs	2	Qualitative Analysis - an Introduction to Collecting and Analysing
2011, Mar 10th	2.5 Hrs	1	Conference Presentation Skills - Part B
2012, Jan 24th	9 Hrs	3	Teaching Skills for those Working with Small Groups
2012, Feb 1st	3 Hrs	1	Excel 2010 Advanced - Tables and Lookup Functions
2012, May 17th	7 Hrs	1	Project Management in the Real World

18 courses studied over 22 sessions totalling 79.25 hours (not including online courses and course recorded on other systems.)

Appendix B1: House unit survey report sheet

<table>
<tr><td rowspan="5">ADMIN</td><td>Area</td><td></td><td>Street</td><td></td></tr>
<tr><td>COD=</td><td></td><td colspan="2">Report number on map</td></tr>
<tr><td>Enumerator</td><td></td><td>Date</td><td></td></tr>
<tr><td>Starting time</td><td></td><td>Finishing time</td><td></td></tr>
</table>

<table>
<tr><td colspan="5">Questions adressed to any dwellers aged 18 and above living in the compound</td></tr>
<tr><td rowspan="2">1</td><td colspan="2">Type of house unit</td><td>Traditional compound house</td><td>Other multi families house</td></tr>
<tr><td>Single family house</td><td>Multi storeys</td><td>Container/ kiosk</td><td>Other:</td></tr>
<tr><td>2</td><td colspan="3">Number of households living in the house unit</td><td>…</td></tr>
<tr><td>3</td><td colspan="3">Number of Landlords</td><td>…</td></tr>
<tr><td>4</td><td colspan="3">Number of Tenants</td><td>…</td></tr>
<tr><td>5</td><td colspan="3">Estimated number of people living in the house unit</td><td>…</td></tr>
<tr><td>6</td><td colspan="3">Estimated number of person who cannot use toilet outside the house unit due to disability or age</td><td>…</td></tr>
<tr><td>7</td><td colspan="3">Number of household headed by women</td><td>…</td></tr>
<tr><td rowspan="2">8</td><td colspan="2">Ethnicity of households</td><td>Akan = …</td><td>Ga/ Adangbe= …</td></tr>
<tr><td>Ewe= …</td><td>Hausa= …</td><td>Other= …</td><td></td></tr>
<tr><td>9</td><td>Religion of households</td><td>Christian= …</td><td>Muslim= …</td><td>Other= …</td></tr>
<tr><td>10</td><td colspan="3">Number of habitable rooms in the house unit?</td><td>…</td></tr>
<tr><td rowspan="2">11</td><td colspan="2">Toilet in the house ?</td><td>VIP / KVIP= …</td><td rowspan="2">No Toilet (go to question 16)</td></tr>
<tr><td>WC= …</td><td>Traditional= …</td><td>Pan/ Bucket= …</td></tr>
<tr><td>12</td><td colspan="3">Number of toilet hole for the use of landlords and tenants</td><td>…</td></tr>
<tr><td>13</td><td colspan="3">Number of toilet hole for the use of landlords only</td><td>…</td></tr>
<tr><td>14</td><td colspan="3">Number of toilet hole for the use of tenants only</td><td>…</td></tr>
<tr><td>15</td><td colspan="3">Number of toilet hole unit for the use of outsiders</td><td>…</td></tr>
<tr><td rowspan="2">16</td><td colspan="3">What kind of toilet the house had in the past?</td><td>No toilet</td></tr>
<tr><td>WC= …</td><td>Traditional= …</td><td>Pan/ Bucket= …</td><td>KVIP/ VIP</td></tr>
<tr><td rowspan="2">17</td><td colspan="3">Conversion of the old toilet room</td><td>New toilet system</td></tr>
<tr><td>Bathroom</td><td>Common Room</td><td>Rental room</td><td>Other: …</td></tr>
<tr><td>18</td><td colspan="3">Estimated distance of the closest accessible sanitation facility in meters</td><td>m</td></tr>
<tr><td rowspan="2">19</td><td colspan="4">Which type of toilets located outside the house, household members visit. State the estimated number of toilet?</td></tr>
<tr><td>Ashma= …</td><td>Commercial= …</td><td>Neighbours= …</td><td>Other= …</td></tr>
</table>

Appendix B2: Toilet survey report sheet

<table>
<tr><td rowspan="4">ADMIN</td><td>Area</td><td></td><td>Enumerator</td><td></td></tr>
<tr><td>CODE=</td><td></td><td colspan="2">Report number on map</td></tr>
<tr><td>Enumerator</td><td></td><td></td><td></td></tr>
<tr><td>Starting time</td><td></td><td>Finishing time</td><td></td></tr>
</table>

<table>
<tr><td colspan="5">Questions adressed to owner or attendant of the toilet facility</td></tr>
<tr><td rowspan="2">1</td><td colspan="2">Access type of toilet ?</td><td>Private use only</td><td>Landlord tenant</td></tr>
<tr><td>Neighbour shared</td><td>Commercial</td><td>AshMA/ Public</td><td>Other</td></tr>
<tr><td rowspan="2">2</td><td colspan="2">Technology type of toilet ?</td><td>VIP / KVIP=</td><td>Other</td></tr>
<tr><td>WC=</td><td>Traditional=</td><td>Pan/ Bucket=</td><td>Don't know</td></tr>
<tr><td>3</td><td colspan="3">How many holes in total?</td><td>...</td></tr>
<tr><td>4</td><td colspan="3">How many holes only for landlord?</td><td>...</td></tr>
<tr><td>5</td><td colspan="3">How many holes only for tenants?</td><td>...</td></tr>
<tr><td>6</td><td colspan="3">How many holes only for landlords and tenants together?</td><td></td></tr>
<tr><td>7</td><td colspan="3">How many holes for business (or open to outsiders)?</td><td>...</td></tr>
<tr><td>8</td><td colspan="3">How many holes only for men?</td><td>...</td></tr>
<tr><td>9</td><td colspan="3">How many holes only for women?</td><td>...</td></tr>
<tr><td>10</td><td colspan="3">Is the facility open 24h?</td><td>Yes</td><td>No</td></tr>
<tr><td>11</td><td colspan="3">Can all the the doors of the cubicles be locked from inside?</td><td>Yes</td><td>No</td></tr>
<tr><td>12</td><td colspan="3">Is there light in the toilet at night?</td><td>Yes</td><td>No</td></tr>
<tr><td>13</td><td colspan="3">Is there place for handwashing within the facility?</td><td>Yes</td><td>No</td></tr>
<tr><td>14</td><td colspan="3">Is there attendant at all time?</td><td>Yes</td><td>No</td></tr>
<tr><td>15</td><td colspan="3">Is there faecal matter present inside the facility on floor or walls (human or animal)?</td><td>Yes</td><td>No</td></tr>
<tr><td>16</td><td colspan="3">Is there faecal matter present in the pit less than 30 cm of the surface</td><td>Yes</td><td>No</td></tr>
<tr><td>17</td><td colspan="3">Price per use in cedis</td><td></td></tr>
<tr><td>17</td><td colspan="2">Any comment on pricing?</td><td></td><td></td></tr>
<tr><td>18</td><td>Other service offered</td><td>Shower</td><td>Water supply</td><td>Other:...</td></tr>
</table>

Verso: Add any comments

Appendix B3: Protocol for the participatory exercises

<u>LOCALISATION AND DATE</u>

Following the enumeration, participatory group exercises will be held in the area of Amui, Nii and Oko. Focus group are held in October 2011, most of them will be held on week end as it is the best time to reach the highest number of residents.

In each area, 6 groups' discussions will be held. Composition of the group and selection of the participants is a key in the success of the research, in term of validity. Each group should have a minimum of 6 participants, 8 participants will be invited, the session start when the sixth participant arrives.

<u>SELECTION OF PARTICIPANTS IN EACH GROUP</u>

The different group should respect as much as possible the ethical and religious distribution of the household but also the access to sanitation facilities.
In each group, participants must live in the area where enumeration was conducted. In each group, each participant should live in different sections of the area in order to cover the full geographical area.

<u>COMPENSATION</u>

Participants will receive, at the end, compensation in cedis (5).

<u>RUNNING THE SESSION</u>

   a) Welcoming of the participants
Introduce ourselves and conduct a short round table to know the first name of participants. Participants are informed that the session should last around an hour.

   b) Presentation of the study
"The research is managed by Adrien Mazeau from Loughborough University with the support of the local research centre, TREND.
Research investigates the provision and the use of toilets in Ashaiman. The study focuses on shared toilet which include public toilets, commercial toilets but also toilets shared with tenants.
Research is carried out in four areas of Ashaiman: Nii, Amui, Oko and Laka.
Different methods are used. Initially a large survey was conducted in order to picture the number of housing units and toilets. During the second part, the research team wishes to understand how and why residents of an area select their sanitation facilities. This is done through participatory group where individuals gathered in group of 6 people build map and scoring matrices of their toilet facilities. The last part of the study will be done through interviews with residents, institution and sanitation providers."

   c) Activities
"Today, the meeting will last an hour and we will do two different activities: mapping, and scoring/ ranking.
Before starting, ethical aspects: Anything discussed during the session today will be treated anonymously by the research team. It is asked to the participants to do the same and to leave the discussion at the group level. During the discussion, participation of all is encouraged. There is no bad or good answer. The research team is just interested in hearing your stories. Participants have the right to withdraw at any time."

   d) The mapping
Borders and main streets of the map are drawn before the session.
The map is put on a desk/ table and participants sit or stand around it.
Facilitator ensures that the participants locate the map and eventually add geographical elements (mosque, church, shop, school...)
Participants are asked to locate their house using sticky notes.

Participants are asked to locate WHERE they go to ease themselves using sticky notes (see colour codes table, the facilitator make sure of respecting the colour codes).
In case they indicate more than one place/facility, the facilitator ranks each travel, writing a one under the most often visited place. Then, the participants indicate where their husband/ wife ease themselves (or where they think they do). Then in the last round, the participants indicate where the children (under 10) ease themselves. To finish, people are free to add something in the map if they wish to.

Colour codes:

The next table shows the code of colour that should be used during the mapping. Any changes will be noted by the enumerators.

Elements	Support	Colour
Border/ Street	Marker	Black
House of participants	Sticky notes square	Blue
Ashma/ public toilet	Sticky note triangle	Orange
Commercial/ Business toilet	Sticky note triangle	Pink
Neighbour toilet	Sticky note triangle	Purple
Private toilet	Sticky note triangle	Yellow
Bush/ Free range	Sticky note triangle	Green
Toilet travel women	Marker	Green
Toilet travel men	Marker	Red
Toilet travel children	Marker	Blue

e) Scoring / ranking

Using the semantic differential scale, participants will score the toilet facilities. From the identified facilities during the mapping, the most significant types of toilet are selected.
The facilitator ensures that each participant understands the difference between the facilities. One colour is associated to each facility/ place (maximum of 4, for instance: Ashma toilet, commercial toilet, landlord toilet and the gutter).
The facilitator introduces the scale. For each line of the scale, the two opposite adjective need to be clearly introduced ensuring that participants get the right meaning, the adjective will be described in the three major languages of the area (Twi, Ewe, Ga).

	1	2	3	4	5	6	7	
DIRTY								CLEAN
FAR								CLOSE
EXPENSIVE								CHEAP
UNSAFE								SAFE
NO PRIVACY								PRIVATE
SMELLY								NO SMELL
UNPLEASANT								PLEASANT

The vertical line 4 represents a neutral value
Then the participant themselves score the different type of toilet facilities regarding the pair dirty/clean. Facilitator can leave participants with the use of the post it, just ensuring that participants understand the adjectives and the direction of the scoring. Once all the facilities are scored under the dirty/ clean dimension, the second line is introduced by the facilitator: far/expensive. Then we move to the next lines. At the end of the scoring, the facilitator goes through the full table ensuring that the opinions of all are represented as they wanted.

Appendix B4: Dwellers interviews report sheet

	COD
Area	
Name interviewee	
Name interviewer	
Starting and finishing time	

Thematics to be discussed with interviewees	
	COD

1 Sanitation facilities used by you and your household members

Numbers	Motivation
Location	Perception

2 Sanitation facilities used by you and your household members in the past

2 years ago	
5 years ago	

3 Sanitation facilities used by you and your household members in the future

In 2 years	
In 10 years	

4 (for landlords) Providing sanitation facilities to your tenants

Actual situation	Constraints, barriers
Motivation, incentives	Conflict

4 (for tenants) Relation with your landlords concerning sanitation facilities

Conflict	Demand, paiement, maintenance

Appendix B5: Stakeholders interviews report sheet

Area	
Name interviewee	
Name interviewer	
Starting and finishing time	

Thematics to be discussed with interviewees

1 The interviewee

Job description	Relation with Ashaiman sanitation
Location	Perception

2 Sanitation in Ashaiman

Historical perspectives	Actual situation
Succes stories	Challenges

3 You, Your organisation and sanitation in Ashaiman

Reason of involment	Mission, Mandate
Constraints, difficulties	Project
Action	

5 The facilities provided

Description	Description of users
Economic aspects	Daily management, operation, maintenance

6 The users

What are they looking for?	How do they select their sanitation facilities?
Relation with users	Evolution of services provided

7 Relation with other sanitation providers and stakeholders

Other facilities providers	Health and hygiene authorities
Ashaiman assembly	Traditional and politic leaders

Appendix C1: Mapping of the stakeholders' interviews
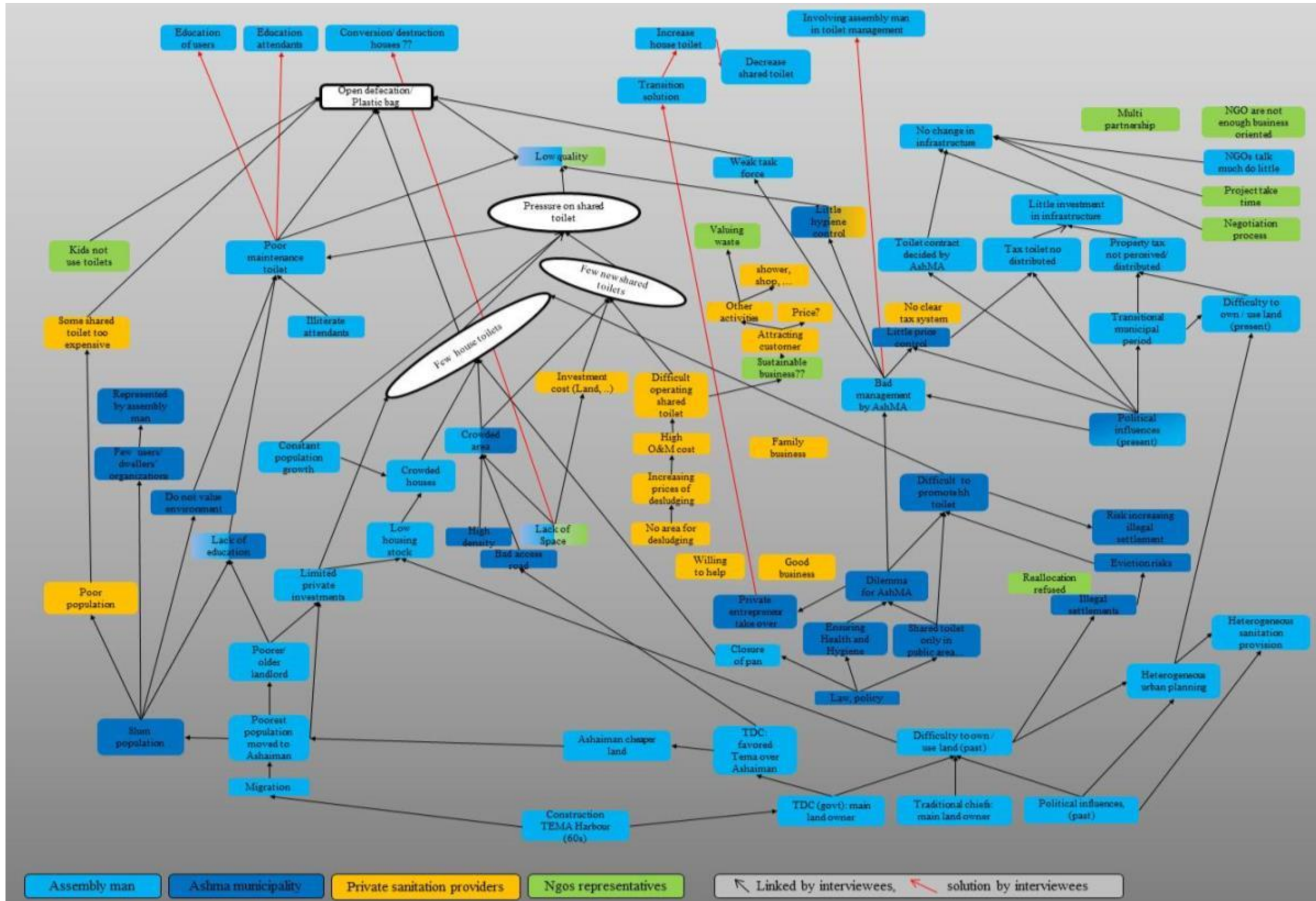
Appendix C2: House unit survey results

	FOUR NEIGHBOURHOODS OF ASHAIMAN									
	TOTAL		Nii		Oko		Amui		Laka	
House unit enumerated	**438**		115		99		111		113	
Questionnaire analysed	**432**		115		96		109		112	
SIZE OF POPULATION										
Number of household	**2914**		860		679		693		682	
Number of people per household (mean)	**3,5**		2,9		3,1		4,7		3,1	
Number of people per household (median)	**2,9**		2,5		3,0		3,0		2,6	
Estimated population	**8107**		2218		1893		2188		1808	
Estimated area (ha)	**16,5**		3,57		2,78		5,74		4,4	
Estimated density (pop/ha)	**492**		621		681		381		411	
HOUSING										
CROWDING AND ROOM NUMBER										
Household per house unit (mean)	**7**		7		7		6		6	
Household in compound house unit (mean)	**8**		8		9		8		7	
Number of room per house unit (mean)	**7**		8		7		8		7	
Number of people per room (mean)	**2,6**		2,5		2,9		2,7		2,4	
Percentage of house unit crowded (over 3 people / room in average)	**153**	**35%**	39	34%	44	46%	38	35%	32	29%
Number of people per house unit (mean)	**19**		19		20		20		16	
Number of people per house unit (median)	**16**		17		15		17		14	
TYPE OF HOUSING										
Traditional compound house	**227**	**53%**	87	76%	19	20%	32	29%	89	79%
Other compound house	**126**	**29%**	19	17%	52	54%	47	43%	8	7%
Total compound house	**353**	**82%**	106	92%	71	74%	79	72%	97	87%
Single house (Self-contained)	**37**	**9%**	8	7%	6	6%	13	12%	10	9%
Multi storeys	**2**	**0%**	1	1%	0	0%	1	1%	0	0%
Kiosk/ container	**36**	**8%**	0	0%	17	18%	15	14%	4	4%
Undefined	**4**	**1%**	0	0%	2	2%	1	1%	1	1%
TENANCY STATUS OF HOUSE UNIT										
Tenancy status of house units	**430**		115		95		109		111	
House occupied by landlord only	**46**	**11%**	6	5%	4	4%	24	22%	12	11%
House occupied by tenant only	**179**	**41%**	53	46%	52	54%	32	29%	42	38%
House occupied by tenant and landlord	**205**	**47%**	56	49%	39	41%	53	49%	57	51%
TENANCY STATUS OF HOUSEHOLDS										
Total number of households in the house unit	**2914**		860		679		693		682	
Landlord household	**340**	**12%**	66	8%	73	11%	90	13%	111	16%
Tenant household	**2572**	**88%**	794	92%	605	89%	603	87%	570	84%
CULTURAL CHARCTERISTICS OF HOUSEHOLDS										
Total number of households in the house unit	**2914**		860		679		693		682	
ETHNICITY										
Akan household	**659**	**23%**	282	33%	87	13%	98	14%	192	28%
Ga/ Adangbe household	**651**	**22%**	139	16%	287	42%	81	12%	144	21%
Ewe household	**959**	**33%**	197	23%	184	27%	299	43%	279	41%
Hausa/ Dagomba household	**534**	**18%**	204	24%	106	16%	177	26%	47	7%
Household with other ethnicity	**111**	**4%**	38	4%	18	3%	38	5%	17	2%
House unit with same ethnic group amongst households	**66**	**15%**	26	23%	10	10%	10	9%	20	18%

House unit with different ethnic group amongst households	**290**	**67%**	85	74%	64	67%	65	60%	76	68%
House unit with only one household	**74**	**17%**	4	3%	22	23%	33	30%	15	13%
House unit with no data on household ethnic group	**2**	**0,5%**	0	0%	0	0%	1	1%	1	1%
Household in ethnical homogeneous house unit (mean)	**5,2**		5,7		4,4		4,4		5,4	
Household in ethnical heterogeneous house unit (mean)	**8,6**		8,3		9,6		9,3		7,3	

RELIGION									
Christian household	**2217**	**76%**	631	73%	529	78%	443	64%	614	90%
Muslim household	**609**	**21%**	227	26%	138	20%	189	27%	55	8%
Household with other or without religion	**7**	**0%**	1	0%	0	0%	5	1%	1	0%
House unit with same religion amongst households	**190**	**44%**	53	46%	35	36%	32	29%	70	63%
House unit with different religion amongst households	**158**	**37%**	56	49%	36	38%	40	37%	26	23%
House unit with only one household	**72**	**17%**	6	5%	23	24%	29	27%	14	13%
House unit with no data on household religion	**12**	**3%**	0	0%	2	2%	8	7%	2	2%

OTHER									
Household headed by women	**294**	**10%**	52	6%	96	14%	82	12%	64	9%
Number of disabled/ aged having difficulties to go to toilet	**45**	**0,6%**	16	1%	7	0,4%	8	0%	14	1%

SANITATION FACILITIES WITHIN THE HOUSE UNITS

NUMBER OF HOUSE UNIT EQUIPED									
Total number of house unit	**432**		115		96		109		111	
House unit with at least one toilet	**51**	**12%**	9	8%	1	1%	25	23%	16	14%
House unit with one toilet	**34**	**8%**	8	7%	1	1%	11	10%	14	13%
House unit with no toilet	**381**	**88%**	106	92%	95	99%	84	77%	96	86%
House unit which had toilet in the past, now without	**87**	**20%**	32	28%	1	1%	12	11%	42	38%
House which never get toilet	**294**	**67%**	74	64%	94	95%	72	65%	54	48%

NUMBER OF INHABITANTS IN HOUSE UNIT NOT EQUIPED									
Total number of inhabitants	8107		2218		1893		2188		1808	
Inhabitants with no toilet in their house unit	7464	92%	2114	95%	1878	99%	1804	82%	1668	92%

TECHNOLOGY OF EXISTING TOILET									
Number of functioning toilets	**75**		10		1		46		18	
Number of functioning toilets (type known)	**65**		10		1		38		16	
KVIP/VIP	**16**	**21%**	4	40%	1	100%	8	17%	3	17%
Flush/ WC	**49**	**65%**	6	60%	0	0%	30	65%	13	72%
Type undetermined (between VIP and WC)	**10**	**13%**	**0**	0%	**0**	0%	**8**	17%	**2**	11%

TECHNOLOGY OF CLOSE DOWN TOILETS									
Number of house where toilet(s) close down and not replace	**87**		32		1		12		42	
Number of toilet closed	**93**		34		1		14		44	
KVIP/VIP	**15**	**16%**	1	3%	0	0%	9	64%	5	11%
Flush/ WC	**12**	**13%**	5	15%	1	100%	1	7%	5	11%
Pan/ Bucket	**65**	**70%**	27	79%	0	0%	4	29%	34	77%
Traditional toilet	**1**	**1%**	1	3%	0	0%	0	0%	0	0%

CONVERSION OF CLOSED TOILETS									
Number of toilet closed	**93**		34		1		14		44	
New toilet	**2**	**2%**	0	0%	0	0%	1	7%	1	2%
Bathroom (shower)	**9**	**10%**	3	9%	0	0%	1	7%	5	11%
Bedroom (room to rent)	**8**	**9%**	6	18%	0	0%	1	7%	1	2%
Storage room	**25**	**27%**	8	24%	0	0%	0	0%	17	39%
Other (often empty and not used)	**49**	**53%**	17	50%	1	100%	11	79%	20	45%

SANITATION FACILITIES AND TENANCY STATUS OF HOUSE UNIT										
SANITATION FACILITIES AND LANDLORD HOUSE UNIT										
Landlord only house unit	**46**		6		4		24		12	
Only landlord house with no toilet	**33**	**72%**	4	67%	4	100%	18	75%	7	58%
Only landlord house with at least one toilet	**13**	**28%**	2	33%	0	N/A	6	25%	5	42%
Only landlord house without toilet now and in the past	**26**	**57%**	3	50%	4	100%	15	63%	4	33%
Only landlord house with toilet in the past, now without	**7**	**15%**	1	17%	0	N/A	3	13%	3	25%
SANITATION FACILITIES AND TENANTS HOUSE UNIT										
Tenant only house unit	**179**		53		52		32		42	
Only tenant house with no toilet	**165**	**92%**	51	96%	52	100%	25	78%	37	88%
Only tenant house with at least one toilet	**14**	**8%**	2	4%	0	N/A	7	22%	5	12%
Only tenant house without toilet now and in the past	**132**	**74%**	38	72%	51	98%	23	72%	20	48%
Only tenant house with toilet in the past, now without	**33**	**18%**	13	25%	1	2%	2	6%	17	40%
SANITATION FACILITIES AND TENANTS LANDLORD HOUSE UNIT										
Tenant landlord house unit	**205**		56		39		53		57	
Tenant landlord house with no toilet	**181**	**88%**	51	91%	38	97%	41	77%	51	89%
Tenant landlord house with at least one toilet	**24**	**12%**	5	9%	1	3%	12	23%	6	11%
Tenant landlord house without toilet now and in the past	**135**	**66%**	33	59%	38	97%	34	64%	30	53%
Tenant landlord house with toilet in the past, now without	**46**	**22%**	18	32%	0	0%	7	13%	21	37%
SANITATION FACILITIES AND TENANCY STATUS OF HOUSEHOLDS										
SANITATION FACILITIES AND LANDLORD HOUSE UNIT										
Landlord household	**340**		66		73		90		111	
Landlord household without toilet	**297**	**87%**	59	89%	72	99%	71	79%	95	86%
Landlord household with toilet	**43**	**13%**	7	11%	1	1%	19	21%	16	14%
Tenant household	**2572**		794		605		603		570	
Tenant household without toilet	**2416**	**94%**	757	95%	597	99%	525	87%	537	94%
Tenant household with toilet in their house unit	**156**	**6%**	37	5%	8	1%	78	13%	33	6%
ACCES TO SANITATION FACILITIES FOR TENANTS IN HOUSE UNIT WITH TOILETS										
Tenant household with toilet(s) in their house unit	**156**		37		8		78		33	
Tenant household with no access to the house unit toilet	**67**	**43%**	23	62%	8	100%	35	45%	1	3%
Tenant household with access to the house unit toilet	**79**	**51%**	14	38%	0	0%	47	60%	18	55%
Tenant household sharing the house unit toilet with the landlord	**46**	**29%**	10	27%	0	0%	22	28%	14	42%

Few house units have two or three toilets, which explain the difficulty of expressing percentage. Sometimes one toilet in the house will be for the use of landlord only, and another toilet for the use of tenants only.

SANITATION FACILITIES AND CULTURAL CHARACTERISTICS OF HOUSEHOLDS										
SANITATION FACILITIES AND RELIGION										
Toilet in house unit with same religion amongst households	**24**	**13%**	4	8%	0	0%	12	38%	8	11%
Toilet in house unit with different religion amongst households	**7**	**4%**	3	5%	1	3%	2	5%	1	4%
Toilet in house unit with only one household	**16**	**22%**	2	33%	0	0%	8	28%	6	43%
Toilet in house unit with no data on household religion	**4**	**33%**	0		0	0%	3	38%	1	50%
SANITATION FACILITIES AND ETHNICITY										

	Total		A		B		C		D	
Toilet in house unit with same ethnic group amongst households	**10**	**15%**	3	12%	0	0%	5	50%	2	10%
Toilet in house unit with different ethnic group amongst households	**24**	**8%**	5	6%	1	2%	11	17%	7	9%
Toilet in house unit with only one household	**15**	**20%**	1	25%	0	0%	8	24%	6	40%
Toilet in house unit with no data on household ethnic group	**2**		0		0		1		1	
SANITATION FACILITIES AND SIZE OF HOUSE UNIT										
SANITATION FACILITIES AND CROWDING										
Number of crowded house unit	**153**		39		44		38		32	
Crowded house with no toilet	**144**	**94%**	38	97%	44	100%	32	84%	30	94%
Crowded house with at least one toilet	**10**	**7%**	2	5%	0	0%	6	16%	2	6%
Crowded house with toilet in the past, now without	**27**	**18%**	8	21%	1	2%	4	11%	14	44%
Number of non-crowded houses	**279**		76		52		71		80	
Non crowded house with no toilet	**237**	**85%**	68	89%	51	98%	52	73%	66	83%
Non crowded house with at least one toilet	**41**	**15%**	7	9%	1	2%	19	27%	14	18%
Non crowded house with toilet in the past, now without	**60**	**22%**	24	32%	0	N/A	8	11%	28	35%
SANITATION FACILITIES AND NUMBER OF HOUSEHOLDS IN HOUSE UNIT										
Only one household in the house unit	**76**		6		22		33		15	
One household house unit with toilet	**17**	**22%**	2	33%	0	0%	9	27%	6	40%
2 to 5 households in the house unit	**106**		27		25		22		32	
2 to 5 households house unit with toilet	**21**	**20%**	4	15%	0	0%	10	45%	7	22%
6 to 10 households in the house unit	**176**		64		27		28		57	
6 to 10 households house unit with toilet	**11**	**10%**	2	3%	1	4%	5	18%	3	5%
Over 10 households in the house unit	**74**		18		22		26		8	
Over 10 households house unit with toilet	**2**	**3%**	1	6%	0	0%	1	4%	0	0%
SANITATION FACILITIES AND DISABLED IN HOUSE UNIT										
House unit with no disabled	**387**		99		89		101		98	
Toilet in house unit with no disabled	**47**	**12%**	8	8%	1	1%	24	24%	14	14%
House unit where one or more disabled live	**45**		16		7		8		14	
Toilet in house unit where one or more disabled live	**4**	**8%**	1	6%	0	0%	1	13%	2	14%
SANITATION FACILITIES AND FORM OF HOUSING										
Compound house	**353**	**82%**	106	92%	71	74%	79	72%	97	87%
Compound house with at least one toilet	**33**	**9%**	6	6%	1	1%	15	19%	11	11%
Compound house with toilet in the past	**83**	**24%**	31	29%	1	1%	10	13%	41	42%
Self-contained house	**37**	**9%**	8	7%	6	6%	13	12%	10	9%
Self-contained house with at least one toilet	**16**	**43%**	3	38%	0	0%	8	62%	5	50%
Self-contained house with toilet in the past	**9**	**24%**	3	38%	0	0%	4	31%	2	20%
Kiosk container	**36**	**8%**	0	0%	17	18%	15	14%	4	4%
kiosk container with at least one toilet	**0**		0		0		0		0	
kiosk container with toilet in the past	**0**		0		0		0		0	

**Appendix C3: Toilet survey results**

Area	Code	Management type	Cabins men only	Cabins women only	Cabins unisex	Cabins total	Years of operation	Opening hours	Open 24h	Attendant all time	Technology	Light at night	faecal matter on the wall	faecal matter observed 30 cm	Doors locked from inside	Place for hand washing	Price	Child price	Water delivery	Shower	Soap selling	Overall quality
Amui	K1	Neighbour T	2	2	0	4	2008	5am / 10 pm	No	Yes	WC	Yes	No	No	Yes	Yes	20		No	Yes	No	4
Amui	K2	Neighbour T	1	1	0	2	2007	5am / 10 pm	No	No	T P	Yes	No	No	Yes	No	20		No	No	No	3
Amui	K3	Neighbour T	0	0	2	2	2004	5am / 9 pm	No	Yes	T P	Yes	No	No	Yes	No	20		No	No	No	3
Amui	K4	Neighbour T	1	1	0	2	2007	5am / 10 pm	No	No	T P	Yes	No	No	Yes	Yes	20	10	No	Yes	No	4
Amui	K5	Commercial T	6	6	0	12	2011	5am / 10 pm	No	Yes	WC	Yes	No	No	Yes	Yes	20		No	Yes	No	4
Amui	K6	Commercial T	6	6	0	12	2000	5am / 10 pm	No	Yes	/	Yes	No	No	Yes	No	15		No	Yes	No	3
Laka	L1	AshMA T	12	12	0	24	Old		Yes	Yes	VIP	Yes	Yes	No	Yes	No	10		No	No	No	2
Laka	L2	AshMA T	12	12	0	24	Old		Yes	Yes	VIP	Yes	Yes	Yes	Yes	No	10		No	No	No	1
Laka	L3	AshMA T	12	12	0	24	Old		Yes	Yes	VIP	No	No	No	Yes	No	10		No	No	No	3
Oko	M1	Commercial T	4	5	0	9	2007	4am / 10pm	No	Yes	T P	Yes	Yes	Yes	No	No	20	10	Yes	Yes	Yes	0
Oko	M2	Commercial T	9	9	0	18	1985		No	Yes	VIP	Yes	Yes	Yes	No	No	20	10	No	No	No	0
Oko	M3	Commercial T	15	15	0	30	2008		No	Yes	VIP	Yes	No	No	Yes	Yes	20	10	No	No	No	4
Oko	M4	Neighbour T	3	3	0	6	x		No	Yes	T P	Yes	Yes	Yes	No	No	20	10	No	No	No	0
Oko	M5	AshMA T	8	8	0	16	Old		Yes	Yes	VIP	Yes	Yes	Yes	No	No	10		No	No	No	0
Nii	N1	Commercial T	6	8	0	14	2009	4 am / 11pm	No	Yes	Flush	Yes	No	No	Yes	Yes	15	10	Yes	Yes	Yes	4
Nii	N2	AshMA T	6	6	0	12	Old		Yes	Yes	VIP	Yes	Yes	No	Yes	No	10		No	No	No	2
Nii	N3	Commercial T	14	13	0	27	2010		No	Yes	VIP	Yes	No	No	Yes	No	20		No	Yes	No	3
Nii	N4	Commercial T	0	0	6	6	1990	4am / 10 pm	No	Yes	Flush	Yes	No	No	Yes	No	20		No	No	No	3
Total		18 toilets surveyed	117	119	8	244																

Appendix C4: Users' determinants listed during the pilot study

Five focus groups were asked to list all factors they were taking into account when selecting a toilet. Results from three groups are here presented.
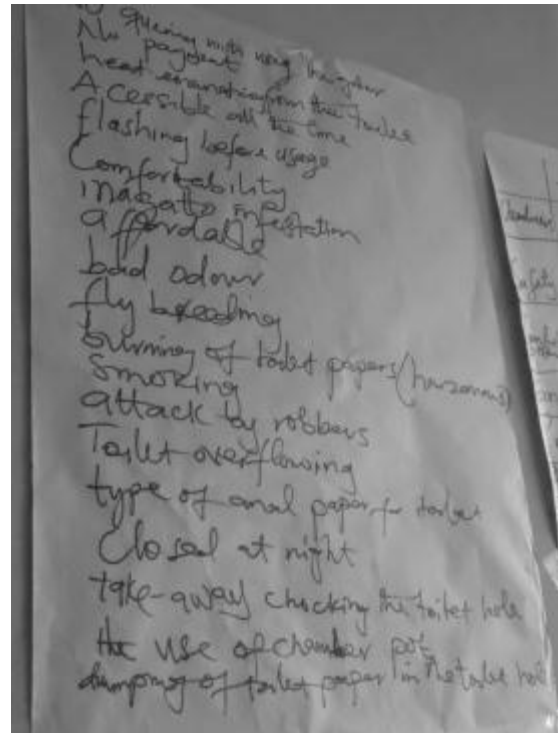
<u>Men group</u>
- Queuing
- Risk of walking there at night
- Money
- Privacy
- Unhygienic
- Closed at night
- Heat
- No water to wash hands
- Infection caused by heat
- Type of toilet paper
- Not neat
- Risk cholera
- Lighting
- Smoking
- Children fall into the toilet pit
- Old ladies cannot squat
- Not good for disabled
- Clean the toilet yourself if you miss the hole
- Political interferences
- No use of disinfectant to reduce smells
- Disludging bring bad odours
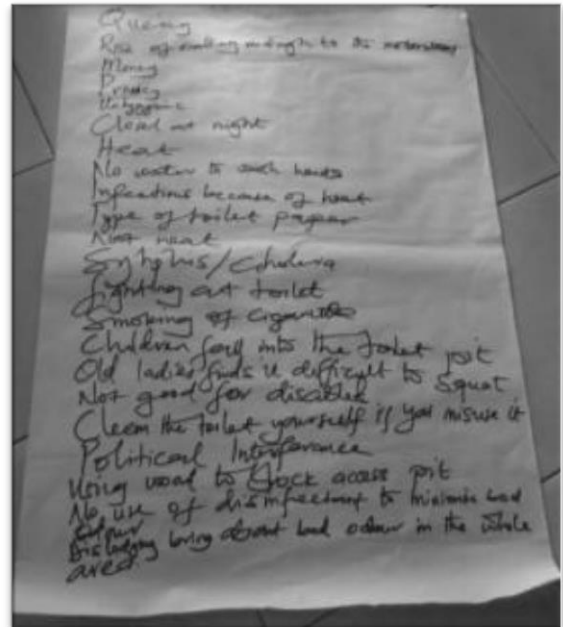
Women group

- Queuing
- No payment
- Heat from toilets
- Accessible all time
- Flushing before using
- Comfort
- Maggot's infection
- Affordable price
- Bad odours
- Flies breeding
- Owning of toilet papers
- Smoking
- Attack by robbers
- Toilet overflowing
- Type anal paper
- Closed at night
- Take-away blocking the drain
- Use of chamber pot
- Dumping toilet paper in toilet hole

Women group

- Bad odours
- Technology (sitting or squatting)
- Infections
- Cleanliness
- Maggot's infestations
- Money
- Cleanliness, Neat
- Fly breading
- Smoking weed and cigarettes
- Surroundings very bad
- Urine all around toilet
- Queuing
- Sickness from odour
- Type of cleansing material
- Distance (suggested)
- Closed at night
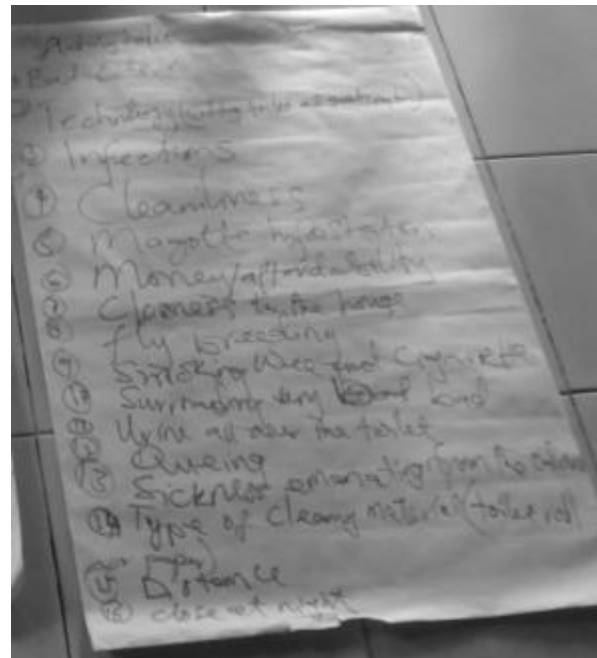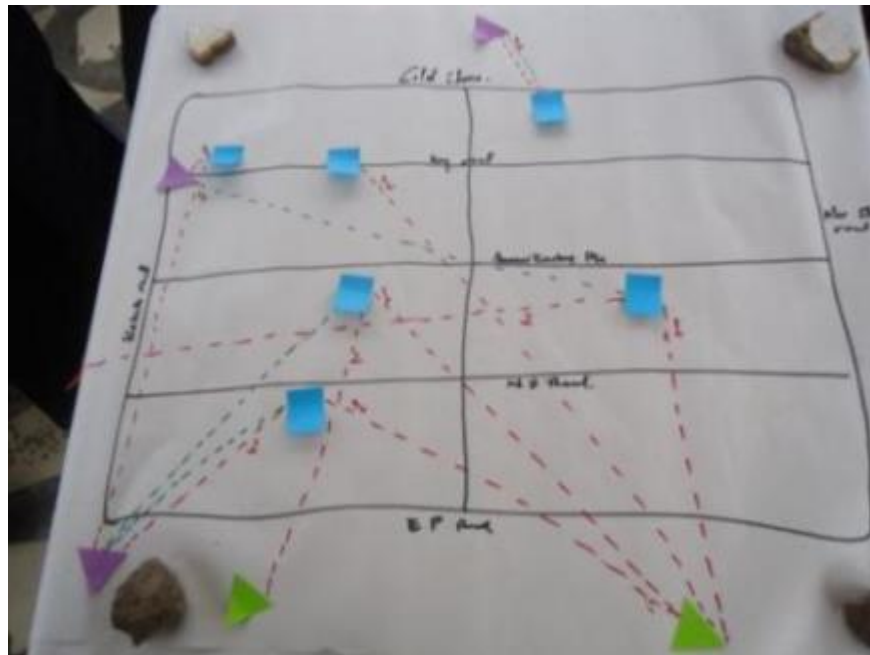
Appendix C5: Coloured maps from participatory mapping

Figure 10-1 Map of sanitation facilities drawn by a group of young male tenants in Amui

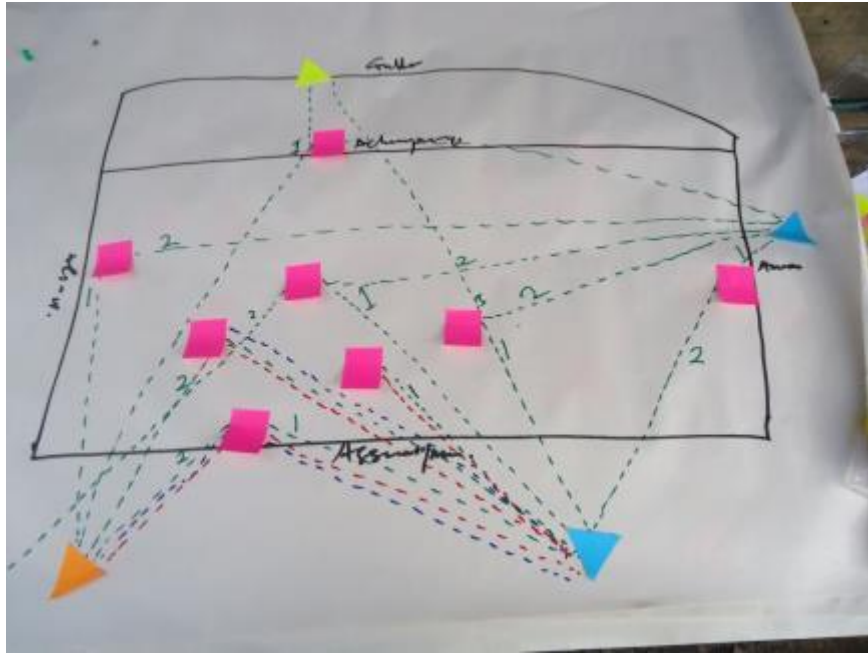*Figure 10-2 Map of sanitation facilities drawn by a group of female tenants in Amui*

Figure 10-3 Map of sanitation facilities drawn by a group of young female tenants in Nii

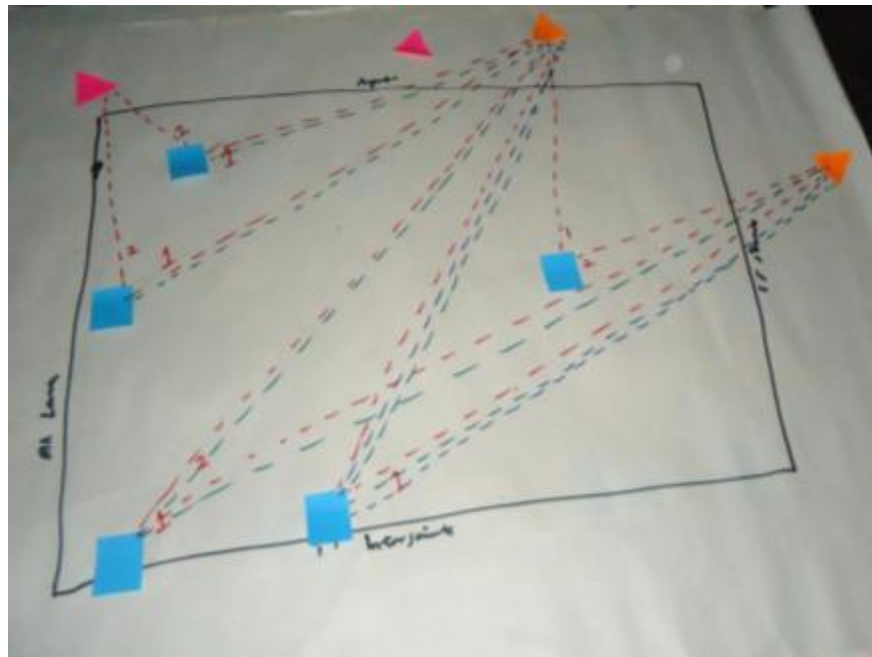(The colours used in the figure 10-3 are not standard)

Figure 10-4 Map of sanitation facilities drawn by a group of male tenants in Oko

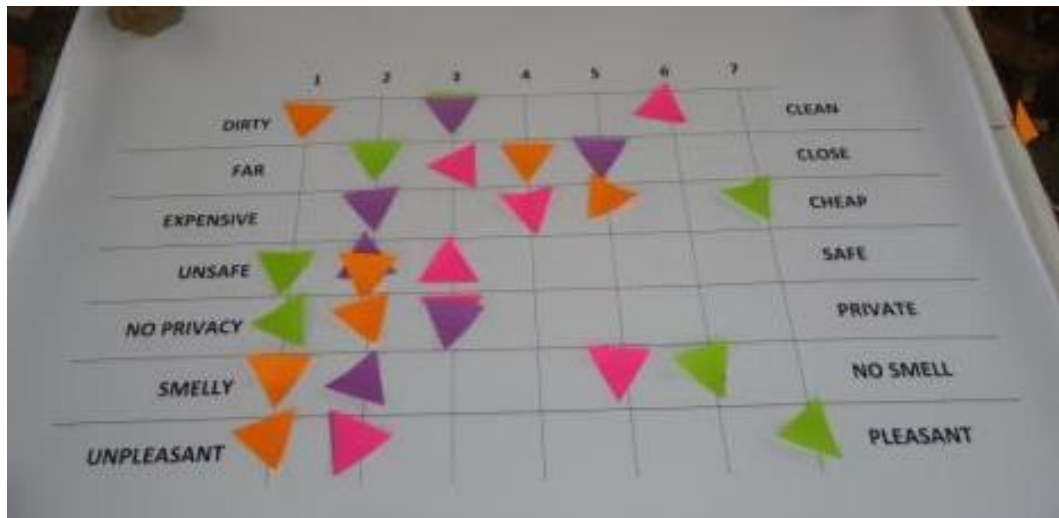# Appendix C6: Coloured version of participatory ranking / scoring

Figure 10-5 Ranking of facilities by a group of young male tenants in Amui

The open defecation practice (illustrated by a green sticker) was highly rated for its affordability but also for the general feeling. The male group, figure 10-5 considered that all shared toilets were smelly and generally very unpleasant; they illustrated their preference for open defecation by rating all shared toilets very low compared to the high mark for open defecation. The municipally owned toilet model (orange) was poorly marked by this group. The neighbour toilet model (purple) and the commercial toilet model (pink) received here some average marks.

The female group did not identify any commercial toilets but one of them had a private toilet in her house unit (yellow). The appreciation of the toilets is slightly different between the two groups as shown in the Figure 10-6.
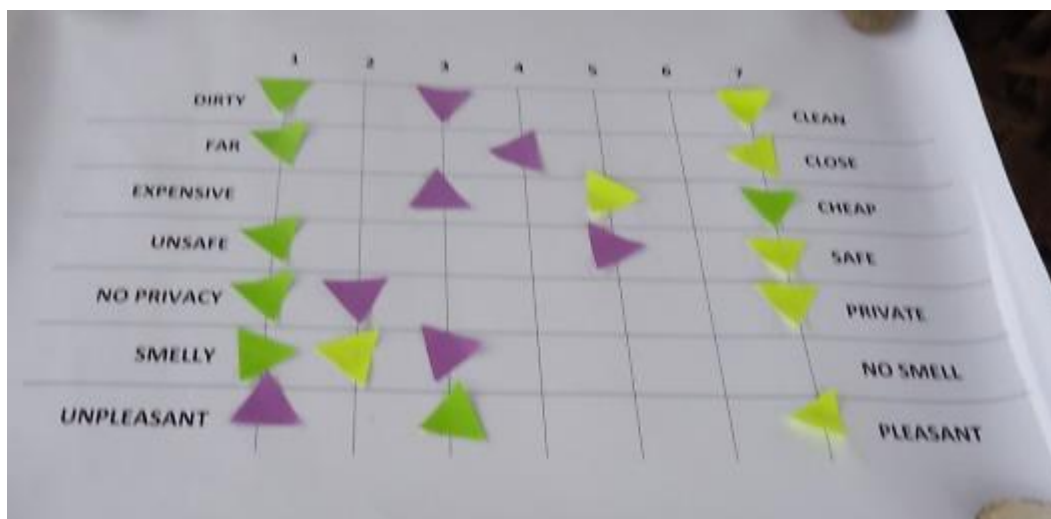

Figure 10-6 Ranking of facilities by a group of female tenants in Amui

Appendix C7: Some transcripts from dwellers interviews

| Area	Amui	Amui	Amui
Date	22/10/2011	22/10/2011	22/10/2011
Caract.	Man, tenant	Woman, landlord	Man, tenant
Code	MAA2	MAA31	MAA4
Q1 - Which facility are you and your household using? What motivate your choice?	VIP located in the house	Goes to a 2-seater public toilet (located in the other street behind Kwaku maame-sells tomatoes). I go there because it is near me. They charge 20p.	Bush. Because there is no toilet in-house. My roommates also use the bush.
Q2 - Was the sanitation situation the same in the past? If not how has it evolved?	Same, the toilets here before I moved with my family.	Same	Same
Q3 - Are you satisfied with your toilet situation? If not, who should provide better services? What are the main reasons for not having the level of service you expect?	No because it is not a WC. Bad scent comes out of it. The landlord should provide WC. However, we have not complained to him/her thinking if we talk too much, s/he might throw us out of the house. S/he therefore thinks we are satisfied with the facility.	Not pleased because there are always long queues and the more you sit on it you contract diseases because of the heat. The 20p charge is expensive.	No. No places of convenience. There are few small number seater toilets for both males and females. one therefore contracts diseases for using them. Landlords should provide toilets. For public toilets, the Municipal assembly should provide.
Other comments	There is no OD in the area. OD takes place around the high tension and Tulaku. Tulaku is for TMA and residents are not allowed to build toilets	OD is present around the house. The land in our house is waterlogged Public toilet on which one squats is better than the one which requires you to sit. The government, companies, individuals could put up toilet.	Lived here for 28 years. It should be enshrined in policy that, landlords provide toilets before renting them out. I also recommend that assemblymen/women should make it compulsory for all landlords to provide toilets in their houses.

Appendix D: Local Government Structure
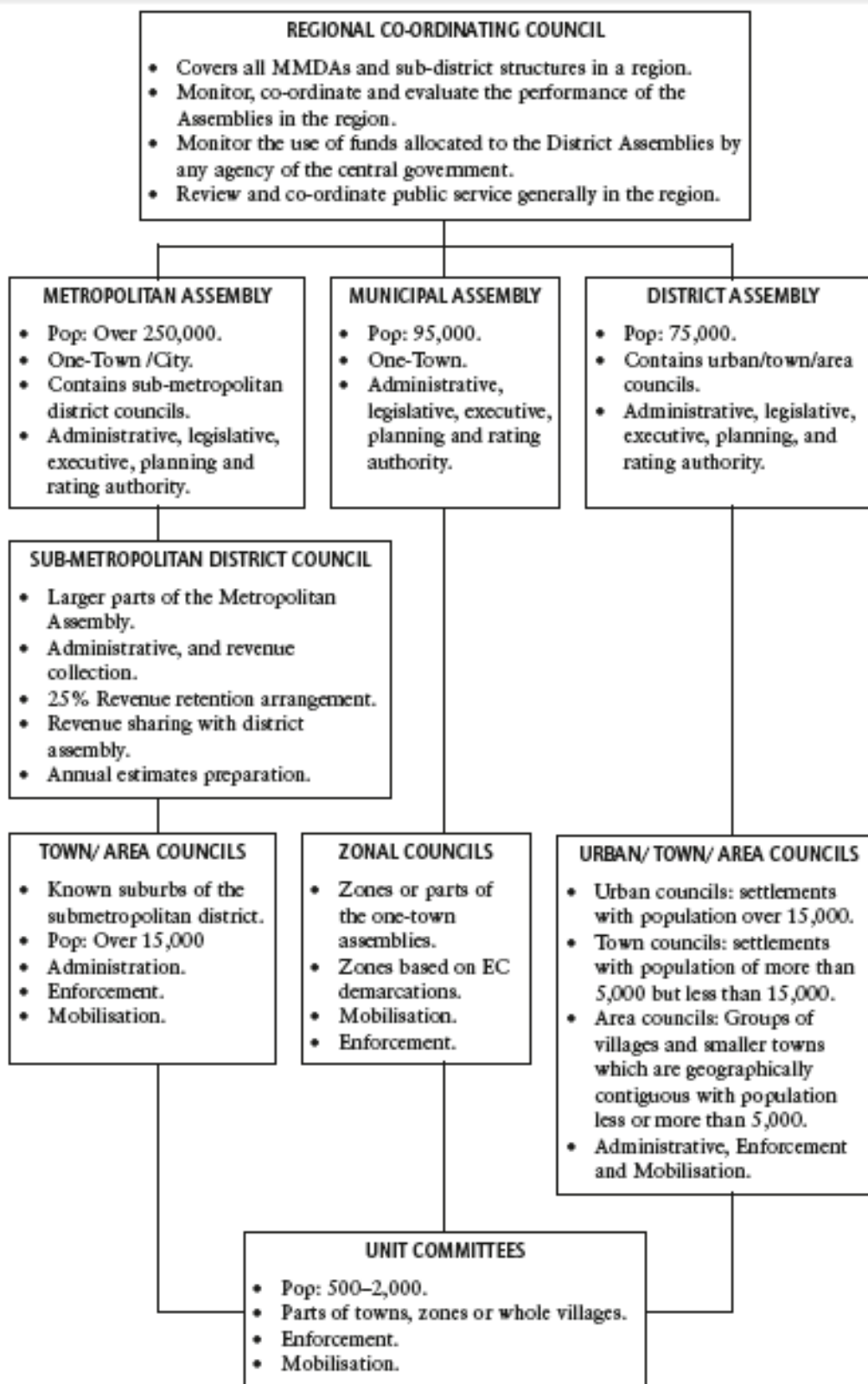
Figure 10-7 Local government structure (Koranteng, 2011)

Appendix E: Photos of surveyed areas

Figure 10-8 Main street in Laka

Figure 10-9 Secondary street in Amui

Figure 10-10 Tertiary street in Nii

Figure 10-11 Main drainage channel in Nii

Figure 10-12 Wooden kiosks also used as bedroom at night-time

Figure 10-13 Compound houses in Nii

Figure 10-14 Inside a courtyard of a large compound house in Nii

Figure 10-15 Houses and roofing in Amui

Figure 10-16 Houses and roofing in Oko

Figure 10-17 Houses and roofing in Nii

Appendix F: Photos of toilet facilities

Figure 10-18 Closed down bucket toilet of a compound house in Nii

Figure 10-19 Closed down bucket toilets of a self-contained house in Amui

Figure 10-20 Municipally owned toilet in Laka

Figure 10-21 Commercial shared toilet in Oko

Figure 10-22 Commercial shared toilet in Nii

Figure 10-23 Entrance of a commercial shared toilet in central Ashaiman

Figure 10-24 Neighbour shared toilets in Amui

Figure 10-25 Neighbour shared toilets in Amui

Figure 10-26 Toilet blocks in Nii: six VIP toilets (left) and four closed bucket toilets (right)

Figure 10-27 Men' cubicles in a commercial shared toilet in Oko

Figure 10-28 Cubicle in a neighbour shared toilet in Amui

Figure 10-29 Urinal in Amui