



People's Choice First

A 4-Country Comparative Validation of the
HCES Planning Approach for Environmental
Sanitation

Christoph Lüthi, Antoine Morel, Petra Kohler,
Elizabeth Tilley

NCCR North-South Dialogue, no. 22

2009

dialogue

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HCES workshops in Laos and Costa Rica in 2007/2008.
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Foreword

The lack of adequate environmental sanitation is a major issue related to sustainable development in many parts of the developing world. According to the latest report of the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, more than 2.5 billion people do not have access to improved basic sanitation facilities. The consequences are dramatic, not only with regard to the health situation of hundreds of millions of people, but also in terms of the impact on national economies. Readers of the *British Medical Journal* recently identified the improvement of sanitation in industrialised countries as “the most important medical advance since 1840”. Therefore, finding new ways to improve the environmental sanitation situation in the developing world is one of the main challenges of this century. This need is also reflected in the Millennium Development Goals (MDGs), an integrated set of time-bound targets set at the United Nations Summit in September 2000. Among these targets is Millennium Development Target 10: to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

The conventional top-down approach in planning and implementing sanitation facilities, which does not sufficiently consider the needs and means of the beneficiaries, has been identified as one of the main reasons for the appalling lack of sanitation in many parts of the world. In an attempt to develop a new approach that would contribute to the overall goal of “water and sanitation for all within a framework which balances the needs of people with those of the natural environment”, the Environmental Sanitation Working Group of the Water Supply and Sanitation Collaborative Council has conceived the Household-Centred Environmental Sanitation (HCES) approach. The HCES approach is a radical departure from past, central planning approaches as it places the household and its neighbourhood at the core of the planning process. The approach responds directly to the needs and demands of the users but also attempts to avoid problems resulting from purely “bottom-up” or “top-down” approaches.

I am very grateful that it was possible within the NCCR North-South programme, and with the strong commitment of many partners, to test the HCES approach at 7 different urban and peri-urban sites across Africa, Asia and Latin America. Based on the lessons learned in the case studies presented and analysed in this document, the HCES approach can be further developed and improved for the benefit of the many millions of people in urban and peri-urban areas in the developing world who are still deprived of the chance to lead a healthy and productive life owing to lack of access to improved environmental sanitation.



Roland Schertenleib

*Former Chairman of WSSCC Working Group on Environmental Sanitation
Former Head of the NCCR North-South Institutional Partner, Eawag/Sandec*

1 Introduction

The Household-Centred Environmental Sanitation approach (HCES) was conceived in 2000 by the Environmental Sanitation Working Group of the Water Supply and Sanitation Collaborative Council (WSSCC). The HCES concept was described in the 2005 publication *Household-Centred Environmental Sanitation – Implementing the Bellagio Principles in Urban Environmental Sanitation: Provisional Guidelines for Decision-Makers* (Eawag/WSSCC, 2005). However, the guidelines were just that: provisional. What was drafted was a concept based on the combined experiences and practical knowledge of the authors, but it had never been tested in the field.

From 2006 until the end of 2008 the HCES guidelines, and the concept of a participatory top-down/bottom-up planning approach, were tested in 7 different urban and peri-urban sites across Africa, Asia and Latin America. Case studies from four of the seven sites are presented and analysed in this publication. To date, there are few publications that document practice-oriented research into planning concepts. This publication will add significantly to the growing body of literature.

The HCES guidelines propose a 10-step process initiated with a direct request from a community or community leader and culminating with the implementation of plans developed during the planning process. Figure 1.1 shows the steps that were used as a foundation for case studies.

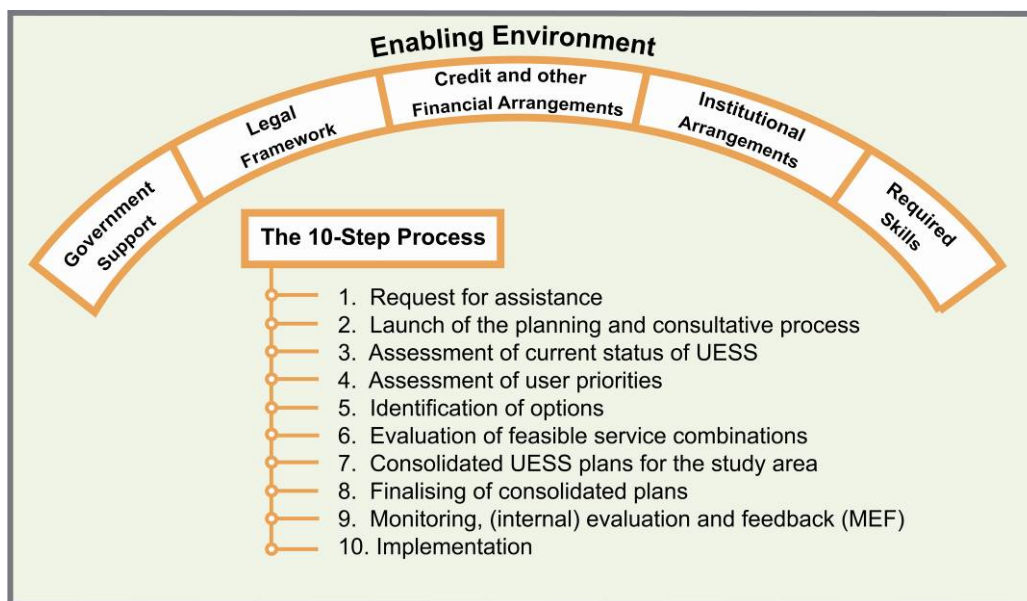


Figure 1.1: The 10-step process in the HCES approach. (Source: Eawag 2005)

However, as the reader will notice, not every case study resulted in a comprehensive, integrated Urban Environmental Strategic Sanitation (UESS) plan. In one sense this could be seen as a shortcoming. But by analysing the barriers and challenges that caused the process either to stall or come to an end, we hope that this knowledge can be used to inform decision-makers who will be facing similar challenges in practice.

The results presented here are the first in what we hope will be a series of publications based on ever-improving guidelines and tools that move in an iterative cycle of testing, analysis, revision, and so forth. The results generated from this first validation step will directly feed into the updated HCES guidelines that will address the barriers and challenges identified in this first testing phase.

More than just summarising 'what' happened during the planning process, the goal of these case studies is to analyse 'why' it happened the way it did.

This publication is unique for several reasons:

- The range of case studies: the case studies cover 3 continents, from small sections of dense urban areas to large, peri-urban communities;
- The range of success: fully completed, as well as partially completed case studies are presented, along with the reasons for respective successes and failures;
- Duration of the study: the planning process was not constrained by a strict timeline: the true length of the participatory planning process is exposed.

Though we attempt to show the complexity of stakeholder interactions, the impact of politics, and the frustration of bureaucracy, words cannot adequately describe the true reality of participatory planning. Crowded, sweltering meeting rooms, late-night negotiations, tense discussions and many hours waiting for appointments characterise this far-from glamorous procedure. But even more memorable were the small steps: when the municipality finally sent an engineer to discuss options; when an older man drew his dream toilet with a stick in the sand; or when more writing paper had to be found because a previously uninterested audience began to take rapid notes.

The case studies, and the conclusions gleaned from them, show us that planning, though it can be guided by a structure such as HCES, is somewhat unpredictable and case-specific and requires an extremely good understanding of the 'enabling environment' and local power dynamics. The energy, effort and commitment of the numerous families, officials, NGO representatives and researchers cannot be overstated, and as the reader will see in the concluding chapter, these factors played a considerable role in the success of the validation process.

It is our hope that planners, engineers and policy-makers using the HCES or a similar approach will find this collection of experiences useful and applicable to their own work. We look forward to revising the provisional guidelines based on this work, and to publishing a follow-up collection of case studies based on a modified approach. Until then, we sincerely look forward to comments and thoughts regarding these and other planning experiences, and we hope you find this collection as interesting to read as it was to put together.

2 Hatsady Tai, Vientiane, Laos

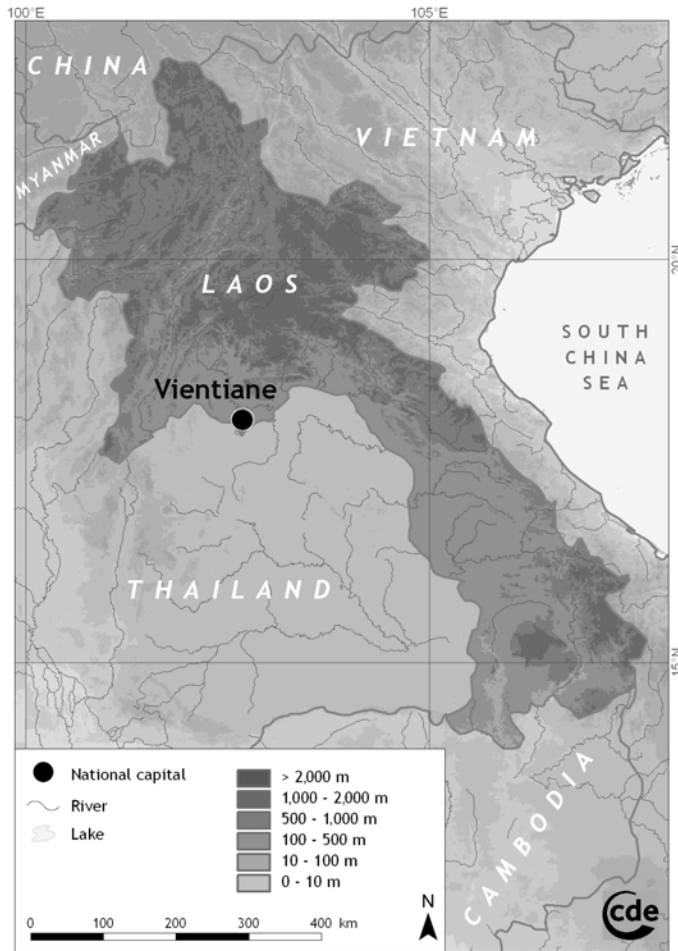


Figure 2.1: Map of Laos. (Source: Centre for Development and Environment [CDE], Switzerland)

Table 2.1: Project details for Hatsady Tai

Project duration:	From July 2007 to April 2009 [21 months]
Project site:	Ban Hatsady Tai, Changthabuly District, Vientiane
Project coordinator:	Public Works and Transportation Institute (PTI)
Main stakeholders:	Village Environmental Unit (VEU), Changthabuly District Authorities (Health Department, Public Works and Transportation Office, Governor), Water Resources and Environment Administration (WREA), VUDAA (drainage and solid waste service provider), mass organisations, residents of Hatsady Tai.
Main beneficiaries:	Low-income residents of Hatdady Tai (approximately 275 inhabitants)
Funding and resources:	Two grants of about US\$ 16,500 and US\$ 48,000 from Sandec and the NCCR North-South research programme; private contributions totalling US\$ 3,800.
Main outputs	Construction/rehabilitation of approximately 300 m of stormwater drainage; construction of 3 community wastewater collection and treatment systems; implementation of a solid waste management concept; definition of management regulations; training courses on environmental sanitation.

2.1 Introduction

Lao PDR is a landlocked and mountainous country surrounded by Cambodia, China, Myanmar, Thailand and Vietnam. Vientiane, the capital city of the Lao PDR, is by far the largest urban area, with a current estimated population of 600,000 and growing at a rate of 3.3% per annum. Lao PDR is essentially rural, but since the mid-1980s expanded marketing and commercial opportunities following economic liberalisation stimulated rural-urban migration, including a large proportion of poor people in search of better livelihoods. These poor migrants usually arrive in low-income villages such as Hatsady Tai, which are characterised among other things by inadequate environmental sanitation services.

2.1.1 Project site

Hatsady Tai is a typical low-income, unplanned urban village. It is a high-density, low-prestige settlement in the city centre, excluded from higher-level infrastructure upgrading initiatives. Many buildings were illegally built on public land. Hatsady Tai is located in the centre of Vientiane, in Changthabuly District. It has common borders with Ban Hatsady Neua to the north, Ban Nahaidieuo to the east, Ban Nongchan (Morning Market) to the south, and Ban Sisaketh to the West (Figure 2.2).



Figure 2.2: Location of Hatsady Tai (yellow) in Vientiane, project boundaries (red). (Source: Google Earth)

Hatsady Tai was selected as an HCES case study for the following reasons:

- The urban environmental sanitation services (UESS) in Hatsady Tai were inadequate, resulting in environmental degradation, deterioration of living conditions and increased threats to health;
- Improvement of UESS in Hatsady Tai was perceived as a priority issue by local authorities and residents alike;
- The socio-economic and socio-cultural disparities within village boundaries reflected Vientiane's typical characteristics.

Table 2.2: Demographic information for Ban Hatsady Tai.

Population:	275 inhabitants (2008)
Area, density:	1.4 hectares, 196 persons per hectare
Income:	50% of households earn less than 500,000 Kip per month (<US\$ 55 per month)
Average household size:	4.9 persons
Household head:	1/5 women, 4/5 men
Education of household head:	22% of women and 61% of men have secondary (or higher) school education.

2.1.2 Geography, topography, climate

Lao PDR has two distinct seasons. The dry season lasts from November to April, and the wet season from May to October. The temperature in Vientiane ranges between 12°C (December/January) and 38°C (March to May). The relative humidity is generally 75–80% during the rainy season and 65–70% during the dry season. The average annual rainfall is around 1,600 mm in Vientiane, of which about 85% occurs from May to September.

Hatsady Tai was built on a former natural wetland, which was drained in the late 1950s to cope with increasing rural-urban migration. The groundwater level in the project area is very high, averaging 0.5-1.0m below ground level.

2.1.3 Current status of the urban environment

Environmental health

In 2007, the prevalence of water-borne diseases in Hatsady Tai was high, with 14.5% of the population suffering from diarrhoea. While the municipal health department of Vientiane organised awareness campaigns in the village on bird flu, dengue fever and other diseases, there was a lack of awareness about environmental sanitation and its impact on public health.

Water supply

Vientiane draws its water from two intakes, both upstream and downstream of Vientiane, on the Mekong River. In 1998, 81% of the urban households had access to potable water (UN-HABITAT 2001). In Hatsady Tai, water is supplied by Nam Papa Lao, a state-owned enterprise. Households are connected to water meters and pay a monthly charge of about US\$ 2–3 per month to the service provider. The average per capita consumption in Hatsady Tai is estimated at 80–120 litres per day. Most residents of Hatsady Tai are satisfied with the quality, reliability and costs of the water supply.

Sanitation and drainage

It was estimated that almost all (94%) households had access to private sanitation facilities. Most households use pour-flush toilets with soak pits (90%) or septic tanks (10%) as onsite wastewater disposal or pre-treatment facilities. Sanitation facilities are

often poorly designed, constructed and maintained. Flat terrain, a high groundwater table and low soil permeability further contribute to system failure. There is no sewer system in the project area. Septic tank effluent and other wastewaters such as greywater are discharged into the mostly uncovered, natural drainage system (see Figure 2.3). Some households (10%) discharge their greywater into their soak pits, others (15%) discharge on open ground. Women are usually responsible for the in-house maintenance of the toilet facilities. Septic tank and soak pit emptying is a problem for almost 50% of the village (mainly in the low-income core), since vacuum trucks cannot access the pits. In these cases households empty their pits manually by making a hole in the pit and allowing the sludge to run into the stormwater drains. This leads to blockages of the drainage network, frequent flooding and odour nuisance – problems often mentioned by the residents.

Solid waste

In Hatsady Tai, solid waste is collected twice a week by a private service provider, contracted by the VUDAA (Vientiane Urban Development Administration Authority), who also defines collection frequency and collection fees. As alleys and streets within the village are too narrow and do not allow access by four-wheel vehicles, the service provider does not collect solid waste in the project area – residents organise collection and transportation of solid waste to the main road. Waste dumping and burning within the community boundaries are common practices and contribute to drainage blockages, localised flooding, odour problems, aesthetic nuisance and an increased risk of fire (Figure 2.3). Waste segregation and recycling is done by a minority of the households (40%). The average daily waste production is 0.75–1.00 kg per capita, consisting mainly of organic material (30%), plastic (30%), paper (15%), glass, cans and other metals (25%).



Figure 2.3: Rudimentary open drainage, solid waste dumping.
(Photo: Sandec)

2.2 Partner institutions

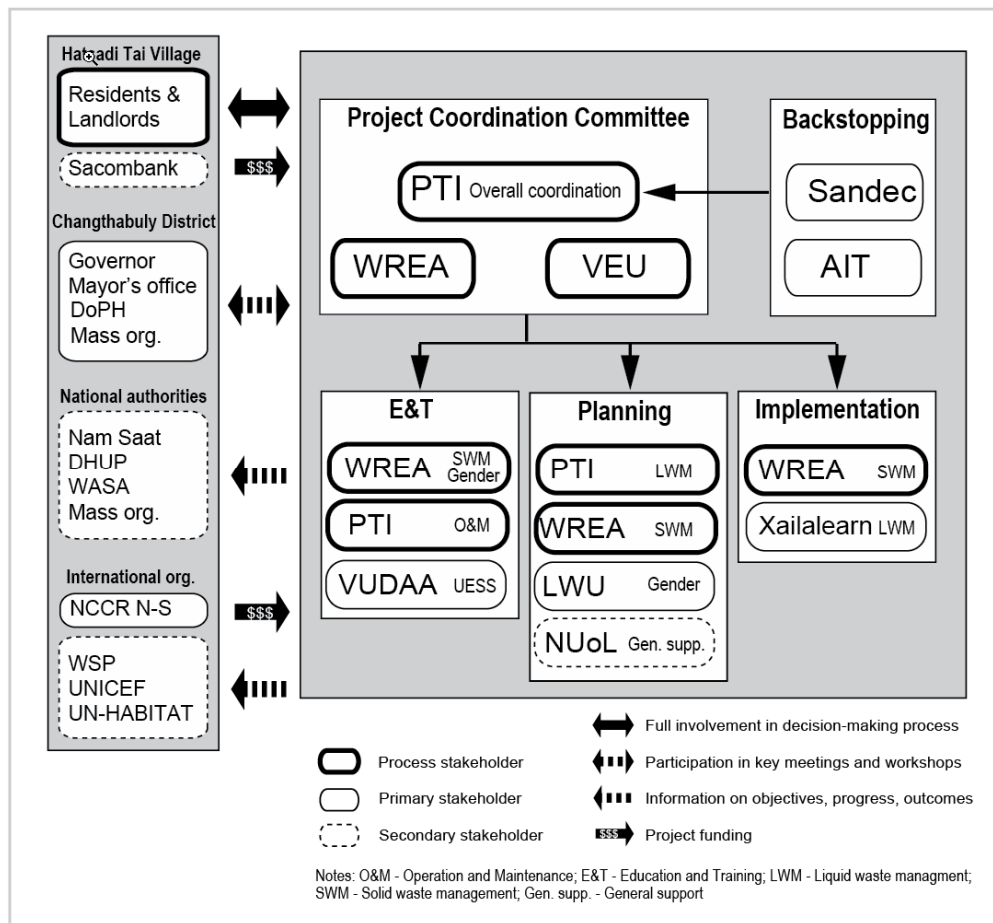


Figure 2.4: Stakeholder map of main HCES stakeholders in Hatsady Tai.

This chapter makes a distinction between process stakeholders, primary stakeholders, and secondary stakeholders. Process stakeholders are understood as the key stakeholders responsible for driving the HCES process and essential to achieving the main outcomes of the HCES validation process. Primary stakeholders are institutions that have a “stake” in the planning process or have the potential to affect or be affected by planning decisions. Secondary stakeholders are other stakeholders who may take part in workshops or meetings but are not essential to the planning process.

2.2.1 Process stakeholders

Public Works and Transportation Institute (PTI)

PTI is a governmental agency under the Minister of Public Works and Transport (MPT). PTI has many years of experience in the implementation of donor-funded projects related to environmental sanitation services and urban development. It was selected as the main HCES project coordinator early in 2007 after being recommended by several governmental and non-governmental institutions. PTI also chaired the project coordination committee (PCC). Contact: Mrs S. Thammanosouth (Director of co-operation and relations division), email: saykhamt@yahoo.com

Water Resources and Environment Administration (WREA)

WREA was established in July 2007 as part of the efforts of the Government of Lao PDR to improve the management of water resources and the environment. It operates under the Prime Minister's Office. On the provincial level, WREA implements programs aimed at increasing public awareness on issues such as health, environmental education, and poverty reduction. WREA coordinated the solid waste management component of the HCES project in Hatsady Tai. Contact: Mrs K. Phumvongxay (Director WREA Vientiane), email: oulaphone@wrea.gov.la

Hatsady Tai Village Environmental Unit (VEU)

The Village Environmental Unit (VEU) was formed in March 2008 during Step 4 of the planning process. The main mandate of the VEU was to ensure community ownership of the UESS during and after project planning and implementation. The VEU is led by a president, and consists of three sub-groups (financial team, technical team and advisory team). Members of the VEU include community representatives of the different neighbourhoods, mass organisations (Lao Women Union, Lao Elderly Association, Lao Youth Union, Lao People's Revolutionary Party), and local authorities. More than 50% of the VEU are women (defined in the Management Regulations). The VEU is presided over by the political head of the village, called the *Naiban*.

2.2.2 Primary stakeholders

Sandec

The Department of Water and Sanitation in Developing Countries (Sandec), Swiss Federal Institute of Aquatic Science and Technology (Eawag), is coordinating validation of the Household-centred Environmental Sanitation (HCES) programme internationally. Sandec assisted the PCC in implementing the 10-step process in Hatsady Tai. Sandec provided US\$ 16,500 to PTI to coordinate planning activities. Contact: A. Morel (Programme officer), email: antoine.morel@eawag.ch.

Asian Institute of Technology

The School of Environment, Resources and Development (SERD) of the Asian Institute of Technology (AIT) in Bangkok, Thailand, provided technical and scientific assistance to the HCES project. Contact: T. Koottatep (Ass. Professor at SERD/AIT), email: thamarat@ait.ac.th

Changthabuly district authorities

Plans related to urban development, public health, transportation etc., are decided at district level. For this reason, district authorities (Vice-Governor, Public Health Office, Public Works and Transportation Office) were involved as advisors in different steps of the HCES planning process. They played a central role in negotiations with households (relocation of houses, household connections) and with private service providers (solid waste collection).

Mass organisations, civil society

“Mass organisations” in the Lao PDR participate widely in development activities and perform some functions that NGOs fulfil in other countries. While closely linked to the governing Lao People’s Revolutionary Party (LPRP), these mass organisations have extensive organisational networks stretching from the top of the central hierarchy down to the village level. Mass organisations involved in the HCES project include local branches (at the village and district level) of the Lao Women’s Union (LWU), the Lao Youth Organisation (LYO), and the Lao Front for National Reconstruction (LFNR).

Xaichalern Construction Company

Xaichalern Comp. Ltd. was contracted based on a competitive bidding procedure. Xaichalern implemented the liquid waste management component developed by the project team. Components included the rehabilitation of 15 private toilets, the construction of the drainage system, and the construction of the small-bore sewer system with semi-centralised treatment.

NCCR North–South

The National Centre of Competence in Research (NCCR) North-South, through its PAMS programme, provided US\$ 48,000 for field-testing the HCES approach in Vientiane. (www.north-south.unibe.ch). PAMS are a vehicle for testing the applicability of development research results. Each project is designed to implement strategies developed jointly by researchers and local stakeholders. Based on a transdisciplinary approach to development research, PAMS are meant to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

VUDAA

The Vientiane Urban Development and Administration Authority is responsible for the planning, implementation, management and control of basic urban infrastructure such as roads, drainage, solid waste collection and disposal, and sanitation in Vientiane. VUDAA was involved as an important discussion partner and advisor in the development of the UESS plans. VUDAA also facilitated an awareness-raising workshop on the benefits of improved environmental sanitation services.

2.2.3 Secondary stakeholders

A wide range of institutions was involved in the planning process. Though they had little influence on the decision-making process, they deserve to be mentioned here:

NUoL

The National University of Lao PDR supported PTI in conducting field investigations and in facilitating community consultation workshops.

Private consultants

Two small engineering consultancy companies (PDC Survey and Design Co. Ltd., A+ Architecture Co. Ltd.) were involved in the project on a mandate basis. They conducted the topographic survey of the study site, and did detailed designs of drainage, sewer and community wastewater treatment systems.

Sacombank

The branch of this bank located in the project area financed one drainage line (approximately US\$ 3,800).

WSP, UNICEF, UN-HABITAT

Experts from these international organisations were invited to participate in different strategic workshops.

National sector agencies

The Lao Agency for Rural Water Supply and Sanitation (Nam Saat), the Department of Housing and Urban Planning (DHUP), and the Water and Sanitation Authority (WASA) were consulted in several workshops and were regularly informed about the progress of the project.

2.3 Enabling environment

2.3.1 Laws, policies and strategies

National policies, and the strategies adopted to implement them, support the basic principles of the HCES approach. Increased access to adequate urban environmental sanitation services (UESS) is recognised as an important element in socio-economic development, and is highlighted as a priority intervention in the government's Sixth Five-year Socioeconomic Plan 2006–2010. The Prime Ministerial Decree 14 (2000) provides for a decentralised planning system, delegating planning and implementation responsibilities to the district and village level, respectively, and promoting community participation in the development process. However, a number of factors hinder the effective implementation of the decentralisation policy, including the lack of supportive planning guidance. In practice, participatory planning has not usually been successfully applied in sub-district planning. The HCES planning approach was acknowledged by national (MPT, DHUP, WASA, PTI) and provincial authorities as a promising framework.

Legislation, regulations and standards are partly hindering and partly enabling: Legislation related to urban planning and provision of environmental sanitation services has evolved quickly in Lao PDR. Inconsistencies have surfaced in different pieces of legislation as a result of different ministries leading the development of sector-specific legislation. Principal inconsistencies include overlapping mandates given to different ministries and a lack of regulations and supporting environmental standards. Finally,

enforcement of standards and codes remains minimal. The main laws and related management instruments that affect the provision of UESS include:

- Water and Water Resources Law, and the related National Water Sector Strategy and Action Plan;
- Environmental Protection Law, and the related Regulation on the Monitoring and Control of Wastewater Discharge;
- Land Law, and the related Regulations of Land Uses and Titles;
- Hygiene and Disease Prevention Law, and the related Drinking Water Standard, Water Supply and Sanitation Standard;
- Urban Planning Law, and the related Regulation related to Urban Planning, Housing, Domestic Drainage System and Design.

2.3.2 Institutional framework

The definition of national urban development strategies and the elaboration of master plans are the responsibility of the Ministry of Public Works and Transportation (MPT), but district authorities have gained important decision-making power in the framework of the decentralisation process launched by the Government of Laos in 2000. Village development plans are decided at the district level. In Vientiane, VUDAA is responsible for the implementation, management and control of basic urban infrastructure such as roads, drainage, solid waste collection and disposal, and sanitation. Also included in VUDAA's mandate is the collection of fees for the use of urban services and infrastructure. In Hatsady Tai, this mandate is handed over to a private service provider. Private Sector Participation (PSP) for design, construction and management of water supply and sanitation infrastructure is steadily increasing, especially in Vientiane.

The duties and responsibilities of the main institutions working in the field of urban planning and environmental sanitation are presented in Chapter 2.2.

2.3.3 Land tenure and property rights

Lack of access to land and housing is a critical issue in Vientiane. In a study in 2001, women ranked insecurity of tenure as the second priority problem after flooding. According to this study, lack of formal land rights makes people reluctant to invest in their houses and services (UN-HABITAT 2001). Since 2000, the government has had a strategy of moving toward implementation of a land registration system and issuing titles to all landholders. In Ban Hatsady Tai, about one-third of the land still belongs to the government. Many private buildings were partly constructed on public land without a permit.

2.3.4 Skills and awareness

Under-developed governmental staff capabilities, in terms of both quality and quantity, are a major constraint in the promotion of sustainable environmental management in

Lao PDR (World Bank 2006). Technical capacity at the provincial, district and village level is generally low. The government is working with several donors to strengthen the capacity of staff through both management and on-the-job training (e.g. in the framework of the Mekong Water and Sanitation Initiative financed by UN-HABITAT or the Small Towns Water Supply and Sanitation Sector Project financed by ADB).

2.3.5 Financial arrangements

The government of Laos has limited financial resources for provision of UESS. In the past, investments related to upgrading environmental sanitation were funded through international grants and loans. While sanitation improvement initiatives are still financed mainly through foreign investments, some financing mechanisms and policies have been introduced to reduce dependency on international donors. These include the Lao Environmental Protection Fund (EPF), the principle of cost recovery for environmental sanitation service provision, and micro-credit schemes. In Hatsady Tai, a village development fund is used to finance micro-credits for community development initiatives (see Box 2.1).

Box 2.1: Enabling environment at a glance

- Government support is given, in terms of political support and enabling policies and strategies.
- At the village level, a Village Development Fund is operational and can be used to finance micro-credits for community development projects.
- National laws are inconsistent, but basically support a participatory, bottom-up, pro-poor approach. Technical standards and codes are still lacking, and law enforcement is weak.
- Capacities and skills at the provincial, district, and village level to plan, implement, and operate UESS are lacking.

2.4 The planning process

2.4.1 Request for assistance (Step 1)

The HCES planning process was launched in 2007. A Sandec-AIT exploratory mission took place in January 2007 to inform relevant national and provincial authorities (PTI, MPT, DHUP, WASA, VUDAA) and international organisations (WSP, ADB) about the project goal and objectives, select potential sites for validation, and identify viable process stakeholders. PTI was finally appointed as the project coordinator. An MoU and a contract between PTI and Sandec were drafted, after which the partners started the planning process with the identification of the enabling environment. Ban Hatsady Tai was selected as the project site following an official request for assistance, submitted by the village authorities to PTI.

Box 2.2: Main outputs of Step 1

- Expressed request for assistance from local authorities of Hatsady Tai
- MoU and contractual agreement between main partners (PTI, Sandec, AIT)

2.4.2 Launch of the planning and consultative process (Step 2)

The project was officially launched during two workshops conducted in July 2007. Prior to the official launching workshop, a community workshop was organised with the aim of identifying the main issues in the village, mapping current environmental sanitation services, and discussing the suggested planning process (HCES approach).

Community workshop

The half-day community workshop was organised in the village meeting room of Hatsady Tai and attended by 60 community members, representatives of local authorities, mass organisations, PTI, and Sandec (25 women, 35 men). The goal of the workshop was to present and discuss the project idea and the HCES planning procedure, to conduct a rapid assessment of the current UESS, and to identify the main stakeholder groups in the village. Focus group discussions and problem mapping were used as the main participatory assessment methods.

Official launching workshop

The project was officially launched on 11 July, 2007 in the framework of a multi-stakeholder workshop conducted at PTI. The objectives of the workshop were to validate the project site, formalise the process (i.e. the HCES methodology), identify relevant stakeholders, review the current political and legislative environment in Lao PDR, and set up a project coordination committee. The workshop was attended by participants representing relevant national, provincial and district level authorities, NGOs, academia, and village representatives. A major issue mentioned by the workshop participants was the need to identify funding sources at a very early stage of the project. As a result, PTI (together with Sandec and the *Naiban*) developed a project proposal that was successfully submitted to the Swiss-funded NCCR North-South programme (PAMS project, US\$ 48,000).

Box 2.3: Main outputs of Step 2

- Delimitation of project boundaries
- Problem statements for the different UESS
- Approved planning methodology (HCES)
- Definition of Project Coordination Committee (PCC)

Box 2.4: Further reading



Souksakhone P. Thammanosouth S, Morel A. 2007. *HCES Project Community Workshop in Hatsady Tai*. Report of the Community Workshop on HCES in Hatsady Tai, Vientiane, Lao PDR, 8 July, 2007. Vientiane, Lao PDR: Public Works and Transport Institute (PTI). (Report of the community consultation workshop (8 July, 2007)).



Morel A, Thammanosouth S. 2007. *HCES Project Launching Workshop in Hatsady Tai*. Report of the Official HCES Project Launching Workshop in Hatsady Tai, Vientiane, Lao, 11 July, 2007. Vientiane, Lao PDR: Public Works and Transport Institute (PTI). (Report of the official launching workshop (11 July, 2007)).

2.4.3 Assessment of current environmental sanitation services (Step 3)

Environmental sanitation services were assessed by a multi-disciplinary team led by PTI in close collaboration with the community and the local authorities. Data related to socio-economic conditions, health and hygiene conditions, the state of housing and shelter, land tenure, administrative organisation, current UESS, etc., were collected using three methods: (a) household surveys (48 households were interviewed); (b) key informant interviews (village, district and provincial authorities; service providers); and (c) generation of detailed maps of the project site, using satellite images and conventional surveying tools. The outcomes of the participatory rapid assessment and mapping exercise conducted in Step 2 were used as a basis for the detailed assessment.

In brief, the UESS assessment revealed that current environmental sanitation services were poor and demand for improvements was high. Most households (90%) rely on old and defective cesspits for wastewater disposal. The project area is regularly flooded due to inadequate stormwater drainage. Access roads are very narrow and not accessible for service vehicles such as solid waste collection trucks or vacuum trucks. The assessment also concluded that the community and the local authorities were eager to improve the prevailing conditions, and willing to actively participate in the process. The assessment report was approved by the community and the local authorities during the Step 4 workshop attended by all relevant stakeholders (see below).

Box 2.5: Main outputs of Step 3

- Assessment report
- Topographic and thematic maps of the project area

Box 2.6: Further reading



Duannouluck M, Thammanosouth S, Chanthala T, Morel A. 2008. *UESS Assessment Report Hatsady Tai. Outcomes of the HCES project Step 3.* Vientiane, Lao PDR: Public Works and Transport Institute (PTI).

2.4.4 Assessment of user priorities (Step 4)

A one-day community consultation workshop was conducted on 18 January, 2008. Fifty-three people (26 women, 27 men, see Figure 2.5) participated at the workshop, facilitated by PTI and Sandec. The objective of the workshop was to endorse the assessment report, to define UESS priority issues, and to elect a Village Environmental Unit (VEU). In the afternoon, there was a special session facilitated by WREA, aimed at raising awareness of the health and environmental implications of inadequate UESS, and at creating demand for improved services. VUDAA presented two UESS projects that were successfully implemented in other villages in Vientiane.

Participants were asked to assess the quality of the assessment report and to prioritise UESS components (water supply, drainage, sanitation, solid waste) through anonymous pocket voting. Votes of women and men were analysed separately. Figure 2.5

shows that drainage was ranked as the highest priority issue by both women and men, followed by solid waste and sanitation.

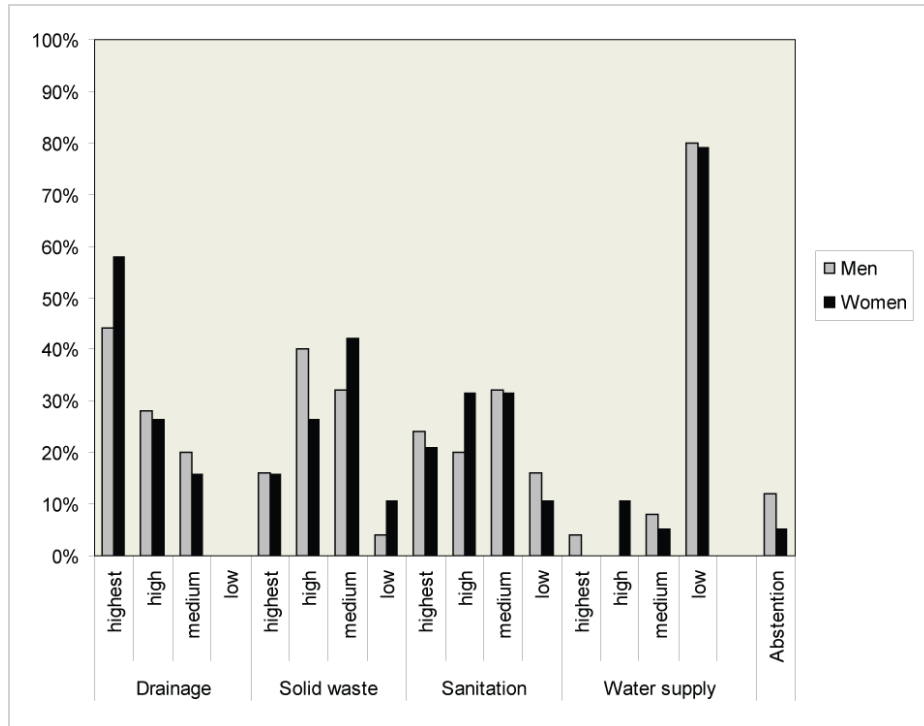



Figure 2.5: Priorities related to UESS set by the community.

Terms of Reference (ToR) and members of the Village Environmental Unit (VEU) were suggested to the community by the Head of the village (*Naiban*) together with PTI. The ToR and the members of the VEU were approved by a majority vote. The first VEU meeting was presided over by Mrs. Khamvanh (mayor of the village), and consisted of 6 women and 3 men, representing the different interest groups in the village (residents, mass organisation, local authorities) and the project coordinator, PTI.

Box 2.7: Main outputs of Step 4

- Approved assessment report
- Environmental priority issues (drainage, solid waste and sanitation)
- Formation of Village Environmental Unit (VEU)

Box 2.8: Further reading

 Duannouluck M, Thammanosouth S, Chanthala T, Morel A. 2008. *HCES Project in Hatsady Tai Village, Vientiane*. Step 4 Workshop Report. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).

2.4.5 Identification of options (Step 5)

Possible options to improve the current UESS in Hatsady Tai were determined in two steps (expert meeting, project coordination meeting). The UESS assessment report (outcome of HCES Step 3), the priorities defined by the community (outcome of

HCES Step 4), and a draft version of the Compendium of Sanitation Systems and Technologies (Tilley et al 2008) were used as starting points to identify options.

Expert meeting

The applicability of different sanitation systems was first assessed by urban planning and sanitation experts from PTI, Sandec, and MPT (9 February, 2008 at PTI). The different systems suggested by Tilley et al (2008) were discussed and their applicability to Hatsady Tai assessed, based on a list of pre-defined questions. The main factors that influenced the pre-selection were:

- a) People traditionally use water for flushing and anal cleansing;
- b) The reuse of human waste (including urine) is not culturally acceptable in Lao PDR;
- c) Housing density is very high;
- d) Soil infiltration capacity is low and hinders localised infiltration of wastewater;
- e) The existing water-based sanitation system is well accepted.

Project coordination committee (PCC) meeting

Three systems pre-selected by the expert group were next adapted to the local context (with translated and simplified system templates) and discussed within the Project Coordination Committee (PCC) (Figure 2.6). The PCC concluded that the main sanitation products (stormwater, blackwater, greywater) would be most efficiently managed by a combination of two sanitation systems that could also build on existing sanitation services.



Figure 2.6: Adaption of system templates to the local context. (Photo: Sandec)

The proposed system consisted of rehabilitating and converting existing cesspits into sedimentation chambers for the pre-treatment of blackwater and greywater, and connecting the chambers to a solids-free, shallow-depth sewer system with semi-centralised anaerobic treatment. The effluent of this system would be discharged together with effluent from existing household septic tanks to an improved stormwater drainage network that would be connected to the city drainage network. Faecal sludge management would be handed over to private service providers.

Box 2.9: Main outputs of Step 5

- Basic liquid waste management concept
- Main implications (financial, institutional, social, environmental) of the concept discussed

Box 2.10: Further reading



Duannouluck M, Thammanosouth S, Chanthala T, Morel A. 2008. *Definition of Environmental Sanitation System for Hatsady Tai*. Outcomes of the HCES project Step 5 and 6, Hatdady Tai. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).

2.4.6 Development of UESS plan (Step 6/7)


The first plans of the UESS were drafted by PTI, with the support of a private consulting company (A+ Architecture Co. Ltd.). The plans included possible layouts of the system (i.e. the placement of drainage channels, sewer and semi-centralised treatment systems, technological options for drainage and wastewater treatment), cost estimates, and O&M requirements for each component. A solid waste management concept was developed by WREA and the VEU. The plans drafted (see ) were first discussed within the PCC, and later presented and discussed at a community consultation workshop (6 May, 2008). Although the basic sanitation concept was approved by the participants, a series of recommendations and requests was formulated to address perceived shortcomings (e.g., a revision of the topographic map, cost estimates for upgrading household infrastructure; see Table 2.3).

Table 2.3: Implications of the project approved by beneficiaries and local authorities in the framework of Steps 6/7

The beneficiaries agreed to:	The local authorities agreed to:
<ul style="list-style-type: none"> • Cover investment costs at household level (retrofitting of cesspits, connection to sewer system, approx. US\$ 30 per capita) • Retrofit some buildings that hinder implementation of UESS • Provide land for implementation of drainage and semi-centralised wastewater treatment • Contribute (in kind, labour or cash) to implementation and O&M of UESS; • Cover the costs for O&M (US\$ 0.6 per capita per month). 	<ul style="list-style-type: none"> • Support low-income households in mobilising funds for household infrastructure improvements • Review and adapt institutional setup and implement regulations to guarantee sustainable management of UESS (financial management, O&M) • Negotiate the connection to city services (drainage, maintenance of wastewater treatment systems, etc.) with higher level authorities • Assure that the community contributes to implementation and O&M of UESS.

Box 2.11: Main outputs of Step 6/7

- UESS plans approved by community and local authorities
- Implications of project accepted by beneficiaries and local authorities
- Provision of land by 2 households for construction of wastewater treatment system

2.4.7 Finalising the UESS plans (Step 8)

This step took place in three stages.

First, the PCC revised the plans developed under Step 6 and 7, by integrating the outcomes of the community consultation process. Detailed infrastructure improvement plans were developed and cost estimates for household infrastructure improvements were re-assessed. Management regulations (defining the institutional setup, financial mechanisms, O&M procedures) were drafted based on national and international experience.

In a second step, the revised plans were presented and discussed at a key stakeholder consultation workshop (6 August, 2008), where representatives of relevant sector agencies, district authorities, regulatory bodies etc., participated. The plans were critically reviewed, and possible improvements were identified. The UESS plans were ultimately approved by all key stakeholders, and commitments were made (Box 2.12). An important outcome of the meeting was the decision by the District authorities that all roads in the project area should be widened to a minimal width of 4 m to guarantee fire protection. This decision had important implications, as it required 13 buildings to be renovated. For this purpose, a relocation negotiation committee was established, headed by the District Vice-Governor.

Box 2.12: Main commitments of the different parties in the framework of Step 8

- PTI will contract a private construction company to implement the liquid waste management concept (based on competitive bidding), finalise management regulations, define detailed project timeline, second VEU in construction supervision, and develop final project reports.
- *Naiban* and VE will collect household contributions for household infrastructure improvements, supervise construction work, assure household participation in construction, negotiate with households that need to retrofit their houses, and implement management regulations.
- VUDAA will approve and support connections to wider city infrastructure (drainage), and advise WREA in the implementation of solid waste management concept.
- WREA will implement solid waste management concept, support PTI in the development of management regulations, and develop final project report.
- District authorities (Vice-Governor) will support *Naiban* in the identification of funding sources for low-income households and lead the relocation negotiation committee

Management regulations for the UESS were developed in a third step. The process started with a VEU workshop held on 7 August, 2008, in which the institutional setup and the responsibilities of the VEU were adapted and management principles were defined. PTI was given a mandate by the VEU to develop detailed management regulations and O&M procedures. These regulations were finally endorsed by the District authorities and the VEU in April 2009.

Box 2.13: Main outputs of Step 8

- Tendering document for final UESS plans
- Management regulations for UESS

Box 2.14: Further reading

Morel A, Duannouluck M, Thammanosouth S, Chanthala T. 2009. *Management Regulations for UESS in Hatsady Tai*. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).

2.4.8 Monitoring, evaluation and feedback (Step 9)

A project performance monitoring and evaluation procedure was developed by the PCC at the start of the project. A set of indicators was defined based on the project framework and objectives. Gender-specific indicators were defined whenever possible and appropriate. Post-project evaluation will be conducted in 2010 to assess the sustainability of the project and the long-term impacts on the village and community.

2.4.9 Implementation (Step 10)

An official invitation to bid for the procurement of construction services was published in December 2008. The bidders were evaluated based on the price and quality of the bid. Xaichalern Construction Company was selected from among the four domestic bidders to implement the plans related to stormwater drainage, household sanitation infrastructure, and wastewater collection and treatment. WREA implemented the solid waste management component following the ToR defined in a contractual agreement with PTI.

The construction of the liquid waste management component started on 2 January, 2009, and was completed on 30 March, 2009. Community members participated voluntarily and informally, e.g. by providing food and shelter for the workers, deconstructing obstructing parts of their houses, participating in the village cleaning campaigns, etc. The construction work was done manually without heavy machinery (Figure 2.7). The usual problems were encountered during construction, such as groundwater infiltration, obstructing water supply pipes, tree roots, etc. Thirteen buildings had to be renovated to allow construction. Minor conflicts between the construction company, the construction supervisors (PTI), the Project Coordination Committee (PCC), and the residents of Hatsady Tai were solved ad-hoc. More serious issues such as the partial deconstruction of three houses or the collection of residents' financial contributions to household sanitation improvements were managed by a negotiation committee, chaired by the District Vice-Governor.

Implementation of the solid waste management concept started with a village cleaning campaign (17 January, 2009). The concept consisted of:

- a) Improving household waste management practices (i.e. segregation, recycling, composting);
- b) Organisational adaptations (i.e. transfer of SWM responsibilities from an accredited service provider to local authorities and VEU); and
- c) Financial reforms (i.e. re-negotiation of waste collection tax).

Solid waste management equipment, including 70 collection baskets and conventional cleaning equipment, was provided to households and to the local authorities, respectively. Small-scale composting schemes were installed in 15 households. In the period from January to February 2009, WREA conducted 10 household inspection campaigns to assess living conditions in the houses in general, and waste management practices in particular. A rating system was introduced to reward families with improved living conditions.

The resulting physical interventions, as well as other outputs from the planning and implementation process are summarised in the next section.



Figure 2.7: Participants of the priority setting. (Photo: Sandec)



Figure 2.8: Construction of new infrastructure without heavy machinery. (Photo: Sandec)



Figure 2.9: New stormwater drainage in Hatsady. (Photo: Sandec)



Figure 2.10: Community septic tank treating the wastewater of 20 households. (Photo: PTI)

2.5 Timeline

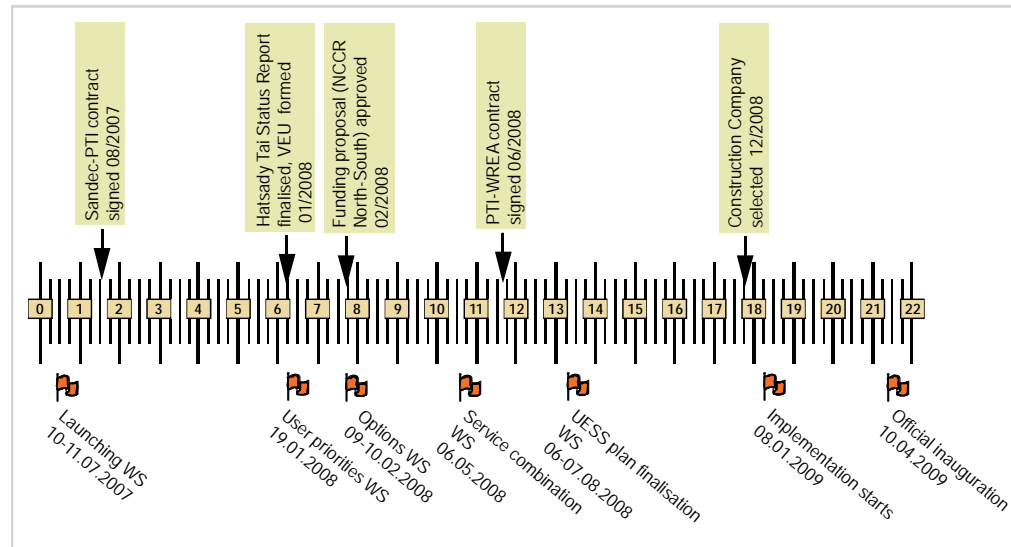


Figure 2.11: Timeline of HCES activities in Hatsady Tai 2007–2009.

2.6 Project outputs and outcomes

2.6.1 Project outputs

The project benefited about 275 residents in the centre of the village by providing improved urban environment sanitation services, i.e. stormwater drainage, liquid and solid waste management (Figure 2.9 and Figure 2.10).

The project's institutional interventions have focused on the establishment of a VEU who is in charge of managing the environmental sanitation services. Management regulations which define the responsibilities and roles of all members of the VEU, the local authorities, and the residents, were developed and implemented.

The project tried to adequately consider gender issues by including the Lao Women Union (LWU) in all strategic steps of the project. Gender sensitivity was directly addressed in a training course on gender equality and environmental sanitation and in the different community workshops. Special attention to gender issues was given when establishing the VEU committee (at least 40% female representation).

No household was relocated. Approximately 80 m² of land were provided voluntarily by two private landowners. Thirteen households were forced to renovate their buildings in order to allow for construction of the drainage network (mainly fences or walls and land along the drainage). Three houses had to be substantially deconstructed.

The main interventions related to infrastructure, management, capacity building and awareness raising are summarised in Table 2.4: Interventions related to the improvements of the ESS in Hatsady Tai.

Table 2.4: Interventions related to the improvements of the ESS in Hatsady Tai.

Infrastructure improvements	
Sanitation:	<p>Rehabilitation/construction of 15 private toilets, including improved squatting pan, storage chambers, and connections to the sewer system.</p> <p>Construction of a wastewater collection and treatment system servicing 32 households, comprising (a) a small-bore sewer (265m), and (b) 3 community septic tanks to treat the effluent of the sanitation facilities and greywater conveyed by the small-bore sewer.</p>
Drainage:	<p>Construction of 4 drainage lines (303 m). The drainage lines are partly covered (168 m) and partly open (135 m). For the purpose of drainage improvement and increased accessibility, 13 houses were backfitted or reconstructed.</p>
Solid waste:	<p>Provision of basic solid waste collection equipment (waste baskets) to 70 households. Small-scale composting schemes provided to 15 households (for testing and demonstration purposes).</p>
O&M equipment:	<p>Installation of a storage room in the community hall, with material for the O&M of the UESS.</p>
UESS management Improvements	
Institutional reforms:	<p>Creation of a Village Environmental Unit (VEU), with appropriate representation of the different local stakeholders (authorities, community representatives, mass organisations), and clear ToRs and reporting procedures for all stakeholders.</p>
SWM concept:	<p>Revised solid waste management concept, with re-defined responsibilities (i.e. house-to-house collection of SW by contracted community members), installation of sub-collection points, adjusted waste collection fees.</p>
Management regulations:	<p>Revised management regulations with updated infrastructure plans, O&M procedures for liquid and solid waste management components, financing procedures, reporting structure.</p>
Awareness raising and capacity building	
Training courses:	<p>Half-day training course on improved solid waste management (type and amount of solid waste generated, segregation of solid waste at source, recycling possibilities, income generation through solid waste recycling, etc.) for 53 community members.</p> <p>Half-day training course on household solid waste composting for 15 community members.</p> <p>Five-day training course for local authorities on gender-sensitive environmental management, with participation of members of the PCC (<i>Naiban</i>, PTI) (funded by AIT and CIDA).</p> <p>One-day training course on O&M for improved UESS conducted for 20 VEU members and community representatives (scheduled for June 2009).</p>
Awareness raising activities:	<p>Community workshop on improved solid waste management and the role of women in UESS provision, facilitated by WREA and VUDAA (45 community members)</p> <p>Awareness raising through community dialogue, i.e. community involvement in the assessment of current environmental sanitation services (Step 3), definition of priority issues (Step 4)</p> <p>Village cleaning campaigns (2) coordinated by WREA. Slogans such as "Cleaning is the behaviour of civilised people" were displayed during the campaigns.</p> <p>Ten participatory assessments of indoor and outdoor living conditions for 70 households, with rating and awarding procedure.</p>

2.6.2 Project outcomes and impact

Mid- to long-term effects of the project can only be assumed at this stage. It is expected that the project will have a beneficial impact on both the health and well-being of the community, and on the village economy.

Health benefits will come from: (a) improved environmental sanitation infrastructure; (b) increased use of domestic sanitation facilities (due to increased awareness); (c) increased knowledge and awareness of health and hygiene issues.

The village economy will benefit from enhanced productivity as a result of health improvement and increased urban efficiency arising from improved drainage and sanitation.

2.7 HCES planning and implementation costs

Sandec signed a contract worth US\$ 16,500 with PTI for the HCES validation in Vientiane. An additional US\$ 48,000 was provided for planning and implementation process through a PAMS project funded by the NCCR North-South. Other expenses were covered by the households (including household sanitation improvement and land provision; approximately US\$ 4,000) or third parties (US\$ 3,800 provided by Sacombank for the construction of a 60 m-long drainage network). Total planning and implementation costs amounted to US\$ 263 per targeted beneficiary (275 inhabitants).

Xaichalern Company Ltd. was sub-contracted to implement the liquid waste infrastructure component (i.e. the stormwater drainage and wastewater collection and treatment system). The contract was worth US\$ 27,000 (US\$ 20,000 material costs and US\$ 7,000 labour costs). The solid waste management component was planned and implemented by WREA. The contract, worth US\$ 5,600, included planning, evaluation and documentation costs (US\$ 2,500), implementation costs (US\$ 1,900), and costs related to training (US\$ 1,200). Project costs and cost-sharing are summarised in Table 2.5.

Table 2.5: Overview of project costs and contributions by beneficiaries.

Items	Total expenses (in US\$)	Expenses (in US\$) covered by			
		Sandec	NCCR North-South (PAMS)	Beneficiaries	Sacombank
Personnel costs (salaries, consultancy fees, DSA)	11,000	4,500	6,500	–	–
Equipment / infrastructure	40,000	5,000	27,200	4,000	3,800
Fieldwork expenses, consumables	10,700	5,000	5,700		–
Training courses	4,000		4,000		–
Travel expenses	4,200	1,000	3,200		–
Miscellaneous (taxes, VAT, etc.)	2,500	1,000	1,500		–
Grand Total	72,400	16,500	48,100	4,000	3,800

2.7.1 Contribution by the beneficiaries

The contribution by the beneficiaries to the total costs is difficult to quantify. Non-monetary contributions including workshop attendance, participation in meetings, informal discussions, provision of food for construction workers, etc., were considerable in this project. Though the monetary value of these contributions cannot be quantified, the original target of a 10% contribution by the beneficiaries to the total costs (i.e. \$ 7,300) can be assumed.

2.7.2 Operation and maintenance costs

The operation and maintenance costs of the improved environmental sanitation services are expected to amount to US\$ 0.5-0.6 per beneficiary per month. This covers the costs of labour and materials for routine inspection and maintenance of the liquid waste management system (drainage network, wastewater collection and treatment system), replacement of equipment, and amortisation of the infrastructure, assuming a life span of 30 years. The O&M cost estimation was used to define monthly O&M tariffs for the residents of Hatsady Tai. A monthly fee of US\$ 0.5 was defined by the VEU. The fee will be re-assessed on a yearly basis by the VEU.

2.8 Challenges, constraints and strengths

The following sections summarise the main challenges faced during planning and implementation of the project, and highlight strengths of the planning process.

2.8.1 Challenges and constraints

While there is no reason to question the overall success of the project, a series of challenges was faced. Some of these challenges were external to the project (e.g. national institutional reforms) and therefore could not be addressed by the project coordination team. The following section focuses on the internal challenges, which could have been partly avoided if recognised and addressed early enough.

Project management capacities

The project did not put sufficient emphasis on training and human resource development prior to the planning and implementation of the project. Some training was carried out, but it was not oriented specifically enough towards the core stakeholders of the project (i.e. members of the PCC) and not focused enough on the specificities of participatory assessment, planning and implementation of urban environmental sanitation services. Surveys, workshops, focus group discussions, and other critical steps were not well prepared and were conducted intuitively, without a clear methodological framework. This resulted in patchy and statistically irrelevant information that had to be partly reassessed.

Coordination between implementing agencies

The institutional separation of the planning and implementation of the solid waste component and the liquid waste components (drainage, sanitation) compromised the effectiveness of the project elements. Sharing of responsibility between WREA (coordination of the solid waste management component) and PTI (coordination of the liquid waste management component) with limited coordination and information exchange meant that (i) community consultation was not well organised and thus partly inconsistent or repetitive; (ii) one planning team could not benefit from the interactions of the other team with the community; and (iii) operation and management procedures were defined separately, generating a feeling of confusion among the community.

Involvement of key stakeholders

The importance and the decision-making power of the district authorities were underestimated. This key stakeholder was not involved early and actively enough in the planning process, which compromised full political commitment and thus the smooth management and execution of the project. This was felt especially during Step 8 (finalisation of ESS plans) and Step 10 (implementation), when top-down decisions were taken by the district authorities, jeopardising the outcomes of the participatory planning process. Project implementation (i.e. construction) was complicated by the fact that the local contractor (selected on the basis of the lowest tender) was not involved in the planning process, and thus did not understand the participatory solution-seeking process that had taken place for more than one year. This resulted in ineffective community mobilisation (community contracting) and communication difficulties with the community.

Differing expectations within the beneficiary–implementer–backstopper relationship

There were different interests and expectations among the community (i.e. the beneficiaries), the implementing agencies (PTI, WREA) and the backstopping agency (Sandec). The community expected the implementing agency to provide services as quickly as possible. Sandec, as a research institution, was mainly interested in the planning process, and requested well-defined working plans and progress documentation. PTI, as the main implementing agency, found itself at the centre of this conflict. Despite contractual agreements and a clarified ToR for each party in the PCC (i.e. PTI, WREA, VEU, Sandec, AIT), the roles and responsibilities were interpreted in as many ways as there were parties. Clear project monitoring, feedback, and accountability procedures were missing. Sandec's role in particular was misinterpreted by the local partners (project funding and coordination rather than back-stopping), which resulted in a general lack of pro-active leadership among the local partners.

Limited willingness/ability to pay

During implementation, it was found that the residents were not able to pay for planned household sanitation improvements and were reluctant to take out loans despite the micro-credit scheme established at the village level. This reluctance was not recognised early enough, and not well addressed in community consultation and awareness campaigns. This eventually led to friction between residents and the project coordination committee during implementation. Issues such as the financial contribution of households or cost-sharing for the retrofitting of buildings had to be settled by the negotiation committee, which was presided over by the District Vice-Governor.

Narrow range of applicable technologies

The range of institutionally accepted sanitation technologies for urban areas in Lao PDR is quite limited and heavily based on the principle of "flush and forget". Cultural barriers to such things as the reuse of treated human waste in agriculture were perceived as insurmountable by the project coordination team. This strongly affected the ability to apply innovative technologies, and resulted in rather mainstream technical interventions.

2.8.2 Strengths

Despite the numerous challenges listed above, the project was perceived as very successful by all participating stakeholders. The following section summarises the factors that contributed to project success.

Demand-responsive approach

The project responded to a clear call for assistance by the community and its political leaders to improve environmental sanitation services. Furthermore, it was in line with the initiative of the government to develop standardised participatory urban planning methodologies.

Highly recognised project coordinator

PTI has a proven track record of successful projects in the field of urban planning. This was very useful in the identification of possible project partners (e.g. WREA), the establishment of a planning team, and the mobilisation of high-profile actors in strategically important moments (e.g. launching workshop, finalisation of UESS plans, setting up of relocation negotiation committee etc.).

Local political support and leadership

The *Naiban* played a central role in managing the project and negotiating solutions between the different actors. She helped to bridge the difficult gap between the interests of the community and the higher level authorities, ensured community participation, and mobilised additional funds for the implementation of the drainage system. Under her leadership, new development plans are being developed (e.g. road improvement), and potential funding sources are under investigation.

Community mobilisation and contributions

The participation of the residents in the planning process was extremely positive and beneficial. A majority of the community participated in consultation meetings and training courses. Three households provided some of their land for the installation of semi-centralised wastewater treatment systems; thirteen house owners were willing to remove or replace parts of their houses to allow the construction of the drainage system.

Community-based management structure

The Village Environmental Unit (VEU) proved to be a good instrument to guarantee community representation in the project coordination committee. The VEU members were officially approved by the community, thus giving them the authority to define environmental sanitation service plans for the village. The VEU was fully involved in all strategic project decisions, including the selection of a suitable environmental sanitation system, negotiation with residents on the placement of sanitation infrastructure, the definition of O&M requirements, and the division of responsibilities. The VEU was increased to fourteen members during Step 8, and is now in charge of operating and maintaining the improved sanitation services (Figure 2.12).



Figure 2.12: Involvement of the Village Environment Unit in every step of the decision-making process. (Photo: Sandec)

Involvement of women

Attendance of community members at the project meetings and workshops over the 18-month planning period indicates that the interest of women in environmental issues was more pronounced than that of the male community members. This was well rec-

organised by the project coordination team, who ensured adequate representation of women in the PCC and the VEU. Gender-sensitive planning was guaranteed by involving representatives of the Lao Women Union in all relevant steps of the project, and by providing training for key project staff on gender aspects in environmental management.

2.9 Conclusions







The pilot project in Hatsady Tai helped to improve urban environmental sanitation services for 275 residents by adopting a demand-led and participatory planning approach. More than 300 m of stormwater drainage and three community wastewater collection and treatment systems were constructed, and a solid waste management concept was implemented. Regulations and O&M procedures for the management of the new services were developed and endorsed, and a series of training courses and awareness-raising workshops for environmental sanitation were organised for community members and local authorities.

The fact that the project responded to a clear call for assistance by the community and its political leaders contributed significantly to its success. An important conclusion is that although time-consuming and cumbersome, a comprehensive stakeholder analysis must be conducted at a very early stage of the project. This analysis should also determine the influence and the interest of the different actors in the project. This analysis should ultimately lead to the definition of a strategy for how and when to involve/consult/inform the different actors in the different stages of the project. Another important factor in project success is local political support and leadership. The village head (*Naiban*) was the key node in the project's partnership network. She successfully established the difficult link between the interests of the community and the higher level authorities. Despite the great enthusiasm of the project coordination committee, the application of the HCES approach was not without constraints. In Lao PDR, top-down decision-making processes still prevail (and are partly still expected by the community), and hinder bottom-up approaches. Capacities must be created to facilitate participatory planning processes. The most important pre-condition for the successful application of a participatory planning approach, such as the HCES approach, is that all involved stakeholders, especially the community, understand the rationale of such processes, their respective roles, and the additional effort required.

2.10 Project reports and papers

The following reports and papers are directly related to this project and can be downloaded from www.sandec.ch.

Box 2.15: Reports

-  **Duannouluck M, Thammanosouth S, Chanthala T, Morel A.** 2008. *UESS Assessment Report Hatsady Tai*. Outcomes of the HCES Project Step 3. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).
-  **Souksakhone P, Thammanosouth S, Morel A.** 2007. *HCES Project Community Workshop in Hatsady Tai*. Report of the Community Workshop on HCES in Hatsady Tai, Vientiane, Lao PDR. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).
-  **Morel A, Thammanosouth S.** 2007. *HCES Project Launching Workshop in Hatsady Tai*. Report of the Official HCES Project Launching Workshop in Hatsady Tai, Vientiane, Lao. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).
-  **Duannouluck M, Thammanosouth S, Chanthala T, Morel A.** 2008. *HCES Project in Hatsady Tai Village, Vientiane*. Step 4 Workshop Report. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).
-  **Duannouluck M, Thammanosouth S, Chanthala T, Morel A.** 2008. *Definition of Environmental Sanitation System for Hatsady Tai*. Outcomes of the HCES Project Step 5 and 6, Hatdady Tai. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).
-  **Morel A, Duannouluck M, Thammanosouth S, Chanthala T.** 2009. *Management Regulations for UESS in Hatsady Tai*. Vientiane, Lao PDR: Public Works and Transport Institute (PTI).

Box 2.16: Further reading

-  **Lüthi C, Morel A, Tilley E.** 2008. Integrate at the top, involve at the bottom – The household-centred approach to environmental sanitation. *Proceedings of the IRC Symposium on Sanitation for the Urban Poor, Partnerships and Governance, Delft, The Netherlands: 19–21 November 2008*. Delft, The Netherlands: International Water and Sanitation Centre (IRC).
-  **Thammanosouth S, Duannouluck M, Chanthala T, Morel A.** 2008. Improvement of urban environmental sanitation services (UESS) in Ban Hatsady Tai, Vientiane City, Lao PDR. *Proceedings of the International Conference on Sustainable Urban Environmental Practices, Chiang Ma, Thailand, 28–30 October, 2008*. Bangkok, Thailand: Asian Institute of Technology.

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Abbreviations

ADB	Asian Development Bank
AIT	Asian Institute of Technology
CIDA	Canadian International Development Agency
DHUP	Department of Housing and Urban Planning
Eawag	Swiss Federal Institute of Aquatic Science and Technology
EPF	Lao Environmental Protection Fund
LWU	Lao Women Union
MPT	Ministry of Public Works and Transportation
NUoL	National University of Lao PDR
O&M	Operation and Maintenance
PAMS	Partnership Actions for Mitigating Syndromes
PCC	Project Coordination Committee
PSP	Private Sector Participation
PTI	Public Works and Transportation Institute
Sandec	Department of Water and Sanitation in Developing Countries, Eawag
SERD	School of Environment, Resources and Development, AIT
SWM	Solid waste management
ToR	Terms of Reference
UESS	Urban Environmental Sanitation Services
UN- HABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
VEU	Village Environmental Unit
VUDAA	Vientiane Urban Development and Administration Authority
WASA	Water Supply Authority
WREA	Water Resources and Environment Administration
WSP	Water and Sanitation Programme of the World Bank

3 Waruku Settlement, Nairobi, Kenya

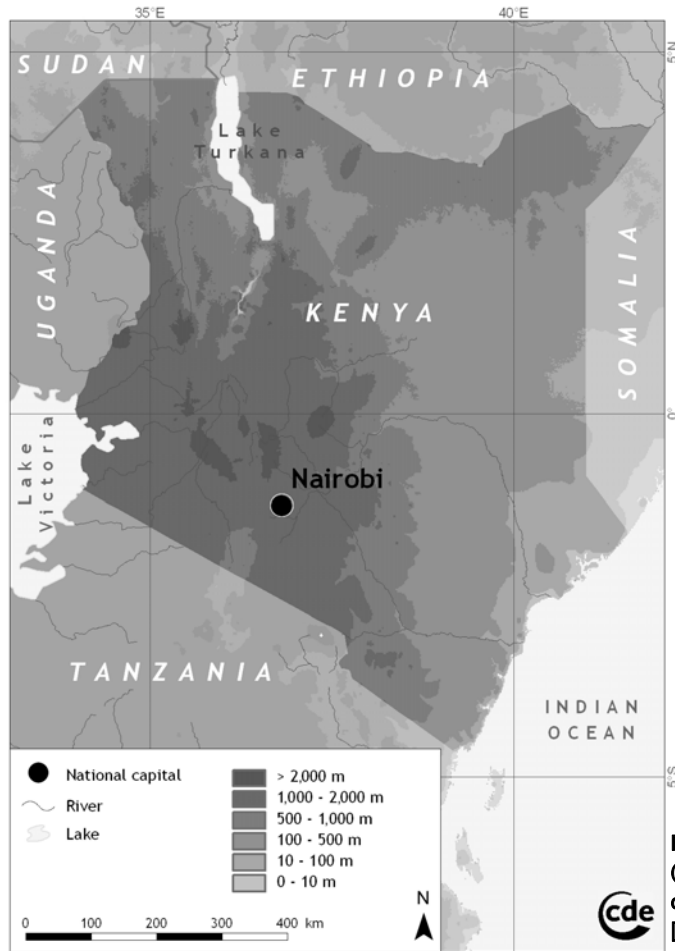


Figure 3.1: Map of Kenya. (Source: Centre for Development and Environment [CDE], Switzerland)

Table 3.1: Project details for Waruku, Kenya.

Project duration:	From January 2007 to November 2008 [23 months]
Project site:	Waruku Village Kangemi, Westlands Division in Nairobi, Kenya
Project coordinator:	Maji na Ufanisi (MnU) (Water and Development – an NGO based in Nairobi).
Main stakeholders:	Waruku Community Development Programme (WACODEP), City Council of Nairobi (Public Health Department), Athi Water Services Board (AWSB), National Environment Management Authority (NEMA), Provincial Administration and the Waruku youth group.
Main beneficiaries:	Residents of Waruku (approximately 7,000 inhabitants)
Funding and resources:	A grant of 16,000 CHF (US\$ 14,000) from Eawag and in-kind contributions from Maji na Ufanisi (technical expertise and logistics) and WACODEP.
Main outputs:	The main output has been the consolidation of community social capital in the form of the officially registered community based organisation (CBO) “Waruku Community Development Programme (WACODEP)”.

3.1 Introduction

Nairobi, the capital city of Kenya, is laced with approximately 200 informal and unplanned settlements, which house an estimated 60% of the city's population. For the purpose of validating the Household-Centred Environmental Sanitation (HCES) process, a small, unplanned settlement was selected which already had an active community representation in the form of a registered CBO.

3.1.1 Project site

Waruku in Kangemi was chosen as a case study site because it was a smaller unplanned settlement with partly informal and mostly formalised land tenure. Environmental sanitation services are poor or completely lacking and contribute to the spread of water-borne diseases. Thanks to previous efforts by the NGO Maji na Ufanisi, there was already an organised village committee.

Table 3.2: Demographic information of Waruku, Nairobi. (Source: Maji na Ufanisi 2003)

Population of Waruku	7000 inhabitants (estimate based on 1999 National census)
Area, density	13 hectares, 538 people per hectare
Income	Estimated avg. household income: KShs 4,500 (US\$ 54 per month)
Average household size	4.1

According to the Kenyan National Census of 1999, Waruku had a population of 6000. Waruku's estimated current population of around 7000 residents can be broken down as follows:

- 25% children (0-17 years);
- 60% youth (18-35 years);
- 15% adults - above 35 years of age (Maji na Ufanisi 2003).

According to a baseline survey conducted in Kangemi in 2003, about one-quarter of all households are female headed and there are even a sizeable number of households headed by children. Like many other informal settlements in Nairobi, HIV prevalence is quite high, estimated at around 20% (Maji na Ufanisi 2003).

Residents of Waruku are engaged in a wide range of informal economic activities including running small businesses, hawking, prostitution, and begging, though a small proportion of the population is involved in the formal sector. The average household income is estimated at KSh. 4,500 (US\$ 52) per month per household. This is slightly above US\$ 1 per day. The highest expenditure is for food (KSh. 1,500, or about one-third of household income). The other main expenditures are for education (Ksh. 1,096), rent (KSh. 1,000 to 1,500), health care (KSh. 626) and water (KSh. 410) (Maji na Ufanisi 2003).

Though the actual figures cannot be ascertained, the level of employment has been estimated by Maji na Ufanisi as:

- 20% in formal employment, mainly blue-collar jobs in offices, shops and factories;
- 80% in informal employment – mostly vendors, informal shop owners and sellers of second-hand clothes and shoes. (Maji na Ufanisi 2003).

3.1.2 Geography, topography, climate

Waruku is one of the twelve villages in Kangemi, a large peri-urban area to the west of the city centre. It is set on a steep hill overlooking the Nairobi River. Along the river there is a flood zone which is used for urban agricultural activities. The area is densely populated and an increasing number of multi-storey structures have been constructed in recent years. There are also less densely populated pockets of landlord-occupied areas in Waruku that feature better water and environmental sanitation facilities. With an area of about 13 hectares and an estimated population of about 7000, Waruku has a density of approximately 540 persons per hectare – less than the renowned informal settlement of Kibera, where density can be as high as more than 2000 people per hectare.

3.1.3 Current status of environmental health and urban environment

The settlement is characterised by inaccessible muddy roads, insecure housing, and poor water and sanitary facilities. The lack of sanitation generates rivers of liquid and excreta waste, and there is a massive solid waste problem as garbage is dumped indiscriminately. All of these factors result in a high incidence of water and excreta-related diseases and serious environmental degradation.

Environmental health

Waruku's poor urban environment leads to considerable health problems for the resident population. The most common communicable diseases are respiratory and water-borne diseases such as diarrhoea or hepatitis. There are no public health facilities in Waruku, only small private health posts run by poorly qualified staff. The nearest public health facility is 5km away.

Water supply

Water supply in Waruku is provided by private individuals and in one case a community group. Every tenant plot in Waruku (which can house several dozen residents) has a water connection; in total there are about 54 connections. The price of water depends on the individual owners of the water points, the time of day, and the consumption rate. The most prominent community-based water vendor is the CBO "Waruku Community Development Programme" (WACODEP) who has been selling water at more affordable prices since March 2008.

Sanitation

Sanitation is grossly inadequate in Waruku. In 2003 it was found that 70% of the residents used simple pit latrines, while the rest (30%) had access to flush toilets. Due to the lack of sufficient sanitation facilities and sewerage management options, a number of people still use polythene bags which they later throw away (hence the name 'flying toilets'), especially at night. The average distance to a pit latrine is about 100 metres. This mode of excreta disposal poses severe health risks, especially for children playing in the urban environment (Figure 3.2).

About 30% of Waruku's residents had washrooms and 40% bathed at nearby bushes and in the Nairobi River, while the rest (30%) used their one-room flats.

Due to the poor availability of sanitation, Maji na Ufanisi, through the assistance of Athi Water Services Board (AWSB), decided to construct a sanitation block (communal facility) in the informal sector of Waruku. The sanitation block provides toilets for men and women, showers, and public water taps for the low-income population that does not currently have access to a household connection. The sanitation block was inaugurated on 11 March 2008 in the presence of the Minister of Water and Irrigation.



Figure 3.2: Current environmental sanitation conditions in Waruku. (Photo: Sandec)

Solid waste

Currently, there is no private or municipal solid waste collection service in Waruku. The Nairobi City Council does not collect garbage, despite the fact that the market vendors pay a fee of KSh. 25 per week (US\$ 0.4). The authority only occasionally collects garbage from the roadside (not from within the community); therefore, most of the waste remains. Due to the lack of a common dumping site, the majority of Wa-

Waruku residents dump their waste in the community’s public cemetery and open drains. Furthermore, flimsy polythene is littered all over the neighbourhood.

There are some isolated efforts by individuals to earn a living out of solid waste collection but this has not had the desired impact so far.

Drainage

Only two stormwater drains currently exist in Waruku, both of which were recently constructed with the assistance of Maji na Ufanisi and funded by Constituency Development Funds (CDF) in 2007. All stormwater runoff currently drains into a tributary of the Nairobi River.

3.2 Partner institutions

The primary and secondary stakeholders have been instrumental in ensuring success in implementing the HCES process. A distinction is made here between (i) process stakeholders, (ii) primary stakeholders, and (iii) secondary stakeholders. Process stakeholders are understood to be the key stakeholders, who are responsible for driving the HCES process and who are essential to achieving the main outcomes of the HCES validation process. Primary stakeholders are those institutions which have a “stake” in the planning process or have the potential to affect or be affected by planning decisions. Secondary stakeholders are other stakeholders who may take part in workshops or meetings but are not essential to the planning process.

Maji na Ufanisi, who is the process stakeholder, has ensured the involvement of the different stakeholders.

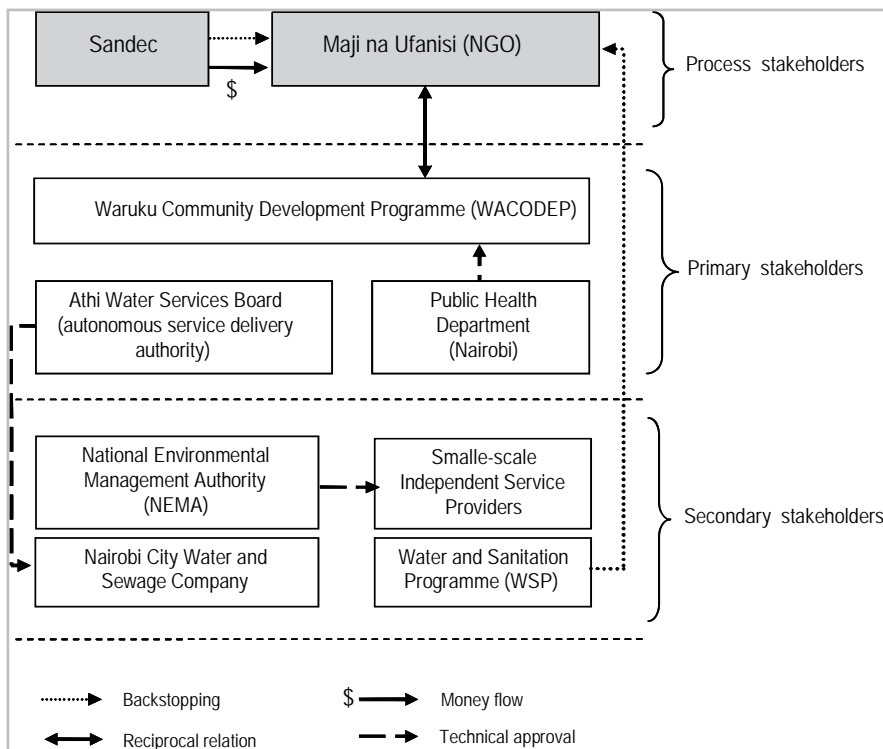


Figure 3.3: Stakeholder map of main HCES stakeholders in Waruku.



Figure 3.4: Sketch map of Waruku settlement with Nairobi River. (Source: Sandec)



Figure 3.5: Solid waste dump site adjacent to Waruku. (Photo: Sandec)



Figure 3.6: Stormwater drains with solid waste in Waruku. (Photo: Sandec)



Figure 3.7: Overview of Waruku settlement looking down towards Nairobi River. (Source: Sandec)



Figure 3.8: Sanitation working group at the Waruku Options Workshop. (Photo: Sandec)



Figure 3.9: Inauguration of the new community-managed sanitation block in March 2008. (Photo: Maji na Ufanisi)

3.2.1 Process stakeholders

In the case of Waruku, Maji na Ufanisi was the main process stakeholder. Sandec provided technical assistance and backstopping during the HCES process.

Maji na Ufanisi (MnU)

Maji na Ufanisi (Water and Development) was registered as an NGO, following a strategic decision by WaterAid to close its country programme in Kenya in March 1998. Maji na Ufanisi works in partnership with communities, government, donor agencies and the private sector to bring innovative water and environmental sanitation solutions to poor and disadvantaged people. For the last 10 years, it has been working with marginalised urban communities with the vision of designing and implementing pro-poor water and environmental sanitation solutions. Contact: Nancy Githaiga, email: nancy.githaiga@majinaufanisi.org.

Sandec

The Department of Water and Sanitation in Developing Countries (Sandec) coordinates validation of the Household-Centred Environmental Sanitation (HCES) programme internationally. Sandec provided backstopping for Maji na Ufanisi in implementing the 10-step process in Waruku, Nairobi. Contact: C. Lüthi, email: christoph.luthi@eawag.ch.

3.2.2 Primary stakeholders

Three primary stakeholders have played a significant role in this project. Their involvement has contributed to its continued success. These stakeholders are the Waruku Community Development Program (WACODEP), Athi Water Services Board (AWSB), and the Public Health Department, City Council of Nairobi. Their contributions are summarised below.

Waruku Community Development Program (WACODEP)

WACODEP is a community-based self-help environmental group that was formed in 2003 and registered in 2006 under the Ministry of Social and Cultural Services. The group has since been working with Maji na Ufanisi on water and sanitation interventions. Based in Westlands Division in the Kileleshwa Location, WACODEP has a membership base of about 40 households.

Athi Water Services Board (autonomous service delivery authority)

Athi Water Services Board (AWSB) is a state corporation under the Ministry of Water and Irrigation in charge of providing water and sewerage services in five parts of Kenya, including Nairobi. The Board was created under Section 51 of the Water Act 2002 and serves an area of about 15,000 km² and a population of over 4.5 million. In Waruku, the Athi Water Services Board funded the construction of a sanitation block.

Public Health Department – City Council of Nairobi

The City Council of Nairobi (CCN) is mandated to provide and manage basic social and physical infrastructure services including education, housing, health, refuse and garbage collection, planning and development control, urban public transport and fire services to the people of Nairobi. Due to poor management and a lack of resources, CCN has shown inconsistent performance. However, the Public Health Department has been active in sensitising the residents of Waruku to health issues on a regular basis.

3.2.3 Secondary stakeholders

National Environmental Management Authority (NEMA)

The National Environment Management Authority (NEMA) is a government agency that was established to exercise general supervision and co-ordination over all matters relating to the environment. NEMA is responsible for implementing environmental policies.

Small-Scale Independent Providers

Small-Scale Independent Providers (SSIP) in Waruku play an important role in providing water and pit emptying services for on-site sanitation facilities for residents. SSIPs buy water from the Nairobi City Water & Sewage Company and re-sell it to the community. The providers are not part of any organisation.

Nairobi City Water & Sewerage Company Limited

The Nairobi City Water & Sewerage Company Limited (NCWSC) is a commercialised subsidiary of the City Council of Nairobi. It was formed after the 2002 Water Act was enacted. It was appointed by the Athi Water Services Board (AWSB) to provide water and sewerage services to the greater Nairobi area. It is meant to ensure an adequate quantity and quality of water, affordable tariffs, and maintenance and improvement of water and sewerage infrastructure.

Water and Sanitation Programme (WSP)

This World Bank-funded international partnership for improving water and sanitation sector policies, practices and capacities has its African headquarters in Nairobi. WSP took part in several HCES workshops and provided technical support for the process stakeholder, Maji na Ufanisi.

3.3 Enabling environment

The enabling environment is of great importance for the success or failure of a process like HCES. This chapter looks at national policies (legislative and institutional framework), land tenure issues, and finally at available skills and awareness and the formation of social capital for environmental sanitation.

3.3.1 Laws, policies and strategies

Given the poor performance of the water and sanitation authorities and the deteriorating state of the urban environment in the 1990s, the Government of Kenya has since undertaken far-reaching reforms in the water and sanitation sector. These reforms were triggered by the enactment of the Water Act 2002, which stipulates the following policy principles:

- Decentralisation: decision-making and operations must be decentralised from the national to the local level to increase efficiency;
- ‘‘No responsibility without authority’’: all actors must have clearly defined roles and delegated authority;
- Increased private sector participation to encourage more effective management through commercialisation; and
- Separation of regulatory functions from service delivery functions.

In 2007, the Kenyan Ministry of Health drafted a National Environmental Sanitation and Hygiene Policy. The policy seeks to create and enhance an enabling environment that will motivate Kenyans to improve both their hygienic behaviour and environmental sanitation. It is the first government policy paper addressing sanitation, and is quite vague in outlining appropriate policies and institutional arrangements on how to extend environmental sanitation and hygiene, especially in urban areas (GoK 2007). Also, the policy is not linked to any clear financing mechanism for implementing the recommendations.

3.3.2 Institutional framework

The Nairobi City Water & Sewerage Company (NCWSC) is a municipally-owned, commercialised service provider that manages water and sewerage services for the City of Nairobi and its environs. The newly formed utility has found it difficult to provide adequate services to informal and peri-urban settlements and to enact pro-poor service improvement. However, NCWSC has recently started addressing the great service backlog in the city's informal settlements and is now providing pro-poor solutions, e.g. in the form of sanitation blocks.

The Water Services Board (WSB) is the regulatory body of regional institutions responsible for improvement and efficient provision of water supply and sewerage services in their area of jurisdiction. They do this mainly by contracting local service providers in designated service areas. In Nairobi, the main service provider is the Nairobi City Water & Sewerage Company.

3.3.3 Land tenure and property rights

Lack of tenure for the majority of Nairobi's population living in informal settlements remains the greatest impediment to improving livelihoods and the urban environment. However, the land situation in Waruku is less complex than in most of Nairobi's informal settlements. It is assumed that most plots in Waruku are privately held, in the

form of individual leasehold tenure with 99 year leases. The proportion of absentee landlords in Waruku is smaller than in other informal settlements in Nairobi. Waruku is estimated to have approximately 100 plots and land ownership is classified as follows:

- 10% government land (squatted land occupied by the poorest residents that was initially allocated for the establishment of a shopping centre, social amenities and public utilities);
- 90% individual leasehold with proper title deeds.

Private landowners clearly have more incentives than tenants to invest in improvements; with improved services they can charge higher rents. There is a reasonable level of social cohesion amongst poor residents (tenants). Some residents have formed self-help groups and landowners have formed their own association. Waruku also features committed leadership on community development issues, spearheaded by the CBO WACODEP and the association of Waruku landlords. These active groups lay a good foundation for the process of validation of the HCES approach.

3.3.4 Skills and awareness

Compared to other low-income settlements in Nairobi, Waruku features higher levels of education despite the fact that there is no public school in Waruku. The Waruku Community Development Programme (WACODEP) is a Community Based Organisation (CBO) which gives a voice to the majority of the tenants living in Waruku (but excludes the landlords). The NGO Maji na Ufanisi conducted community building workshops prior to the HCES process, thus creating greater awareness of urban environmental issues within the Waruku community.

3.3.5 Financial arrangements

The Kenyan government has limited financial resources allocated to the water and sanitation sector. In the past, investments related to upgrading environmental sanitation were funded through international grants and loans. While sanitation improvement initiatives are still mainly financed through foreign investments (especially from Germany and Japan), some financing mechanisms and policies have been introduced to reduce dependency on international donors. The urban water and sanitation sectors have been reformed by increasing self-funding at municipal level. The government also introduced constituency development funds which are used to finance community development initiatives, but this programme has become highly politicised.

3.4 The planning process

This section details how the HCES process in Waruku has been conducted. It highlights the main planning steps and the relevant outcomes that were achieved.

3.4.1 Request for assistance (Step 1)

The first request involved Maji na Ufanisi seeking assistance on behalf of the Waruku community. A Memorandum of Understanding (MoU) was signed between Maji and Eawag-Sandec in October 2006.

3.4.2 Launch of the planning and consultative process (Step 2)

The official HCES Launching Workshop was organised to inform all key stakeholders about the 10-step process. Prior to the official launching workshop, a community workshop was organised to mobilise and inform the residents and identify the main concerns of the community at large. This one-day workshop took place in Waruku and was attended by CBOs, church leaders, youth groups, women's groups, the ward health officer, and the local Chief, as well as representatives from Sandec. In total, 65 community members (60 % men and 40 % women) participated. After a briefing about HCES, the participants conducted a rapid urban environmental assessment of their neighbourhood. Participants split into 4 working groups to discuss key issues that concerned the community: Group 1: Socio-economic issues; Group 2: Sanitation; Group 3: Water; Group 4: Solid waste and drainage. Each group was facilitated by staff from Maji na Ufanisi. Results of this group work were presented two days later at the official launching workshop.

The multi-stakeholder launching workshop was on 19 January 2007 and drew a variety of stakeholders: the then Assistant Minister of Housing, the Chairperson from the NEMA Board of Management, the Water and Sanitation Programme (WSP), the Public Health Department of Nairobi, the Provincial Administration, other CBOs and NGOs, as well as professors and students from two Kenyan universities (University of Nairobi and Kenyatta University). The following activities were conducted at the workshop: (i) the outcome of the community workshop was presented to the stakeholders; (ii) the Household-centred Environmental Sanitation (HCES) planning process was presented; (iii) the primary and secondary stakeholders were identified in a plenary session; and (iv) a HCES task force was formed for follow-up.

This significant occasion was graced by the attendance of the Assistant Minister of Housing and Member of Parliament, Betty Tett, and the NEMA representative. The event also served as the groundbreaking ceremony for a previously proposed sanitation block, the first one to be built in Waruku.

Box 3.1: Main outputs of Step 2

- Definition of project boundaries
- Approval of planning methodology (HCES)
- Initial stakeholder assessment
- Nomination of an HCES task force

3.4.3 Assessment of current environmental sanitation services (Step 3)

The status assessment report was written by the process stakeholder, Maji na Ufanisi, with input from Sandec. The final version was produced in May 2007. The report in-

cludes an analysis of the socio-economic situation and the state of urban environmental service provision in Waruku.

Box 3.2: Main outputs of Step 3

- Waruku Status Assessment Report
- Map of project area depicting project area boundaries.

Box 3.3: Further reading



Maji na Ufanisi. 2008. *Waruku Status Assessment Report – Household-Centred Environmental Sanitation.* Nairobi, Kenya: Maji na Ufanisi. (Provides more details on the environmental sanitation situation in Waruku).

Between Steps 3 and 4 there was a major interruption in the HCES process due to post-election turmoil in Kenya and political paralysis in the first quarter of 2008. Nevertheless, once the situation had stabilised, the major stakeholders agreed to continue with the project.

3.4.4 Assessment of user priorities (Steps 4)

Steps 4 & 5 were merged into one workshop. The main aim of Step 4 was to learn about the community’s priorities for environmental sanitation, while the aim of Step 5 was to identify the various options for environmental sanitation services that are affordable and technically viable for Waruku. This multi-stakeholder one-day workshop was held on 8 May 2008 with 70 participants, including tenants, landlords, representatives of the Water and Sanitation Programme (WSP), private sector participants, funding institutions (Acumen Fund), and other local NGOs.

The participants used pocket voting to identify their priorities for environmental sanitation. Three issues were identified as being the most pressing for the community (in order of priority): (i) solid waste management; (ii) stormwater drainage systems, and (iii) sanitation. Water availability was seen as a less important problem. The results of the pocket voting were disaggregated by gender: women were given purple cards while men were given blue cards. Each person had three cards with which he or she could vote for priority issues. The results of the pocket voting are presented in the figure below.

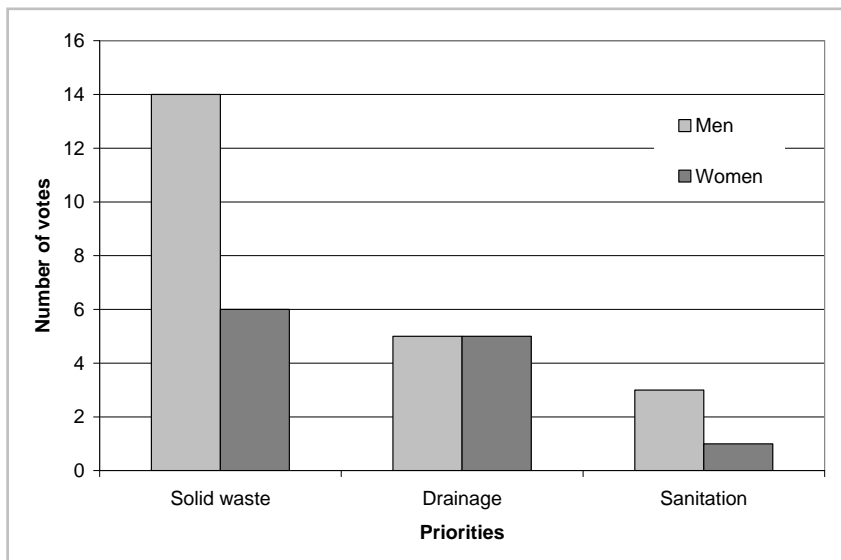


Figure 3.10: Priorities related to UESS set by the community.

3.4.5 Identification of options (Step 5)

In the second part of the workshop, two working groups were formed to deal with two of the key issues identified: solid waste/drainage and sanitation. Both groups were facilitated by external stakeholders: Dr. Gakuya from Kenyatta University for the solid waste group, and Mr. Mbuvi (WSP) for the sanitation group.

Group 1: Solid Waste

The discussion was initiated with complaints about the lack of solid waste services by Nairobi City Council, even though every registered resident must pay collection fees to the Council. Some of the issues discussed were:

- Sorting at source – how can this be better managed?
- Law enforcement – how do deal with non-compliance?; and
- The designation of specific collection points in Waruku – where could they be put?

In addition, the issue of raising awareness and sensitising the community about behaviour change in dealing with waste was discussed. The key conclusions of this working group were:

- Maji must help to initiate a solid waste management scheme in Waruku;
- Not all garbage is waste, therefore it should be sorted at source;
- Links with the Kangemi Ward Manager in charge of city cleansing must be improved;
- Private collection efforts must be encouraged (e.g. collectors of recyclable materials);
- An action plan and a strategy to seek external funding for improvements must be devised.

Group 2: Sanitation

The group discussed the existing sanitation system(s) in Waruku. All elements of the sanitation chain were examined, from the user interface (i.e. toilets) to disposal practices (see Table 3.3).

Table 3.3: Overview of current sanitation systems prevalent in Waruku

		System Components				
		User Interface	Storage	Conveyance	Treatment	Disposal
Existing	System 1	Majority of existing facilities: Squat pan + simple latrines, but too few toilets in Waruku	Simple pits, majority unlined, but a few lined	Manual emptying into open drains or in nearby Nairobi River; Cover existing pit, dig new one; Council exhauster (rarely used as too costly)		Majority: unsanitary, health hazard
	System 2	Few pour flush toilets (multi-storey buildings): (~100 tenants)	Very few septic tanks exist; "direct septic": 3-chamber system on 1 plot	Non-connected: emptied by exhauster; All others empty into sewer mains	Nairobi treatment works	Deposited next to ponds by private service providers
	System 3	1 sanitation block with toilets & showers (since March 2008)		Gravity sewer to sewer mains (12 inch pipe)	Nairobi treatment works	Nairobi waste stabilisation ponds
	System 4	Flying toilets (especially at night)				
Proposed	System 1	Upgrade existing toilets	Encourage double-vault or lined pits	Develop local pit emptying solutions.	(There is no space for decentralised treatment options in Waruku)	
	System 2	Second sanitation block for lower part of Waruku		Transfer stations next to main sewer line to enable safe pit-emptying		

The three main problem areas identified by the sanitation group were:

- Insufficient number and inadequate quality of pit latrines;
- Unsanitary emptying of pits into open drains or the Nairobi River; and
- Lack of low-cost and appropriate emptying and disposal systems.

Two possible solutions were discussed by the group:

- Replacement of unlined single pit toilets with improved, lined VIP toilets which make emptying easier. Funding options would need to be discussed, especially with the landlords.
- Construction of a sludge transfer station next to the main sewer line (12 in. mains). The transfer station would enable cheaper and closer sludge disposal for the area.

In a follow-up to the Options Workshop, discussions were held with the Nairobi Water & Sewerage Company to discuss the possibility of a sludge transfer station in Waruku. This received an unfavourable response from the NWSC Regional Manager as it was, in his view, “untested” sanitation technology.

Main Outputs of Step 4/5:

Box 3.4: Main outputs of Step 4/5

- Workshop report outlining community priorities and the way forward

Box 3.5: Further reading



Maji na Ufanisi and Eawag-Sandec. 2008. *Priorities and Options Workshop Report for Waruku, Nairobi.* Nairobi, Kenya: Maji na Ufanisi.

3.4.6 Development of UESS plan (Step 6/7)

Instead of preparing a full Urban Environmental Sanitation Services Plan (Steps 7 and 8), the HCES committee in Waruku decided to expedite the process and produce a funding proposal for two of the most pressing issues identified in Waruku: solid waste management and improved stormwater drainage. A funding proposal totalling US\$ 40,000 was forwarded to the Swiss-funded NCCR research programme for “Improved Management of Human Waste and Environmental Sanitation”, but the project was rejected by the NCCR selection committee in May 2009.

Box 3.6: Main outputs of Step 6/7

- UESS Plan submitted as a funding proposal)

Box 3.7: Further reading



Maji na Ufanisi. 2009. *Improved Management of Human Waste and Environmental Sanitation in Waruku.* Funding proposal submitted to NCCR North-South.

The official HCES planning process ended with the completion of the proposal – a total of 23 months from launching to finalising the proposal. However, because the proposal was rejected, new funding opportunities are being sought.

3.5 Project outputs and outcomes

The Waruku HCES process has partially benefited the 7000 residents by providing a step-by-step approach for proposing improved environmental sanitation services, especially for the informal part of the settlement (see Table 3.4). It failed to reach out to the formalised parts of the neighbourhood.

Table 3.4: Infrastructure interventions in Waruku.

Sanitation:	Construction of a sanitation block in Waruku (funded by the Athi Water Services Board (AWSB and implemented by Maji na Ufanisi) with 5 women’s and 5 men’s toilets, a water kiosk, and two showers. This facility serves Waruku residents without regular access to toilet and bathing facilities for a small fee. It also provides services to visitors and guests on a pay-to-use basis. The facility was planned in parallel with the HCES planning process and funded outside of HCES. This project demonstrated the willingness of the community to accept public facilities, and more importantly, that they are willing to pay to use them.
Solid Waste:	The construction of three waste collection centres to collect and process solid waste
Drainage:	Construction of one 800 m masonry drain and two 200 m feeder drains were planned outputs in the UESS proposal.
Awareness and capacity building	
Training courses:	Half-day training course on rapid urban environmental assessment for 65 community members Capacity building of the Waruku youth network; activities so far include yearly clean-up campaigns and HIV/AIDS awareness events

An unforeseen output is the installation of electricity now available to individual households as a result of the main line to the sanitary block. The sanitation facility has also enabled the electrification of poor households in the neighbourhood. Individual metres were installed in the sanitation block and connected to individual households that were previously not connected to the grid.

3.6 Timeline

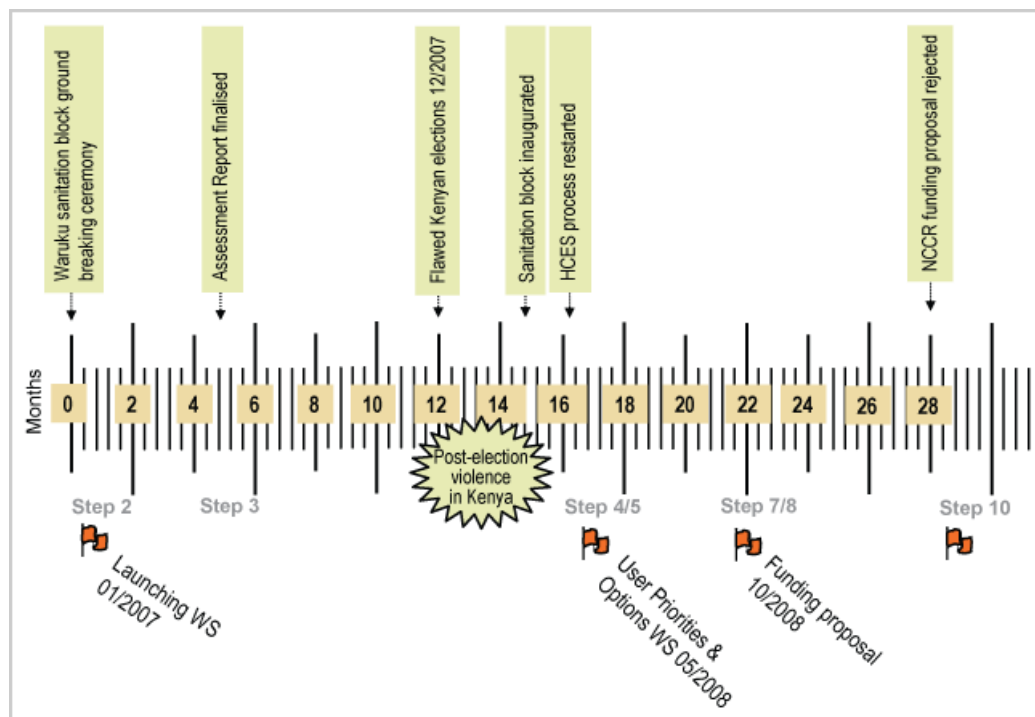


Figure 3.11: Timeline of activities in Waruku 2007–2009.

3.7 HCES planning and implementation costs

Process stakeholder costs

Sandec signed two contracts worth US\$ 14,000 for Maji's contributions to the HCES validation in Waruku. This covered salaries, overheads and transport.

Additional workshop costs:

Launching workshop (January 2007)	US\$ 1600 (Community and Official Launch)
Options Workshop (May 2008)	US\$ 900 (One-day workshop)
Total workshop costs	US\$ 2500

Total known costs for HCES planning process: US\$ 16,500. This is approximately US\$ 2 per resident in planning costs (sum divided by number of inhabitants).

Estimated cost for voluntary work

Community and HCES Committee members spent an estimated 13 days attending meetings, workshops, focus group discussions and the like. It is difficult to put a price on this but these in-kind contributions should be considered in a final calculation of the overall planning costs.

3.8 Challenges, constraints and strengths

Improving living conditions in Nairobi's numerous slums is a notoriously challenging task as demonstrated by decades of failed attempts by donors, government and NGOs to improve livelihoods. The HCES experience in Waruku is no exception. Unlike the other case studies presented here, politics came into play during the planning process, as Waruku was one of the settlements riveted by ethnic violence after the election in early 2008.

3.8.1 Institutional challenges

This section discusses some of the institutional challenges encountered during the implementation of the HCES planning process in Waruku, Kangemi.

Low priority for on-site sanitation

All major stakeholders in Nairobi – the Athi Water Services Board, the city utility, the Water Ministry, etc. – continue to promote offsite transport of wastewater to centralised treatment plants as the most promising liquid waste disposal and treatment option. The city government envisions Nairobi as a "global city" with modern services and infrastructure. This is emphasised in policy documents and national legislation, which all speak of sewered services for urban areas (National Environmental Sanitation and Hygiene Policy (2007), The Water Act (2002) and the Local Government Act, Cap 265). Room to introduce more flexible and decentralised options is quite limited in

this policy environment (see, for example, outcome of Step 5, the sludge transfer station option). Changing this “centralised” regulatory environment in a major African city will only happen in the long term and with continued sensitisation and lobbying.

Weak and fragmented grass roots leadership fails to build community-wide support

Maji na Ufanisi began to strengthen community organisation and leadership in Waruku a few months before the HCES process started. The newly registered WACODEP was not a fully mature organisation with proven leadership, which became evident in some of the focus group discussions when residents questioned WACODEP’s role as a mediator and representative of their interests. It was also impossible to build a community spirit that managed to bridge the divide between landlords and tenants and to overcome their vested interests. Stakeholder relations in Waruku were characterised by conflict, as stakeholders competed for control of the decision-making process. In Nairobi, landlords can nearly double their rent by adding improved sanitation and shower facilities. The current tenants are thus not very keen to see improvements to their sanitation facilities. It is absolutely necessary that a community support collective actions and strengthen the process stakeholder’s mediation role in this kind of planning intervention.

3.8.2 Process-related challenges

Loss of momentum

Eawag-Sandec’s main partner left the NGO for another job and significant project momentum was lost. Kenya’s NGO sector is plagued by a habit called “searching for greener pastures”, i.e. the practice of abruptly leaving a job for a more prestigious, better paying one, whenever one becomes available, with little regard for the future of work in progress. Like the public sector, non-governmental organisations cannot pay private sector salaries and are thus subject to constant staff turn-over and lack of continuity. The HCES process in Kenya also suffered from this fact when the main project coordinator left Maji (after Step 3) for a more lucrative job in Nairobi. The validation process lost considerable momentum after this loss of leadership.

Service combinations for environmental sanitation are seen as too complex

When dealing with complex unplanned urban settlements like Waruku, stakeholders are overwhelmed with the difficult issues that need to be tackled: informality, inequality, and diverging interests between different socio-economic groups (e.g. landlords and tenants). The integrated planning of various issues such as sanitation, solid waste management, stormwater drainage, etc., is often seen as too complex in combination. What sounds good in theory: “The task primarily matches a particular level of service with the associated on- and off-site facilities. The various technical combinations can then be matched with various institutional options” (Eawag 2005), was not practical in reality. The authorities responsible for the diverse UESS services did not find a way to harmonise their activities, e.g. the utility continues to provide conventional sewerage

for the area, solid waste is organised by the agency/company in charge, etc. The process stakeholder was unable to bring the different institutions to the table and develop cross-sectoral synergies.

3.8.3 Strengths

Though long, the two-year process had positive effects, as it enabled decision-makers and authorities to rethink their approach to service delivery for poor and unplanned neighbourhoods. Although there is still a long way to go before achieving improved sanitation in Waruku, the framework tested in Waruku has achieved the first step in this process – getting the community actively involved in seeking affordable and manageable solutions. The HCES planning process is only the beginning; what has been achieved in the past 23 months is just the start of a long process to achieve a safe, hygienic and clean urban environment in Waruku.

The new sanitation block in Waruku is an example of how sanitation infrastructure can be an entry point for wider neighbourhood upgrading efforts and for introducing further urban services in unplanned and unserved settlements. Physical infrastructure such as public sanitation blocks effectively provides the first step towards legalisation and “formalising the informal” by providing basic services to disenfranchised populations.

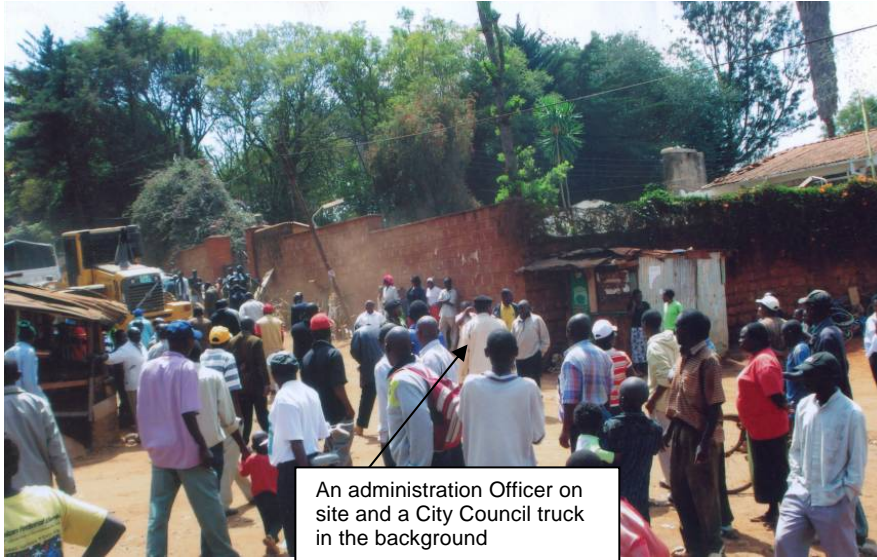
Not only does the Waruku community now have access to clean public toilets and a water kiosk, but many poor households have also been able to connect to the electricity grid via the sanitation block’s main connection. As a result, new economic activities and improved livelihoods have been achieved in the past year since inauguration of the sanitation block.

3.9 Conclusions

The HCES experience showed the limitations of working with segmented urban communities where the interests of the opposing stakeholders do not necessarily converge. The Waruku case also highlights the importance of land tenure when trying to achieve more sustainable sanitation solutions. Ironically, it was easier to build a sanitation block on squatted public land than provide better toilets on private land.

As we go to press we have been informed that the entire informal settlement area of Waruku was demolished on Tuesday, 11 August 2009. The newly built sanitation block, inaugurated just 16 months earlier by the Ministry of Water, was not spared. Inside sources say that the son of the former president, Gidion Moi has claimed ownership of the informal settlement area and the court ruled in his favour. All squatter residents were evicted and the sanitation block bulldozed as well.

We received photos showing the destruction of the site.



Project reports and papers

The following reports and papers are related to the Waruku project and can be downloaded from www.sandec.ch.

Box 3.8: Reports



Maji na Ufanisi. 2008. Waruku Status Assessment Report – Household-Centred Environmental Sanitation. Nairobi, Kenya: Maji na Ufanisi.



Maji na Ufanisi and Eawag-Sandec. 2008. Priorities and Options Workshop Report for Waruku, Nairobi. Nairobi, Kenya: Maji na Ufanisi.



Maji na Ufanisi. 2009. Improved Management of Human Waste and Environmental Sanitation in Waruku. Funding proposal submitted to NCCR North-South.

Box 3.9: Further reading



Lüthi C, Morel A, Tilley E. 2008. Integrate at the top, involve at the bottom – The household-centred approach to environmental sanitation. *Proceedings of the IRC Symposium on Sanitation for the Urban Poor, Partnerships and Governance, Delft, The Netherlands, 19-21 November 2008.* Delft, The Netherlands: International Water and Sanitation Centre (IRC).

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Abbreviations

AWSB	Athi Water Services Board
CBO	Community-based organisation
CCN	City Council of Nairobi
CDF	Constituency Development Fund
MnU	Maji na Ufanisi (NGO)
MoU	Memorandum of Understanding
NCWSC	Nairobi City Water and Sewerage Company, Ltd.
NEMA	National Environmental Management Authority
NGO	Non-Governmental Organisation
SSIP	Small-scale independent providers
WACODEP	Waruku Community Development Programme (CBO)
WSB	Water Services Board
WSP	Water and Sanitation Program (at the World Bank)

4 Chang'ombe Settlement, Dodoma, Tanzania

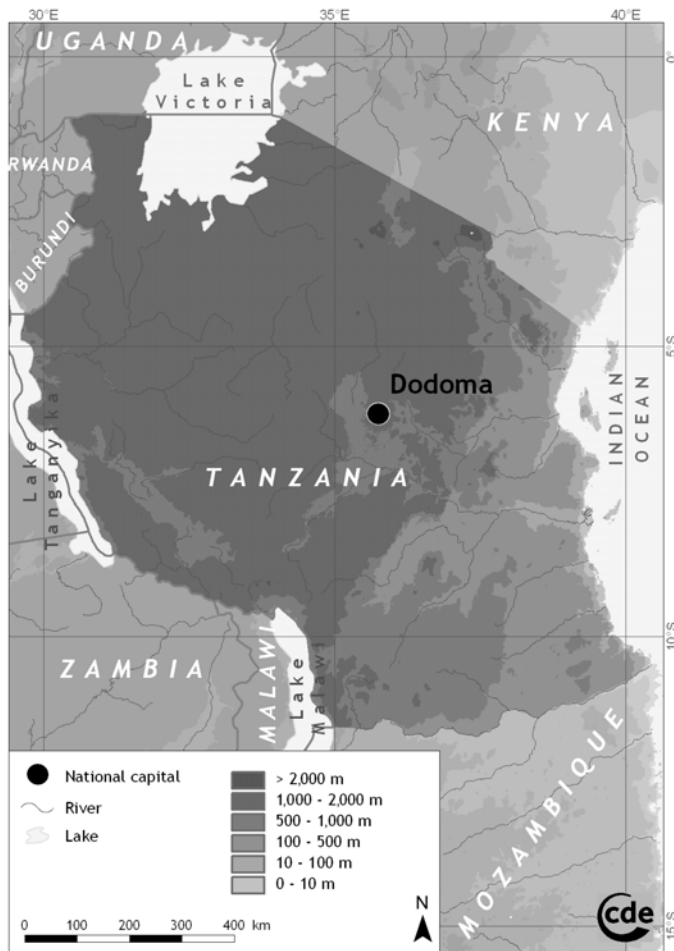


Figure 4.1: Map of Tanzania. (Source: Centre for Development and Environment [CDE], Switzerland)

Table 4.1: Project details for Chang'ombe Settlement, Dodoma, Tanzania.

Project duration:	From July 2007 to April 2009 [21 months]
Project site:	Chang'ombe Settlement, Chamwino Ward, Dodoma
Project coordinator:	Maji na Maendeleo Dodoma (Mamado), a local NGO
Main stakeholders:	Ward Committees, Municipality of Dodoma (Health Department), DU-WASA (utility and water service provider), locally based CBOs, Chang'ombe residents, school teachers
Main beneficiaries:	Low-income residents of Chang'ombe (approximately 35,000 people)
Funding and resources:	A grant of approximately US\$ 60,000 from the Swiss State Secretariat for Economic Development (seco), Eawag and the NCCR research programme.
Main outputs:	The most significant output of this process has been the creation of a community-based microfinance system that will allow households to access affordable loans for building improved sanitation facilities

4.1 Introduction

Dodoma has been Tanzania's capital city since the 1970s and is the seat of the Union Parliament. The third largest city in Tanzania, Dodoma has about 400,000 inhabitants with a high annual population growth rate of approximately 4%. Dodoma has an area of 70 km² and is divided into 17 urban and 13 rural wards. Chang'ombe is an unplanned peri-urban settlement within Dodoma, situated 6 km north of the town and located within the Chamwino ward. This ward is the fastest growing ward of Dodoma Municipality (population growth rate 1988–2002: 5.45%) (Table 4.2).

4.1.1 Project site

Since Dodoma became the capital city and the largest urban centre in central Tanzania, it has experienced increased urban growth at the city fringe. Many poor, rural immigrants moved to settlements like Chang'ombe, as they were unable to buy or secure land in the urban centre. The constant influx of settlers over the years has brought deteriorating living conditions in the peri-urban fringe. Chang'ombe thus has a set of conditions which make it an ideal case study site:

- Chang'ombe is the largest and poorest unplanned area in Dodoma Municipality, with about three-quarters of the population living on less than US\$ 2 a day;
- The lack of proper water and sanitation systems greatly jeopardise the health of Chang'ombe's residents;
- Improper garbage collection and drainage contribute to the high incidence of water-related and infectious diseases, including typhoid, intestinal worms, malaria, diarrhoea and skin infections. Cholera remains endemic in Chang'ombe and outbreaks are frequent during the rainy season.

Despite the lack of services and economic resources, the neighbourhood has a well organised community that is willing to improve its situation, as witnessed by the number of citizens organised in self-help groups and community-based organisations (CBOs). This is an essential element and a precondition for undertaking the HCES process.

Table 4.2: Demographic summary for Chang'ombe, Dodoma. (Based on 2002 National Census)

Population:	35,000 inhabitants
Area, density:	165 hectares, approximately 212 people per hectare
Income:	¾ of the population earns less than Tsh 50,000 per month (<US\$ 45 per month)
Average household size :	5.5 persons

4.1.2 Geography, topography, climate

Dodoma Region is located in the centre of Tanzania. Dodoma is a semi-arid region at an altitude of 1000 m. Average annual rainfall is around 570 mm. There is one rainy season that lasts from December to April. Dodoma's main water source is an underground aquifer, 30 km north of the town in Mzakwe. Most of Dodoma has acidic clay soils with low permeability. Large parts of the town (including Chang'ombe) also feature a high water table which is about 1 meter below ground level, especially during the rainy season.

4.1.3 Current status of environmental health and the urban environment

Environmental health

No reliable data on environmental health exist for Chang'ombe, although the prevalence of water-borne diseases is considered very high by municipal health officials. According to the Dodoma Health Department, Chang'ombe has the highest number of cholera cases in Dodoma. According to a socio-economic survey carried out in 2005 in several wards in Dodoma, diarrhoea was mentioned as the most common disease by 47% of the respondents (Basler & Hofmann 2005).

Water supply

Since many residents cannot afford to buy water, they must rely on unsafe shallow wells with poor water quality. It is estimated that only 30-40% of the community boils their water and a considerable part of the community uses untreated water for drinking, which means that there is a constant threat of waterborne disease outbreaks.

Sanitation

A survey in 2007 (referenced in Kessy and Obrist 2008) estimated that almost 90% of Chang'ombe households use simple pit latrines, while around 10% use septic tanks. A pit latrine is often shared by 4-5 households. About 50% of the pit latrines have a permanent structure while the rest are temporary and prone to collapse.

Solid waste

Solid waste management in Chang'ombe is almost non-existent. Households are expected to dispose of their wastes on-site in pits. This practice is unsustainable, as available land is in short supply. Accordingly, burning is the most common form of "waste disposal" practiced. The municipal authority has located one community dump site near Chang'ombe Primary School for the whole of Chang'ombe. Unfortunately, this site is approximately 2 km away from the centre of town, which makes it inconvenient and sometimes difficult for people to carry their garbage there. Without transport, either for the residents or for the garbage itself, this site is unlikely to be used as a permanent solution for solid waste disposal.

Drainage

The absence of drainage is a serious health risk, as uncontrolled stormwater spreads the contents of poorly constructed latrines over lower-lying areas during the rains. Most of the households wash kitchen utensils outside the house, allowing the grey-water to flow onto the streets, which creates pools of stagnant water that act as breeding grounds for mosquitoes and other vectors.

4.2 Partner institutions

A distinction is made between (i) process stakeholders, (ii) primary stakeholders, and (iii) secondary stakeholders. Process stakeholders are understood as the key stakeholders, who are responsible for driving the HCES process and essential to achieving the main outcomes of the HCES validation process. Primary stakeholders are those institutions which have a “stake” in the planning process or have the potential to affect or be affected by planning decisions. Secondary stakeholders are other stakeholders who may take part in workshops or meetings but are not essential to the planning process.

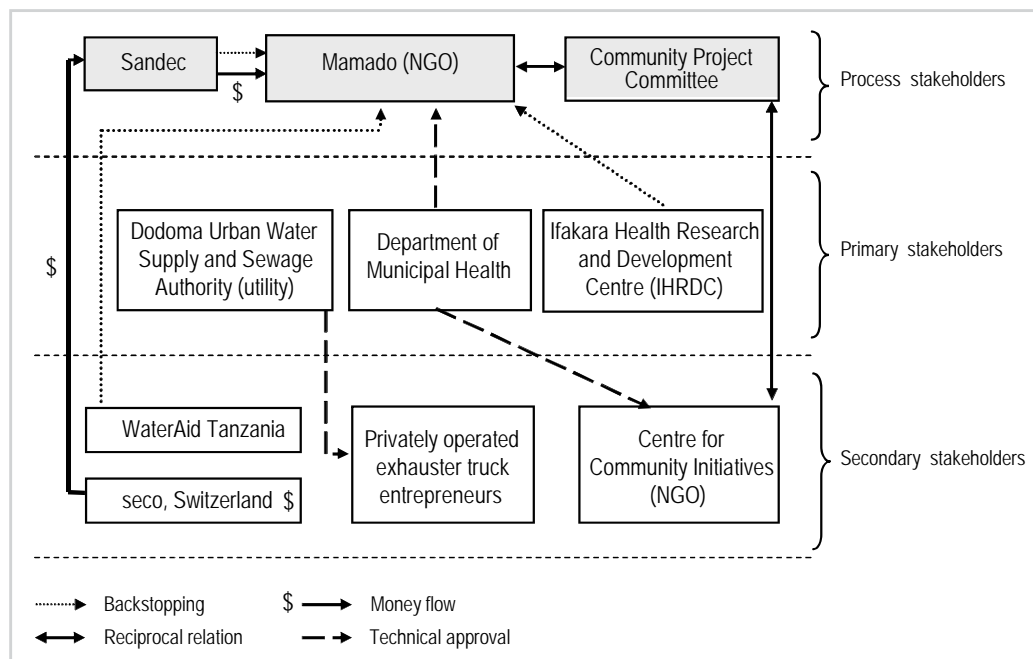


Figure 4.2: Stakeholder map of main HCES stakeholders in Dodoma.

4.2.1 Process stakeholders

Maji na Maendeleo Dodoma (Mamado)

Mamado is a registered NGO that has been operational since 2000. It operates in all six districts of Dodoma Region in the fields of water, sanitation and health promotion. The organisation has local experience with sensitisation and awareness campaigns, implementation of donor-funded projects, and support for local communities through development of organisational and administrative skills. Mamado currently employs a staff of six. In 2007, Mamado was chosen as the HCES process stakeholder after an

evaluation of several NGOs in Dodoma. Contact: Mr. A. Rukeha (Project officer), email: mamadotz@yahoo.com

Chang'ombe Community Project Committee

The role of the Project Committee and its members is to ensure community ownership of the HCES project, communicate project issues to the community, and follow up on project activities. The Project Committee is the direct representative of the community at large. The Committee was formed in April 2008 during Step 4 of the planning process. It consists of a total of 12 members: 2 members from each sub-ward plus 4 ward leaders who were chosen by virtue of their elected position for a three-year period.

Sandec – Water and Sanitation in Developing Countries

The Department of Water and Sanitation in Developing Countries (Sandec) coordinates validation of the Household-Centred Environmental Sanitation (HCES) programme internationally. Sandec assisted Mamado in implementing the 10-step process in Chang'ombe. Contact: Christoph Lüthi, email: christoph.luthi@eawag.ch

4.2.2 Primary stakeholders

Dodoma Urban Water Supply and Sewerage Authority (DUWASA)

DUWASA is a semi-autonomous entity in charge of water supply and sewerage services for the municipality of Dodoma on a financially self-sustaining basis. DUWASA is directly accountable to the Ministry of Water. It supplies water to approximately 141,000 people in Dodoma and has a sewerage system serving around 12% of the population.

Department of Municipal Health

The Municipal Health Department has a mandate to ensure a clean and healthy urban environment in Dodoma. The Health Department participated in several HCES workshops and contributed to awareness and sensitisation campaigns.

Ifakara Health Research and Development Centre (IHRDC)

The Ifakara Health Research and Development Centre provided assistance to Mamado by carrying out selected socio-economic surveys in 2008. Data provided by the research team were used in the Assessment Report published in February 2008.

4.2.3 Secondary stakeholders

Swiss State Secretariat for Economic Affairs (seco)

Seco signed a contract with Eawag-Sandec in June 2006 to fund the field-testing of the HCES approach in Dodoma. Seco is investing over CHF 11 million (US\$ 10 million) for water and sewerage extension in the Tanzanian towns of Dodoma and Tabora.

Centre for Community Initiatives (CCI)

CCI is a local NGO active in only one part of Chang'ombe. During 2008, CCI built more than 20 urine-diverting "Ecosan" toilets using a credit payment scheme.

WaterAid Tanzania

A Memorandum of Understanding was signed between Sandec and WaterAid to provide assistance to the HCES process.

Privately operated exhauster truck entrepreneurs

There are currently 2 privately operated exhauster trucks that service the on-site sanitation facilities in town.

4.3 Enabling environment

This section examines the main features of the enabling environment that are found in the Municipality of Dodoma and at the national level in Tanzania. It looks at national policies (legislative and institutional frameworks), land tenure issues, available skills, and the level of awareness about environmental sanitation.

4.3.1 Laws, policies and strategies

Currently, Tanzania does not have a national sanitation and hygiene policy; however, the Ministry of Health and Social Welfare began developing such a policy in 2008. At the 2nd AfricaSan Conference in Durban, the Tanzanian government committed to increasing the funding for the sanitation sector from US\$ 1 million to US\$ 10 million annually. In the 2005 "National Strategy for Growth and Reduction of Poverty" (NSGRP), the Government of Tanzania set five operational targets for sanitation and waste management:

- Increase access to improved sewerage facilities from 17% in 2003 to 30% in 2010 in urban areas;
- Reduce the number of households in slums without adequate access to essential utilities;
- Ensure that 100% of schools have adequate sanitary facilities by 2010;
- Ensure that 95% of people have access to basic sanitation by 2010;
- Halve the number of cholera outbreaks by 2010.

4.3.2 Institutional framework

DUWASA has a mandate to provide water supply and sewerage services within the urban area of Dodoma, but on-site sanitation is not included in the mandate. DUWASA's core business is therefore networked sewerage service and drinking water delivery.

The current institutional framework for the provision of water supply and sanitation services is based on separation of urban water and sewerage services and rural water supply services (Table 4.3). Multi-donor funding supports two distinct programs to implement the National Rural Water Supply and Sanitation Program (RWSS) and the National Strategy for the Improvement of Urban Water Supply and Sewerage.

Table 4.3: Functional responsibilities for water supply and sanitation in urban areas.

Institution	Responsibility
Ministry of Water	Prepares and implements national sector policies and strategies Co-ordinates planning for projects of national importance Secures financing for projects of national importance Monitors performance Provides technical guidance to councils
Local Governments	Responsible for public service provision Manage environmental sanitation including solid waste
Energy and Water Utilities Regulatory Authority	Regulation of urban utilities in the major cities (functional since 2007)
Urban Water Supply and Sewerage Authorities (UWASAs)	Own, manage and develop water supply and sewerage assets Develop business plans to provide water supply and sanitation services Secure financing for capital investment and relevant subsidies Contract and manage service providers Formulate by-laws for service provision
Independent Service Providers	Adhere to UWASA regulation

The central government and donors are still funding the majority of capital investments for UWASAs. Since 2007, the Swiss State Secretariat for Economic Affairs (seco) has been supporting DUWASA in a three-year project to improve overall management, billing, tariff collection and routine maintenance of DUWASA's portfolio of responsibilities. A network extension for water supply is planned for seven areas of the town, and Chang'ombe is among them. A sewer network extension with an additional 31 km of new lateral pipes is proposed for Chadula, Hazina and Area 'A'. For the 80% - 90% of Dodoma's citizens who rely on on-site sanitation, there is no formalised service provision to improve their sanitation infrastructure.

4.3.3 Land tenure and property rights

Although Chang'ombe has all of the characteristics of an informal, unplanned settlement, it is technically a regularised settlement with formal land tenure. In the past few years, the Capital Development Authority (CDA) has carried out a topographic survey and identified structure owners. The majority of Chang'ombe's residents are now landlords with some tenants – there are no squatters. CDA is now following up with an infrastructure upgrading program which aims to provide basic urban infrastructure (e.g. roads, drainage) for Chang'ombe in the next 2 years.

4.3.4 Skills and awareness

Skills are sorely lacking in all public sector departments due to a lack of human resources in regional and municipal offices throughout the country. The health sector likely has the best coverage, ranging from Regional and Municipal Health Departments to Ward Health Officers who are responsible for raising health awareness in the municipal wards of Dodoma. There is, however, no single entity that is conversant in or has the appropriate skills for dealing with on-site sanitation in urban areas. This responsibility is divided between national and international donor organisations (e.g. WaterAid) or the nascent private sector (e.g. local masons or privately operated exhauster trucks). Experience has also shown that the masons who construct the on-site sanitation infrastructure in Dodoma (i.e. septic tanks and pit latrines) often produce sub-standard work at inflated prices to the individual household.

Financial arrangements

The central government and donors are still financing the majority of the capital investments for service extension (e.g. seco in Tabora and Dodoma). Since 2007, the Swiss State Secretariat for Economic Affairs (seco) has been supporting DUWASA in a three-year project to improve overall management, billing, tariff collection and routine maintenance of DUWASA's portfolio of responsibilities. DUWASA is a category 'A' authority, meaning that its revenue must cover operation and maintenance costs. Category A authorities are run on performance-based structures, including the right to hire and fire and define the salary structure. In Dodoma, infrastructure assets have been transferred from the central government to DUWASA.

4.4 The planning process

In Chang'ombe, the process started with the identification of the enabling environment, i.e., analysing the commitment of local government, the existing legal framework associated with water and sanitation, support available from financial institutions, donors, etc. This was done by holding a series of workshops where participants such as ministry staff, local municipal representatives, local NGOs and the community expressed their interest in and commitment to the project. This collaboration created the framework of the enabling environment.

4.4.1 Request for assistance (Step 1)

Ideally, the 10-step process starts with Step 1 "Request for assistance" where a formal request for assistance by the community is made to the process stakeholder. In the case of Chang'ombe, seco actually expressed its interest in supplementing their country programme "Improving Water Supply and Sanitation Services in Dodoma and Tabora" (2007–2009) with an HCES component. In a further step, seco consultants and Sandec carried out a joint 1-week mission in June 2007 to identify a site for validation (Chang'ombe) and a viable process stakeholder (Mamado).

4.4.2 Launch of the planning and consultative process (Step 2)

The launching events took place at the end of October 2007. Prior to the official launching workshop, a community workshop was organised to mobilise and inform the residents and to identify the main concerns of the community at large.

Community Workshop: A one-day workshop took place in Chang'ombe and was attended by cell leaders (local community leaders), primary and secondary school teachers, clinical officers from local dispensaries (health clinics), representatives from social committees, ward health officers, and members of local NGOs and CBOs, as well as representatives from Sandec. After a briefing about HCES, the participants were split into four working groups to discuss key issues that concerned the community, as follows: Working Group 1: Socio economic issues; Group 2: Health, hygiene and sanitation; Group 3: Water, drainage and solid waste; Group 4: Mapping of the Chang'ombe neighbourhood and definition of project boundaries. Group 4 took a transect walk and was able to identify the exact boundaries of the Chang'ombe settlement for future planning purposes (Figure 4.1).

Official Launching workshop: The official launch of the process was held two days after the Community Workshop at the CCT Conference Centre in downtown Dodoma in the form of an interdisciplinary experts workshop. The objective of the workshop was to formalise the process and identify all necessary stakeholders. The workshop was attended by participants from various backgrounds, including Municipal Health Officers, Municipal Community Development Officers, the CDA, NGOs (WaterAid, Mamado), University lecturers (Institute of Rural Development Planning (IRDP) - Research and Environmental Dept.), University students, and representatives from the community.

Box 4.1: Main outputs of Step 2

- Definition of project boundaries
- Approval of planning methodology (HCES)
- Initial stakeholder assessment
- Summary Report of community and official launching workshops

Box 4.2: Further reading



Mamado [Maji na Maendeleo Dodoma]. 2007. *Summary Report of Community and Launch Event on 16 and 24 October.* Dodoma, Tanzania: Mamado.

4.4.3 Assessment of current environmental sanitation services (Step 3)

Mamado and IHRDC collected up-to-date information by conducting household surveys, focus group discussions, and key informant interviews to determine the socio-economic conditions in Chang'ombe. A random sample survey covering 217 households was used to illustrate socio-economic data, health and hygiene conditions, land tenure, the state of housing and shelter, and physical and social infrastructure in Chang'ombe.

Fourteen different focus group discussions were conducted with adult males, adult females, and mixed youths. These focus groups elicited perceptions about access to safe water and sanitation services, health risks and community-wide involvement in waste management with respect to interactions and networks. In brief, the assessment found that the economic status of Chang'ombe's residents was very low, with poor social services, poor roads and no proper waste management practices. The assessment also concluded that the community was willing and eager to improve the prevailing poor conditions. The report was distributed to the main stakeholders, including DUWASA, the municipality, and seco.

Box 4.3: Main outputs of Step 3

- Waruku Status Assessment Report
- Delineated map of project area depicting project area boundaries

Box 4.4: Further reading

Mamado [Maji na Maendeleo Dodoma] and Eawag-Sandec. 2008. *Status Assessment Report of Chang'ombe, Dodoma*. Dodoma, Tanzania: Mamado.

4.4.4 Assessment of user priorities and identification of options (Steps 4/5)

Steps 4 and 5 consisted of three different workshops; the aim of Step 4 was to learn about the community's priorities concerning environmental sanitation, while the aim of Step 5 was to identify the various options for UES services that are affordable and technically viable for Chang'ombe. After an initial experts workshop (Step 5) narrowed down the system options to four distinct choices, the different technology options were explained at a community options workshop. A user-priorities workshop (Step 4) was held on the same day to minimise travel and investment of time by the participants. The steps were done in a reverse order to optimise limited time with experts (some of whom had travelled from Dar es Salaam) and to expedite the process. This modification was made intentionally to determine how an alteration in the 10-Step order would work in practice.

Experts options workshop

This workshop was attended by 17 invited participants, including representatives of DUWASA, the municipal health department, WaterAid, CCI and the ward health leaders. The aim of the workshop was to develop a list of feasible sanitation systems which could then be presented to the community as potential options for them to assess. This was done in a moderated discussion using interchangeable technology cards to build up complete, logical systems. Simplified templates from the Compendium (Tilley et al 2008) were used to guide the planning session.

Community user priorities and options workshop

This workshop took place within the community and was moderated by Mamado with 64 participants. The workshop was attended by the various community representatives, cell leaders, women and youth groups, and by others who wished to attend. The workshop consisted of two parts: the first addressed the overall priorities of the community (i.e. the relative importance of improving solid waste, sanitation, etc.), and the second addressed sanitation options as identified by the experts group earlier.

The user priority exercise was conducted utilising a prepared questionnaire with 9 questions in Swahili, which asked participants to rank their priority problems from 1-5 (1 being the top priority). Figure 4.3 shows that roads were ranked as the highest priority, followed by water supply and sanitation.

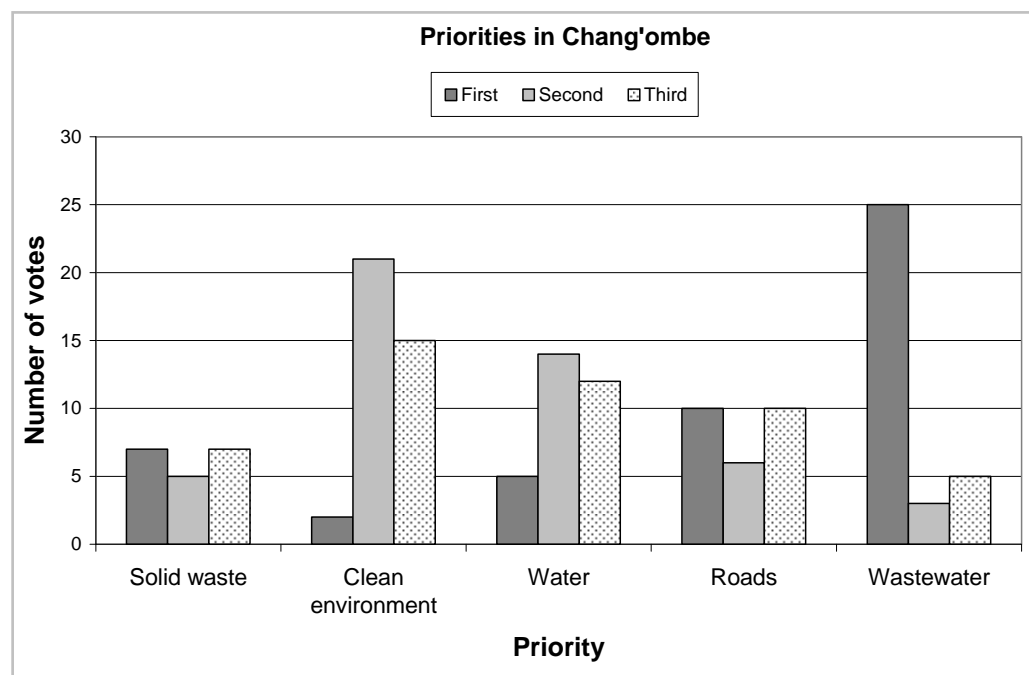


Figure 4.3: Priorities related to UESS set by the Chang'ombe community.

The community was then given the chance to discuss, question, and give their opinion about the different options that were deemed appropriate for the environmental and economic environment of Chang'ombe. These were:

- Double or single ventilated improved pit (VIP) latrines – lined pits with a ventilation pipe for improved hygiene and user comfort;
- Fossa Alterna - a waterless double-pit technology which is the cheapest option;
- Urine diverting dry toilet and dehydration vaults ('Ecosan') – a dry toilet which separates urine from faeces and allows the two waste products to be treated and used beneficially;
- Public toilets – pour-flush toilets connected to a bio-digester for sludge treatment and energy generation.

Both the Fossa Alterna and the “Ecosan” toilet can be maintained by the families themselves without the need to pay for an evacuator truck, and provide opportunities for peri-urban agricultural activities (urine, compost, etc.). The idea of a public toilet was popular, but it was not immediately clear how it would be operated or managed.

Formation of community project committee

A new HCES project committee was created to ensure ownership and consistent follow-through of the project. The main objective of the committee was to communicate project issues to the community and follow up on project activities. An eight-member team, consisting of 4 males and 4 females, was created. These members represented the four Chang’ombe wards and were responsible for the activities in their respective wards for three years. The criteria for selection of these members were as follows:

- Respected individuals within their ward;
- Committed to improve the conditions in their wards;
- Willing to work with and for the wards;
- Must be a Chang’ombe resident.

Shortly after the July workshop, pilot facilities were constructed in Chang’ombe to test user acceptability. The demonstration facilities were financed by separate Swiss funding. Three different technologies at different locations were chosen, based on community priorities: Chang’ombe Primary School (communal VIP), Ward Office Mazengo (Fossa Alterna), and Ward Office Hamvu (“Ecosan” toilet). These pilot facilities allowed the process stakeholders to assess the real costs and quality of construction. Upon completion, further improvements and adaptations to bring down the costs were suggested before up-scaling to the neighbourhood level. The pilot facilities built at public venues allow community members to test and better understand novel, previously unseen sanitation facilities that may not have been quite clearly explained during the workshops. All three facilities were finalised in early January 2009.

Box 4.5: Main outputs of Step 4/5

- Workshop report for Step 4 and 5
- Formation of HCES project committee

Box 4.6: Further reading



Mamado [Maji na Maendeleo Dodoma]. 2008. *Step 4: User Priorities, Step 5: Environmental Sanitation Options, Dodoma.* Dodoma, Tanzania: Mamado.

4.4.5 Development of UESS Plan (Steps 6/7/8)

The final planning step involved the production of the UESS Plan for Chang’ombe, which took eight weeks to complete. The UESS Plan summarises the HCES planning process, mentions the focus areas of the plan, and details improvement options and responsibilities for implementation. Action areas include: (i) a social marketing pro-

gramme, (ii) sanitation technology options for Chang'ombe, (iii) liquid waste disposal options, and (iv) drainage options for low-lying areas in Chang'ombe.

During this step, the process stakeholders began discussing the possibility of introducing a microfinance funding instrument to enable the inhabitants of Chang'ombe to pay for the toilet facilities they want. The microfinance scheme involves an executing agency (e.g. Mamado), construction brigades, i.e. trained masons, and sanitation groups, i.e. a maximum of five households who formally request micro-loans. Loan recovery begins one month after construction and is paid back over a period of 18 months, during which time the sanitation group can pay in monthly or quarterly instalments. A monthly interest rate of 1% will be charged.

The UESS Plan for Chang'ombe includes an action plan and an itemised budget for future implementation. The HCES planning process was finalised in January 2009 at a stakeholders' workshop where the draft UESS Plan was presented and implementation issues, especially concerning the microfinance tool, were discussed. The UESS Plan will be implemented in 2009–2010; it is therefore too early to evaluate implementation results.

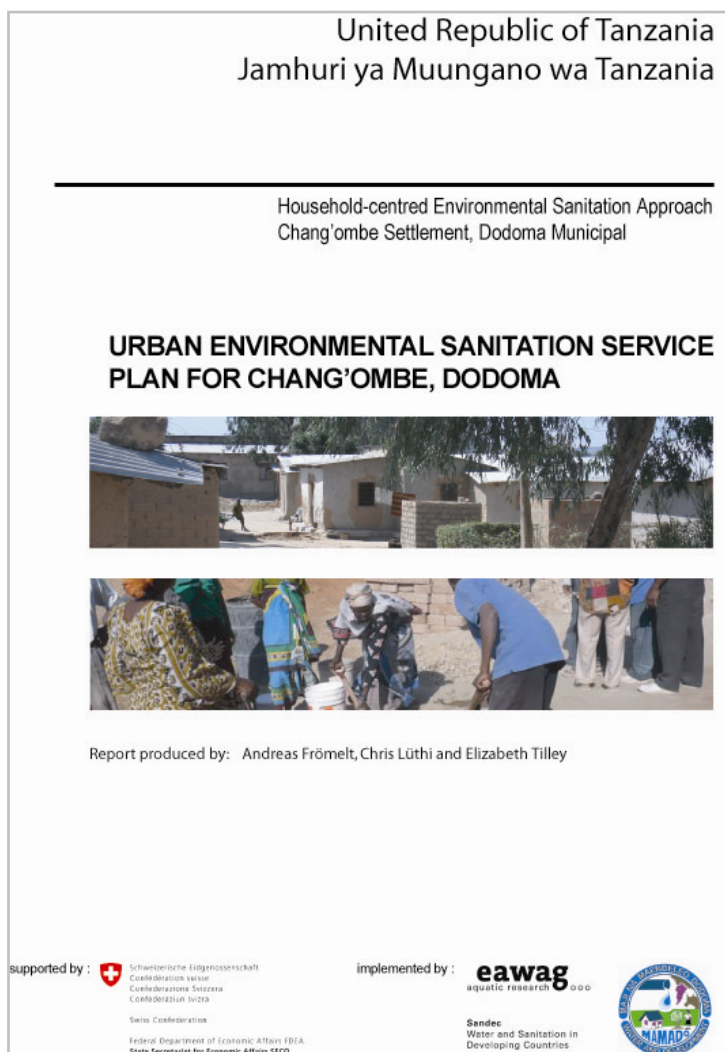


Figure 4.4: Cover page of UESS Report, Chang'ombe.

Box 4.7: Main outputs of Step 6/7/8

- Microfinance for Sanitation Workshop in Dodoma August 2008
- Chang'ombe HCES Committee formed

Box 4.8: Further reading



Mamado [Maji na Maendeleo Dodoma], Eawag-Sandec. 2009. *Urban Environmental Sanitation Service Plan for Chang'ombe, Dodoa*. Dodoma, Tanzania: Mamado.

4.5 Project outputs and outcomes

The Dodoma HCES planning project has provided the following outputs to Chang'ombe's residents:

Table 4.4: Main outputs of the HCES process in Waruku

Infrastructure improvements	
Sanitation:	3 pilot sanitation technologies built in Chang'ombe: (i) Fossa Alternata, (ii) Urine diverting double-vault dehydration toilet (Ecosan Toilet), (iii) VIP latrines (primary school).
Improvement of management of UESS	
Institutional:	Operational HCES Project Committee representing the community at large
Funding vehicle	"Microfinance for sanitation" framework discussed and agreed with main stakeholders. Formation of a Technical Committee to provide guidance (initial seed funding from Switzerland: US\$ 10,000)
Awareness raising and capacity building	
Training courses	Half-day training course on on-site sanitation options (held in preparation for Step 5)
Awareness raising activities:	Two community workshops and several focus group discussions (organised by Ifakara Health Research and Development Centre) Microfinance workshop to sensitise stakeholders about novel financial tools Opening day for newly constructed VIP school toilets at the Chang'ombe Primary School

4.6 Timeline

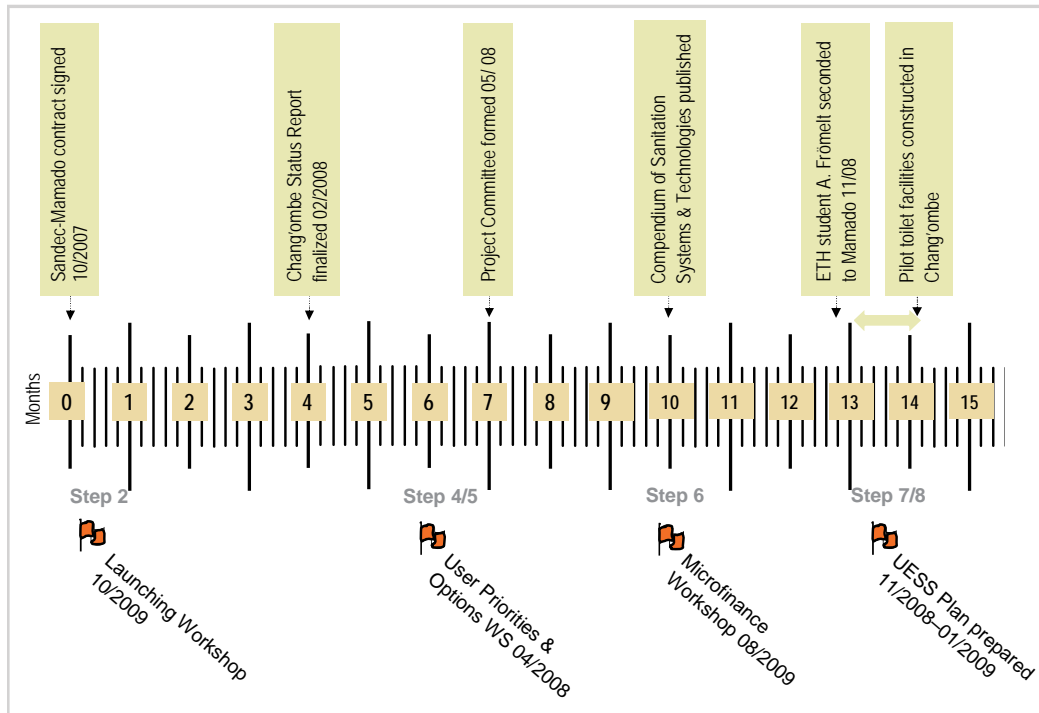


Figure 4.5: Timeline of activities in Chang'ombe 2007-2009.

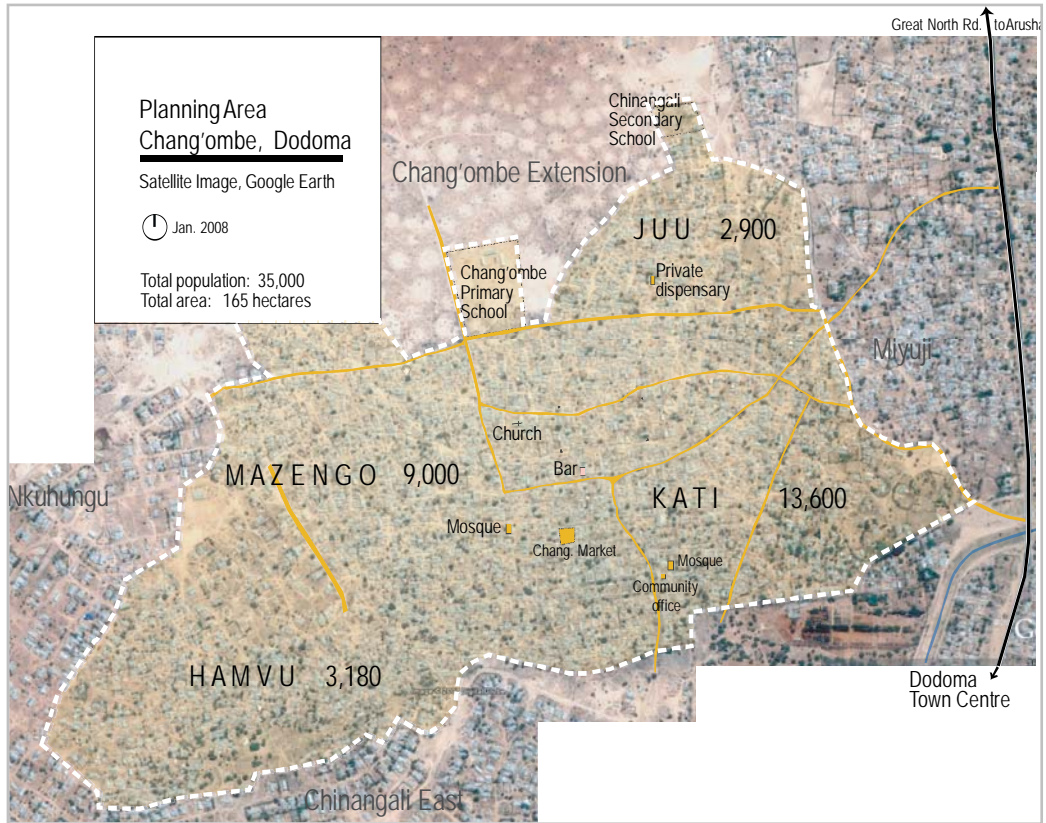


Figure 4.6: Google Earth map showing Chang'ombe with its 4 sub-wards. (Source: Google Earth)



Figure 4.7: The peri-urban settlement of Chang'ombe, Dodoma. (Photo: Sandec)



Figure 4.8: Existing unimproved pit latrines in Chang'ombe. (Photo: Sandec)



Figure 4.9: Experts meeting discussing sanitation options (Step 5). (Photo: Sandec)



Figure 4.10: Workshop results: overview of sanitation system and technologies for Chang'ombe. (Photo: Sandec)



Figure 4.11: Construction of pilot urine-diverting toilet for awareness raising purposes. (Photo: Sandec)

4.7 HCES planning and implementation costs

Process stakeholder costs

Sandec signed a contract worth US\$ 18,000 for Mamado's inputs towards the HCES validation in Dodoma. Because of currency devaluation (20% in 1 year) and cost savings, only US\$ 12,500 were effectively spent. This covered salaries, overhead, and transport.

Additional workshop costs

Community Workshop (October 2007):	75 participants
Launching event (October 2007):	55 participants
Cost of Community Workshop:	US\$ 1,000
Cost of Launching Workshop:	US\$ 1,100
Cost of Options and Experts Workshop (April 2008)	US\$ 1,000
Total workshop costs (2007–2008)	US\$ 3,100

All other workshops were smaller, with lower participation, and were funded within the Mamado budget.

Hardware costs

Within the PAMS project, Mamado was given an implementation budget of CHF 35,000 (US\$ 29,000) for building the pilot sanitation facilities in Chang'ombe. PAMS are a vehicle for testing the applicability of development research results. Each project is designed to implement strategies developed jointly by researchers and local stakeholders. Based on a transdisciplinary approach to development research, PAMS are meant to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

Total costs for HCES planning phase (including pilot facilities)

Contractual costs (Mamado)	US\$ 12,500
Construction costs	US\$ 29,000
Workshop costs	US\$ 2,800
TOTAL	US\$ 44,300

Approximately US\$ 1.25 were spent per resident for the planning.

4.7.1 Contribution by the beneficiaries

Certainly there have been dozens of hours spent by ward representatives and project committee members in making the HCES process a reality, but putting a price tag on voluntary work is not easy. Some expenses have been paid – for example, all work-

shop participants were given a small per diem (“incentive”) for their attendance. Further interviews must be carried out to try to estimate the number of days/hours spent in dealing with the entire planning process.

4.7.2 Operation and maintenance costs

Maintenance costs will depend on the chosen on-site technologies. Single-pit VIP latrines will have the highest maintenance costs due to the high pit emptying costs (15,000 - 30,000 TSh per latrine –approximately US\$ 15-30). Both the Ecosan toilet and Fossa Alterna cost far less to maintain, as most of the maintenance can be done as unpaid labour by the individual households.

4.8 Challenges, constraints and strengths

This chapter examines some of the challenges faced during the 14-month validation process in Dodoma.

4.8.1 Institutional challenges

The main institutional challenges were in dealing with the two most powerful institutions in Dodoma: the Dodoma Urban Water Supply and Sewerage Authority (DUWASA), and the Capital Development Authority (CDA). Both institutions found it difficult to diverge from the status quo and foster experimentation outside of the norms within which they were deeply embedded. DUWASA’s institutional inertia made it difficult to transform mainstream processes and to try a new approach that diverged from ‘business as usual’. DUWASA carries the term “sewerage” in its name and is above all interested in expanding its sewerage network to all planned areas of town, even if almost 90% of Dodoma’s citizens will continue to rely on on-site systems such as septic tanks and simple latrines. DUWASA currently does not operate any exhauster trucks (although it is planning to purchase one in early 2009), does allow faecal sludge to be disposed of in the waste stabilisation ponds, and believes that centralised sewerage is still the most efficient and safest way for excreta removal.

Inflexibility on the part of DUWASA has at times caused uneasy relations between the HCES project unit and DUWASA representatives; DUWASA did not attend the workshops and showed general disinterest in the process. However, following the options workshop (July 2008), the DUWASA Sanitary Engineer did start to show interest and contributed to the experts meetings. Willingness to invest in the purchase of a new exhauster truck shows that DUWASA began to see a potential money-earning market in emptying the thousands of on-site facilities in Dodoma. Overcoming “institutional inertia” takes time and comes in gradual steps, but it appears as if DUWASA is making steps in the right direction.

The Capital Development Authority (CDA) is a powerful institution that holds all public land in Dodoma and wields overall planning authority. This means that unlike other local authorities in Tanzania, Dodoma Municipality has no major assets and no real planning authority. CDA managed to regularise the entire unplanned settlement of Chang'ombe in 2007 and ensured that the inhabitants secured tenure. The promised

upgrading of roads and drainage systems has been delayed due to lack of funds. The CDA also created some project delays by initially refusing to grant construction permits to the three planned pilot facilities in Chang'ombe.

A third institutional challenge was the limited professional capacity at all levels; capacity that is needed to carry out this kind of comprehensive planning approach in a secondary city in Africa. There are too few professionals who understand sanitation options at household and community levels, a lack of expertise to carry out statistically sound sample surveys, and a lack of skilled moderators/communicators who combine communication skills with knowledge about community dynamics. Professional capacity development requires considerable attention in the near future.

4.8.2 Process-related challenges

Given the low capacity in terms of time and human resources, the HCES approach in its current format is still too demanding for the reality of small and medium-sized African towns. During the project period, a number of additional tasks were added to the original planning steps (e.g. socio-economic surveys, micro-finance workshop, construction of pilot toilets, etc) which exposed weaknesses in project programming and implementation. By streamlining and combining certain planning steps, the time-frame and complexity can hopefully be reduced.

The second challenge was regarding the mode of participation. Workshop participation was not entirely voluntary in that participants were paid with so-called "incentives" in the form of travel expenses or lunch, or both. Compensation seems to be standard procedure in Tanzania but it does raise some questions about genuine participation and the real motives for community participants attending a planning workshop.

Finally, there is the question of replicability. It is not certain if the process stakeholder Mamado is sufficiently empowered and capable enough to carry out another household-centred approach on its own without external backstopping. In terms of executing the process, i.e. organising workshops, mobilising the community, etc., there would be no foreseeable problems. However, the NGO does not possess sufficient technical knowledge or institutional leverage to perform high-quality design and assessment work in collaboration with the institutions that should be involved.

4.8.3 Strengths





The 14-month planning process in Dodoma brought together a great many stakeholders from public, private and civil society (local and international NGOs). During the process, officials and community representatives shared their views and discussed viable options for improving environmental conditions. A good degree of agreement was achieved during the workshops and group work sessions. Initial resistance from the water and sewerage utility could be partially overcome.

Due to the many workshops, focus group discussions and social events (e.g. official opening of the school toilets at Chang'ombe Primary) there is now a greater willingness to improve urban environmental conditions in the neighbourhood. This is crucial for raising demand for funds from the microfinance project to be used for sanitation.



The participation and active involvement of women was taken seriously and adequate representation of women was addressed in the formation of the HCES Project Committee: 4 male and 4 female representatives were elected for a three-year period. To make sure that targeted interventions differentiated by gender are made possible, gendered user priorities regarding environmental sanitation were assessed during the Step 4 community workshop.

4.9 Project reports and papers

Box 4.9: Reports

-  **Mamado [Maji na Maendeleo Dodoma].** 2007. *Summary Report of Community and Launch Event on 16 and 24 October.* Dodoma, Tanzania: Mamado.
-  **Mamado, Eawag–Sandec.** 2008. *Status Assessment Report of Chang'ombe, Dodoma.* Dodoma, Tanzania: Mamado.
-  **Mamado [Maji na Maendeleo Dodoma].** 2008. *Step 4: User Priorities, Step 5: Environmental Sanitation Options, Dodoma.* Dodoma, Tanzania: Mamado.
-  **Mamado, Eawag–Sandec.** 2009 *Urban Environmental Sanitation Service Plan for Chang'ombe, Dodoma.* Dodoma, Tanzania: Mamado.

Box 4.10: Further reading

-  **Lüthi C, Morel A, Tilley E.** 2008. Integrate at the top, involve at the bottom - The household-centred approach to environmental sanitation. *Proceedings of the IRC Symposium on Sanitation for the Urban Poor, Partnerships and Governance, Delft 19-21 November 2008.* Delft, The Netherlands: International Water and Sanitation Centre (IRC).
-  **Kessy F, Obrist B.** 2008. Identifying resilience pathways to sanitary health problems in an unplanned ward of Dodoma, Tanzania. *Medische Antropologie* 20(2): 227-239.

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Abbreviations

CBO	Community-based organisation
CCI	Centre for Community Initiatives
CDA	Capital Development Authority
DUWASA	Dodoma Urban Water Supply and Sewerage Authority
IHRDC	Ifakara Health Research and Development Centre
IRDP	Institute of Rural Development Planning
NSGRP	National Strategy for Growth and Reduction of Poverty
RWSS	Rural Water Supply and Sanitation Program
seco	Swiss Secretariat for Economic Affairs
UESS	Urban environmental sanitation services

5 La Europa, Curridabat, Costa Rica

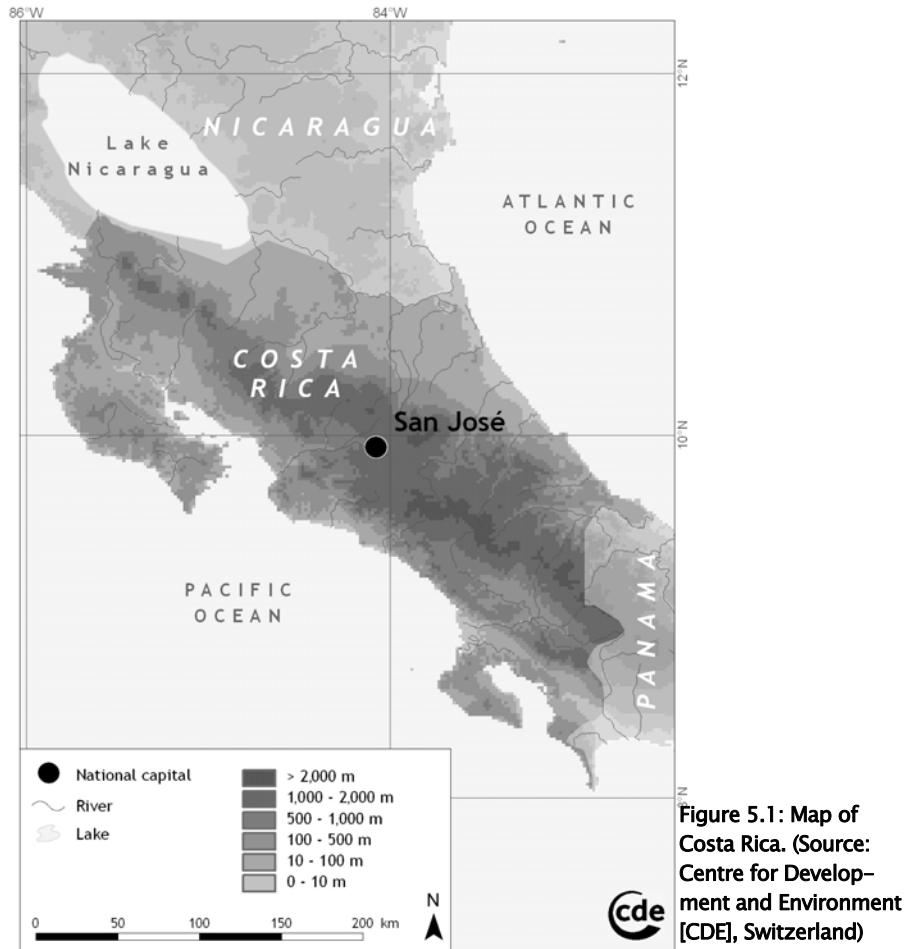


Table 5.1: Project details for La Europa, Costa Rica.

Project duration:	From July 2006 to February 2007 [8 months], followed by a pause
Project site:	La Europa neighbourhood, southeast of downtown San José, Canton of Curridabat
Project coordinator:	Latin American Faculty of Social Sciences (FLACSO): international organisation with regional character, conducting research on social, political, economic and environmental issues
Main stakeholders:	Neighbours' Association of La Europa, FLACSO, Foundation for Housing Promotion (FUPROVI), Canton of Curridabat, Institute for Waterlines and Sewerage (AyA) – linked to the Public Health Ministry (MSP); Mortgage Bank of Housing (BANHVI) – linked to the Ministry of Housing (MIVAH)
Main beneficiaries:	Residents of La Europa (approximately 748 inhabitants)
Funding and resources:	NCCR North–South research programme (SDC and SNF funded)
Main outputs:	The community was empowered to deal with urban environmental improvements. Although there was no infrastructure construction, the HCES process acted as a catalyst for community organisation and action.

5.1 Introduction

Costa Rica is rich in hydrological resources and in 1990 an estimated 92% of the population had access to drinking water (though questions remain about water quality). Despite near complete drinking water coverage, the country as a whole suffers from inadequate environmental sanitation services, particularly in dense urban settlements. In 2001, only 4.5% of the domestic wastewater was collected by a sewer system, with the remainder going to septic tanks or being discharged openly, thus creating public health risks and water resource contamination. Despite a relatively high level of development, the level of sanitation coverage in Costa Rica is one of the lowest in Latin America. The sewer system in the metropolitan area of San José, which consists of four collectors with an extension of 86 kilometres, is more than 30 years old and nearing collapse (El Estado de la Nación 2008).

For the validation of the HCES process, a small settlement within the GAM was selected because of its manageable size and the presence of an active community group.

5.1.1 The project site

The neighbourhood of “La Europa” is located on the southeast edge of the city in the canton of Curridabat. La Europa was built in the early 1980s, as the result of a governmental housing programme, and is an urban area for low-income families, but is not an informal settlement. The land was acquired with financial capital from various European countries, which gave the settlement its name. Currently, most of the inhabitants have property titles on their houses and land. The settlement is flanked by two perennial water-bearing creeks, which also mark the natural boundaries to other eastern and western settlements. Table 5.2 summarises demographic and socio-economic information.

La Europa was selected as an HCES case study for following reasons:

- Settlements such as “La Europa”, built by the Institute of Social Welfare (IMAS) since its foundation 1970, represent one type of social living arrangement available for the Costa Rican poor (estimated around 20% of the total population);
- The sanitation system was not functioning, and was causing environmental pollution and affecting living conditions;
- Community members are active and well-organised; a Neighbours’ Association is interested in developing projects to improve the community.

Table 5.2: Demographic and socio-economic information of La Europa, San José. (FUPROVI 2006)

Population of La Europa:	748 inhabitants (2005)
Nationality:	94% Costa Rican, 5.2 % Nicaraguan
Area:	6.6 ha
Household income:	66% of the households earn less than CRC 150,000 (US\$ 267 /month)
Employment:	39% have permanent employment, 11% of household heads are unemployed
Average household size:	4.5 persons
Household head:	75% men 25% women
Education of household	31% have an incomplete secondary education
Age groups:	22% children (0–10 years) 43% youth and young adults (11–23 years) 35% adults (> 33 years)

5.1.2 Geography, topography, climate

San José, the largest city in Costa Rica, is located in the Central Valley at an altitude of 1150 m and is the seat of national government and the focal point of economic activity. The city area, the canton of San José, covers an area of 45 km² with about 350,500 inhabitants. Urbanisation and migration have led to vast increases in the population of San José and the Central Valley. The Gran Metropolitan Area (GAM), which includes 31 cantons, is home to about 2.6 million people on an area of 2044 km² and has a population growth rate of approximately 2.4% (2007). The metropolitan area has a humid, tropical climate with two distinct seasons. The dry season, with very little rain and temperatures from 18 to 32 °C, is generally between late December and April, and the wet season lasts from May to December with temperatures ranging between 15 to 22 °C.

5.1.3 Current status of environmental health and urban environment

Environmental health

There are no known cases of previous governmental, municipal or non-governmental awareness campaigns regarding environmental health (i.e. the link between diseases and poor sanitation). However, the majority of inhabitants are aware of the failing sanitary system and the improper treatment of wastewater in the community of La Europa. Community members have noted that bad odours are a direct result, and some have linked the failed sanitation systems to health risks.

Water supply

All households have a water connection that is exclusively provided by the Costa Rican Institute for Waterlines and Sewerage (Acueductos y Alcantarillado, AyA). The

price of drinking water depends on the amount consumed and includes a basic tariff of about US\$ 5 per household, plus a fixed tariff of about US\$ 10 for the first 15,000 litres consumed (AyA 2008).

Sanitation

Sanitation facilities are inadequate: 78% of the households in La Europa use septic tanks, but they are not properly constructed, are not dimensioned properly, and have not been designed to consider ventilation or drainage. The remaining 7% of the houses are not equipped with septic tanks and no data were available for 15% of the houses (Picado Vásquez 2007). Maintenance of the septic tanks varies; some families have had the sludge removed from the tanks by a private emptier while other households have not emptied their tanks once in 20 years. Septic tank emptying is not only expensive but also difficult, since exhauster trucks cannot reach the tanks due to the narrow and mostly gravelled roads. Most of the greywater runs freely and untreated along the gravel streets, whereas on the two paved streets it runs into rainwater channels and flows into the two creeks (see Figure 5.7). There is no sewer system or treatment plant in La Europa.

Solid waste management

Though the municipality collects solid waste twice a week, large amounts remain uncollected. Dumping along the hill, in some corners of the streets, and especially at the entrance to the community is a common practice. Uncontrolled dumping intensifies odours and creates an aesthetic nuisance as well as conflicts among neighbours within the community. Because waste separation and recycling are not (yet) concerns of the municipalities (national policies on the reformation of solid waste management were being discussed at the time of writing), the community has started to react. One member of the Neighbours' Association has run a small recycling business since 2008. The president of the Neighbours' Association wants to establish an education program within the community regarding the proper manner of waste separation and recycling and pursue a profitable business, but the sources of human and financial capital remain unclear.

Drainage

Stormwater drainage only exists along the two asphalted main roads, both of which were constructed in 2005/2006 thanks to a community self-help initiative. The work was done by community members with technical assistance from the Foundation for Housing Promotion (FUPROVI) and funds from the local government (see Figure 5.8). Currently, all stormwater runoff flows into the two creeks.

5.2 Partner institutions

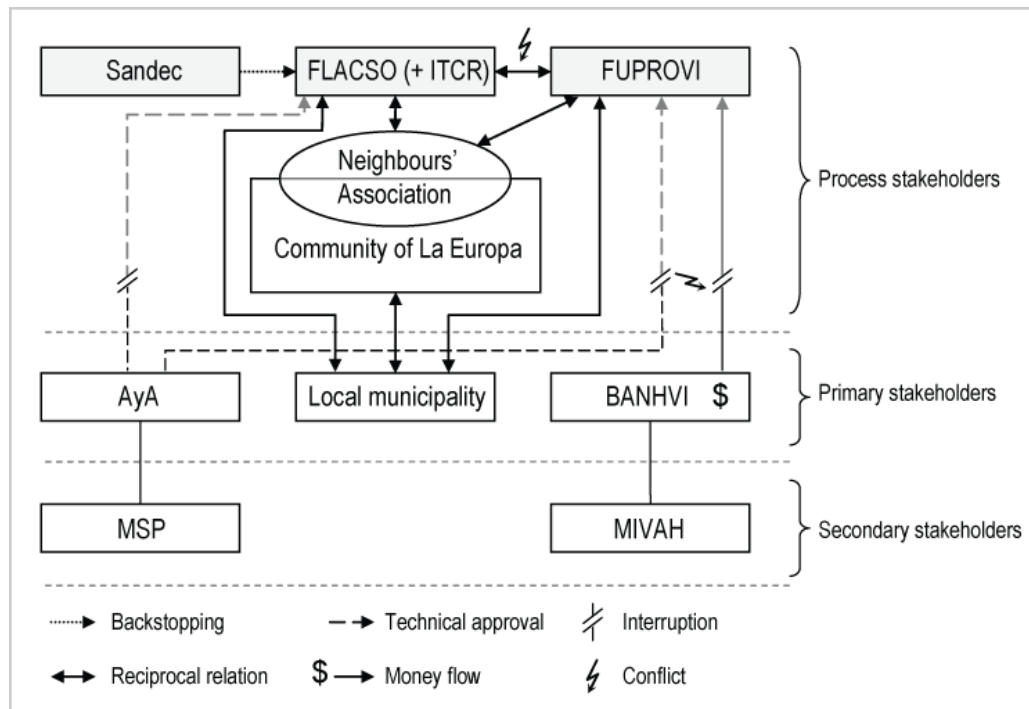


Figure 5.2: Stakeholder map.

A distinction is made between (i) process stakeholders, (ii) primary stakeholders, and (iii) secondary stakeholders. Process stakeholders are understood to be the key stakeholders responsible for driving the HCES process and essential to achieving the main outcomes of the HCES validation process. Primary stakeholders are institutions that have a “stake” in the planning process or have the potential to affect or be affected by planning decisions. They may allocate funds or give permits for construction. Secondary stakeholders are other stakeholders who may take part in workshops or meetings but are not essential to the planning process (Figure 5.2).

5.2.1 Process stakeholders

Sandec

The Department of Water and Sanitation in Developing Countries (Sandec) coordinates the validation of the Household-Centred Environmental Sanitation (HCES) programme internationally. Sandec assisted FLACSO in implementing the HCES process in La Europa and in backstopping. Contact: Petra Kohler, email: petra.kohler@eawag.ch

FLACSO (+ ITCR)

The Facultad Latinoamericana de Ciencias Sociales (FLACSO) is an international organisation with a regional focus that conducts academic research on social, political, economic and environmental issues. FLACSO cooperates with universities, national governments, and local and international nongovernmental organisations and was chosen as the process stakeholder after a request by the mayor of the municipality of

Curridabat in 2006. For technical contributions, FLACSO cooperated with the Costa Rican Institute of Technology (Instituto Tecnológico de Costa Rica, ITCR). Contact: Mrs M. Perez, email: mperez@flacso.or.cr (Project coordinator, FLACSO); Mr E. Rosales (Engineer, ITCR), email: erosales.cr@gmail.com

Neighbours' Association of La Europa

The Neighbours' Association (Asociación de Vecinos de Urbanización La Europa) consists of seven active members and is the direct representative (Junta Directiva) of the community at large. Its members work on a volunteer basis in different projects to improve infrastructure and the quality of life in the community. The Association (which was previously a committee) was formed in 2003 (several years before the HCES planning process started). During the HCES process it communicated project issues to the community and followed up on project activities. The community holds the organisation in high regard, especially as a result of the personal engagement of its president and some other members of the Junta Directiva. Contact: Mr A. Jimenez (President), email: alexjimenez71@hotmail.com

FUPROVI

The Foundation for Housing Promotion (Fundacion Promotora de Vivienda, FUPROVI) is a private, non-profit development organisation that provides funding and technical assistance for projects in low-income areas. FUPROVI consists of three sub-sectors: financial (analysing and formalising monetary resources), social (strengthening of the community), and construction (engineering). Since 2005, FUPROVI has supported the community with the upgrading of roads, and the construction of rainwater channels, and sidewalks. FUPROVI had not done, nor did it plan to do, anything in the area of sanitation before HCES became a topic in relation to the settlement and the municipality. Contact: Mrs E. Ulibarri (Executive director), email: eulibarri@fuprovi.org

5.2.2 Primary stakeholders

Municipality of Curridabat

By the time HCES planning started, the upgrading of roads and the construction of rainwater channels and sidewalks were finalised by community members with assistance from the municipality. The HCES process was initiated by the former mayor and continued by the next (current) mayor. The municipal engineers were informed about HCES and remained informed throughout the process.

AyA

The Costa Rican Institute for Waterlines and Sewerage (Acueductos y Alcantarillado, AyA) is a centralised governmental institution linked to the Ministry of Public Health (MSP, see below) and is responsible for policies related to the planning, financing and development of all aspects related to water provision and wastewater (treatment). AyA is responsible for (drinking) water provision and the regulation of sanitation, particu-

larly in urban areas. The approval and control of sanitation projects would also (in theory) include the disposal of excreta as well as the treatment and disposal of household wastewater. In practice, however, AyA does not achieve all of these objectives. AyA did not give permits to either the alternative sanitation solution developed by HCES or to the traditional one proposed by FUPROVI.

BANHVI

The Mortgage Bank of Housing (Banco Hipotecario de la Vivienda, BANHVI) is an institution under the Ministry of Housing (MIVAH, see below) and facilitates the transfer of the *bono colectivo* (collective grant) to subsequent organisations. The purpose of the money from the *bono colectivo* in La Europa (FUPROVI was assured of the *bono colectivo* via BANHVI) was for community infrastructure, with a focus on the sanitary system.

5.2.3 Secondary stakeholders

MIVAH

In 2006, the Ministry of Housing (Ministerio de Vivienda y Asentamientos Humanos, MIVAH) began the “Improvements of low-income areas and eradication of slums” program, i.e. the system of the *bono colectivo* for economically depressed areas and the *bono familiar* for low-income families. The *bono colectivo* can be used exclusively to improve the infrastructure of a whole community, whereas the *bono familiar* can be used for individual necessities. MIVAH and BANHVI are the decision-takers in the allocation of the *bono colectivo* and in choosing an organisation to implement a funded project. FUPROVI assumed that they would be given the *bono colectivo* for their suggested sanitary project in La Europa, but the transfer of funds was halted because of a personnel change in the MIVAH, and the *bono colectivo* was then subject to renegotiation.

MSP

The Ministry of Public Health (Ministerio de Salud Publico, MSP) is the national authority on health policies and is, amongst other things, responsible for the approval of projects related to water provision, the standardisation and supervision of the quality of drinking water, and the approval and control of sanitation projects. A representative from MSP participated in an HCES workshop and expressed interest but did not continue with the project.

5.3 Enabling environment

This section examines the main features of the enabling environment for water and sanitation found at the national and municipal level. Land tenure issues and property rights, as well as skills and awareness related to water and sanitation in La Europa, are also examined.

5.3.1 Laws, policies and strategies

Drinking water

Though drinking water is widely accessible, Costa Rica still wants to enhance access. In the 2004 the Government of Costa Rica formulated the ‘‘Millennium Development Objectives’’ (OMD), to ensure that by 2015, 99% of the population will have access to potable water. There is widespread awareness about water quality and programs to ensure safe drinking water. The cholera epidemic at the beginning of the 1990s highlighted the importance of safe drinking water; this awareness is reflected in the improvement of the municipal distribution system and the chlorination of water.

Sanitation and wastewater treatment

In the same OMD, the Government of Costa Rica set general operational targets for environmental sustainability, with sanitation as just one task among many. The aim is to halve, by 2015, the percentage of people lacking sustainable access to basic sanitation in urban and rural areas. In 2003, 94% of the population already had access to either a sewerage system or a septic tank (even though not always working properly). When emptied from septic tanks, faecal sludge is removed by private companies and sometimes put directly into the rivers. Another National Policy is ‘‘Eradication of slum areas’’. This is a general plan for improving the quality of wastewater treatment in low-income areas that suffer from environmental pollution. It is estimated that US\$ 842 million for the period of 2001–2020 (US\$ 42 million per year) would be needed to achieve the OMD goals. Other sources estimate double this amount for a sector modernisation program (2001–2020) focusing on urban and rural water coverage and coverage of urban sewerage (AyA 2002). The high estimates reflect the many years of neglect of the water and sanitation sector.

Institutional framework

Functional responsibilities for water supply and sanitation in urban areas at national and municipal levels are summarised in Table 5.3.

Table 5.3: Functional responsibilities for water supply and sanitation in urban areas at national and municipal levels.

Institution	Responsibility
Ministry of Environment and Energy (MINAE)	Responsible authority for utilisation, administration, conservation and monitoring of water resources in public domain Warrant concession to public service (AyA) on water provision and sanitation In coordination with AyA: conservation of the catchment area (watershed), ecological protection and control of water contamination
Public Health Ministry (MSP)	National authority on health policies In cooperation with AyA: responsible for the approval of projects on water provision, standardisation and supervision of the quality of drinking water, approval and control of sanitation projects
Institute for Waterlines and Sewerage (AyA)	Conducts and designs policies on planning, financing and development of all aspects related to water provision and wastewater treatment Responsible for (drinking) water provision Regulation of sanitation Approval and control of sanitation projects, including disposal of excreta and treatment and disposal of household and industrial wastewaters
Local Governments, Municipalities	Responsible for common infrastructure (excluding electricity, water connection and house itself) Administration and operation of drinking water supply through/via disposition of the constitutive law of AyA Manage environmental concerns (e.g. solid waste) excluding sanitation
Independent Service Providers	Adhere to AyA regulations

The double role of AyA presents a conflict of interest: AyA has a mandate to provide water and sewerage services, but at the same time they monitor compliance with technical norms. AyA is responsible for monitoring its own service delivery. Furthermore, they can take over failing systems and advise the ministries on development of the water and sanitation sector.

Under a new urban rehabilitation plan, the GAM project, AyA has stated that by 2014 all cantons should be connected to a single centralised sewage collection and treatment system (with primary treatment only). The plan is seen as flawed and expensive (US\$ 230 million), although the Japanese government offered a grant and the central government promised to contribute (US\$ 100 million) (AyA 2002).

AyA has a mandate to provide water and sewerage services to the municipality of Curridabat and hence to La Europa. However, prior to HCES, there was no provision of service or plans to improve sanitation infrastructure for the community. A plan was later introduced for the whole settlement though it has not yet been formalised (through AyA) or implemented (see chapters 5.2 and 5.4).

5.3.2 Land tenure and property rights

According to a 2005 census, La Europa has 165 inhabited houses, of which 83% are owned by the inhabitants. Only 8% of the population rents a house and only 4% lives in an informal situation (FUPROVI 2006). The IMAS is still the owner of some of the houses (5%), parkways, untitled areas, and streets.

5.3.3 Skills and awareness

Awareness of the importance of urban sanitation systems has increased over the last few years among governmental and municipality institutions, and some NGOs have started including sanitation as an essential task in their community development programmes.

However, the skills required to deal with environmental sanitation in urban and rural areas are lacking. Isolated examples of awareness and concrete actions related to environmental sanitation result from initiatives for various activities such as:

- The Costa Rican Network of Housing, Environment and Health (Red Vivienda Ambiente Salud, REDVAS-CR) includes the President of the Republic, Ministry of Health (MSP), Pan American Organisation of Health (OPS), Ministries of Environment and Energy (MINAE), Ministry of Housing (MIVAH), and Institute of Technology (ITCR). Among other goals within their ‘‘healthy housing’’ program, this network aims to promote sanitation techniques.
- Sanitation and health experts from the ITCR and the OPS co-funded the National Network on Environment, Water and Sanitation (Red Ambiental Nacional en Agua y Saneamiento, RANAS) as a platform for knowledge exchange and as a think tank. Members include academics from various universities and institutes, representatives of government (MSP and MINAE), service providers (AyA and ASADAs: Association of Administration of Waterlines and Sewerage in rural areas) and NGOs. This network aims to reach all actors interested in the improvement of sanitary and health conditions within the country and intends to link universities and service providers to improve communication.

In La Europa, FUPROVI has conducted community-building workshops prior to the HCES process in order to create greater coherence among community members, better leadership for members of the Neighbours’ Association, and greater awareness of environmental problems (except for sanitation) among the community.

5.3.4 Financial arrangements

Uncertain and small funds, plus poor communication and links between the various actors in the different departments, are still constraints in the promotion of urban environmental sanitation services.

5.4 The planning process

In January 2006, the HCES approach was presented to FLACSO, who had been asked in advance by the local government (the municipality of Curridabat) to support La Europa to improve the quality of their infrastructure. With the consent of the local government, the existing legal framework, financial institutions, and the main responsibilities of the stakeholders involved were discussed and identified. This was followed by a reconnaissance visit to La Europa with additional representatives from the Ministry of Housing (MIVAH) and the Ministry of Health (MSP). All the involved stakeholders expressed their interest and commitment to supporting the HCES project.

5.4.1 Request for assistance (Step 1)

A formal request for assistance (see Figure 5.3) was initiated and submitted (in March 2006) by the Neighbours' Association and residents of La Europa to the process stakeholders (FLACSO and Sandec), to express their wish to see a change in the existing infrastructure. By that time, the community had formulated a strategy and had already obtained support from the municipality and FUPROVI to improve the quality of basic infrastructure.

Box 5.1: Main outputs of Step 1

- Expressed request for assistance from the Neighbours' Association

San José, 13 de marzo de 2006

Srs. SANDEC

Estimados Srs.:

Nosotros los abajo firmantes, miembros de la Asociación de la Urbanización Europa de Curridabat, estamos muy interesados en que su organización impulse la formulación de una Estrategia de Saneamiento Ambiental a partir de los Hogares en nuestra comunidad.

Como es de su conocimiento, nuestra Urbanización cuenta con el apoyo de la municipalidad de Curridabat y de la Fundación Promotora de Vivienda (FUPROVI) en sus esfuerzos por mejorar la calidad de la infraestructura básica con que cuenta. Una visión como la que se plantea en la metodología que ustedes proponen, nos permitiría contar con un plan integral de inversión que sería de una enorme ayuda en la gestión de los recursos necesarios.

Les agradecemos de antemano la buena acogida que puedan brindar a esta solicitud.

Atentamente,

Por la Asociación de la Urbanización Europa:
Asociación de Vecinos
URB. EUROPA
Granadilla Norte, 3-002-422940

Alex Jimenez Soreano
Roger Vindas Marín
Pablo Vindas Marín
Gerardo Alberto Guerra Vargas
Patricia Sandoz Barnes
Yamilet Angulo Rodríguez
Belma Arias
Alberto Villegas Ugalde
Charline Vindas Marín
Stephanie Castillo Espinoza
María Cecilia Espinoza Ch.
Alex Espinoza
Juliano Castillo Espinoza
José Antonio Bartolomé
Jorge A. Rodríguez B.
Armadita Arce
Mercedes Guzmán Castro
Karla Portillo Navarro
Dave Jiménez Angulo
Jessica Calderón Orozco
Elizabeth Sánchez Salazar
Patricia Cortés Fernández

Oscar Espadas Delgado
Patricio Rodríguez Picado
Gustavo A. Torres Rodríguez
Danida Ramírez Rivas
Katherine Ordóñez Pérez
Christopher Guido Navarro
Maikol González H.
Jiménez José Antonio
Jorge Sarquín Oporto
Silvia Acosta Valverde
Armina Pérez O.
Paola Díaz,
Luis Gerardo Ceballos
Mónica Maza González
Miguel Ángel Sánchez López
Lizbeth Pérez Salazar
Felipe Argueta
Mercedes Argueta

Figure 5.3: Letter of request.

5.4.2 Launch of the planning and consultative process (Step 2)

A one-day launching workshop took place (on 28 July, 2006) in the community centre of La Europa with residents, the Neighbours' Association, representatives of FLACSO, FUPROVI, MSP, MIVAH, the University of Costa Rica (UCR), the Investigation Program on Sustainable Urban Development (ProDUS) and a representative from the municipality and from Sandec.

After a presentation about HCES, the participants defined and agreed on the geographical planning boundaries of the area, and in four groups they identified key sanitation challenges in the settlement: environmental pollution; health, hygiene and sanitation; rain water treatment; greywater treatment; blackwater treatment; solid waste; recycling; green areas; and drinking water (see Figure 5.9).

A stakeholder analysis was carried out and the results of the various working groups were discussed. The groups identified the positions, capabilities and responsibilities of the institutions and stakeholders involved in sanitation planning. Furthermore, existing and desired resources, as well as real and potential obstacles for Steps 3 and 4 were analysed, and a decision about the timeframe for the planning process was made.

A memorandum of understanding (MoU) was signed between Sandec and the partner institutions FLACSO, the municipality, the Neighbours' Association, and FUPROVI to provide assistance to the HCES process. Participants from MSP and MIVAH did not sign, although they wanted to commit to the process. No one from AyA participated, nor did they want to commit.

Box 5.2: Main outputs of Step 2

- Definition of project boundaries and stakeholder analysis
- Approval of planning methodology (HCES)
- Summary report of the launching workshop

5.4.3 Assessment of current environmental sanitation services (Step 3)

The UESS status assessment was done at the beginning at Step 4 (see Assessment of User Priorities). In conjunction with local residents, investigators and specialists on environmental sanitation engineering from ITCR completed an analysis of residents' knowledge about the status of infrastructure and its operation and maintenance. The survey focused on: (i) general information; (ii) treatment of greywater; (iii) treatment of black and yellow waters; and (iv) the drainage system.

Because FUPROVI had been working with the community on community improvement before the HCES planning process started, socio-economic, land tenure, state of housing, and physical and social infrastructure data were available (FUPROVI 2006). Data on the health and hygiene conditions of the community residents are still lacking.

Box 5.3: Main outputs of Step 3

- Status Assessment Report (as part of J.D. Picado's thesis)
- Status report summary

Box 5.4: Further reading

Picado Vásquez JD. 2007. *Sanitation Plan for the Treatment of Wastewaters in the Community of La Europa, Curridabat* [Master's thesis in Spanish]. Cartago, Costa Rica: Instituto Tecnológico de Costa Rica.

5.4.4 Assessment of user priorities and identification of options (Steps 4/5)

Step 4 and the beginning of Step 5 were merged into one workshop which was attended by more than 50 local residents. The technical options for water and sanitation were assessed by two engineers from ITCR, while parallel research on public space, safety and non-technical needs was assessed by a researcher from the University of Costa Rica (UCR) and an analysis of national environmental sanitation policies was undertaken by a different researcher from UCR.

The general priorities of the residents were evaluated by FUPROVI in 2005. The results revealed that the most pressing needs for the community (in order of priority) were: (i) improvement of the road infrastructure; (ii) need for greater safety; (iii) creation of recreation areas; and (iv) construction of a new community centre.

However, the priorities relating to environmental sanitation, which were evaluated in Step 2 as mentioned above, were: environmental pollution; health, hygiene and sanitation; rainwater treatment; greywater treatment; blackwater treatment; solid waste; recycling; green areas; and drinking water.

The results of the status assessment from Step 3 were reported to the community. A survey of 170 households was done to determine user priorities and perceptions, general housing data, and details of the existing treatment system (see Figure 5.8). The results were as follows:

- Septic tanks (used by 78% of the households) are not built correctly; they are not properly dimensioned and do not have proper drainage trenches.
- The maintenance of the septic tanks varies; some families have removed their sludge from the tanks – the emptying of a tank by an exhauster truck costs about US\$ 50-60 and should, at least, be done annually – while some households have not emptied them once in 20 years.
- Most of the greywater runs free or into the rainwater channels to the two creeks.
- There is no separation or recycling of solid waste. The municipality collects the solid waste but some of it is still dumped indiscriminately, which leads to social conflicts within the community.

Every family was given a report on the condition of their wastewater treatment system, with specific attention to their septic tank. Furthermore, the sanitation technology options that were evaluated and proposed by the technical expert group were presented to the participants. There were discussions, questions and statements about the different options:

1. **Combined household treatment of wastewater:** septic tank + drainage bed;
2. **Combined household treatment of wastewater:** septic tank + anaerobic up-flow filter (Filtro Anaeróbico de Flujo Ascendente, FAFA) + drainage. Through an additional treatment step with the FAFA, the water quality is improved before it percolates through the drainage bed;
3. **Separated household treatment of wastewater:** blackwater treatment via septic tank + FAFA + drainage; pre-treated greywater (to eliminate solids and grease) flows to a *biojardinera* (planted bio-filter) + reuse and/or drainage;
4. **Household and collective treatment of separated wastewater:** septic tank + FAFA + simplified sewer + disinfection in combination with pre-treated greywater to 'biojardinera' + individual reuse;
5. **Collective treatment, no separation of wastewater:** septic tank + FAFA + simplified sewer + collective disinfection (in a small treatment plant).

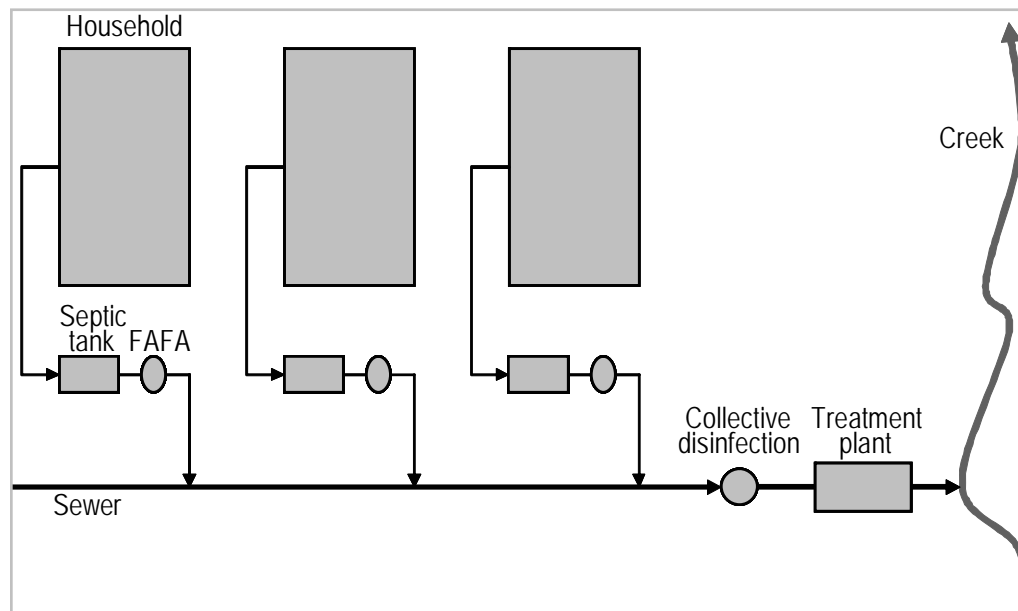


Figure 5.4: Option (5): collective treatment, no separation of wastewater. (Source: Picado Vásquez 2007)

Identification of options for individual households

In the weeks following the Step 4/5 workshop, the technical expert group from ITCR visited the residents of the different blocks to discuss the options identified. The majority of the residents argued for option 5, i.e. collective treatment, with no separation of wastewater, though this implies that there is no reuse of the wastewater (Figure 5.4). The main reasons for this choice were that only a small space on the individual lots would be needed, and that the treatment plant would be maintained by the municipality, which would be simpler for the families. The cost of solution 5 was estimated to be US\$ 249,500 for the whole community. The other options were deemed to be too ‘‘alternative’’ and were not well understood.

Box 5.5: Main outputs of Step 4/5

- Identification of technical options (as part of J.D. Picado's thesis)

Box 5.6: Further reading



Picado Vásquez JD. 2007. *Sanitation Plan for the Treatment of Wastewaters in the Community of La Europa, Curridabat* [Master's thesis in Spanish]. Cartago, Costa Rica: Instituto Tecnológico de Costa Rica.

5.4.5 Interruption in the planning process

After the technical options were identified, there was a pause in the HCES planning process. Therefore, it was not possible to complete the remaining HCES steps.

By the time it was shown that the proposed options were indeed technically and socially feasible, the financial portion was guaranteed (through FUPROVI via BANHVI) but the funds were soon frozen. Detailed reasons for the pause are described in Chapter 5.8 (‘‘Challenges, Constraints and Strengths’’).

5.4.6 Post-HCES process

Construction and financing

After freezing the HCES planning process, FUPROVI presented their own sanitation project: a system of sewer pipes with connections to each household, and one collective treatment plant for the whole settlement. This technical proposal was approved by community members in an open vote (27 July, 2008). Afterwards, FUPROVI started constructing the new sanitary system (from August to November 2008). Workers from the community – under the guidance of an engineer from FUPROVI – constructed rainwater drains and tanks (from where the rainwater would be channelled to the creeks), as well as concrete ponds by some of the non-asphaltic roads to gather the black- and greywaters which flow from the individual households. The idea was that the existing septic tanks would eventually be connected to these intermediate stations, though the piping (connections) would have to be provided by the households them-

selves. The collected wastewater would be channelled to the planned collective treatment plant.

Construction stopped suddenly at the end of 2008 when FUPROVI's own source of funds was blocked and there was a new allocation of the *bono colectivo*. With the approval of the *bono colectivo* (in January 2009, for about US\$ 1.7 million) for La Europa, this time via the Foundation for Rural Housing Costa Rica – Canada (Fundación para la Vivienda Rural Costa Rica-Canadá, FVRCRC), it was assured that this money would be used to improve the sanitation system in the community, but it is not yet clear if FUPROVI will be selected to continue with the construction of the sanitation system. This was the choice of FVRCRC, and at the time of writing (April 2009) they were tendering bids for construction.

When a construction company is chosen, FVRCRC will either start from scratch with a new collaborator or they will take up FUPROVI's work and let them continue, but under FVRCRC's guidance. With FVRCRC as the third actor in the domain of environmental sanitation, La Europa cannot count on beginning construction before the end of 2009.

Community perception of participation

The participation process was investigated to obtain insight into the social dimensions of the HCES planning process. Participation in this context is understood as involvement by different actors in the identification, planning, implementation, and evaluation processes. This work was in partial fulfilment of Step 9: Monitoring, Evaluation and Feedback.

Individual interviews (39) were held with residents of La Europa, who had participated in the workshops and discussions regarding options (Steps 4 + 5). Twelve interviews with representatives from the Neighbours' Association, FUPROVI, FLACSO, ITCR, and the municipality, were also conducted. The results of the survey showed surprisingly high levels of satisfaction with the participation processes, despite the fact that the decisions taken (from Steps 4 + 5) have not been put into practice. The workshops were considered as social acts, and were said to strengthen feelings of togetherness and give residents a sense of being able to have an effect.

Box 5.7: Main outputs of Step 4 + 5

- Report on the evaluation of the HCES participatory processes in La Europa

Box 5.8: Further reading



Colombo C, Knöpfli B. 2009. Evaluation of a participatory process on improved sanitation in Curridabat, Costa Rica [in German]. Dübendorf, Switzerland: Eawag [Swiss Federal Institute of Aquatic Science and Technology].



Figure 5.5: Map of La Europa. (Source: Google Earth)



Figure 5.6: Greywater discharge into a street. (Photo: Sandec)



Figure 5.7: Asphalted main road with stormwater drains. (Photo: Sandec)

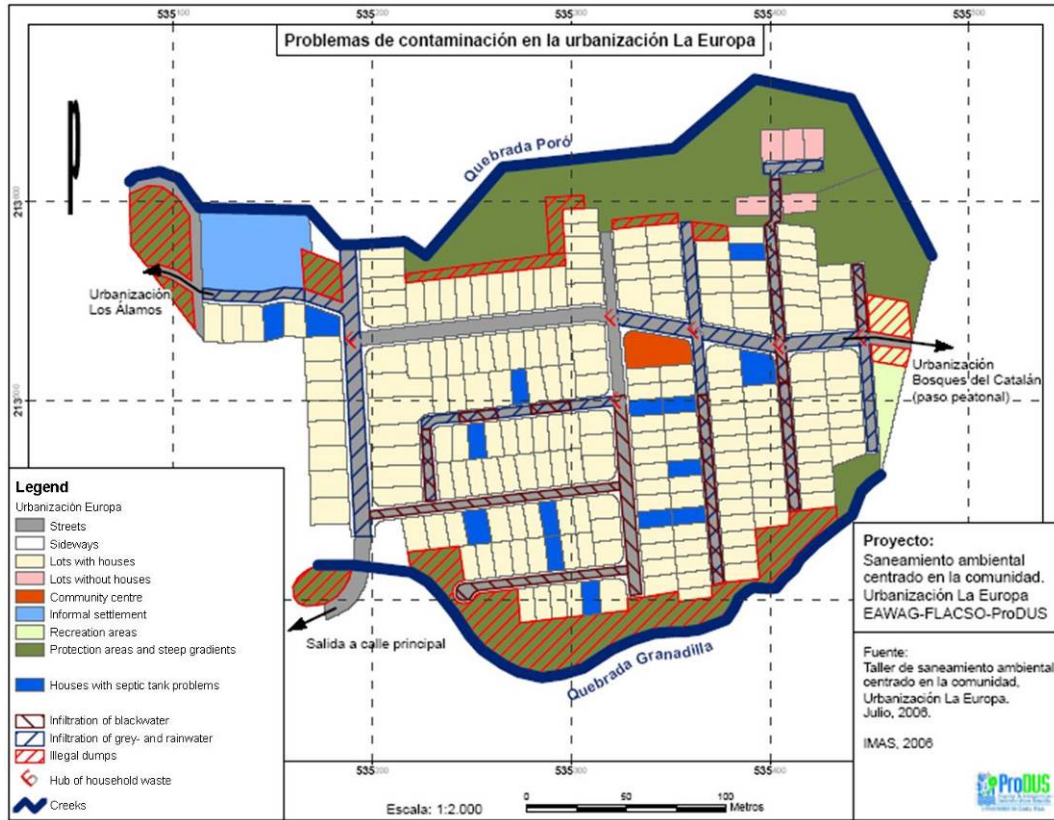


Figure 5.8: Contamination problems of the neighbourhood identified at the launching workshop. (Source: ProDus)



Figure 5.9: Participants at the launching workshop. (Photo: Sandec)



Figure 5.10: Meeting and recreation area of La Europa. (Photo: Sandec)

5.5 Project outputs and outcomes

Because the HCES process was forced to stop, there are no concrete technical outputs or changes in sanitary technologies in La Europa. At the time of this writing, the future of the sanitary infrastructure was being negotiated by a third actor (FVRCRC, see chapter 5.4.6).

Nevertheless, the community of La Europa has benefited from non-technical outputs. The results are summarised in Table 5.4. The process resulted in increased knowledge and awareness of environmental and health issues, which contributed to the general awareness, cohesion and well-being of the community.

Table 5.4: Non-technical outputs.

Participatory processes:	<ul style="list-style-type: none"> The various stakeholders gave accounts of high satisfaction with the participatory processes
Improvement of relations between the different stakeholders and the community:	<ul style="list-style-type: none"> Relations between the municipality, FUPROVI, FLACSO and the community were described as being very good, practical, friendly, respectful, reciprocal and transparent, with good, open communication. Due to the enormous engagement and the reliability of the Neighbours' Association, the community can count on support from various stakeholders and from a good reputation with the public.
Raising of environmental awareness:	<ul style="list-style-type: none"> Waste separation and recycling is now considered important for a better environment and as a source of monetary profit. An education program on waste separation and recycling is being discussed within the community. The effluents of a nearby textile colouring factory are released into the local creek and disturb the community with bad odours, strange colours and potential toxins. The president of the Neighbours' Association intends to hold the textile factory responsible for environmental damage.
Creation of meeting and recreation areas:	<ul style="list-style-type: none"> The community centre is very important as it is a meeting point for the residents, for social activities, and for formal meetings. Residents feel it is too small and too simple and are hoping to build a new one. Construction plans already exist but lack of financing has slowed implementation. Revaluation of green space and creation of recreation areas: a resident rebuilt the promenade along one of the creeks. A playing field is being planned where youth can meet for group sports – until now they had to meet outside the community. Within the forestation program <i>sembrar un árbol</i> supported by EPA (a private hardware-store), community members planted about 400 seedlings on one of the slopes. With further financial and technical support from EPA, they built a meeting place with a fountain beside the new playground at the top of the hill (see Figure 5.10).

5.6 Timeline

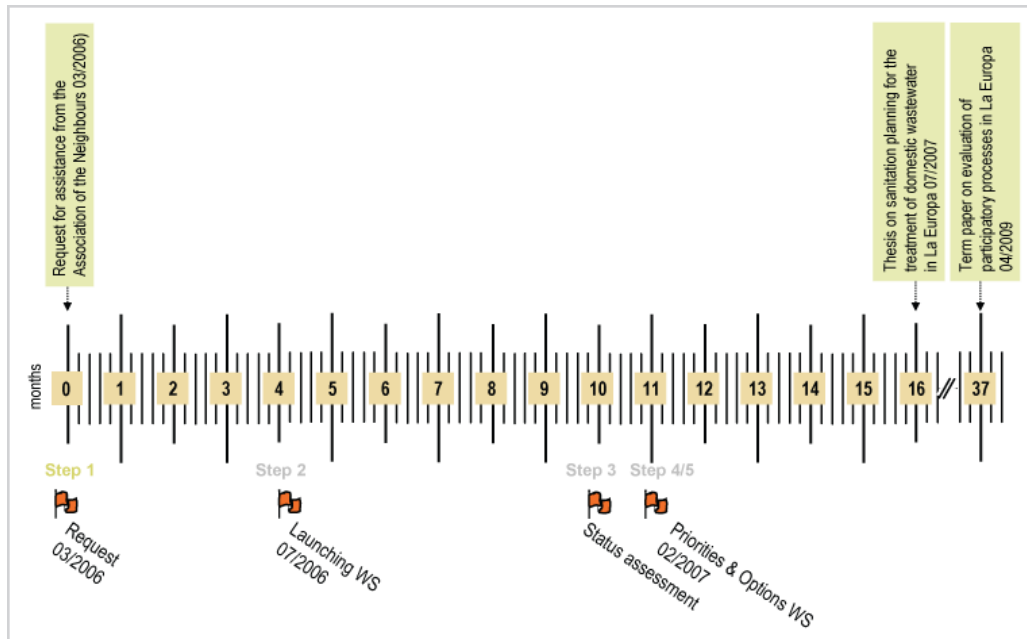


Figure 5.11: Timeline of activities in La Europa 2006–2009.

5.7 HCES planning and implementation costs

Sandec signed a contract with FLACSO to lead the HCES validation in Curridabat with funds from the NCCR North-South. The contract included technical backstopping, workshop and stakeholder coordination, costs related to a PhD, costs related to a Masters, and other activities not directly associated with the HCES process. Therefore it is difficult to determine the exact amount of the contract budget directly allocated to administering the HCES process.

There were no expenses for renting space or equipment (workshops were held in the community centre of La Europa) or for transportation. Furthermore, the technical expert in the priorities and options workshop did not demand a salary.

Total cost of the 8-month planning process in Costa Rica

Launching workshop (July 2006):	US\$ 900
Workshop on priorities and options (February 2007):	US\$ 500
Fieldwork expenses of engineering student, (including sample taking, household visits and discussions of options, as well as writing of theses)	US\$ 1,800
Total cost for the planning process:	US\$ 2,800
This is the equivalent of approximately US\$ 3.70 per resident.	

Residents, and especially members of the Neighbours' Association, spent a large amount of time volunteering, e.g. preparing, communicating and attending meetings, organising focus group discussions, helping the students, etc. Although difficult to express in monetary terms, this should also be mentioned.

5.8 Challenges, constraints and strengths

The following chapter summarises the external (institutional) and internal (process-related) challenges and constraints that arose during the planning and after the pause in the HCES process. The strengths in the development of the community are highlighted in the last section. The outcomes of this chapter originate mainly from 40 semi-structured interviews that were held (in the period from June 2008 to January 2009) with representatives of the various stakeholders, including residents of La Europa.

5.8.1 Institutional challenges

National policies on environmental sanitation

The political system works in a top-down manner and the structure impedes an alternative approach to sanitation. Communication between the political and civil actors is poor. Sanitation is not a primary concern on the political agenda, and people are told that there is insufficient money for sanitary projects. There are binding regulations for the construction and maintenance of septic tanks, but they are not enforced. The legislation does not adequately address treatment or the final disposal of faecal sludge. The regulations and institutions are limiting innovation of other novel, more appropriate sanitation technologies; this situation complicates or even impedes adequate solutions for settlements.

Political participation

Political institutions in Costa Rica do not, generally, allow participatory approaches. The communities are not yet equal partners in decision-making processes, and they have little political power. FUPROVI, for example, which has become a main stakeholder and important contact for the community over the years, receives funds from the government for their projects. In order to secure further funding, they must work quickly and efficiently to spend current funds, which means it is almost impossible to work in a participatory manner. La Europa needs to accept the projects recommended by an actor like FUPROVI because the community itself has no access to the financial resources or political powers like FUPROVI. In general, the role of participation must be held in higher regard. There are different types of participation: the type favoured in Costa Rica is simply coming to meetings and workshops and raising one's hand for a suggested solution. Genuine participation is about equal partnership in the decision-making process, where the inputs and the solutions come from the community itself, where the members have power, and where the motives for all stakeholders to attend community-based planning and implementation are questioned and discussed.

Lack of (environmental) education

One of the main problems during the project was the mentality of giving instructions instead of education. Workshop organisers mentioned that people did not show much interest in improving their sanitary situations, that they did not perceive their sanitary conditions as problematic, and therefore did not understand the technical aspects (e.g. how to handle a septic tank). Lack of clarity regarding alternative sanitary solutions and the connections between sanitary problems and health was mentioned by various stakeholders as a weak point in the HCES planning. There was a pause in the process because, among other things, people from the community had the impression that the chosen solution would bring complications; they were not convinced by the alternative sanitary solution (FAFA technology), which would mean on-site treatment and on-site maintenance. Environmental education programs are important and could lead to sustainability, but they are also expensive and are not a primary concern for policy-makers.

Demanding and complex history of the *bono colectivo*

With all the recent changes in the ministries, the collective bonus had to be negotiated again, but at the time of this writing it had been granted to La Europa via FVRCRC (see chapter 5.4). The demanding and complex history of the *bono colectivo* has led to discontent and insecurity within the community. It means that the sanitary situation will be analysed again, which will lead to another delay in the implementation of a sanitary solution. Until FVRCRC can start implementing their sanitary project, the members of the community will continue to rely on the existing sanitary system with non-working septic tanks and non-treatment of wastewater.

Obstacles concerning AyA

AyA is responsible, but is not legally obligated, to provide sanitation, whereas they are legally obligated to provide water, though they do not facilitate local water management. The dual role of AyA includes a conflict of interest: on the one hand, AyA is a service provider, and on the other hand it has an important policy and regulatory role in the water and sanitation sector. AyA carries the term “sewerage” in its name but it does not fulfil its duty related to sanitation. AyA does not currently operate any exhauster trucks and does not aim to do so. The evacuation and maintenance of septic tanks still remains a household responsibility. AyA does not provide for sedimentation ponds and believes that centralised sewerage is still the most efficient means of excreta and greywater removal. An arrangement between an institution and AyA can be made but AyA does not allow any technology to be installed that will not result in connection to the planned GAM centralised sewage system. However, the topographic situation on the outskirts of San José does not allow for a centralised solution in a hilly settlement like La Europa. A decentralised solution would therefore be more appropriate and efficient. However, under AyA, this is not allowed, and AyA did not accept the proposed sanitary solution for La Europa. Although involved from the beginning of the planning process, AyA and MSP (although MSP authorities are aware of the problem) were not supportive and actually hindered the HCES process.

5.8.2 Process-related challenges

Conflict between process stakeholders FUPROVI and FLACSO

Before FLASCO arrived, FUPROVI, with support from the municipality, had been working with the community for more than one year on infrastructure projects. FLACSO was the first to propose a sanitation project, and FUPROVI took up this theme in their program (and was guaranteed money by BAHNVI). At first, the two institutions worked together, though after a disagreement between their respective engineers they discontinued cooperation. FUPROVI possessed the monetary requirements but did not have the technical expertise, while the opposite was true of FLACSO (who had the highly regarded support of engineers from ITCR). Having the two organisations working together was difficult for the community members, and they felt torn between the diverse views. Furthermore, there was a lack of clarity regarding cost sharing for implementation and maintenance.

Vague division of responsibility

There was a pause in the HCES process because the alternative idea (proposed by FLACSO) clashed with the traditional proposal (proposed by FUPROVI) and also due to the freezing of the funding channelled through FUPROVI. The participants were positive about the workshops, but there was no consensus within the community, and people did not really believe in the alternative solution. Different people perceived the project as coming only from FUPROVI; FLACSO was not well known and was perceived to be supporting the FUPROVI project. The latter had many personnel changes (in the period from 2005–2008) which had negative effects on La Europa. People from the community often felt neglected by FUPROVI, especially by the engineering division, though the social section remained engaged and interested in the concerns of the community.

Community priorities and attitude

The FUPROVI feasibility study (2005) showed that sanitation was not a primary concern for the inhabitants (because of competing concerns), but also because hygiene education was lacking (see Steps 4 + 5). Interest waned due to non-confidence in FUPROVI and FLACSO and over-fatigue due to the demanding process of holding meetings and struggling for financing. Furthermore, there was a feeling of disappointment because different organisations had made promises but had not complied with support.

Passive attitude and belief in traditional solutions

Different actors have mentioned that people from Costa Rica in general have a custom of waiting patiently for a solution from “above” and that they were not willing to take the initiative. The traditional FUPROVI technical solution (which was favoured by the majority of the community members) was known and therefore assumed to be trustworthy, despite its technical difficulties and challenges. The alternative idea of HCES

was said to have a bad image, and people were neither very willing to discuss waste water nor to handle it.

5.8.3 Strengths

Although construction has been delayed, it is important to note the development and general progress of the community, which can be seen as a process-related strength.

Participatory processes

Participatory processes (and their correct procedure) are important instruments in the HCES planning process and influence the success of any project. The participatory processes in the workshops and in individual discussions showed high levels of satisfaction among the various stakeholders, even though the decisions taken have not been put into practice. Feelings of togetherness, and the impression of being able to affect change, had positive impacts on the whole community; social coherence among the inhabitants has improved.

Good relations between the stakeholders

Relations were described by the different stakeholders as being very good, practical, friendly, respectful, reciprocal and transparent, with open and good communication. The community can count on support from various stakeholders and from a good public reputation, thanks to the reliability and the enormous, long-lasting and voluntary engagement of the Neighbours' Association, especially of their president, during the last years.

Raising environmental awareness

Some of the solid waste is still not disposed of adequately, and waste separation and recycling is not (yet) a concern of the municipalities. However, waste separation and recycling is considered important for a better environment and as a source of monetary profit. An education program on waste separation and recycling is being discussed within the community. Another topic of environmental awareness is the pollution of one of the creeks by a neighbouring textile factory. The community is going to submit a complaint about environmental damage. These environmental problems are motivating the community to discuss and deal directly with community issues.

Creation of meeting and recreation areas

The importance and significance of the community centre as a meeting point for all the residents, as a location for social activities and as a location for formal meetings is obvious after visiting La Europa. Residents of the community complain about the size (too small) and the style (very simple) of the centre and demand a new one. Construction plans, drafted by architectural students from The University of Design (Universidad del Diseño) in cooperation with community members, already exist. Implementation depends on (yet unclear) financial resources. In response to the demand for green space and for the creation of recreation areas, the promenade along one of the creeks

has been rebuilt by a private resident. A playing field for group sports is being planned. Within a forestation program, residents planted seedlings on one of the slopes, and they built a meeting place for outdoor get-togethers. These projects were not only to beautify the area and to improve the environment but also to foster social coherence through community work.

Progress from a passive to active community

Due to the previous projects described, and based on comments from different stakeholders, the community has developed from a rather passive to an active one (within a period of only four years). In this context, community social capital has grown and been strengthened.

5.9 Conclusions

Due to institutional and process-related challenges, a pause in the HCES process was necessary; there have been no concrete technical outputs or changes to the sanitary technologies in La Europa so far. The HCES process, although not completed to the point of implementation, promoted the general development of the community of La Europa and has initiated positive after-effects. The community has benefited from various non-technical outcomes and is continually rising to the challenges of urban environmental improvements as it grows stronger and capitalises on growing social capital.

5.10 Project reports and papers

The following theses and papers are related to the La Europa project and can be downloaded from www.sandec.ch.

Box 5.7: Reports



Picado Vásquez JD. 2007. *Sanitation Plan for the Treatment of Wastewaters in the Community of La Europa, Curridabat* [Master's thesis in Spanish]. Cartago, Costa Rica: Instituto Tecnológico de Costa Rica.



Colombo C, Knöpfli B. 2009. *Evaluation of a participatory process on improved sanitation in Curridabat, Costa Rica* [in German]. Dübendorf, Switzerland: Eawag [Swiss Federal Institute of Aquatic Science and Technology].

Box 5.8: Further reading



Lüthi C, Morel A, Tilley E. 2008. Integrate at the top, involve at the bottom – The household-centred approach to environmental sanitation. *Proceedings of the IRC Symposium on Sanitation for the Urban Poor, Partnerships and Governance, Delft, The Netherlands, 19-21 November 2008*. Delft, The Netherlands: International Water and Sanitation Centre (IRC).



Chamizo Garcia HA. 2006. Information and knowledge on the regulation of state policies on environmental sanitation in Costa Rica [in Spanish]. *Gestión – Revista de ciencias administrativas y financieras de la seguridad social* 14(1):71–82.

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Abbreviations

ASADA	Association of Administration of Waterlines and Sewerage (in rural areas)
AyA	National Institute for Waterlines and Sewerage (mostly in urban areas)
BANHVI	Mortgage Bank of Housing
FVRCRC	Foundation Costa Rica - Canada
FLACSO	Latin American Faculty of Social Sciences
FUPROVI	Foundation for Housing Promotion
GAM	Grand Metropolitan Area
IMAS	Institute of Social Welfare
ITCR	Costa Rican Institute of Technology
MINAE	Ministries of Environment and Energy
MIVAH	Ministry of Housing
MSP	Public Health Ministry
OPS	Pan American Organisation of Health
ProDUS	Investigation Program on Sustainable Urban Development
Sandec	Department of Water and Sanitation in Developing Countries, Eawag
UCR	University of Costa Rica
UESS	Urban Environmental Sanitation Services

6 Main Conclusions and Lessons Learnt

The 2008 International Year of Sanitation highlighted the enormous increase in the number of (and use of) sanitation facilities that will be required to meet the Millennium Development Goal target on basic sanitation. Creativity and better planning and programming approaches are desperately needed to achieve the target of halving the number of people without sanitation by 2015. The daunting task of improving global access to sanitation is complicated by a growing consensus that conventional approaches are economically and environmentally unsustainable. Proposed interventions are often beyond the resources available to governments or the approaches suggested are often unworkable.

Though there are many facets to improving sanitation such as hygiene promotion, funding strategies and technology development, planning is one aspect that attempts to integrate sanitation into the broader scope of program and service planning. Furthermore, numerous methods and approaches exist within the realm of planning, and each one is, or could be, appropriate to a different objective or context. The approach and results summarised in this publication are simply one contribution to the massive global effort to achieve the MDGs for sanitation.

This chapter summarises some conclusive points and synthesises lessons learned during Phase 2 research on improved environmental sanitation in the NCCR North-South. It highlights some important issues in further development of the HCES approach under the following five headings:

- Enabling environments and governance;
- Ensuring effective participation;
- Planning timeframes;
- Achieving consensus in multi-stakeholder planning contexts;
- Piloting innovation.

6.1 Enabling environments and governance

There is now international agreement that successful provision of water and sanitation services must be based on a planned and coordinated approach by local, publicly accountable municipalities and/or utilities. Municipalities and utilities are, however, best at providing services in formalised, serviced urban areas to customers who are likely to pay their bills. Good access roads, metered water provision, pour flush toilets and secure tenure are the main features of urban middle and upper class neighbourhoods. The greater challenge lies in providing affordable services to areas that lie “off the grid” – the burgeoning slums and areas of expansion on the peri-urban interface. Ef-

fective planning for these unplanned urban areas requires an environment that enables change, namely:

- Local, regional and federal authorities and utilities that support progressive policies and strategies;
- Legal frameworks that enable affordable and non-centralised solutions;
- Financial arrangements that support multi-stakeholder and cross-sectoral planning and programming;
- The necessary skills to plan and implement; and
- Institutional support that encourages innovative thinking.

In a majority of countries, institutional responsibility for the sanitation sector is spread across a range of institutions including different ministries, national or city-level utilities, local authorities and even NGOs and CBOs. This was the case in all four pilot studies presented earlier. None of the four pilot sites offered the “perfect” enabling environment. In Tanzania there was political commitment at the municipal level but a lack of skills and human resources. The case of Costa Rica featured a well-balanced institutional set-up, but a flawed regulatory framework. Finding the perfect institutional arrangement will never be possible, but one lesson learned during the validation process is that demand-driven planning processes can catalyse a gradual move towards a more enabling regulatory, institutional and financial environment.

Based on the four-country validation experience, some of the key features of an enabling environment for successful demand-responsive planning approaches are listed below.

6.1.1 Government support

Government support and involvement becomes essential when working in the urban sphere (as opposed to the rural context, which requires less interaction with central government). Strong political will at the local or political level is perhaps the single most important factor in achieving sustainable improvements in sanitation and hygiene for unserved urban areas.

Experience in the four case studies suggests that basic government support can be easily secured, but that real support and commitment by relevant authorities is much less certain. Transforming a way of thinking and adopting innovations cannot be done overnight. Endorsement of innovative approaches such as the HCES requires a paradigm shift that takes time and calls for a well-designed advocacy strategy. In Tanzania, DUWASA’s initial support vanished when the options under consideration diverged from the classic sanitation with which they were familiar. In Laos, the project received much ostensible support from national sector agencies, but many failed to provide real support (in terms of human resources, creation of enabling institutional conditions, or financial support).

Strategies and policy frameworks defining how and by whom urban environmental sanitation services should be improved are necessary for public policymaking. In all

cases except Costa Rica, such policy documents existed on paper, and favoured a decentralised and demand-responsive approach such as the HCES approach. Due to a lack of supporting instruments (planning frameworks, community involvement methodologies etc.), clear financing mechanisms, and the skills and capacities to implement communicative planning processes, these strategies and policies are not implemented at local level. In the case of Laos, the political environment tends towards decentralisation and greater civil society responsibility (private and community sectors) for the economic and social development of the country. Unfortunately, local authorities (at the district and village level) have neither the skills nor the instruments to implement such local initiatives.

One key lesson from the Costa Rica case is that without the enthusiastic support of the municipal leadership, and its willingness to take the steps necessary to support an enabling environment (i.e. enabling bottom-up decision-making processes), application of the HCES approach should not be considered.

6.1.2 Legal framework

Public sector officials are unlikely to diverge from national laws, standards and building codes, as they are not willing to risk a backlash by deviating from accepted procedures and practices. While legislation in all four countries allowed for the application of the HCES approach, some laws, standards and codes were either hindering or inconsistent. In Laos, inconsistencies surfaced in different pieces of legislation related to urban planning and environmental sanitation as a result of different ministries working on the development of sector-specific legislation. Principal inconsistencies include overlapping mandates given to different ministries and a lack of implementation regulations and supporting environmental standards.

In Kenya, legislation prohibits provision of service to settlements considered “illegal”, i.e. slums. As a result, the Nairobi City Water and Sewerage Company (NCWSC) faces legal difficulties in providing services to informal and peri-urban settlements which very often lack legal status. Unrealistic technical standards are another obstacle to the use of more appropriate and less expensive systems and technologies. In Laos, for example, technical standards, coupled with strongly institutionalised perceptions of the applicability of sanitation technologies, resulted in rather mainstream technical interventions. In Costa Rica, technical standards for onsite sanitation technologies do not exist or are incomplete. For example, emptying, treatment and disposal of faecal sludge (i.e. the sludge that accumulates in on-site sanitation systems such as septic tanks or latrines) is not addressed in existing legislation.

A key lesson learnt from the four cases is that the legal framework related to environmental sanitation needs to be analysed to determine how it affects the applicability of the HCES approach and innovative environmental sanitation systems. Assessment of the legal framework should be carefully reviewed with relevant authorities and sector agencies, and a strategy to overcome conflicting or inconsistent laws or standards should be defined prior to project implementation. While permanent changes are unlikely to be feasible, temporary adjustments to appropriate standards, procedures,

etc. should be guaranteed by the authorities, to the extent needed to allow the initial application of the HCES approach. Experience from such initial trials could then be used to identify what permanent changes should be introduced.

6.1.3 Financial arrangements

Low-income communities are not always capable of and/or willing to self-finance the planning and implementation of improved environmental sanitation services. Local governments' annual budgets are barely able to cover salaries and project overheads during the planning phase. The majority of capital investments for urban infrastructure in less developed countries are still funded by central governments and/or international development agencies. Yet the sustainability of subsidy schemes needs to be carefully examined. The question is how external support can encourage community-based financing, without negatively distorting community expectations or ownership. Innovations in funding basic infrastructure, such as the microcredit system introduced in Dodoma (Tanzania) or the community development fund installed in Hatsady Tai (Laos) are promising but still widely untested funding tools in most countries.

It is of paramount importance to assess the community's ability to pay prior to proposing funding schemes in a given context. Not only do the technical solutions have to be context-specific but the funding and cost-sharing arrangements must be as well.

6.1.4 Required skills

HCES is a novel approach to urban services planning that requires specific skills at different levels. These skills are not usually available prior to project launching, and must be created through training and awareness-raising. In some cases (such as government and municipal officials) this should take place very early in the process, while in other cases it is more appropriate later on, as the different roles within the approach are better understood. A major bottleneck experienced in most cases was the inadequate skill level encountered in the municipalities, both at strategic as well as at lower staffing levels. Technical expertise in dealing with bottom-up, participatory approaches was generally absent and led to frustration. Breaking with set ways and dogma, especially with the staff of local government and utilities, is perhaps the greatest challenge of all.

Planning and programming for challenging urban environments requires skills that are not taught in conventional engineering or planning education programmes, namely mediation and trouble-shooting skills. All four cases presented here demonstrated that municipal officers and sector specialists (i.e. planners, engineers) responsible for the coordination of the planning process should be helped to achieve a better understanding of the social, institutional and financial factors that have to be addressed during planning and implementation.

The development of an appropriate technical response to prevailing physical constraints and to local needs and demands for infrastructure was strongly limited by the range of technologies perceived as applicable and acceptable (i.e. water-based, centralised sewer system). While the application of the Compendium of Sanitation Sys-

tems and Technologies (Tilley et al 2008) helped to widen the range of technologies, barriers to more advanced technologies (e.g. improved anaerobic treatment systems as an alternative to septic tanks) could not be completely overcome. Formal teaching and training institutes in the regions, including universities or international institutes, play an important role in influencing public opinion on advanced technologies and developing appropriate curricula to create the required engineering skills at the local level.

Capacity must also be built at the community level. For the approach to be truly demand-responsive, residents need to understand more about the implications of the options open to them. The lack of environmental education for community inhabitants was perceived as an important reason for project failure in Costa Rica.

Communities and their organisations (CBOs) that undertake construction, operation and maintenance and/or management of local UESS need training on technical matters, accounting and simple financial management, basic contract procedures, and monitoring and reporting. Training activities should not be treated as isolated events, but integrated with the UESS plan development, so that training reinforces practice and vice versa. In Vientiane, training was provided to the members of the project coordination committee and the Village Environmental Unit on aspects such as the role of women in environmental management, solid waste segregation and recycling, and operation and maintenance of urban environmental sanitation services, parallel to the development and implementation of the plans.

6.1.5 Institutional arrangements

At the local level, institutional arrangements are required that suit the highly decentralised and zone-by-zone approach used in HCES, and which support multi-stakeholder and cross-sectoral planning and programming. Experience in the four cases re-emphasises the importance of a sound and comprehensive stakeholder analysis, which is a precondition for an adequate stakeholder involvement strategy. Although time-consuming and cumbersome, a comprehensive stakeholder analysis must be conducted at a very early stage of the project (prior to the official launching). The analysis should also determine the influence and the interest of the different actors involved in the project. Tools such as the one suggested by Medilanski et al (2007) have proven to be useful. The stakeholder analysis should ultimately lead to the definition of a strategy for how and when to involve, consult, or inform the different actors in the different stages of the project. In Kenya, the influence of the local CBO (WACODEP) was weak, thus reducing community-wide support. In Laos, the importance and decision-making power of the district authorities was under-estimated, which compromised full political commitment and hence the smooth management and execution of the project. In Costa Rica, the decision-making power and differing interests of AyA (Costa Rican Institute for Waterlines and Sewerage) were clearly mis-evaluated, thus contributing to the failure of the project.

Decision-making in multi-stakeholder settings requires strong project leadership to ensure that joint decisions are followed by action. This is especially true in a multi-sector approach such as the HCES, where the power and the interests of the different

stakeholders vary greatly, and where conflicts cannot be avoided, as the examples of Kenya (landlords vs. tenants), Costa Rica (FUPROVI vs. FLACSO) and Laos (district authorities vs. landlords) indicate. It is therefore imperative that the process be led by an institution that is recognised and appreciated by all key stakeholders, ideally local authorities or a strong NGO. In Laos, the village head (*Naiban*) is a highly recognised and respected institution. In the case presented here, the *Naiban* assumed project ownership and played a central role in negotiating solutions between the different actors, especially between landlords and the district authorities, and between the planning team and the residents. In Kenya, strong local project leadership was missing, and conflicting interests among Waruku's landlords and tenants has not yet been solved. In Tanzania, the coordinating NGO (Mamado) did not have the institutional leverage and clout to deal with the two most powerful institutions in Dodoma (DUWASA and CDA).

Full involvement of the beneficiaries, i.e. the community, in the decision-making process is a precondition for project success. The important link between authorities and the community is greatly enhanced through the consultation in steps 1 to 4 of the process (i.e. assessment of current status, definition of priorities). Experience in Laos and Tanzania indicates, though, that the full involvement of community representatives in the project coordination further increases the community's understanding of and commitment to the project. Such a grass-roots setup (e.g. the Chang'ombe Community Project Committee and the Village Environmental Unit in Tanzania and Laos, respectively) also contributes to awareness raising and capacity building, and creates the basis for sustainable operation and maintenance of the improved urban environmental sanitation services.

6.2 Ensuring effective participation

Taylor (2000) distinguishes three levels of sanitation planning in urban areas: (i) the local level, (ii) the municipal level, and (iii) the policy and program development level. In the case of the HCES approach, the local and municipal levels are the main levels of intervention. Since planning at local levels does not occur in isolation, there is a need to deal with cities and towns as a whole and to always have the bigger picture in mind. This does not exclude the possibility of local, more neighbourhood-based actions as exhibited in several cases included here. It is important to strike the right balance between policy development – usually a highly centralised process at national level with very limited stakeholder involvement – and decentralised implementation and community participation at municipal and local levels.

It is now acknowledged that stakeholder participation is necessary to catalyse change and turn people into active participants in their own development. User participation can take on many forms and degrees of empowerment, from weak “participation by consultation” to more empowering “interactive participation,” where stakeholders are fully involved in the analysis and action planning, right down to project implementation. The choice of which approach to use depends on the complexity of the issues and the purpose of the engagement. There is no “one size fits all” formula but a

number of tools and techniques that can be applied. Ideally, a good participatory process features three elements:

- Participatory methods and tools (e.g. pocket voting or problem mapping exercises);
- A flexible process for the planning and sequencing of events;
- A set of guiding principles (as is the case with the HCES Guideline; SEI 2007).

The HCES approach is a multi-stakeholder planning approach for community-based planning that provides an open-ended and flexible planning framework. The provisional guideline (Eawag 2005) outlines the rationale for this methodology: it makes plans more relevant to local conditions, increases people's control over their livelihoods, and helps promote community-based action. Validation of the household-centred approach follows participatory planning principles:

- Participation is relevant and time-efficient to the project end-users;
- Methods and tools used respect the knowledge and experience of all stakeholders;
- There is an emphasis on learning and knowledge for action;
- The process must acknowledge and address inequalities of power amongst participants.

In order to achieve sincere participation, it is important to empower local people by raising their skill-level and capacity. A key issue is information-sharing from the outset of any project or programme. Individual and collective capacity development deserves special attention for the household-centred approach, as this is the main sphere of decision-making. While capacity-building is not explicitly mentioned in the 2005 Guidelines, experience at the four pilot sites has shown that while training and awareness-raising workshops were carried out in several of the case studies (e.g. Laos, Tanzania and Costa Rica), this aspect deserves more attention and resources. In the future, planning efforts must address capacity deficiency at local and municipal levels in a more structured way.

Participatory planning frameworks allow actors from different spheres and sectors (public, private, parastatal) to work together, thereby changing individual and institutional perceptions. Working together and trying to find common ground and workable solutions adds value in unintended ways. As illustrated in chapter 8.1, overcoming "institutional inertia" and conventional thinking takes time, but it appears that the HCES process can catalyse change as in the case of Dodoma's utility DUWASA, which has re-evaluated its business model regarding on-site sanitation.

6.2.1 Constraining factors

Real user participation is constrained by numerous factors such as the absence of secure tenure rights, inappropriate technical standards, rigid, technocratic planning

methods and time-bound project management requirements. It is therefore essential to first consider the favourable (or unfavourable) policy context or “enabling environment” before embarking on community-based participatory planning.

Furthermore, it is important to note that “communities” are not homogeneous units. Within all communities there are community divisions and conflicting interests, for instance between the elected leaders (or NGO representatives) and community members (e.g. in Costa Rica and Laos), between landlords and tenants (e.g. in Kenya), or between different ethnic groups or political parties. It is therefore important not to over-romanticise social networks, social capital and trust. In the case of Kenya, these community-based divisions have led to a real bottle-neck in providing sustainable sanitation solutions for the Waruku community.

Real gender involvement is also not always easy to achieve, as experience at the pilot sites has shown. Certainly the HCES has shown that moving beyond involving women in pre-determined project activities is possible. Still, although good gender balance was witnessed in almost all workshops and users' priorities were differentiated by gender in Step 4, in reality it is still the men who tend to participate and control the project or community group. An exception was Laos, where women are traditionally well represented in local governments and mass organisations (i.e. Lao Women Union, Lao Youth Organisation). In the Lao case study, three women headed the three process stakeholder groups (i.e. PTI, WREA, and VEU).

6.3 Planning timeframes

Comparison of the different pilot sites shows that there is considerable variation in the time allocated to implement the 9 planning steps (Step 10 being implementation). Laos and Tanzania were both sites that were able to begin implementation after a bit more than one year of planning. This was possible thanks to motivated local process stakeholders and a regular backstopping presence by Eawag-Sandec. In the case of Vientiane, Laos, inauguration of the implemented environmental sanitation facilities took place in April 2009: 21 months after the official launching event and the beginning of the HCES planning process. In Dodoma, Tanzania, implementation will take longer, due to the implementation strategy selected (revolving loans to be repaid by individual households over 1½ years).

In the cases of Kenya and Costa Rica, the planning process was delayed for both external and internal reasons. In Kenya, the post-election violence following the December 2007 elections led to several months of interruption. The main process counterpart from the NGO Maji na Ufanisi left for another job, leaving the NGO and the planning process weakened. In the case of Costa Rica, the funding institution (FUPROVI) led to a change in planning strategy and left the process paralysed after Step 5.

Community-based participatory processes are perceived as being slow and in conflict with the time-bound project management requirements of national or international agencies. Based on the experience gathered from HCES validation, demand-driven planning and programming do take more time than supply-driven, expert planning

(12-14 months at best), but deliver community ownership and empowerment by giving the end users a voice regarding priority investments in infrastructure (Figure 6.1). However, the HCES methodology can be enhanced and further streamlined in order to achieve better results with fewer planning steps.

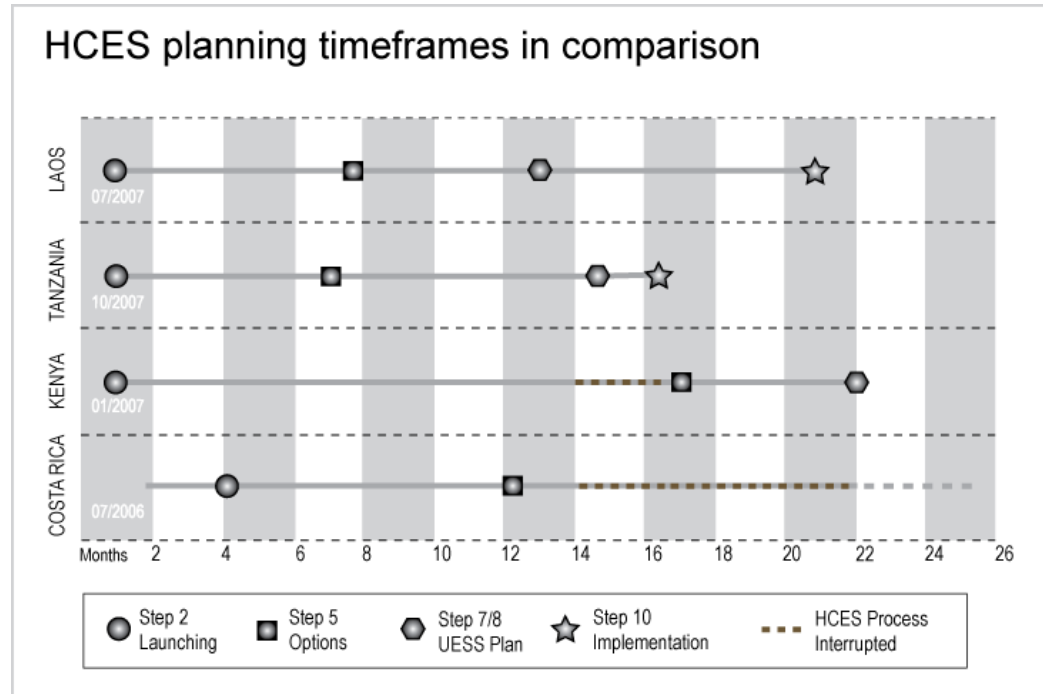


Figure 6.1: The 4 different HCES planning timeframes in comparison.

6.4 Achieving consensus in multi-stakeholder planning contexts

Selecting investment priorities that are responsive to real demands for infrastructure services is an inherently political process – as is planning in general. Planning is, after all, about “making choices among the options that appear open for the future and then securing their implementation” (Roberts 1974).

It is clear that a central aspect and key lesson learned during the planning process is the issue of conflict resolution and consensus-building, where stakeholder interests and influence differ substantially. This refers to steps 4 and 5, where user priorities and different options are identified, evaluated and finally selected. The three examples that underline some potential conflicts are Costa Rica, Kenya, and Laos.

In Costa Rica, the conflict was between the domineering NGO and the community at large. The community and their organisation (in the form of a CBO) were not equal partners in decision-making processes and they had very little leverage compared to a well-connected national NGO. The La Europa community were coerced into accepting the recommended projects from FUPROVI, even if they were technically flawed.

In the example of Waruku in Kenya, the main fault line was between the settlement’s landlords and its tenants. The landlords were only interested in implementing improved sanitation facilities if they could raise rents. Naturally, the tenants resisted, and this led to an impasse in finding a negotiated compromise.

In Laos, conflicts emerged between the local authorities and house owners, following the top-down decision by the district authorities to widen roads to a minimum of 4 m in order to reduce fire risk. The conflict was finally resolved (in a very top-down way) by a negotiation committee, chaired by the District Vice-Governor.

Two important issues can be gleaned from these examples:

- Community representatives (ideally elected) must be respected and trusted by their communities in order to be effective negotiators. They must have political clout when dealing with external stakeholders and powerful external institutions. In the case of Kenya, the CBO “WACODEP” was not seen as representing the entire Waruku community but only the poor “informal” part of the neighbourhood. Similarly, in Costa Rica, the community representatives were very respected by the town, but lacked the political will or economic power to affect change at higher levels.
- Identifying different stakeholders’ priorities and preferred options (Steps 4 and 5) is a sensitive procedure that demands a motivated and experienced process moderator who (a) knows how to negotiate and mediate, and (b) possesses the technical and institutional knowledge needed to guide these kinds of community consultations. This begs for a new generation of planners or engineers to be consensus-builders who know the technological options and are also versed in the art of conflict resolution. As discussed in section 6.1, the required capacities are usually lacking and must be built up. Universities and other recognised training institutions have a central role to play in influencing public opinion on advanced technologies and developing appropriate curricula to create the required skills to lead community-centred urban upgrading projects.

6.5 Piloting innovation

A central aspect of the HCES approach is the wide range of technologies to be considered when identifying options. Most conventional studies or technical solutions assume a fairly narrow range of technology options, i.e. sewerage or septic tanks, VIPs, etc. To advance more affordable, lower cost technologies that are not widely known to potential users and official bureaucrats, “system exposure” is necessary. This is the key to giving stakeholders an opportunity to gain real-life experience with novel technologies (e.g. urine-diverting dry toilets) or innovative service management options (e.g. community-managed sanitation blocks).

By building and setting up demonstration units (see the examples of Chang’ombe, Dodoma or Waruku, Kenya), users can experience a trial period where different options can be compared and evaluated in terms of user friendliness, convenience, maintenance requirements and, of course, the costs implied. Also, once built and opera-

tional, the real costs and financial implications of capital and operational expenditure become clearer for the end-users and local service providers.

The usefulness of demonstration units has been proven at several sites (as well as in other similar projects) and this is a new element that should be added to the revised HCES guidelines. Figure 6 shows the building of demonstration units in Chang'ombe.



Figure 6.2: Building of demonstration Ecosan toilets in Chang'ombe, Dodoma. (Photo: Sandec, December 2008)

Three key issues of the HCES experience are summarised below:

- The multi-actor process can lead to more affordable and manageable sanitation systems for the un-served urban poor than supply-led approaches;
- The approach relies on a sound balance between bottom-up processes (i.e. determining needs, defining solutions, implementing plans) and top-down processes (i.e. navigating the institutional and enabling environment, engagement of government institutions in the expansion of community-led service provision);
- For HCES to be viable, the methods and tools employed must be easy to use and the planning tools must be context-relevant.

The four HCES processes showcased in this book underline the fact that the road to improved urban environmental sanitation services for the poor is not an easy one, but that there are no shortcuts to more responsive and participatory planning processes. The main strength of the HCES approach is to pay special attention to participation at community level, especially when defining needs and wants.

The International Water Association Charter on Urban Sanitation states: “To ensure proper use and operation, every toilet should be a ‘wanted’ toilet; that is, one which users have taken a decision to invest in, operate and maintain.” (IWA 2008). In the context of the experiences of the HCES Validation process, this statement could not ring more true.

7 References

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