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**HOW TO STRENGTHEN COMMUNITY OPERATION
AND MAINTENANCE OF HUMAN EXCRETA DISPOSAL
FACILITIES IN BUSIA TOWN, TORORO DISTRICT, UGANDA**

A Thesis submitted in partial fulfilment of the requirement for the degree of

Master of Public Health

by

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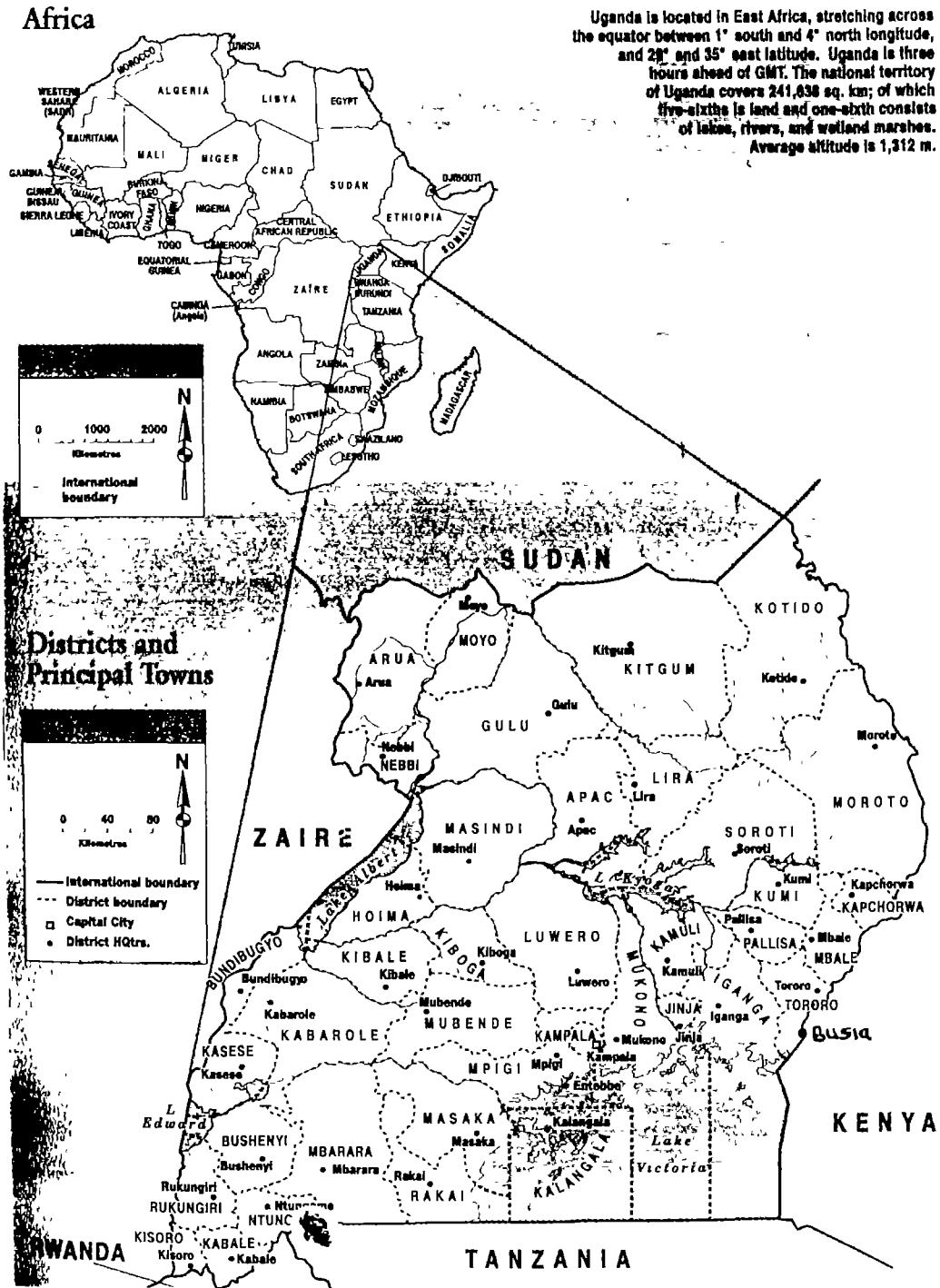
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ABBREVIATIONS

CM	Community management
DCD	Department of Community Development
DWD	Directorate of Water Development
EHD	Environmental Health Division
ESA	External Support Agency
FGD	Focus group discussion
GNP	Gross National Product
GoU	Government of Uganda
HA	Health Assistant
HED	Human excreta disposal
IDA	International Development Assistance
IRC	International Water and Sanitation Centre
KIT	Royal Tropical Institute
KM	Kilometres
LC	Local Committees/Councils
MA	Medical Assistant
MoENR	Ministry of Energy and Natural Resources
MoGCD	Ministry of Gender and Community Development
MOH	Ministry of Health
MoLG	Ministry of Local Government
MoNR	Ministry of Natural Resources
NCC	National Council for Children
NGO	Non- Governmental Organisation
NRC	National Resistance Council
NRM	National Resistance Movement
NWSC	National Water and Sewerage Corporation
O and M	Operation and Maintenance
ONEA	National Water and Sanitation Utility (Burkina Faso)
OPP	Orangi Pilot Project (in Karachi-Pakistan)
PHD	Public Health Department (Busia)
PPA	Priority programme area
RC	Resistance Committee/Council
RTWSP	Rural Towns Water and Sanitation Programme
Sanplats	Sanitation platforms
SSP	Strategic Sanitation Programme (Kumasi, Ghana)
STWSP	Small Towns Water and Sanitation Project
SWIP	South Western Uganda Integrated Water and Sanitation Project
THI	Town Health Inspector
UNDP	United Nations Development programme
UNICEF	United Nations Children's Fund
VIPs	Ventilated improved pit latrines
WES	Water and environmental sanitation
WSC	Water and sanitation committee
WUAs	Water users associations
WUGs	Water users groups
DoUP	Directorate of Urban Planning



MAP 1 LOCATION OF UGANDA



Source: Government of Uganda and National Council for Children (1994), *Equity and Vulnerability: A Situation Analysis of Women, Adolescents and Children in Uganda*.

ABSTRACT

This thesis reports findings of a study carried out in Busia Small Towns Water and Sanitation Project (STWSP), to determine the factors that contribute to the problem of human excreta disposal to identify and recommend a strategy for marketing latrines in Busia town.

The practical questions this thesis set out to answer were as follows:

What are the main factors that influence construction of latrines?

Why are people not using the available latrines?

What strategy should STWSP employ to market community and household latrine construction, use, operation and maintenance?

What are possible low-cost latrine technologies, that can be marketed in Busia town?

The study used a variety of data collection tools, that included *inter alia*: household interviews, focus group discussions with key informants, "Observations"/inspection, and literature search.

The main findings point out practical problems that constrain latrine construction and use, that include landlord restrictions to use latrine, unfavourable physical environment and lack of sustainable latrine operation and maintenance system.

The main conclusions and recommendations of the study were that fewer household latrines available (about 68%) and in use than reported in household interviews (about 95%). There is therefore, an urgent need by STWSP to create demand for latrine construction, use, operation and maintenance (O and M). In order for STWSP to increase chances of success in the latter, low-cost latrine technologies, need to be identified, tested and developed for Busia. The technology developed should fit into a sustainable community operation and maintenance system. Community participation and involvement remains central to successful implementation and sustainability of O and M.

The STWSP implementation strategy should be used as an opportunity for the Government of Uganda, to try out private sector involvement (informal and formal), consider review of vital policies that provide conducive enabling environment such as; sanitation guidelines for small towns which are currently not clear; the 1964 Urban Public Health Act which recognises no other latrine apart from off-site water borne systems; training curricular which excludes innovative skills in community mobilisation.

Try out double vault composting latrines on the basis of being "*empty-and-reuse*" on-site latrine. Pit emptying can use low-cost manually operated portable sludge pump and "cart-mounted-oxen" transportation. While community education is a key to some success in the direction, the process of building the required fundamental awareness on the importance of latrines and risks involved in not using them, requires a lot of time, and other resources (money, materials, personnel). This calls for increased resource allocation to the sector.

Last but not least, consider a review of STWSP approach to focus more on building community (of both men, women and children) capacities and skills to implement, manage and support latrine improvements in a self-propelling manner rather than quantity of installed facilities.

DEFINITION OF TERMS AND CONCEPTS USED

Adequate excreta disposal	is that one that provides each household with safe excreta disposal system.
Boda boda	bicycle hire services, a name coined from a swahili jargon meaning "take me to the border"
Bush	open air defecation
Community management	communities organised to work together to manage shared services like pit emptying, financing, operation and maintenance of community, shared latrines or sewerage system.
Community	individuals and groups living and interacting within certain boundaries e.g. physical/geographical, cultural.
Composting	digestion (break down of organic waste by bacteria) without adding water ²¹ .
Defecation	the deposition of human faeces ²¹ .
Desludging	removing accumulated sludge from septic tank or aqua privies ²¹ .
Effluent	out flowing liquid ²¹ .
Environmental sanitation	refers to all aspects of keeping domestic and public environments clean and safe. It includes such matters as public knowledge and practices concerning housing, designs, latrines, cleanliness of public and domestic areas, the safe use of water and safe disposal of waste ²² .
Fringe area	rural parts surrounding the commercial area of Busia town, characterised by agricultural farming
House owners	the legal owner of the rented premise
Household head	the decision making and economic leader of the household, usually a man in Uganda. Households of polygamous wives where the husband did not spend a night before the survey were counted as female headed households.
Household	a group of persons who normally live and eat together. A family living in the same house or compound and eating together. It consist of a man and a woman and their children, sometimes relatives and visitors. It may consist of one person who lives and eats on his own or it may consist of several persons who are not related to each other ²³ .
Human excreta	human faeces and urine
<i>Kavera sanitation</i> (latrine)	use of plastic bug (locally known as kavera, in absence of latrine)
landlords	a person or group of persons who own the premises and collect house rent from tenants.
Latrine:	place or building, usually outside the house, or other building, for deposition, retention or decomposition of excreta.
Local Committees/councils	local committees and councils with some legislative responsibility, and mandate to plan and implement development interventions within their jurisdiction, (formerly known as Resistance Committees/Councils).
Low-cost latrine	an appropriate and affordable latrine.

Occupant	a household(s) occupying the house at the time of the survey.
Pathogen	an organism which causes disease ²¹ .
Percolation	the soaking of liquids away into the soil
Phase 2A	this is a second phase of STWSP being implemented by John Van Nostrad Associates limited in consortium with Associated consulting Engineers 1975 in 5 towns called so to distinguish it from other STWSP (2B), towns under different implementors in other parts of the country.
Pit latrine	an on-site latrine with a pit for accumulation and decomposition of excreta and from which liquid infiltrates into the surrounding soil.
Public latrines	any latrine to which the public is admitted on payment or otherwise
Safe excreta disposal	refers to the means of getting rid of human faeces and urine without letting it come into direct contact with man; contaminating the ground or surface water; being accessible to animals or insects; coming into contact with food and creating a public or private nuisance.
Sanitation	refers to the means of collecting and disposing of excreta and community liquid wastes in a hygienic way so as not to endanger the health of individuals and the community as a whole. Some other definitions include other aspects in the environment like housing ²⁴ . In this thesis the term has been confined mainly to human excreta (faeces and urine), disposal.
Sewage	human excreta and waste water flushed along a sewer pipe.
Sewerage	a system of sewer pipes
Shadoof	name derived from a system of collecting water from a well used in ancient Egypt. It involves a hand-dug well which is sometimes lined-up with brick/cement framework and open at the top. A container in form of pail is tied at the end of the rope and lowered in the well of depth ranging from 3 - 7 metres and some kind of block and tackle arrangement is used as a pulley system to bail water out.
sludge	solid material which sinks to the bottom of septic tanks ²¹
sullage	domestic dirty water from bathrooms, cleaning dishes, clothes and floor, not containing excreta ²¹
Superstructure	the hut or shelter built over the latrine
Traditional latrine	simple on-site pit latrine.
Water table	the level in the ground at which water is found.

INTRODUCTION

The safe disposal of human excreta remains vital for health and well being. The unsafe disposal of infected human excreta leads to contamination of the ground and the sources of drinking water supplies. A rapid assessment based on review of selected sets of health unit records of 1995 revealed that excreta related diseases (diarrhoea, intestinal worms) accounted for 14% and 5% respectively of the total health unit attendance in Busia in 1995³.

The Government of Uganda, through the Directorate of Water Development (DWD), (which has secured credit from the World bank), is trying to evolve a community managed system for water and sanitation improvement in 11 small urban centres, (including Busia where the author of this thesis is working, as a community mobiliser).

The effort is being implemented under a Small Towns Water and Sanitation Project (STWSP). Busia STWSP implementation faces serious challenges that include: inadequate community structures and institutions. A big proportion of residents (50%), are tenants and not only *temporary stakeholder*, but also as individuals have limited time available to participate in public activities. Furthermore, some landlords are not interested in providing latrines to their tenants. All These make it fairly difficult to organise for this community management.

The study attempted to determine the factors that influence construction, use, operation and maintenance of latrines, analyze, identify strategy, recommend low-cost latrine technology options and viable approaches for marketing latrine improvements.

The findings, conclusions and recommendations will be used to develop a strategy to market sanitation in Busia and other towns under Rural Towns Water and Sanitation Programme.

Chapter one presents a description of selected background information on Uganda in general and on Busia in particular. The circumstances that prompted this study are described as well as the objectives. The last part of the chapter gives an outline of the methodology used in data collection.

Chapter two explores literature that provides various approaches to developing latrines in different urban settings and attempt to translated them for possible adaption in Busia STWSP.

Chapter three summaries the main findings that were considered relevant and that would yield conclusions that require urgent attention by key players in STWSP, if the latter is to realistically meet its stated objectives.

Chapter four provides summary of the main findings and their discussions.

Chapter five attempts to present conclusions and recommendations for improvement at STWSP management and policy making levels.

Chapter six provides an outline of proposed plan of action for implementing the unanswered questions and recommendations. Last but not least, additional information considered relevant for the study is provided in appendices.

CHAPTER 1. UGANDA COUNTRY INFORMATION.

1.1.1 Geographic and demographic characteristics

Uganda is located in East Africa, stretching astride the equator between 1° south and 4° north longitude, and 29° and 35° east latitude, in the heart of Africa. The total area is 241,038 square kilometres of which 17% are swamps and water, and 12% are forest reserves and national parks¹. The average altitude is 1,312 metres².

According to the 1991 population and housing census, Uganda has a total population of about 17.5 million people, of which about 11.3% (1,889,622) live in urban areas². Tororo District has a total population of about 571,171 of which 490,400 and 63,657 live in rural and urban areas of the district respectively. Of those who live in urban areas, more than half (32,249) live in Busia town³.

The national population growth rate was estimated at 2.5% and for Tororo District and Busia town was 2.8% and 2.6% respectively²

The top five causes of morbidity among the general population based on information from 30 hospitals 1992² were malaria 19%, diarrhoea 9%, pneumonia 8%, measles 7%, anaemia 6% and others 51%. The disease pattern of Busia town according to the rapid appraisal carried out by STWSP situation analysis team revealed more or less a similar pattern of diseases³.

Infant mortality rate remain at 122/1000 and 138/1000 live births for national and Tororo District respectively. The corresponding figures for under-five mortality are 203/1000 and 231/1000 for national and Tororo District respectively².

1.1.2 Physical features and climate

There are two distinct rainy seasons in the southern half of the country, with peaks in April/May and October/November while, in the north there is one peak in August. The average annual rainfall is about 500 millimetres¹.

The western and southwestern districts generally have rich agricultural lands and receive heavy and evenly distributed rainfall most times of the year. These districts are suitable for production of tea, coffee, cotton as well as bananas, grain crops and vegetable. Heavy concentrations of livestock are found in the larger and less densely populated districts.

Most of the country's minerals such as copper, cobalt, iron ore, gold, tin, wolfram, beryl and salt are located in western and southern highlands¹.

In the northern, north-western, north-eastern and south-eastern districts - (where Busia is located), rainfall is not reliable, but can support cotton, tobacco, grain and root crops. Large permanent swamps suitable for rice cultivation are present. This zone has a heavy concentration of livestock and supports large pastoral communities. Most of the zone is sparsely populated.

1.1.3 Political context

After independence in 1962, Ugandans initially experienced a time of prosperity. For example, primary school attendance was twice as high as anywhere else in Africa, the proportion of doctors in the population was 3 times as high and the minimum monthly wage could feed a family for 2 months. This affluent period lasted only a few years before the country entered a 20 year period of political instability and violence against the civilian population, during which there were seven changes of governments. The political differences and instability during that time have left scars which are slowly healing as stability returns⁴.

The civil strife, war, corrupt government, extravagant expenditure by the state, the economic mismanagement gave rise to huge loss of capital and human resources. The trend left Uganda's rich economic and administrative infrastructure in ruins.

The National Resistance Movement (NRM), came to power in 1986 and has gradually restored stability to Uganda. Grass roots "*Resistance Councils*" (RCs)⁴ now known as Local Councils (LCs), were set up country wide to mobilise, organise people and to try to avoid the corruption and human rights abuses that had inflicted the country since independence. Amnesty was declared on past crimes and the mammoth task of restoring security, political reconciliation, rebuilding the state and reviving the economy begun.

The development of RC structure from the village RCI culminating in the National Resistance Council (NRC), blended the traditional style of government with modern democratic principles, the council members and the executives being democratically elected.

At least one female representative is elected at each LC level to promote a more positive legal and social gender balance at all levels.

The development of the new Constitution and the subsequent very free and fair elections provided a unique opportunity to lay the foundations for equitable and united society.

Uganda is presently divided into 39 administrative districts². Districts are further divided into counties, sub-counties, parishes and villages. The parallel structures for urban areas with self accounting, semi-autonomous status are city, municipality, town council, town board and township. In this arrangement Busia is a town council, an equivalent of a sub-county. More information is in organisation structure, appendix 6.3

For each administrative level, there is a popularly elected, in bottom-up approach, local council committee, with 9 members with a variety of responsibilities such as promotion of health, defence, mobilisation and women issues. These local councils (LCs) are mandated to identify local problems, seek solutions and formulate development plans¹.

1.1.4 The national economy

When the National Resistance Movement, (NRM), Government assumed power in 1986, it inherited a nation torn by conflict, and an economy shattered by years of war and political instability. Inflation was around 200% per annum, fuelled by severe macro-economic imbalances and acute scarcity of foreign exchange¹.

Industrial production was negligible, and agricultural production was disrupted with most produce being smuggled out of the country.

The new government embarked on a courageous programme of reform and rehabilitation. Its first concern was the restoration of security, law and order in Northern and North Eastern Uganda where to a certain degree pockets of insecurity unfortunately remain a major constraint to full national harmony.

A package of economic reforms were introduced in May 1987 and refined in July 1988. The reforms were aimed at restoring economic stability, establishing more realistic relative prices, and rehabilitating the community's productive and social infrastructure. The Gross National Product (GNP), per capita is estimated to be US \$170⁹.

The issue of remuneration of government employees remain to be addressed as a priority concern, as motivation at present is conspicuously absent and productivity of the civil service is still low¹.

1.1.5 Water and environmental sanitation

The Government has placed increasing emphasis on the water and sanitation improvement as a priority programme area (PPA) in its budget allocation⁵. The national responsibility of water and environmental sanitation (WES), development is shared between the Ministry of Natural Resources (MoNR) and its implementing arm the Directorate of Water Development (DWD), Ministry of Health (MoH), Ministry of Gender and Community Development (MoGCD). The DWD in conjunction with Environmental Health Division (EHD) of the MoH and Directorate of Community Development (DCD) of MoGCD develops and operates rural and small towns water and sanitation. On the other hand the National Water and Sewerage Corporation (NWSC), develops and operates water and sewerage systems in only 9 main municipalities throughout the country⁴.

Sanitation trends in Uganda. Between 1934 and 1935, the colonial government laid down rules governing sanitary human waste disposal facilities (latrines), in Ugandan households. Rapid and unprecedented improvements continued through the 1940s and 1950s and by 1962, 80-90% of all households in Uganda reportedly had latrine facilities. By 1983, however, only about 30% of all existing households had a functioning latrine². After a rise in the level of latrine coverage during the late 1980s (which may have been related to relative peace and therefore better opportunities for counting), latrine coverage declined once again from 65% of homes with latrines in 1988, down to 46% in 1992². In Tororo District the latrine coverage was estimated to be 58%². The calculations of latrine coverage were based on estimates of seven users per latrine². Although this number of users per latrine appear to be larger than the average household size of 4.8 persons² it is not uncommon to find two or so households using one latrine.

WES sector performance. Considering all the expenditures on water supply and sanitation improvements, the proportion of funds allocated to urban water and sanitation systems has remained higher than those for rural water supply and sanitation since the early 1970s. However, a review of the overall performance in the sector revealed disappointing results.

The urban water and sanitation systems managed by National Water and Sewerage Corporation, (NWSC), a government para-statal, and Directorate of Water Development, (DWD), generated insufficient funds to cover costs of operation, maintenance and expansion³. Continued public financing was thus required for the operations of these urban systems at the expense of extending coverage to smaller urban and rural areas where the majority of people live.

It has been recognised that the above was a result of design and planning of urban water and sanitation projects being overly supply oriented. The crucial community and household demand aspects and the associated local socio-economic, and physical environment conditions were largely neglected⁵.

In light of the above the Ministry of Natural Resources, through its implementing arm the Directorate of Water Development, embarked on a search for the means and strategies of understanding the local conditions and involving urban communities and households in planning, construction, and management of water supply and sanitation systems. Under the Rural Towns Water and Sanitation Programme (RTWSP), a "*negotiations-driven*"⁵, community-based approach towards sustainable systems has been launched in a package of 11 towns to be financed by the World Bank (International Development Assistance, IDA - Credit). It was intended that development of urban water and sanitation systems be built on this premise.

A survey to determine the socio-economic and willingness to pay for water, existing water supply and sanitation situation was therefore carried out as part of the planning process. This was part of the assignment of Phase IIA of the World Bank credit financed Small Towns Water and Sanitation Project (STWSP), executed by John Van Nostrand Associates Limited in consortium with Associated Consulting Engineers (1975). The team in the Project included the author of this thesis and utilised parts of the survey to analyse further "*how to strengthen community operation and maintenance of human excreta disposal in Busia town*".

1.1.6 Busia town background information

Geographic and demographic data of Busia town. Busia town is located about 200 Km to the South East of Kampala, the capital city of Uganda, at the boarder with Kenya. The population of Busia as reported in the 1991 national census was 27,967 people and to date an estimated number of 32,249³ people lived in the town. The town is located on a flat topographical setting between 1180 and 1200 metres above sea level, with a high water table hence the existence of numerous shallow wells in form of Shadoof. There are no permanent streams within the town and the rainy season is in the period December - June while the dry season is in July - November. Annual rainfall is about 1200 millimetres³.

The population of Busia town is mainly engaged in trading activities for both retail and wholesale trade. As a result there is a mixed commercial/residential town centre (core) with modern permanent buildings housing shops, lodges, restaurants, offices and warehouses. Although the population size is not rapidly³ increasing in the town, the stock of permanent modern houses is steadily increasing and spreading over to replace semi-permanent houses that existed in the fringe areas within the town boundary.

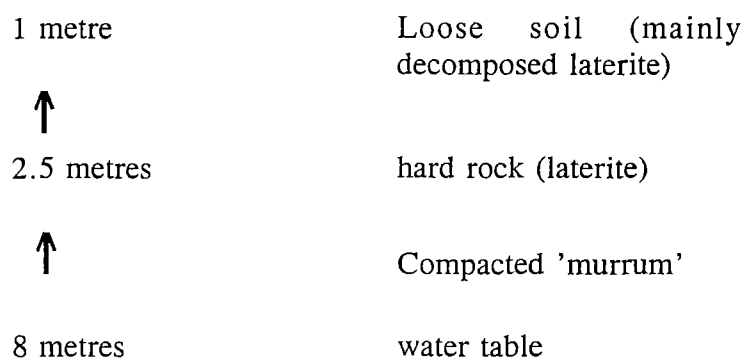
Busia is easily accessible by road from Kampala and other provincial towns in the region. The Northern Transit Traffic Corridor route from Mombasa, Kenya to Beni, Zaire passes through this town and is an all weather surface road. Passenger and cargo transport is readily available in the town for both internal and international transit especially to Kenya.

Since some land within the town council is not yet built up, urban agriculture is significant for both animals and crops. The areas mainly forming the fringe parts of the town, bear crop fields for both cash and food crops as well as grazing ground for livestock⁶.

Busia town is categorized as a town council according to the urban administrative classification in Uganda. The overall administration is in the office of the Town Clerk while the Local Council III office in the town provides the political authority. Within Tororo district, Busia town is the second largest town, only coming next to Tororo Municipal Council, the district headquarters³. Being a border town and a busy trading terminal, government institutions exist in the town. These include Uganda Revenue Authority, Customs, Police, Prison and the local defence forces. Other institutions are:- primary schools, secondary schools, dispensary and religious settlements. "Industrial establishments" are mainly small scale maize/rice milling and milk collection centre.

Soils, Geology and Topography of Busia. The soils in Busia are laterite. Visual observations of latrine pits under construction provide a general profile shown in figure I

Figure I Soil profile



Source: Busia STWSP Situation Analysis Report, June, 1996 (unpublished)

The profile is however generalised and does not strictly apply to some areas. For example most north west parts of the North parish have no loose soil layer the hard rock being on the surface while in Marachi B and C of the South East parish, the water table is very close to the surface. However, permeability is considerably low as evidenced from very low levels of pollution of water sources (shadoof), despite presence of pit latrines within a distance of 4 to 14 metres³.

Topography. Busia town is situated in a fairly flat area. A look on a map of Busia drawn on scale 1:10,000 provides contours with vertical interval of 20 metres. The highest contour is 1200 metres and the lowest in Mawero West and Mawero East B of the North Parish is 1180 metres.

Within the commercial centre the lowest points are around the taxi/bus park and main market areas. These are service areas which are very busy and have high population densities. A large part of Busia Kenya also drains towards the same points³.

Drainage. When it rains, storm water having collected refuse, human excreta and other debris from all over the town, Kenya inclusive, descends down to the commercial centre where it collects and accumulates forcing residents either to leave until the water retreats or place their belongings on tables and shelves and stay on top of their beds, sometimes for days. The public health risk from lack of latrine or indiscriminate excreta in bush or polythene bags, and or children faeces on refuse heaps, remain particularly high in Solo and Marachi densely populated areas at the onset of the rainy season³. At this time, human excreta are washed from the garbage heaps and flooded pit latrines into water sources, which are sources for domestic water (drinking, mouth rinsing, washing food stuffs and utensils and cooking food) (Inspection report, FGD landlords, PHD staff, town authorities).

Land tenure and use. Most of the land in Busia at the time of writing this thesis was owned by individuals based on "*bibanja*" or customary ownership. Under this system rights over land were regulated by local customs and was held in trust of a clan whose member could occupy portions of it on a family lineage or inheritance basis. That has led to land fragmentation in most parts of the town thus precipitating serious problems for planners, overcrowded settlements with severe implication for construction and use of waste and excreta facilities³.

The Town Council has no land of its own and under the 1995 Constitution the administration of land through issuance of leases by town councils was abolished⁷.

The role the town council was limited to control of its development. Busia now faces serious problems of unplanned settlements in parts of South East, Central and North East parishes. Congestion and lack of HED facilities led to highly unhygienic and unsanitary environment³. This is further compounded by access problems that impede delivery of services.

In most cases a demarcated plot in the structure plan fall under several customary owners of pieces of land. The town authority, in attempt to keep within the structure plan, has placed the responsibility of aggregating and compensating customary owners with intending developers. A pre-condition has been set for developers to have their plots surveyed before approval is granted for development⁸

Most of the town is rural especially the North Parish. Sofia B of the North East parish and the southern parts of South West and Central parish. The homesteads are wide apart and there is urban agriculture. Over 80% of the people live in the core area of the Busia town³.

Urban planning. The current structure plan of the town was made in 1991 although it has not yet been approved by the Town and Country Planning Board. Delays have been attributed to absence of a boundary survey which is pending completion due to non-availability of resources from the Town³.

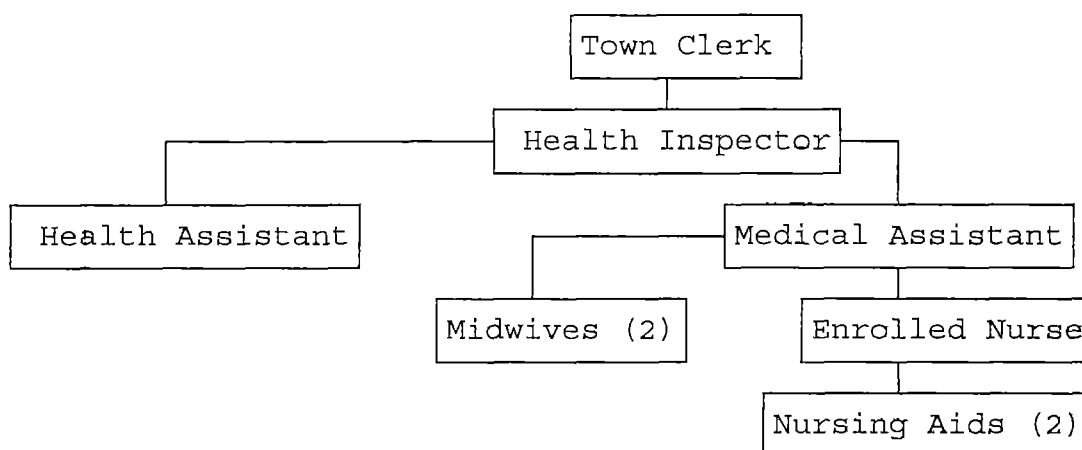
The business or commercial district part of the town is along the main roads to Jinja, Majanji, Tororo and customs post (see map I).

The plot sizes are 30 by 15 metres³. Kisenyi A is planned for Grade A low density housing with plot sizes of 60 by 30 metres. High density residential housing area is planned for Nangwe Madibira, Madibira A and B with plot sizes of 18 by 15, 20 by 15 and 12 by 15 metres. Mawero East B and parts of Mawero West are for medium density residential housing and the plot sizes are 30 by 28 metres. Solo C and B are reserved for industrial structures the plot sizes to be determined by the size of the industry. Plot sizes have great bearing on human excreta disposal service levels and future operation and maintenance.

Institutional responsibility of Busia Public Health Department

The Busia town Public Health Department (PHD), is responsible for causing the provision, promotion and maintenance of HED facilities.

Figure 2 Organizational chart for Busia Public Health Department



Source: Busia, Public Health Office, June, 1996

The department is headed by the Town Health inspector (THI) who reports directly to the Town Clerk. Below the THI are two sections dealing with public health, namely the Health Assistant (HA) and Medical Assistant (MA) for both curative and preventive health needs of the residents. The department is responsible, among as tasks, for inspection of habitable and trade premises, feeding habits, hygienic disposal of human excreta, waste and foul water⁶.

The staff of the department were also affected by the civil service restructuring and reform. Prior to the reforms the department had a health inspector responsible for environmental health with five health assistants and seven health orderlies two of whom were in charge of vector control especially mosquitoes and breeding places in soak away pits. But at the time of this survey, all these tasks were being done by one 2 people (the Health Inspector and Assistant)⁶.

1.2 Study rationale

In recent years, there has been considerable interest in community management (CM) for water and sanitation improvements in developing countries. In Uganda the ten years or so has witnessed a proliferation of plans and strategies aimed at strengthening community participation and therefore increasing possibility of sustainability of these improvements.

In general, these plans have embraced *inter alia*, strategies to:-

- build community management capacities within user communities through social mobilisation and training;
- build and strengthen district and sub-district institutions and infrastructures for efficient delivery of community external resources, like handpump spare parts, repair tools;
- create enabling environment for community management through advocacy, development of policies and legislation at community, district and national levels.

In addition to these efforts, some researchers, academics and planners have attempted to examine the determinants, consequences, processes of strengthening community operation and maintenance of water and sanitation mainly in rural areas.

Furthermore, one of the greatest challenges facing the government of Uganda (GOU), and sector external support agencies (ESA), today is how to provide sustainable, adequate, culturally appropriate human excreta technologies and their management system especially for the rapidly growing, low income, urban communities. The inadequate provision of these facilities and the concomitant health hazards associated with the current unsafe human excreta disposal, constitute a formidable public health problem. A number of public health problems commonly attributed to inadequate use of latrines include, but not limited to^{3,9}:-

- faecal-oral water borne diseases such as diarrhoea, dysentery and cholera,
- latrine sullage related insect vectors such as mosquitoes (bancroftian filariasis),
- soil transmitted helminths such as hookworms,
- excreta related insect vectors, such as flies, cockroaches.
- water related insect vectors, such as malaria (poor drainage), and dengue.

The GOU have attempted to re-address these problems in rural communities through CM, of water and sanitation improvements and in urban communities through provision of centrally government managed human excreta disposal systems. Despite the heavy capital investments, a review of operation and maintenance performance in the sector in urban centres revealed disappointing results. The systems centrally managed by National Water and Sewerage (NWSC) and Directorate of Water Development generated insufficient funds for operation, maintenance and expansion².

Notwithstanding the foregoing, a study into alternative strategies to this centralised system management such as community operation and maintenance of excreta disposal in small urban centres has been relatively neglected.

Despite the abundance of published and unpublished research work on community operation and maintenance of water and sanitation facilities, there is surprisingly little in the sector on urban communities. The apparent lack of literature on this subject may be explained in terms of the community managed sanitation strategy being relatively new for urban areas. As of now, in Uganda, there is virtually no published research work which systematically and comprehensively analyses the community operation and maintenance of human excreta disposal in urban communities. This study is envisaged to meet a long existing need by identifying viable technological options for human excreta facilities and strategies for strengthening community operation and maintenance of these interventions in low income, small urban communities. The study illuminates a wide range of ideas, issues, processes and policy proposals pertaining to this *apparent new subject*, in Uganda.

The conclusions and recommendations are anticipated to be utilised in design, implementation, operation and maintenance of a *negotiated-driven sanitation* intervention component of RTWSP.

Last but not least, the present study was done as a partial fulfilment for the award of Master of Public Health, of Royal Tropical Institute, Amsterdam.

1.3 Statement of the problem

In Busia town, with estimated total population of 32,249 people³ population growth has been faster than the available resources and plans to provide for, among other things, suitable technological infrastructure such as low-cost latrines. The problem expresses itself by overcrowding, growth of illegal settlements, inadequate and sometimes unsuitable human excreta facilities. Furthermore, planning and control of relevant services by the town authorities is insufficient, and the size of plots for extension of human excretion disposal facilities is limited³.

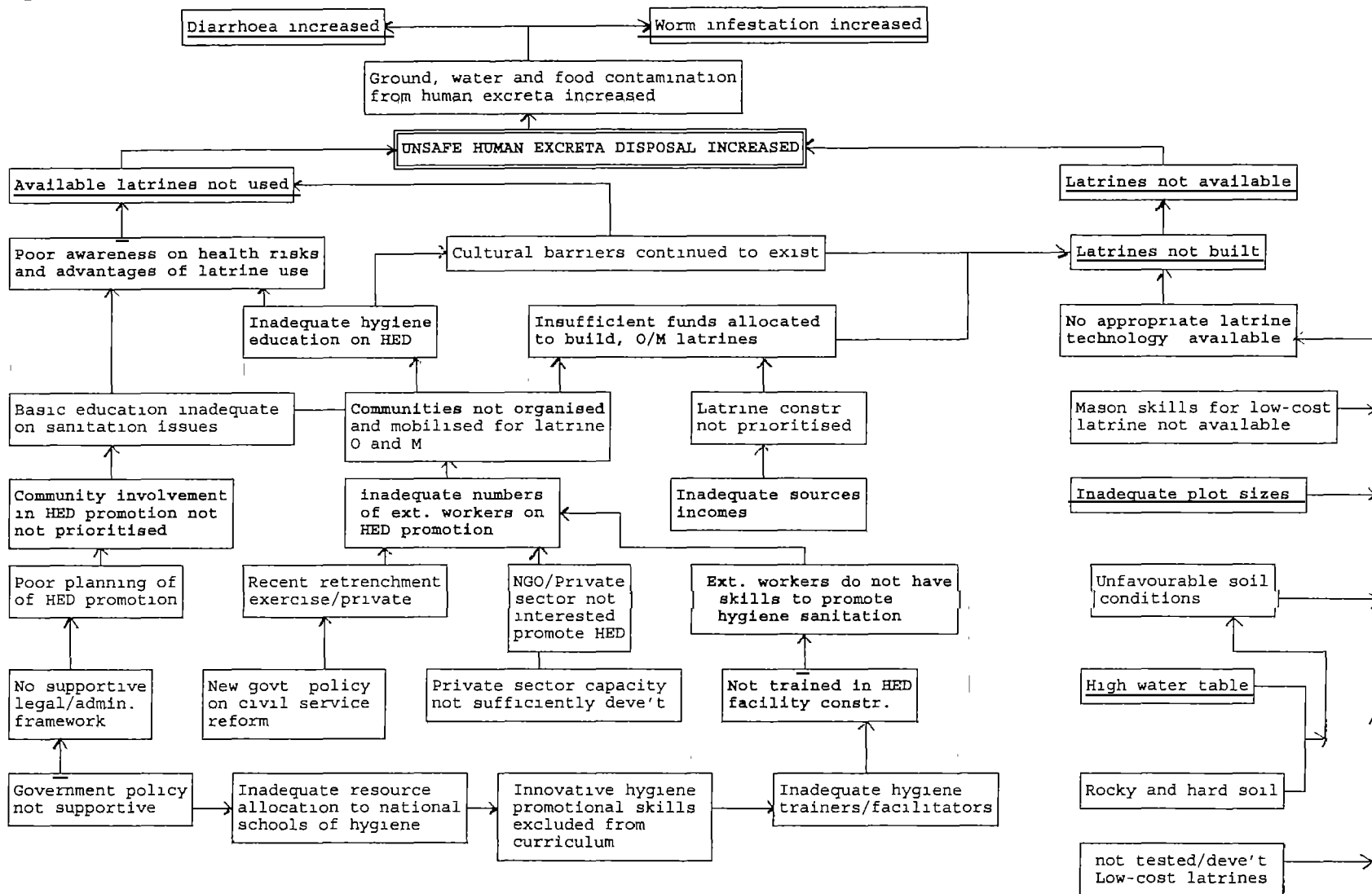
A rapid assessment by STWSP team June 1996, revealed that the proportion of water and sanitation related illnesses varied from 53.5% to 75%. Diarrhoeal diseases contributed about 14%³ of these diseases. Furthermore about 32% of Busia town residents did not have access to pit latrines. They used the so called "*kavera sanitation*" using polythene plastic bag and throw it at rubbish heaps. Other households resort to the "*bush*" (FGD, LCs, PHD staff, women groups, landlords).

As a result, in some heavily built up parts of the town, residents live amidst heaps of uncollected solid refuse and "*human excreta in polythene bags*" and children faeces. This kind of situation exposes the people to a number of hazards and nuisances that include *inter alia*³:-

- ◆ contamination of soil by unsafely disposed of human excreta giving rise to helminthiasis and fostering intestinal parasites such as hookworms and ascariasis especially among children.
- ◆ contamination of ground water that may be used for drinking.
- ◆ odours and an aesthetically displeasing environment
- ◆ multiplication of disease vectors such as house flies, mosquitoes, vermin and associated pathogens.
- ◆ young children playing on the garbage heaps, chew and play with, some of the refuse, such as polythene bags. The children are therefore exposed to risks of swallowing pathogens.
- ◆ pollution of water by storm water washing debris that include human excreta out of piles of refuse into unprotected surface (streams), and ground water (shadoof).

This problem of human excreta is widely spread in the town but most pronounced in central business district, where plot sizes are small and buildings are crowded together. Furthermore it is attributable to various contributing factors that can be categorised as **inadequate use of latrines, lack of latrines and the unfavourable environment**. Figure 3 below gives summary analysis of these contributing factors.

Figure 3 Problem analysis diagram



The Government of Uganda through the Directorate of Water Development, (which has secured credit from the World bank), is trying to evolve a community managed system for water and sanitation improvement in 11 small urban centres, (including Busia)⁵. The strategy of involving urban communities in the entire process of planning, implementation, management and maintenance of sanitation/water improvements is relatively new, and its success is difficult to predict. Hitherto, the communities have been used to being provided with services from the Government at a "free cost". The Government policy towards water and sanitation management is now no longer that of a monopoly of Government but that of entrusting the responsibility with communities. This means that skills for community operation and maintenance must be developed and built to enable them to fulfil this new role.

At present, there is little community involvement in attacking the problem and yet such participation could be powerful factor in solving the problem. The intervention faces challenges of³:-

- inadequate community structures and institutions, due to the mobile nature of most town households. A big proportion of residents (50%), are tenants and therefore *temporary stakeholder* and fairly difficult to organise for this community operation and maintenance.
- landlords who are not interested in providing latrines to their tenants.
- limited time available for individual community members to participate in public activities in view that most are not gainfully employed and have pressing economic obligations.
- identifying a strategy and viable approaches for marketing latrines
- identifying feasible and appropriate low-cost technology options for latrines.

A study was therefore required to ascertain the feasibility of strengthening community operation maintenance of latrines.

1.4 Objectives of the Thesis

1.4.1 General objective

The general objective of this thesis is to determine the factors that contribute to the problem of human excreta disposal, identify and recommend strategies for marketing latrines in Busia.

1.4.2 Specific objectives

The Thesis objectives were to:

- identify the major factors which influence construction and use of latrines (cultural barriers, community awareness of health risks and advantages of latrine use, landlord restrictions, unfavourable environment - policy, inappropriate latrine technology and household socio-economic factors).
- identify approaches for marketing latrine construction, proper use.
- propose a list of promising technology options for low-cost latrines.
- recommend feasible strategies and viable approaches to community operation and maintenance of latrines.

1.5 Methodology

This study analyses part of the raw data of a survey carried out by STWSP Busia, to determine the socio-economic and willingness to pay for water, existing water supply and sanitation situation. It was conducted as part of planning process in July, 1996. The author was part of this planning team. What follows is a summary of how it was conducted.

1.5.1 Study type

This was an analytical study to determine the factors that influence construction and use of latrines in Busia, (cultural barriers, socio-economic factors, unfavourable physical environment, community awareness of health risks and advantages of latrine use, landlord restrictions, policy related factors).

The study also analysed the current operation and maintenance system of latrines in Busia town and explored technology options for human excreta disposal for Busia

The literature analysis attempts to describe approaches to providing O and M of low-cost latrines and these in turn are interpreted for application to Busia town.

1.5.2 Study population

The study population included household heads for interviews and for focus group discussions the following categories of key informants were selected: public health department staff, local resistance committees, women groups, masons, and landlords.

An observation (inspection), of latrines:- shared, private, public, and institutional was conducted, household visits to assess response to children faeces, garbage heaps, pit digging and manual emptying sites.

1.5.3 Sample size

The size was determined using the following:

$$n = \frac{z^2 pq}{d^2}$$

Where:

n = the desired sample size

z = the standard normal deviate, set at 1.96 which = to 95% confidence level

p = the proportion in the households estimated to have no access to latrines in Busia

q = 1.0 - p

d = degree of accuracy desired, set at 0.05

The formula gave us a total of 334 households. We added 166 to make 500 households to cater for absentee landlords and envisaged non- response considering that the population being dealt with was a mobile one. Secondly, the survey was part of planning exercise and involving as many households as possible was considered necessary to capture as many landlords in the sample as possible.

1.5.4 Sampling procedures

Cluster sampling was employed in the study. Villages otherwise known as Local council ones (LC1), were the main clusters. Within each of these clusters, households were selected for the interview. Since household numbers (and not lists) were available, simple random sampling was used to yield a sample size that had been predetermined based on the available figures. On the average, each enumerator was asked to skip 10-15 households before he/she could administer the next questionnaire.

1.5.5 Data collection procedures

A total of 500 households were selected for interview. Furthermore a 30 FGDs were conducted as follows: women group 10, at least 2 in each of the five parishes, LCs 10, at least 2 in each of the five parishes, 10 for landlords/tenants, 1 for PHD staff, 1 for Town authorities, 1 for pit latrine masons. Over 50 household latrines, at least two from each of the LC ones, the 4 public latrines, 5 garbage collection heaps were visited (inspected), as well as literature analysis.

Prior to data collection, the pre-test of the study instruments was done as part of a one-week long training of the enumerators

1.5.4 Data collection quality checks

Each enumerator was supervised by the research team. At the end of the day each enumerator returned with all the questionnaires signed for and these were cross-checked in their presence and errors in recording were rectified there and then. Where necessary, enumerators were sent back to get missing data from households based on the identification numbers marked on the door shutters.

1.5.5 Data management

Quantitative data entry and analysis was done in EPI INFO version 6 due to its relative user friendliness (simple and menu driven). The literature search was done at Royal Tropical Institute (KIT), and International Water and Sanitation Centre (IRC), libraries, as well as from documents and reports on the subject from Uganda. Qualitative data preliminary summaries were written and useful statements recorded for use in illustrating findings and discussions. An inspection report was prepared.

1.5.6 Tabulations and analysis routines

Analysis was carried out in EPI INFO 6 in KIT and where possible tests of significance were done. The FGD data, inspection report were also summarised.

1.5.7 Data Limitations

In this study, one or more of the following problems were anticipated and steps were taken to minimize their effect on results of the study:-

- incomplete and inaccurate records;

- lack of cooperation, suspicion or even apathy on the part of the respondents;
- answers could be passed on to the next respondent from a previously interviewed one;
- undisciplined/non-committed interviewers,
- language difficulties; Busia is a melting pot with several dialects.

The survey was originally designed and conducted mainly as a socio-economic and willingness to pay survey for water and information on sanitation was simply *an add-on*. Some of the information relating to vital issues in sanitation were collected using FGD and observation technique.

These potential sources of bias detected and the approach followed in conducting the survey took into account these problems.

Enumerators were intensively trained and made aware of the major causes of high sampling errors in studies of this nature. Instructions on how to fill the questionnaire and handle situations that could lead to increase in the study error were issued and close supervision at the time of field work was implemented.

2.1 Approaches to development of urban human excreta disposal facilities

In this section, literature analysis focused upon some innovative approaches to providing latrines in low income urban communities. A short description of each of these is presented followed by an attempt to translate them for use in Busia

Case study 1: Orangi Pilot Project (OPP)¹⁰

In Orangi township, a squatter settlement in Karachi, Pakistan, a pilot Project was launched in 1980⁹. The town had inadequate sanitation and waste water disposal facilities. The Orangi project was a research effort to develop low cost sanitation solutions and devise an appropriate organisational form for community managed implementation. This was done through a technically simplified and efficient management of contractors to cut down costs of sewer construction.

The sewers were designed to drain into natural drains "nullahs", which conveyed the effluent into the sea. The sewers were financed, built and maintained by the community itself, at an affordable cost of about Rs 900 (US\$ 36).

The Project employed both technical and social organizers specially trained to deal with sanitation related problems of low income settlements, facilitating community involvement and training to solve these problems. The community was organised to finance and manage the construction of the sanitary latrine in their homes, the underground sewer in their lanes and the intermediate or collector drain at the neighbourhood level.

The work that the community was able to construct by themselves was subsequently operated and maintained by the community and area organisations. Similarly, sewerage trunks, intermediate structures and treatment plants that could not be built by the people, were developed, operated and maintained by the state.

Local activists mobilised communities to establish lane-level organisations for implementing and financing the local sewer lines. The sewerage system had internal component which comprised of private sanitary facilities, local or tertiary sewer pipes and in some cases secondary sewers. The lane organisations assumed responsibility for financing and managing the internal components of the system. The external components of the system comprised of major trunk sewers and treatment facilities¹⁰.

The OPP employed a very flexible strategy and limited its role to stimulating community action. Communities on their own made decisions, organised lane associations, managed implementation and financing.

The users in form of lane organisations supervised the construction companies and workers and labour inputs from residents. Furthermore, lane organisations were granted some supervisory responsibility for external sewer construction, to safeguard against installation of shoddy work by Municipality's contractors.

The OPP demonstrated that low-cost income people like those in Busia have the potential to play a significant role in the provision of latrines provided they are supported to do so.

In Orangi, however, most houses were occupied by owner residents who had been there for quite sometime. They had a strong community cohesion, dependable water supply, very strong leadership and high population densities. This implies that if a similar approach is to be used in STWSP Busia, it has to be modified. The proposed piped water option is likely to ensure dependable water supply but there remain several *huddles to be jumped* in case of Busia. Although, community organisation and mobilisation for participation in the planning, implementation and operation and maintenance of the sewerage system among other systems is envisaged, the process tends to be slow, time consuming and laborious. This has first to be recognised and accepted by all the key players in STWSP. Secondly, community involvement in management including financing especially of large systems like sewerage, is relative new. Until recently, all urban sewerage systems were solely financed and managed by government, (DWD or NWSC)²⁶. The STWSP will require considerably high resource investments in community organisation to achieve the required level of community commitment and cohesion, like in Orangi. Notwithstanding the latter requirement, STWSP has very little if any funds for sanitation improvement. The implication for STWSP in this connection is therefore the urgent need to lobby for either supplementary funding or transfer resources from the hard ware sections to mobilisation. The potential for strong leadership is likely to be available in form of LCs, who are already trying their level best in latrine promotion.

Case study 2: Ouagadougou low-cost sanitation and public information programme¹¹

In Ouagadougou, Burkina Faso, with assistance of UNDP, and technical assistance of the Regional Water and Sanitation Group in West Africa, and its national water and sanitation utility (ONEA), launched a strategic sanitation plan (SSP) for excreta and waste water in 1990. It developed low-cost sanitation in light of the following problems it had to deal with: "... flat-grade topography, low water connection rate, low consumption per capita, low urban density, appropriate soil infiltrative capacity, deep water table, willingness and ability to pay for improved sanitation services.."⁹.

The implementation focused on three aspects: new or improved latrines and sullage disposal facilities financed primarily by households; and a financing mechanism based on sanitation surcharge to subsidise construction. Sewers were built in the down town area - a densely populated area with high water consumption rate, low soil infiltration capacity, and high water table. The treatment was done in ponds, located in the outskirts of the city. The ONEA was responsible for sanitation in the city (excreta and waste water collection and disposal), but all construction works were executed by the private sector.

The project demonstrated that it was possible to cover a substantial area with limited external financing. It scaled up the entire city, 30 neighbourhoods without external financing. Furthermore it showed that local capacity building during the project, was feasible. Local technicians internalised the process and sold their skills.

Increasing sanitation services in towns like Busia will be feasible with the adoption of on-site technologies. In flat-grade areas, like Busia, soakaway and sullage disposal facilities may be need further investigation to determine their feasibility. In Ouagadougou situation, it took the efforts of the ONEA, backed up by financial commitments, strategic plan, concrete operational objectives, to take the lead in improving the services with active participation of community. Improving the private sector (technical skills, marketing), was accompanied by prompt, qualified service, technicians themselves to build their business and expand their services to broader market. In case of Busia, the Ouagadougou experience may be replicable, but two issues remain outstanding: internal financing mechanism based on surcharge may not be feasible; private sector still needs a critical mass (sufficient number), of customers to buy their skills. Until and unless the pool of customers is sufficient to attract investors (new technicians to be trained by old ones on-the-job), it will not be possible to sustain interest and competence. The role of STWSP is to mobilise communities to increase demand for services, while fostering private sector involvement.

Case study 3: Self-help provision of Family toilets in Yogyakarta, Indonesia¹⁰

In Yogyakarta, Indonesia, a self-help family toilet scheme, was implemented within the framework of Yogyakarta Urban Development Project (YUDP). The overriding principle was increased community involvement in service provision.

The pilot scheme which begun operations in January 1993, provided technical support and credit facilities for construction of private toilets and privately managed public toilets in areas where space for private toilets was inadequate. Two broad approaches were employed, with one focusing on implementation with government collaboration, and the other by NGO alone. The implementation followed different conditions and features. While the main emphasis of the first one was direct government involvement (top-down approach), the second one had a bottom-up approach. While the government advanced interest-free loans, the second one charged an interest rate slightly less than that of commercial rate.

Although both of them produced functional on-site sanitary solutions, they had different impacts. The loan recovery rate was much higher than in the government (top-down), approach. This was certainly a useful lesson for Busia. Community based approaches have relatively more long lasting results as opposed to directive, top-down approaches. It demonstrates that "babying" of communities should be avoided in development interventions like STWSP. This may take the form of providing overly subsidised inputs, like sanplats, slabs and vent pipes for VIPs. This creates harmful dependency by setting precedents and consequently being unable to "wean" the communities and setting them off to evolve and grown on their own.

The STWSP Busia principle is based on over all implementation by the private sector, with community participation in all stages including the management. The Indonesian experience used loans to facilitate unable households built up toilets. Although this approach is possible in Busia, it requires an intensive dialogue with the beneficiaries before launching it. While the approach merits trial during implementation, the source of such fund for loans remains questionable.

Case study 4: Strategic Sanitation Programme, Kumasi, Ghana

In Kumasi, Ghana, Strategic Sanitation Programme focused on demand-oriented sanitation services by tailoring technical options in each area of the city, taking into account user preference and willingness to pay⁹. Involvement of private sector enterprises and communities in service provision was promoted while Kumasi Municipal Authority limited itself to planning, facilitating and regulatory roles. Furthermore, sanitation by-laws were revised to provide for private sector participation and a new department was established to manage the system. The department had specialised capacities in contract management, strategic planning, finance, pollution control and administration.

The communities were facilitated and empowered to demand and negotiate for services, and credit scheme was introduced to enable low income households to have access to sanitation facilities⁹. The services being promoted included home latrines, simplified sewer networks, institutional (school and government offices), sanitary facilities, and rehabilitated privately operated public toilets.

The lessons learnt for Busia include the principle of demand-oriented sanitation services. Busia STWSP principle was also initially known as demand-driven but later changed to "negotiated-driven" approach. Community participation is based on what they want but if the latter, falls outside the financial and technical scope then the two parties (STWSP and the community), negotiate and reach a consensus. The public operated latrines were transformed into privately run. This was a good lesson for Busia considering that the existing facilities at the time of writing this thesis were similarly run by the town authority. STWSP should therefore explore prospects of upgrading the current public latrines, increase the numbers and involve the private sector to manage them, within the framework of community O and M.

Busia STWSP is being implemented in rather similar circumstances of public sector reform. The private sector will play a big role to fill the gap and continue to back up support maintenance services. The social marketing strategy employed in Kumasi generated demand for services, promoted efficient use of facilities and improved the payment discipline of users. The strategy is being recommended for STWSP Busia.

Case study 5: Dry excreta based latrines¹³

In this arrangement human excreta (faeces and urine), are subjected to primary treatment, dehydration, which effectively destroys most the pathogenic organisms.

In Yemen, a one chamber desiccating toilet with urine separation. In Sanaa, like in other towns in Yemen, in tall houses of 5 to 9 storeys, each floor has one or two toilet bathrooms next to a vertical shaft that run from top of the house down to the level of the street. The faeces drop through a hole in the squatting slab. The urine drains away through an opening in the wall of the house, down a vertical drainage surface on the outer face of the building. Anal cleaning with water takes place on a pair of stones next to the squatting slab. The water is drained away the same as urine. Sanaa has a hot, dry climate and the faeces dry out very quickly. They are collected periodically and used as fuel.

In Busia, the non- moslem community can be given some training to try out this technology. The moslems mainly use water for anal cleansing, and this is likely to make drying more complicated. Faeces need not be used for fuel, but from public health point of, they are relatively safer during emptying and damping.

In Vietnam and Guatemala, a two-chamber desiccating toilet with urine separation above ground has been tried out. In this arrangement urine is collected and piped into a container or soakpit. Faeces and toilet paper are dropped into one of the chambers. The other one is kept closed. Each time a user defecates, ash or soil is sprinkled on the faeces. When the chamber is nearly full, it is topped up with soil and a plastic bag is placed over the seat. The second chamber is then used. When that one is nearly full the first chamber is opened and emptied. The dehydrated faecal matter is used as fertilizer and soil conditioner^{12, 13}.

This require a lot of training for the users and may be difficult for moslem community who use water for anal cleansing. While it is one of the ecological friendly latrines, they are not likely to be culturally accepted on grounds of using faecal matter as a soil conditioner. Although these latrines may not be promoted on the latter basis, investigations are still needed before considering them for trial in Busia.

Dry systems have been tried out in other parts that include Hermosa Provincia, El Salvador, Mexico, Sweden, North America, in Ecuador and in the Pacific Islands of Kiribati¹³. The main disadvantage was the additional cost of a solar heater to increase evaporation from the chamber. Secondly, they are based on urine separation and desiccation, an important element very difficult to achieve in Busia. The positive aspects are that, in the first place, they are possible in high density urban squatter areas, like in some congested parts of Busia. Secondly, the system can be combined with separate or on-site treatment of household sullage. Thirdly, they involve managing small volumes of urine and faeces and saving on pipe network for sewerage system. A thorough investigation is therefore required for future trial in RTWSP areas in Uganda.

In conclusion, therefore, there is urgent need for STWSP planners to pay more attention to dry HED facilities, since closely spaced latrines in small towns like Busia can in the long run overwhelm the carrying capacity of soils and pollute underground aquifers. Furthermore this will enable households and communities to have a wider range of options to choose from.

These technologies should be promoted bearing in mind the need for gradual improvements in the safe excreta disposal according to what households and communities have, what they want, can afford and are willing to pay for^{14, 32, 33, 34}.

This therefore calls for need to adapt these technologies and approaches to socio-cultural, environment, through carefully planned community participation, promoting responsibility sharing, building community-level competence. Women must be involved.

Therefore, institutional capacity strengthening of the community to participate in planning, implementation, O and M, of shared HED systems like sewerage, services like pit emptying, communal, shared and public latrines, is required to enable them to carry out this new task hitherto done by the municipal authority.

This involves an arrangement for constant skills transfer (previously trained people die, migrate to other parts of the country or even lose interest). Procedures for operating and maintaining shared latrines, communal, and public latrines as well as financial management of shared household latrine services like pit emptying and community managed sewerage system need to be established, by STWSP.

CHAPTER 3 FINDINGS

3.1 Description of the sample

This survey sought responses from either the household head (priority) the spouse and/or any other adult person from the household. Of the 493 respondents, 52.5% (259) were male and 47.5% (234) female. While 84% of the households were male headed, 16% had female heads.

Of the 493 households, 44% (217) were located in the fringe area, while 56% (276) were in the central town area. The mean age of respondents was 34 years. The oldest respondent in our survey was 82 years. Only 4 respondents were below 18 (Uganda's legal age for adulthood), years of age.

In the sample, 93% (458) of the households had at least one child, the mode number of children was 3 and mean number was 4.5. One household had 26 children, with 4 official wives (the highest number).

Tenants constituted 50% (247), of the sample while 48% (237), were owner-occupied households. The remaining 2% (9) of the respondents reportedly staying in institutional or other tenancy category.

Seventeen percent (84), of the respondents had never attended formal (school) education compared to 37% (182), who had attended primary education. Another 34% (168), had attained secondary education and those that studied beyond secondary level were 12% (59).

The proportion of households of respondents living in single roomed premises was 40% (197). Households who shared building premises with others constituted 43% (212), of the sample.

The average number of persons per household in the sample was 6.7 people. The majority of the households (27% n=133) had 5-6 people.

Seventy five percent 75% (370), of the tenants reported that their landlords resided in Busia town.

3.2 Latrine use in Busia

While the results of the household survey indicated that 95% (468) of the households that participated in the survey used pit latrines, focus group discussion estimated the same percentage at 68%. Out of the 95%, only 1% (7) of the sample households reported using a flush toilet connected to a septic tank. Table 1 below gives the different excreta disposal types used in the town.

Table 1: Percentage of households using the different excreta disposal systems

Type	Percent of Households
Private Pit Latrine	89.0 (416)
Bush	4.1 (19)
Public Latrine	5.9 (28)
Plastic bag/bucket	0.0 (00)
Flush toilet, (water closets)	1.0 (5)
TOTAL	100.0 (468)

Of the 89% (416) households that used private pit latrines, 63% (262) households shared the latrine with other households. Only 37% (154) had pit latrines exclusively used by their household members. On average, 4 households shared a latrine.

A total of about 83% (217) of shared latrines were reported to have lockable doors as compared to 26% (40) among the households that never shared latrine with other household members.

3.2.1 Factors that influence latrine use in Busia

Community awareness of health risks and advantages of latrine use

The study looked at whether people were aware about health risks of not using; and the advantages of using latrine. Focus group discussions revealed that in general people were able to correctly describe the relationship between using latrine and health advantages (FGD, women, LCs, landlords).

The study also tried to assess whether inadequate hygiene education on health risks and advantages of using latrine was factor in latrine utilisation. The FGD with LCs, women's groups, landlords, masons, revealed that while people were knowledgeable on what constitutes proper hygienic measures, there was no corresponding proper practice observed. The same people reported resorting to the bush and kavera.

Landlord restrictions

The study found out that households who shared the premises with the landlord, were more likely to have a latrine and utilise it provided it was not lockable. A total of 83% (217) of the shared latrines had lockable doors. Those staying with landlords were more likely to be made to defecate at restricted times of the day. In few cases, however, where several households shared a latrine, each household or a group of households has a separate key.

The survey found out that denied access to the latrine (being locked by landlord), especially in Marachi area, of town, where closely built up areas, denied privacy in the bush, led to suppressing of both defecation and urination by women until nightfall (FGD Marachi women). Furthermore the latrines in the neighbourhood which remained open were reported misused (FGD, landlords).

It was found out that the households with lockable pit latrines were more likely to use the bush (4.1%) than those that were not. This finding may need to be investigated and verified further.

Cultural barriers

The study found out that children faeces were not considered to be associated with any health risks. During focus group discussions with women, it was found out that children's faeces were cleaned up from the household compound and thrown at the garbage heap. Observation tour of five garbage heaps confirmed the presence of least human faeces on these heaps. The household observation revealed that some domestic animals, chicken and dogs also *helped to clean up* the place where children defecated.

While it was observed during the study, that like most immigrants, people of the same ethnicity tended to cluster and live in their own communities, the inspection tour in the town did not detect any correlation between latrine use and ethnicity or cultures of various groups. This finding need further investigation and verification.

Other categories of people reported not using latrines

During the study, it was found out that the following categories of people were reported to use bush at night. They included, street children, shoppers who move goods across the border at night and drunk adult people especially at night. The street children, (although the number is not known), do not have money to pay and use public latrines. These children are homeless and whatever money they "*earn*" is used to meet their basic survival needs. The traders movement at night are difficult to handle since the nature of transactions are illegal.

The non- town residents (transit passengers, shopper and market vendors), were reported as using public latrines. A total of four public latrines were in use at the time of this study. An observation visit to these latrines revealed that they were more likely to be found in filthy conditions especially in the mornings and on every two days in a week whenever there was a market in Busia Kenya, but rather tidy during the rest of the week. They were being operated by the Public Health Department on a pay-and-use basis through a full-day attendant.

3.2.2 Factors that influence latrine construction in Busia

Socio-economic factors

The household survey found out that about 4.1% (20) households reported had no latrine and were using the bush. The FGD (with LCs, PHD staff, women groups, landlords), however, estimated this figure to be about 32%.

Households living in permanent houses 57% (267) were more likely to report having a latrine than those 41% (192) that lived in mud-and-wattle with grass thatch houses.

The focus group discussions conducted during the study, revealed that several factors may have contributed to presence of few built latrines, in Busia town.

Landlords in the town centre (core), reported that emptying was very expensive and that there was no space for new ones. In Marachi for example latrine emptying was only possible through manual labour, due to problems of accessibility to a cesspool emptier truck. On average, this task cost 100,000/- (US\$ 100), a cost equivalent to constructing a new one. Furthermore, these latrines were not designed for emptying. Unless a low-cost, empty-and-reuse latrine technology is identified, tested and developed for such areas, no new latrines are likely to be constructed.

Landlords in rural (fringe) areas, although they had sufficient space for building new latrines, reported insufficient financial resources as a major constraint. The money from tenants was reported being inadequate for one to save part of it for latrine construction. Whether tenants would be willing to pay an increased rent if a latrine was built remains to be answered. STWSP need to investigate this further before implementation gains momentum.

Tenants in both fringe and core areas reported that it was the responsibility of landlords to provide latrines. Tenants have no land tenure rights and cannot be expected to invest their resources (money, time, and materials) in constructing latrines. What appear feasible is an arrangement with landlord and tenants for the latter to contribution towards latrine construction as part of rent fee. The roles of tenants and landlords in latrine construction need to be clarified before implementing STWSP.

Institutional latrines at government offices and government staff quarters. The study found out that 2% (10) of the respondents were staying in institutional or other tenancy category. In these institutions (mainly police, customs and other government officials, schools), their respective ministries/foundations were responsible for providing latrines. An observation visit to these institutions revealed that all except one primary school had some form of latrine. The major constraint in constructing new pit latrine reported by the headmaster of this school included, inadequate space for a new one, lack of money for either emptying the old one or paying for a piece of land for building a new one.

Physical environment

Unfavourable soil conditions. Due to presence of hard rock in the North West, and North parishes of Busia town, most pit latrines are dug by "*self employed private sector professional diggers*" at a high cost. The owners paid an amount between 2,000/- and 4,000/- or 6,000/- to 12,000/- per metre (or 2 to 12 US \$ per metre), a comparatively high cost³. This cost was reported by landlords as one of the constraints to providing latrines (FGD landlords, town authorities, PHD staff).

High water table. On average the water table was reported to be found within 8 metres below the surface. In some parts of the town, such as Marachi B and C of South East parish, the water table was even closer to the surface, far less than 8 metres.

The latrine pits were either shallow or within the water table³ (FGD landlords, town authorities, PHD staff).

Pit latrines were more likely to fill up very quickly since some of the pits were shallow. Those within the water table were more likely to contaminate water points, shadoof³ (Inspection report, FGD PHD staff).

For the foreseeable future, the most affordable latrine type is likely to be the on-site facility. More analysis of soil conditions may be required before promoting the on-site latrine technology in Busia.

3.2.3 Enabling environment for household construction and use of latrines in Busia

Limited presence of private sector and NGOs. Furthermore the, study found out that there was no formal private sector and NGO responsible for promoting latrine construction and use in Busia (FGD Town authorities, PHD staff). Most sector projects focused on rural areas and the only recent project in the town was purely an emergency water supply¹⁵ (FGD Town authorities, PHD staff).

Insufficient number of staff. The FGD with the existing staff revealed that they were not only few (2), but also had fairly low levels of communication skills to promote behaviour change. At the time of the survey, the public health workers had hardly undergone some form of refresher training on latrine promotion, communication skills, participatory community work methodologies as this has been provided mainly through projects in rural areas³.

Basic curriculum of sector training institutions. A review of the basic training curriculum in the national school of hygiene, social development revealed that vital community work skills such as facilitating, communicating in communities, for latrine promotion in urban areas were based on traditional didactic methodology. The latter training has proved incapable of initiating the needed behaviour change, especially for excreta disposal. STWSP implementation should strategically strive to advocate for a review of these curricular to cater for not only innovative community development participatory skills but also for low-cost innovative latrines for urban communities.

Civil service reform policy⁴. The PHD staff were also affected by the civil service restructuring and reform. Prior to the reforms the department had a health inspector responsible for environmental health with five health assistants and seven health orderlies (FGD PHD staff). At the time of this survey, the PHD had only two staff members responsible for sanitation promotion. The PHD staff reported being unable to cover the whole town (FGD PHD staff). STWSP implementation should therefore explore possibilities of filling this gap through involving private sector, as part of the latter's capacity building.

Land tenure security. The new Uganda Constitution 1995, provides for individual land ownership including customary ownership. The study found out that this kind of tenureship involved problems of land fragmentation, that increased serious problems for planners and the public health department, in supervising constructions including latrines.

Unplanned settlements were reported to create space problems for siting latrines³ (FGD PHD staff, landlord, and town authorities). It was not uncommon to find an approved plot in the structure plan to fall under several land owners. Although no major solution can be prescribed for the built up plots, advocacy is essential to interest the planning section of Busia town council, to ensure compliance of intending plot developers, to the structure plan.

The Sector Policies. The proposed National Sanitation Policy⁴ while placing rural communities at the focus and provided for integration of sanitation into all health, water and community interventions, was silent on the similar strategy for small urban and rural growth centre communities. In the same way the Uganda Water Statute 1995¹⁶, although providing for sanitation, limited itself to sewerage system and hardly mentioned any low-cost latrines technologies, their operation and maintenance. The 1964 Public Health Act¹⁷ prescribe off-site water borne system and refer to on-site latrines as nuisance and unhygienic. It empowers urban authorities to "...take proceedings at law against any person causing or responsible for continuance of any such nuisance or condition"¹⁷ has since been overtaken by events and remained unable to serve as a regulating tool. These are the main guiding instruments for planning, construction, operation and maintenance of latrines in small urban communities, and yet remain inadequate in as far as the issue is concerned. Until a clear policy on for example latrine types, their construction, operation and maintenance of both household, public and the shared services like emptying on-site or managing the off-site, efforts in this direction will continue to be difficult.

3.3 Operation and maintenance of latrines in Busia town

Household level. The study found out that in Busia, routine maintenance of the latrine at household level was a responsibility of female family members. This included sweeping, general cleaning and disposal of children faeces. In rented premises where the landlord shared the same roof with tenants, this responsibility was usually borne by the landlord. Residential rented premises where the landlord did not share with tenants, and the latrines were shared by several households were more likely to present the worst latrine maintenance problem³. There is therefore need to organise such households to take responsibility for maintaining their latrine.

Public latrines. The operation of public latrines, was based on pay and use system. An operator was appointed by the town authorities to maintain the latrines and was remunerated by collecting a user fee of Uganda Shillings 50/- (US\$ 0.05), per person for every single use of the latrine. Most of these latrines were fairly well maintained except one at the main market which was found full and overflowing. It therefore presented odour and fly nuisances. The STWSP should therefore strive to enable Busia authorities develop a self-financing community O and M of public latrines.

Institutional latrines. Institutional latrines at police quarters and government offices and schools. The responsibility for day to day maintenance range from use of hired porter in case of government offices; use of pupils in case of schools to prisoners in police cells supervised by lower rank officers and or constables, in police quarters.

Pit emptying. The study found out that in Busia town, response to a full on-site latrine varied from place to place. The following measures were reported to be undertaken:

Abandonment of pit and construction of a new latrine. This was reported to be more common especially in rural/fringe parts of Busia, where there was still plenty of land. This method was found difficult to apply in the commercial area (core area), where plots were small and space was precious.

Manual pit emptying (desludging). This was in two forms. Either the squat hole was widened and a container lowered thus scooping out the waste, which would be buried and covered in another pit, or a parallel pit was dug alongside the full one and when an appropriate depth was reached the two pits would be joined thus allowing waste to flow from the latrine into the newly dug pit. The latter was highly dangerous as the soil separating the two pits could collapse without warning thereby burying the digger (FGD masons, landlords, town authorities and PHD staff).

Mechanical desludging using a cesspool emptier from the nearby municipalities of Mbale and Jinja. The cesspool emptier was hired by the town authorities. The system of pit desludging based on cesspool emptier was found to be impractical. In the first place, use of the emptier was expensive and only affordable by very few. Latrine owners were charged a rate of shillings 15,000/= per trip (FGD landlords, PHD staff³). On average it required four trips to empty a latrine. There were some cases where the sludge was very hard and required softening with water. These facilities were not originally designed for cesspool emptying and the use of water (at high pressure), in the pit sometimes softened the pit sides leading to sinking and collapse of the superstructure. In the second place, some of the pit latrines were "landlocked" so to say and completely inaccessible to the cesspool emptier truck.

Use of chemicals. These were imported from Kenya and employed by some residents to reduce the volumes of the latrine sludge. The chemical composition was neither known nor the nature of their action on the sludge⁶. The PHD staff were of the view that the chemicals catalyses or speed up the biological decomposition. What was fairly clear however, was the collapse, in some instances, of latrines following the "*corrosion*" of the pit sides. This method was widely applied along the four main roads of the town. Further investigation of this chemical regarding its potential role and risks are required as a matter of agency, to advise the desperate residents in Busia.

STWSP is likely to provide piped water supply, as one of the feasible options. This is likely to reinforce improvement of human excreta disposal. Piped water supply with household connections will probably see a rise in construction of off-site latrine options. While this will replace on-site latrine in some households, and therefore improve the situation, an investment will be required by STWSP to building capacity for management of shared off-site system.

3.4 Latrine technology options for Busia

Table 2 Proposed HED technologies for Busia

Technology	Acceptance	Fringe/centre	Ground water level	Affordable investment cost	Operation and maintenance cost	Ease of construction available resources		Water requirement for O & M	Hygiene	Utilisation of decomposed excreta
						Mason skills	Materials			
Pit latrine + sanplat (traditional)	yes	yes, fringe no, in high density centre	stable permeable soil > 1 metre deep	low	low	easy with existing mason skills	possible with local materials	none	moderate	never tried before
VIP Latrine	as in traditional latrine	as in traditional pit latrine	stable permeable soil	Low	low	additional training of existing masons skills	possible with both local and external materials	none	good	never tried before
Pour-flash to soakaway system	yes	not in high density parts of Busia	permeable soil, water table > 1 metre deep	high	low	requires special trained builder	requires external materials	water source nearby	good	difficult
Septic tanks	yes	suitable for fringe and low density parts	permeable soil. water table > 1 metre deep	high	high	requires skilled builder	requires external materials	water piped to toilet	excellent	difficult
Sewerage system	yes	suitable for centre	preferably stable soil no rock	very high	high	requires engineer	requires lots of external materials	water piped to toilet	excellent	difficult
Composting latrines	likely to be accepted	suitable for fringe	can be sited in high water table areas	high	low	requires trained builder	require both internal and external materials	none	good	excellent

Adopted from: Feachem R and Cairncross S (1978) Small Excreta Disposal Systems:27 and Feachem R and Cairncross S (1996) Environmental Health Engineering in The Tropics:An

Table above represent a partial analysis of possible latrine technology options for Busia. The analysis was based on literature review and views of a few STWSP team members working in Busia.

Traditional (simple) pit latrine is the most common form of on-site latrine technology in Busia. It is the most cheapest and most basic form of latrine available to households. In Busia it is easy to construct with available resources (mason skills, materials, household money), require no water for O and M and provides moderate hygiene conditions to users.

The latrine however, contravenes the existing urban public health regulations and is therefore best suited to rural areas where there is plenty of land for constructing new ones. It is not suitable for soil conditions that are either rocky or with high water table, unless additional resources are invested in digging up the pit, like use of mechanical means to dig up the pit. In case of high water table soil, it is likely to pollute underground water. In Busia, they are already posing a danger of polluting shadoof drinking water wells³. Water pollution can be reduced by raising the pit overground like in some parts of Katwe, Kampala in Uganda. Improvement with sanplat, reduces opportunity for fly breeding, and unpleasant smells.

The main advantages of pit latrine are that they are easy and cheap to construct. In rural parts of Busia town, they may be the most feasible option, especially if improved with a sanplat. Use of sanplat makes latrine safe for very small children to use. STWSP team should therefore, consider promoting them in this part of Busia as a temporary arrangement since on-site latrines contravenes the current 1964 urban public health regulations¹⁷.

Ventilated improved pit (VIP), latrine, is an improved pit latrine, that reduces smells, flies, and is easy to clean. This may involve upgrading of existing traditional pit or constructing a new one. They however cost a little bit more to build and require more maintenance than simple pit latrine. They are relatively more pleasant to use than traditional pit latrines, due to less smell and are more hygienic.

The VIPs, like the traditional latrines, require more space for both re-building and to be sited at a safe distance from the dwelling places. Unless additional resources are invested to use mechanical means in case of rocky soils, or raise the pits in high water tables, they remain inappropriate to some parts Busia. Like traditional latrines, VIPs, are likely to pollute ground water, since water table in some parts of Busia are very high, (less than 8 metres)³. The other disadvantages for Busia town, include the necessity of keeping the inside of the shelter semi-dark, which may further discourage use of the latrine by children and the maintenance required to ensure that the vent pipe remains in good working order. Furthermore, a durable fly screen for the vent pipe is difficult to obtain.

The VIP can be further improved by Reed's odourless earth closet (ROEC),^{18, 19} an off-set pit from the floor of the latrine which is connected to it by a chute. The ROEC has greater capacity and needs replacing less often than the VIP, but the chute may foul easily with excreta allowing fly breeding to occur. Like other pit latrines, if they are not used properly, the risk of disease transmission will not be reduced. The VIP technology can also be tried out in rural parts of Busia.

Pour flush to soakaway system. A review of unpublished reports from Uganda, revealed that although the system is popular in the pilot project in Katwe and other peri-urban parts of Kampala, its use and replicability was constrained by inadequate water supply¹⁹.

While the initial investment cost is high, the O and M cost is low. The costs are relatively lower than sewerage system but still more expensive than simple pit or VIP latrines²⁰. While the locally available mason skills in Busia, can be trained to build the latrine, one disadvantage it has is that of requiring water source nearby. It provides good hygienic conditions to users. The STWSP is likely to increase the quantity of water in Busia, the issue to be addressed is whether it can be acceptable.

They can be improved by constructing double soakpits, one being used at a time. Once the full pit is left for at least 2 years, the excreta can be dug out and damped in an acceptable way²⁰. In Busia, although there may be some cultural barriers to using human excreta in gardens, the system makes it much safer to handle dry, odourless and pathogen free excreta. This option merits further investigation (that including water percolation rates and user acceptability). In the interim period it can be tried out as a temporary measure in the fringe areas of Busia where soils appear to be permeable, and excluding the moslem dominated North East and North parishes of Busia. Moslem community use water for anal cleansing.

The main advantages include. lower water requirement (1-3 litres per flush) as compared to (10-12 litres per flush), for most cistern-flush toilets; complete odour and fly elimination by the shallow water seal; and they can be located, if desired, inside the house, and not necessarily on the ground floor⁹. In case these communities get point water sources, the pour flash can still work here. The STWSP should be prepared to invest additional resources in training users in skills for constructing, operation and maintenance of the latrine.

If the soil conditions are not suitable for disposal, like in some parts of Busia, a pour-flush toilet is still feasible but it should discharge into a small two-compartment septic tank⁹. To reduce costs, the septic tank can be shared by two or so adjacent houses. In such circumstances, " . the first component receives only the pour-flush waste water. After settlement this passes into the second compartment which also directly receives all the sullage" ⁹. This strategy, (although not yet tried out in practice by May, 1996), ensure that the septic tank effluent contains fewer faecal solids. The effluent can then be discharged into a small-bore sewer or covered storm water drain. STWSP should explore possibility of trying out this technology.

Septic tanks. This is essentially a watertight chamber sited below the ground level. It is a settling tank into which both human excreta and flush water from toilets and other household waste water (sullage), are carried down a short sewer. It does not dispose of waste but only helps to separate and digest the solid matter and the effluent overflow into a sealed soakpit.

The main advantages are that it has little need for maintenance and has few problems with odour or flies. With modification of the design, it is possible to use septic tanks at higher population densities, provided the soil is suitable for on-plot disposal.

The advantage in this respect, like in the sewered pour-flush toilet, is that the effluent contains fewer faecal solids⁹ In unsuitable soil for on-plot disposal by drainfield, a small-bore sewerage system to receive the septic tank effluent can considered.

These were found to be already in use and acceptable in Busia, and are suitable in fringe and low population density areas. Although it requires skilled builder, piped water supply, recurrent mechanical emptying, require permeable soils and the investment costs are very high, it has low O and M costs, provides excellent hygienic conditions and has possibility of later connection to sewerage system^{20, 9, 22}. In Busia, septic tanks should be promoted especially for households/landlords who can afford them.

Sewerage system. This is a removal of excreta, flushing water from toilets, and household sullage through piped network to treatment works or disposal point. In Uganda, the system is currently restricted to 9 large municipalities. Although acceptable, it involves very high initial cost and high O and M costs. It requires lots of external resources (materials, engineers), and piped water supply. Although it can provide excellent hygienic conditions and suitable for the centre part of Busia, the sewerage effluent remain with large amounts of germs, therefore require treatment.

In the present plot sizes in the Busia structure plan, this system fits well, since on-site latrines conflict with the current urban public health regulations and hygiene requirements.

Furthermore, this may be an opportunity to solve the household sullage problem which can now be conveyed directly through the system. It provides great user convenience when connected. The town is expanding in terms of sophistication and population and this implies that residents will demand and probably be willing to afford a higher off-site service level. The investments made by both the STWSP and the community are more likely to provide better returns if placed in non- temporary arrangement. Given other vexing problems associated with pit emptying, precious space, collapse of pits, odours and fly nuisances a sewerage system remain the most appropriate.

Although the willingness to pay for water survey revealed that a small proportion, 28% (138), of 493, preferred to have house connections³ this number may be well below threshold volume, and the possibility of having a simplified system, where septic tanks can be constructed to retain the excreta leaving the foul water to flow into the sewers should be looked into. Furthermore, certain modifications to the system do not only offer substantial savings in capital expenditure, but also allow for increased level of community management and maintenance. A substantial investment on part of STWSP will be required, however, for community capacity building for operation, maintenance and management of the sewerage system.

Composting latrines. To encourage the emptying of latrines by households or others they may be designed in such way to allow composting to transform excreta into a form which can safely be used as fertiliser. Kitchen refuse is added to the human excreta in the vaults and these are disposed of and broken down together to produce compost^{20, 9}. Although this type of latrine has never been tried out in Uganda, a review of literature suggest that they are possible in unfavourable soil conditions (rocky, or with high water table), since they are in form of two shallow pits or vaults²⁰ Technically they are possible in Busia.

They are more expensive and difficult to build than other types of pit latrines and need relatively high level of training and evaluation to ensure that they are being properly used. The investment in training increases the cost of the latrine.

According to the WHO 1996²⁰, they are most appropriate in rural areas where culture allows for use of human excreta as fertilizers.

They are being recommended for trial in Busia town despite cultural practices not being conducive for re-use of human excreta, largely because of the following reasons: Once designed properly and appropriate capacity is built within the households and communities, they are likely to partially solve the household refuse problem also. In terms of public health risks point of view, pit emptying which is currently being done in a risky manner, the latter risks will be dramatically reduced since excreta stays for at least two years causing pathogenic germs to die²⁰. The use of sawdust, ash, or similar material added after each use, helps to minimise odours and therefore encourages use. Furthermore, even if the dry pathogen free excreta is not directly used in the gardens as soil conditioner, it will be more acceptable for manual pit emptying and damping. The vaults are partially built above the ground and therefore suitable in high water table and hard rocky soil parts of Busia town.

3.5 Strategies for promoting these options in Busia STWSP

Communal latrines. Considering that communal latrines are relatively cheaper per capita to build than individual household latrines, and space limitations in some parts of the town, communal latrines would be an appropriate strategy. According to available information, however, they have been shown to involve several disadvantages. For example, their success depends upon commitment of individual users to put in place a system for keeping them clean and operating properly. In Busia shared latrines were more likely to be found filthy than those used by single households. Furthermore they may not provide sufficient privacy, may be difficult to use at night or in rainy weather, especially by children, the sick and the old. They also require public land, which in Busia may be difficult to secure considering that the town authorities do not own land. Landlords can be mobilised to provide the land in the same way they are providing it for water.

If the communal latrine option is considered, then communities must be facilitated to develop a system for operation and management. The system should include a provision for well-paid full time attendant to keep the facility in good order, lighting, water supply and regular inspection by the overall management group (water and sanitation committee), must be provided for.

In Busia, considering that one of the STWSP water supply options is likely to be piped water supply, then trial communal latrine pour-flush or low-volume-flush toilet, at the rate of one compartment for every twenty five people served merits trial.

Public latrines. These are required at various public places like the taxi, bus park, customs post and the market. The justification for this arrangement is that there are usually large groups of people in these places. Most of these people have children with them and because they have either travelled for a long distance or are about to do so, and therefore need latrine facilities. Like in the communal latrines, they must be enough to cope with the number of people at these places. The attendant must be present to clean the latrine and to ensure that there is enough soap, cleansing materials and clean water as well as safeguard against vandalism and fouling. It should be pay-and-use to raise money for self-financing.

Institutional latrines. The promotion of latrines at various institutions such as schools, health units, religious and police should be used as an opportunity to involve members in the design and implementation of latrine construction, as well as hygiene education.

CHAPTER 4 DISCUSSION

Pit latrine use. By and large, the most common human excreta disposal in Busia town was a simple pit latrine. A half of the 32% reported using the bush in FGD resided in the South East and part of Central (Nangwe Mugungu B), parishes. Similar studies have reported people to use open space to defecate³¹. The latter parishes are largely overcrowded settlements with virtually no space for pit latrines. The other probable explanation for this discrepancy lies in the fact that respondents in an interview were more likely to give what they consider as the right answer to the question. Furthermore, not all latrines were roofed and a significant number only had walls constructed mud and wattle or sometimes polythene/iron/tin sheets. The roofing materials ranged from grass, matting to iron sheets.

In addition, people generally do not necessarily want to use latrines for health reasons but rather for privacy, convenience and status²⁶.

Latrine sharing. Sharing latrines presented several difficulties. Firstly, the shared latrine were likely to be more filthy than those used exclusively by single households. Secondly, they were more likely to be found locked, and the key taken by the landlord. Landlords attempt to regulate use and slow down over use, due to limited space for building new ones. The households sharing latrine have not sat down and agreed on whose responsibility it is to clean up the latrine. Until they are helped to see the need to set up a system of routine cleaning, latrines will continue un attended to.

Cultural barriers to latrine use, although, common in most rural parts of Uganda, were observed mainly in disposal of children faeces. The FGD with women, PHD staff and LCs, revealed that most people considered the faeces harmless. The children in Busia spend most of day time with caretakers who in most cases are children themselves, and sometimes grand mothers. The cultural barriers relating to in-laws were overcome by using the neighbour's facility. The squat holes of these latrines are fairly wide, and parents fear that their children risk falling into the latrines. Unless the a latrine that offers confidence to parents is promoted (say using sanplat with a small squat hole), children are not likely, at least in the foreseeable future, to be trained to use latrines.

The study did not detect a major correlation between latrine use and ethnicity or cultures of various groups. It seems there was more correlation with poverty and income levels of individuals and households than cultural barriers. Studies in the Tororo rural areas documented cultural barriers relating to in-laws, 37% had to use the bush, 33% host's latrine and 27% neighbours latrine⁴. More investigation on how cultural barriers influence use of latrine, may be needed to enable STWSP implement a successful latrine promotion programme.

Other non- users of latrines. Although it was difficult to estimate the magnitude of other non- users of latrine (street children, drunkards and late evening/night shoppers), nevertheless, their act involves public health risks. It was not uncommon to find adult faeces sometimes along the main roads and foot paths, especially in the morning. The street children, (although the number is not known), were reported as being unable to pay and use public latrines. They were not likely to use private latrines since the latter was either locked inside an enclosure or feared to considered trespassers.

The magnitude of this problem merits further investigations by Busia STWSP. The short term measure may be to negotiate for their exemption at the pay-and-use public latrines. The adults will be approached within the general public. Specific messages will be designed to address the issue.

Public latrines were found to be in filthy conditions especially in the mornings and on every two days in a week whenever there was a market across the boarder in Kenya. The likely explanation is that they were more likely to be over used late in the evening by extra people from surrounding villages (the shoppers), and they had no lighting system at the time of this survey. Operation through the private sector appear to be the most feasible long term solution. STWSP should explore the potential of the private sector alternative.

Latrine construction. Several factors appear to have influence on latrine construction in Busia. All of these factors pointed fingers to inappropriate latrine technology, low household/landlord commitment to ensure provision of the facility; inadequate resources and unclear guidance to the community. A review of literature suggested more or less similar constraints to latrine construction^{26, 27, 28,29, 30}. Therefore low-cost, empty-and-reuse latrine technology need to be identified, tested and developed for Busia. The STWSP team in Busia should consider investing some resources in developing a sustainable a self-propelling community based operation and maintenance system for HED.

The STWSP should advocate for private sector capacity building, through contracting out some activities. This will enable them to learn skills as they earn financial resources. As a long term measure, district level planners should endeavour to include in their development programme small urban communities. These communities are equally vulnerable.

In conclusion, the literature analysis on the approaches for community participation in planning and management of HED revealed a number of innovative approaches worth trying out with modifications. Furthermore the problem of human excreta disposal in Busia, deserves careful and concerted efforts. More reviews/research is being recommended to clarify practical problems as STWSP proceed to full scale implementation.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study identified several constraints to latrine construction and use that included: **physical** (high water table, hard rocky soils); **institutional** (low private sector involvement in provision, O and M of public latrines, unclear roles of landlords and tenants regarding provision, O and M; and promotion of latrines on purely health grounds); **structural** constraints related to small size plot for on-site latrines, which contravene the currently used urban public health act 1964 - which provides for only off-site systems¹⁷.

Latrine promotion therefore has been weak and little attention has been paid to ideas and perceptions of users in planning and implementation and yet this is a *sine quanon* for long term construction, use O and M of latrines. There is a need to create demand to sell the idea that latrines are desirable assets. Communities must be involved in decision making of any improvement intervention, to ensure that latrines meet their needs and preferences. In order for the latter to happen, actions must be caused on the following recommendations below.

5.2 Recommendations

5.2.1 Small Towns Water Sanitation Project (DWD/ACE/JVA)

Determine role of culture in latrine promotion. Increased dialogue with key people in the community to determine whether cultural barriers play a role in latrine construction and use. The findings should be used to design a realistic strategy to market latrines.

Analyse chemicals used in latrines. Investigate further how the chemical used in latrines with hope to reduce sullage volumes, acts, its potential role if any and the risks involved in using it. Advise appropriately

Develop a viable O and M strategy. The cost of emptying was found to be equivalent to that of building a new one. Create demand for latrine construction, use, O and M. Market latrines through all feasible means that include *social marketing* based on print and electronic media. Examine prospects of establishing pit emptying and damping system based on low-cost manually operated portable sludge pump which allows access to the highly congested areas of Busia. The transport system can be based on "oxen-pulled-carts".

Identify and initiate dialogue with other non- users (street children, late night shoppers and drunk adults) of latrines.

Open dialogue with institutions and facilitate them to develop a system for O and M, with possibility of contracting these services out to the private sector.

Try out new latrine technologies such as double-vault composting, VIPs, pour flush and at least one desiccating latrine.

Public latrines. The current operation and maintenance system should be critically reviewed and possibilities of involving private sector explored.

The role of STWSP should be to strengthen the capacity of the sector through on job-training in management skills, offering them paid pieces of work to enable them raise the initial capital requirements.

Formation of landlords/tenants associations, as a fora to promote latrine construction, use, O and M in Busia town. Train them in hygiene promotion.

Form and train associations, users groups and committees and private sector in their roles including financial management, skills for system operation, maintenance and repair.

Clarify roles of households and landlords in as far as latrine construction, use, operation and maintenance are concerned.

Empower women and children too. They play a leading role in household latrine use, O and M. Until they are involved in planning, construction, success in latrine promotion will remain marginal. Involve them in hygiene education.

Strengthen school education. School systems should be involved in promotion and showing examples to the rest of community around them.

5.2.2 Policy makers

Ministry of Natural Resources (DWD), Ministry of Health (EHD) and Ministry of Gender and Community Development (DCD) and Ministry of Local Government, (Directorate of Urban Planning, DoUP)

Policy and legislation formulation for community managed small towns water and sanitation improvements.

Increase resource allocation to the sector especially for community capacity building (skills, knowledge, motivation and confidence) for O and M of latrines and hygiene education.

Review and update the 1964 Urban Public Health Act and incorporate new developments and innovative approaches.

Revise and operationalise the 1992 Sanitation guidelines to reflect technologies for on-site, different soil conditions, O and M of both urban and rural communities.

Review curricular of sector related national training institutions (school of hygiene, institute of social development, water engineering in universities). The training and qualifications of sector related practitioners need to be upgraded; the range of topics in which they are trained need to be expanded to include skills in planning, community participation, hygiene education, monitoring and evaluation and principles and features of better programmes. Sector related institutions in Uganda will be enabled to play an increasing and effective role in reinforcing the information transfer mechanism, technology trials, research into low-cost technologies and community management systems.

CHAPTER 6. PLAN OF ACTION

6.1 General objective

To enable communities and households in Busia develop a sustainable, *self-propelling*, community and household operation and maintenance system of HED facilities and services.

6.2 Specific objectives

To mobilise communities and households to participate in planning, implementation, O and M, monitoring and evaluation of HED improvements.

To strengthen the capacity for service delivery level workers to be able to support communities and households to plan, construct, manage and maintain HED improvements in Busia.

To mobilise the Busia town authorities to plan, budget and disburse resources for interventions to improve HED operation and management.

To advocate for review and updating of relevant national policies regulations and sector training curricular to increase the potential contribution of the enabling environment.

Table 3. Plan of action for implementing the thesis findings and recommendations

Objective	Activities	Outputs	Indicators	Responsible officer	Target group	Time frame
Establish consensus on problems of HED in Busia	Present and discuss thesis findings, conclusions and recommendations	Latrine promotion strategy developed by STWSP team Consultant group-ACE/JVA	Successful meeting with a plan of action for tasks requiring higher level decisions	Author of thesis, Resident Manager, Busia STWSP	ACE/JVA and Phase 2A town teams	Within first half of July 1997
To initiate dialogue with client DWD/EHD and lobby for policy development	Prepare and present position paper to RTWSP Management	Consensus on HED promotion issues reached	Successful discussions and decisions made and follow-up plan of action dev't	STWSP Project Manager and Administrator	DWD/EHD RTWSP team	By end of July 1997
To initiate dialogue on key questions relating to latrines constr. and use	Community level meetings with various categories of people	Plan of action dev't. to address the core issues	Nos. of meetings held and follow up actions developed and implemented	STWSP Busia team	Busia community	On-going up to end of September 1997
To raise answers to unanswered issues in the thesis	Organise team prepare and conduct surveys	Consensus on vital issues established	Nos. of issues answered successfully	Busia team	Community Town authorities, STWSP Management	By January 1998
To motivate households/community to build and use latrines	Meeting to give feed back on key findings Develop a plan of action for latrine improvement	Households and communities mobilised for construction and use of latrines	Increased individual awareness of importance of latrine construction and use	STWSP Busia team, PHD town authorities and LCs	General public at LC1 level and landlords	On-going from August 1997

Objective	Activities	Outputs	Indicators	Responsible officer	Target group	Time frame
To increase community participation in latrine promotion	Form WUAs, WSCs LUGs, and train them in various skills	Community structures to plan, implement, O & M shared services established	Increased demand for information on latrine Number of functioning WUAs, WSCs, LUGs	Busia STWSP Team and PHD	WUAs, LUGs, WSCs	On- going from August 1997
To deve'p. promotion materials of latrine construction, use, O & M	Develop, pretest, distribute and use	Hygiene promotion strategy Developed/reviewed	Increased demand for latrine construction	Busia team plus LCs, NGOs and private sector	general public School system women and children	On-going from August 1997
To follow up on policy issues	Meeting - internal/client/WB	Draft policies, guidelines and legal instr dev't	Presence of draft policy papers and follow up plan of action	STWSP/JVA/ACE team	RTWSP/DWD/EHD	By end of September 1997
To increase number of operating latrines	Select and train masons in new technology	Implementation, O and M of latrines	New household with latrines	Busia team	landlords and households LCs	On- going from August 1997

7. APPENDICES

7.1 Questionnaire, focus group discussion schedule and observation checklist

7.1.1. Household socio-economic/willingness to pay for water and sanitation improvements in Busia, Uganda, July 1996.

A. GENERAL INFORMATION

A.1. Would you be willing to respond to this interview.

1. Yes 2. No _____

If NO STOP THE INTERVIEW

A.2. Sex of respondent 1 MALE 2. FEMALE _____

A.3. Are you the head of this household.

1. Yes 2. No _____

A.4. If No. to Q.3, who heads this household.

1. MALE 2. FEMALE _____

A.5. What is your age? _____

A.6. Fill in the composition of your household as below (yourself inclusive):

Age group	Number
Below 5 years	
6-18 years	
19 - 65 years	
Over 65 years	
TOTAL	

A.7. What material was used for building your main house?

Wall _____ 1. Mud & Wattle 2. Burnt bricks 3. Blocks 4. Iron sheets

Floor _____ 1. Earth 2. Cement

Roof _____ 1. Grass 2. Iron sheets 3. Tiles

A.8. Is this a rented or own house?

1. Rented 2. Own 3. Other _____

A.9. If rented to Q.8 does the house owner live in Busia?

1. Yes 2. No _____

A.10. If own to Q.8 do you own the land as well?

1. Yes 2. No _____

A.11. If Yes to Q.10 How did you acquire the land? _____

1. Customary
2. Lease from Town Council
3. Bought from Individual
4. Other (specify)

A 12. At what level did you leave school? _____

1. Not at all 2. Primary 3. Secondary
4. Post-Secondary 5. University/College
6. Other (specify) _____

B. SOCIO-ECONOMIC PROFILE

B.1. How many rooms does your family occupy in this building? _____

B.2. Are there any other households living in this building?

1. YES 2. NO

If No GO TO Q.E.4 _____

B.3. How many other households live in this building? _____

B.4 How many income earning people are in your household _____

B.5 What employment does the household head primarily undertake? _____

1. Farmer
2. Boda Boda
3. Trader/retailer
4. Wholesaler
5. Saloon operator
6. Public officer
7. Salesperson/shop attendant
8. Other(Specify)

C. SANITATION

C.1. What is the sanitation type for your household? _____

- (1). Private Pit latrine
- (2). Bush
- (3). Public Latrine
- (4). Plastic Bag/Kavera
- (5). Flush toilet connected to septic tank

If bush/plastic bag go to F.10

- C.2. What is the floor type of your latrine?
1. Cement 2. Earth _____
- C.3. Do you share the latrine/toilet with other households?
1. YES 2. NO _____
- C.4. If yes to F.3 how many are these? _____
- C.5. Does your latrine have a lockable door?
1. YES 2. NO _____
- C.6. How satisfied are you with the pit latrine system you now have?
1. Very satisfied 2. Fair 3. Not satisfied at all. _____
- C.7. Give information about your latrine/septic tank.
Has it ever been emptied? _____
How was this done? _____
How much did it cost? _____
- C.8. Do you plan to improve your latrine?
1. Yes 2. No _____
- C.9. If yes to F.8 what improvement do you plan to make? _____
1. _____
2. _____
3. _____
4. _____
5. _____
- C.10. Does your main house have in-house toilet plans? _____
(1). Yes
(2). No
(3). Not applicable

Appendix 7.1.2. FGD Guide Schedule

Latrine access, use and maintenance

Women groups

What do you see as the main problems relating to latrine accessibility?

What number of households are not using latrines in this town and what are the reasons for this?

Who cleans latrines in this area?

What people do when latrine gets full?

What kinds of anal cleansing materials do people here use?

What are the roles and responsibilities of landlord and tenant in latrine provision, and maintenance?

What are the categories of people who do not use latrines and why?

What do you do with children faeces and why? What kind of cleansing materials do you use after children has defecated?

What do you do with these materials with children faeces?

Who looks after children while parents are away for work?

What are the main reasons why people are not using latrine.

Who locks the latrine? Who keeps the keys? Why ? What are the reasons for locking them?

Where do people go when the available latrine is locked.

Masons

What is involved in digging up pit and constructing the latrines?

How are they contacted?

What kinds of tools do you use ?

How long does it takes to dig up a pit (approximate days)?

Criteria for setting prices/fees and how much do they charge?

What are the main obstacles, why?

What kind of training did you get? Who trained you? What does an individual do when an individual wants to learn?

What kind of training do you still need?

How many they are you in Busia?

What kind of relationship do you have with PHD

Landlords

Problems in latrine construction, use, operation and maintenance?

What is done when latrine gets full?

How and who empty's latrine?

What costs are involved?

Who pays for construction and emptying and how?

Who cleans up latrine when dirty?

Who is responsible for repairs?

What kind of repairs are done and at what cost?

For shared latrines

What are the arrangement for cleaning up the facility
Average number of household who share one latrine?
Why the latrines are sometimes locked at certain times of the day?
Who keeps the key and why?
What do people do when latrines are locked up?

Local Committees (Lcs)

• How many people do not have access to latrines and why?
• What do you see as the main problems of providing pit latrine?
• Who is responsible for providing latrines?
• What do you see as the role of Lcs in latrine promotion?

Public Health Department (PHD), staff

Estimated number of households without latrines
What are the reasons for not having latrines?
Who is responsible for providing the latrine?
Who cleans the public latrines? How are the public latrines managed?
What are the constraints in latrine construction and use, O ad M?
How do people empty full latrines?
Who pays, how much does it cost to empty latrines?
How many PHD are working on WES?

Town authorities

What do you see as number one problem in Busia town?
What other problems do you face as an urban authority?
What they are doing to try to reduce the problems?
About how many households do not have latrines? Why? Where?
Who is responsible for sanitation promotion in the town?
What proportion of the budget was allocated to sanitation activities?
Number of current staff for sanitation promotion?
Major constraints for marketing sanitation in Busia?
What are planned interventions in sanitation sector?
What kind of contribution do you expect from STWSP?

Inspection/observation guide

Households premises

• Presence of latrine, cleanliness (fly proof) and operation status
• Presence of children's faeces in the compound and what is being done and by who.
• Handling of faeces and washing child and self by caretaker.
• Disposal from defecation site to latrine
• Role of domestic animals (chicken, dogs, and pigs).

Garbage heaps

Presence of children and or adult faeces in kavera.

Presence of cleansing materials at these heaps.

Presence of children playing at these heaps and probable risks involved.

Institutional

Presence of latrine

Cleanliness status (proneness to fly infestation).

Shelter status, privacy for female defecation and urination.

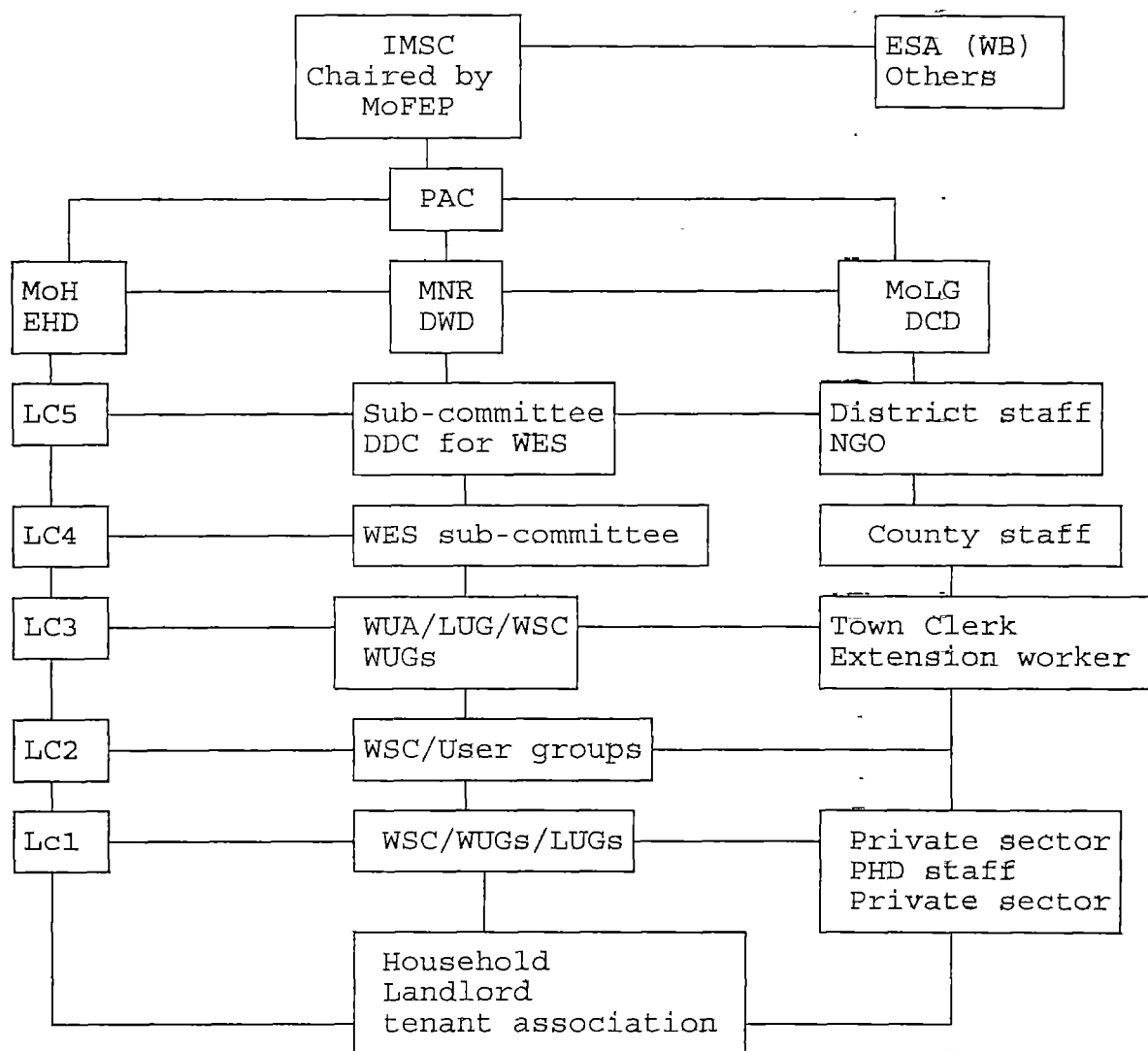
Cleaning process, who cleans and how and what materials are used and where they are kept/disposed of.

Examples of latrine construction, O and M

Pit digging (implements used, who is involved, how and difficulties).

Emptying process (implements used, who is involved, how and difficulties)

Figure 4 Rural Towns Water and Sanitation Programme Management Structure



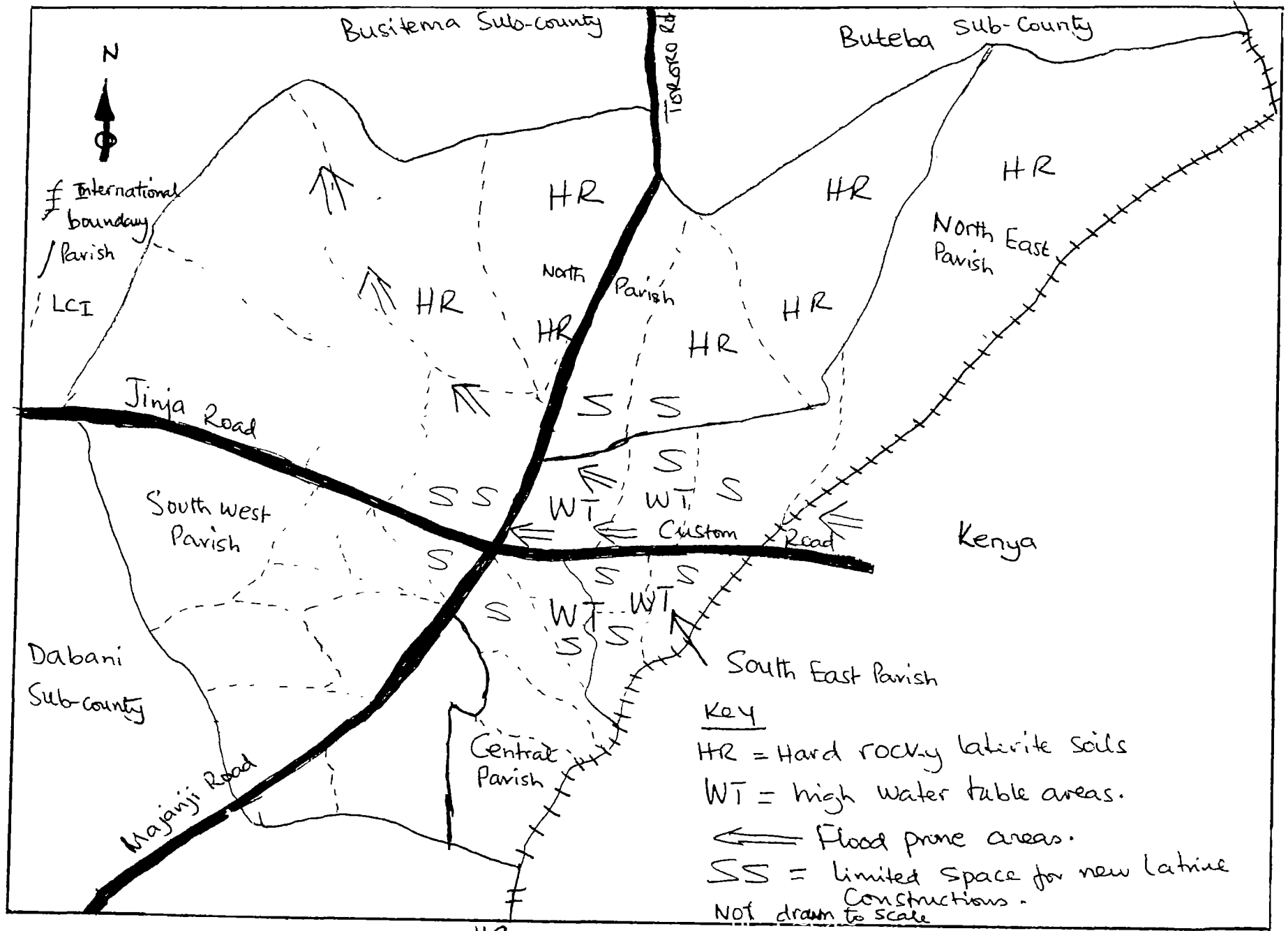
Source: Adapted from RTWSP Plan of Operation, 1996

Key

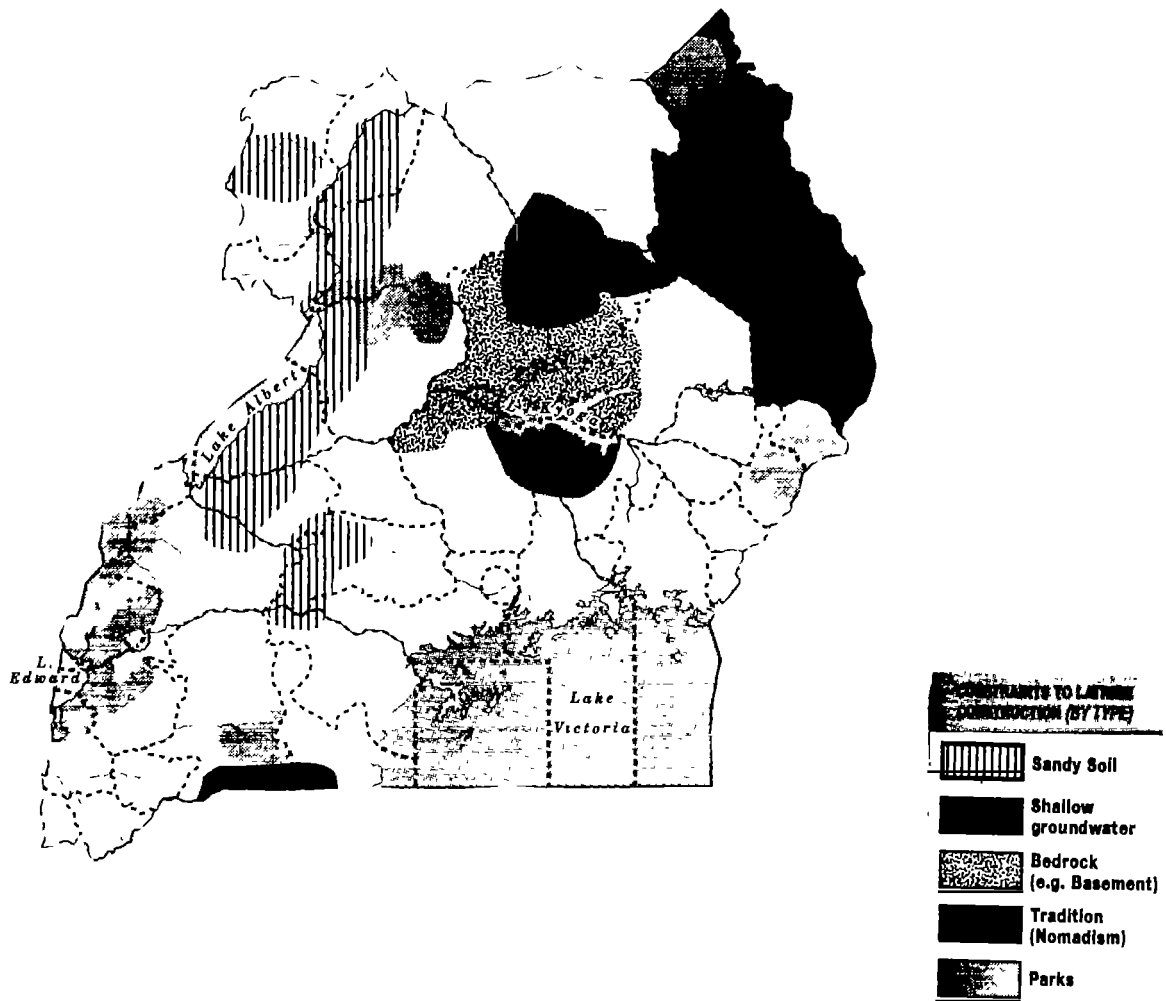
- DDC District development Committee.
- LUG Latrine User's Group
- IMSC Inter-Ministerial Steering Committee
- MoFEP Ministry of Finance and Economic Planning
- MoLG Ministry of Local Government
- MNR Ministry of Natural Resources
- PACE Programme Administrative Committee
- LC Local Council/Committee
- WUG Water Users Group
- WUA Water Users Association
- WSC Water and Sanitation Committee
- DWD Directorate of Water Development
- PHD Public Health Department (Busia)
- DCD Directorate of Community Development
- WES Water and Environmental Sanitation
- EHD Environmental Health Division
- ESA External Support Agency
- WB World Bank

Map 2

Constraints to latrine construction in Busia

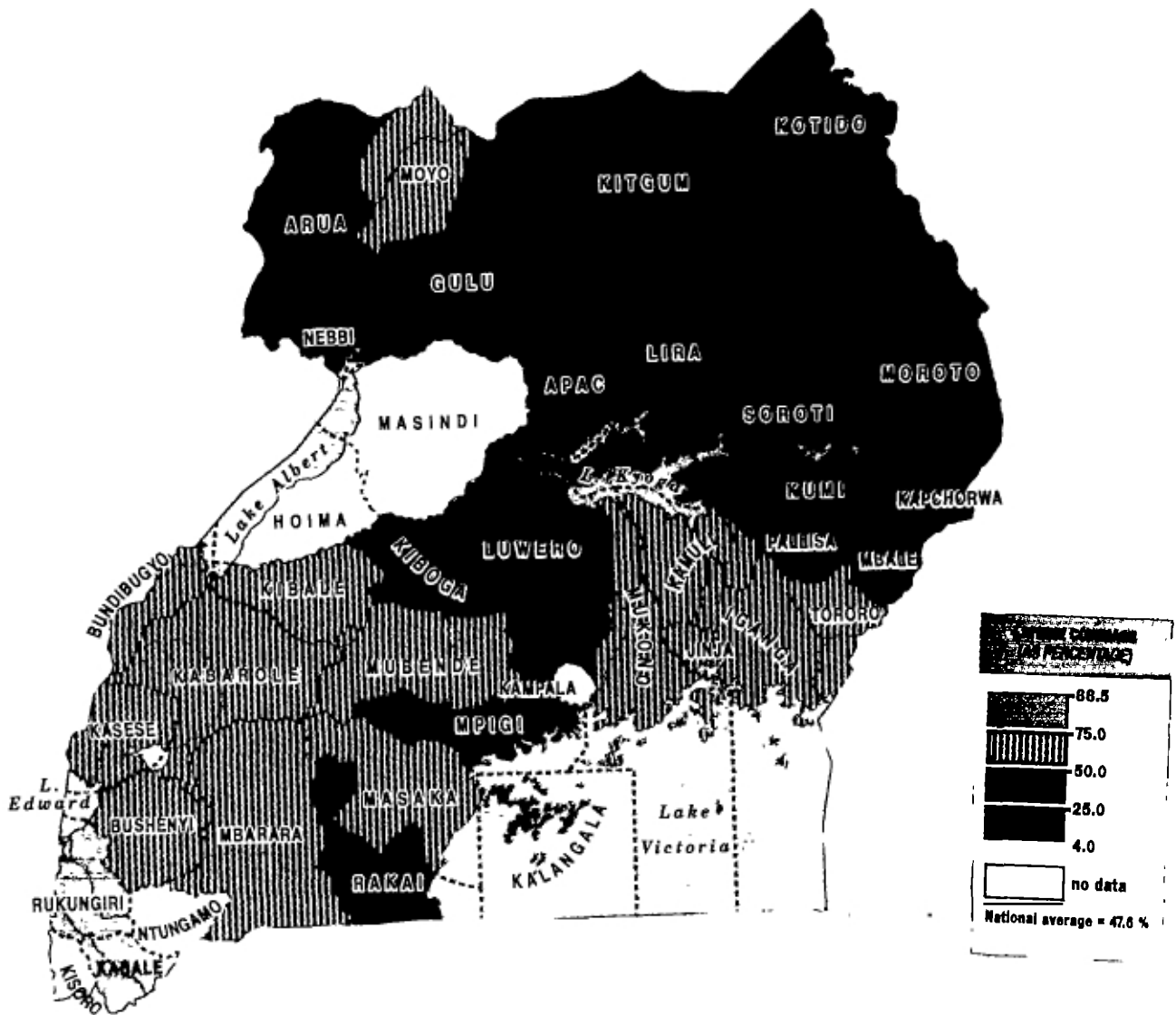


MAP 3 Constraints of latrine construction in Uganda



Source: Government of Uganda and National Council for Children (1994), *Equity and Vulnerability: A Situation Analysis of Women, Adolescents and Children in Uganda*:

Map 4 Latrine coverage in Uganda

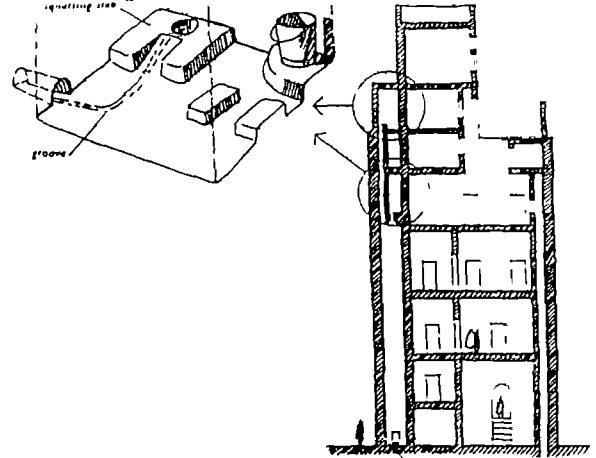


Source. Government of Uganda and National Council for Children (1994), *Equity and Vulnerability: A Situation Analysis of Women, Adolescents and Children in Uganda*.

Figures/photograph showing latrine technological options

Dry Latrines (one chamber desiccating toilet with urine separation)

In Yemen see case study
5 page 20 above



Adapted from: Uno Winblad (1996), *Towards an ecological approach to sanitation, an introductory speech, at International Toilet Symposium, Japan, 9-11 October 1996*

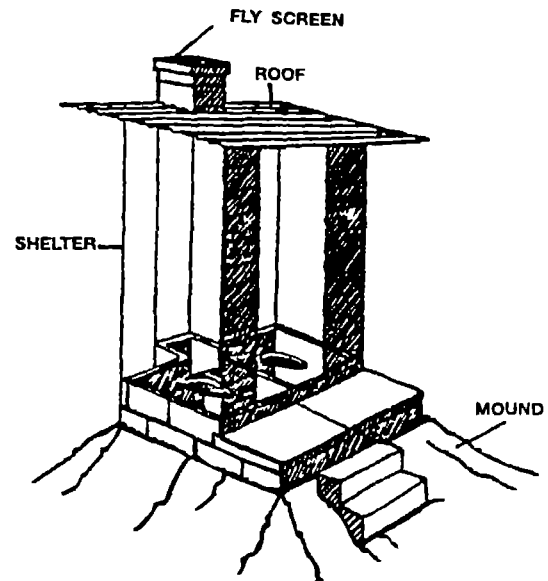
A Simple (traditional) pit latrine

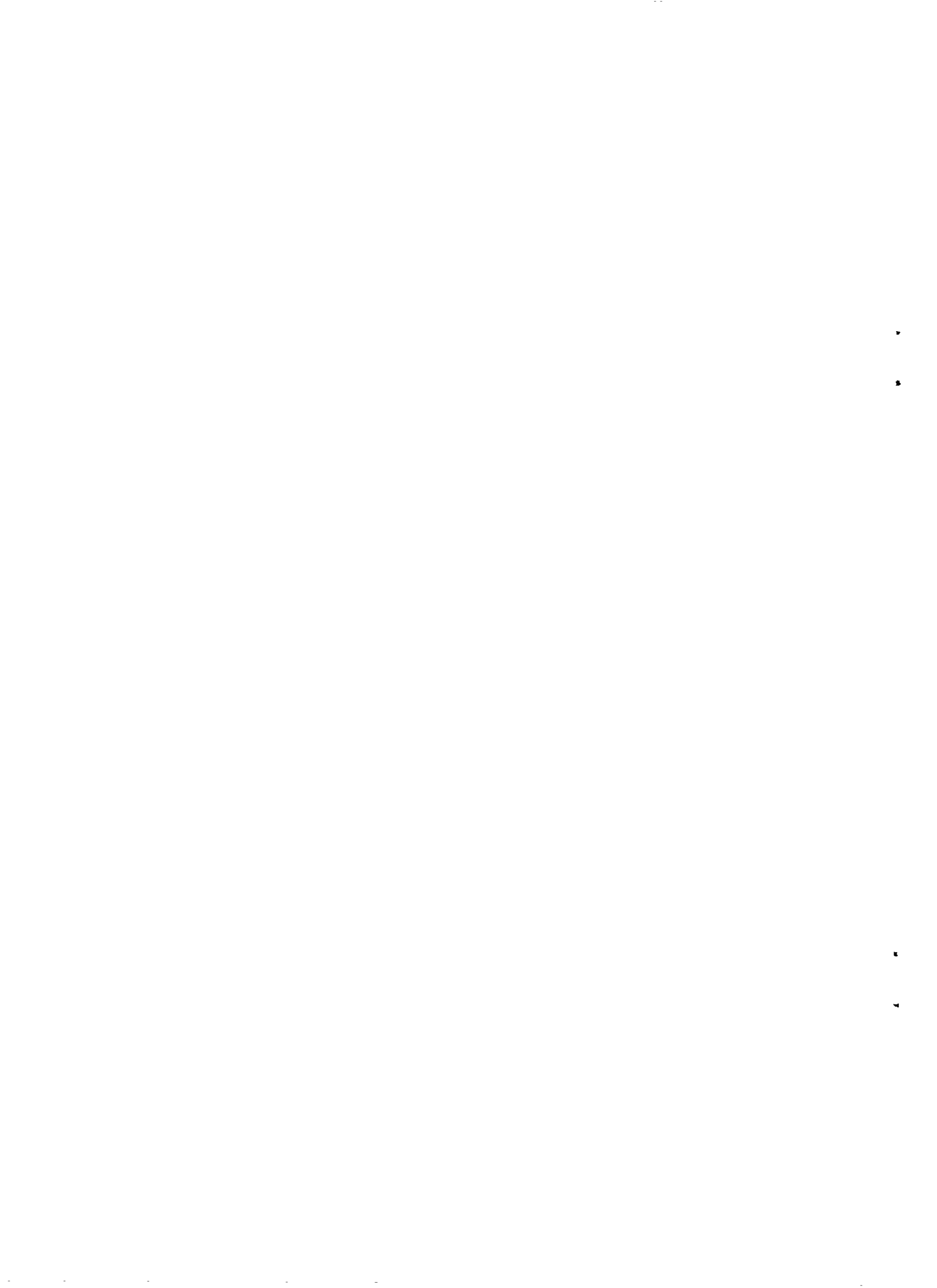
most common in Busia at the time
of the study Photograph taken by the author
of this thesis in one of
the communities in
Busia town - Solo A LC1



A Double Vault Composting latrine

Adapted from World Health Organisation
(1996), *Cholera and other Epidemic,
Diarrhoea Diseases Control
Facts Sheets on Environmental sanitation*





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