REPUBLIC OF GHANA

KOMENDA-EDINA-EGUAFO-ABIREM DISTRICT ASSEMBLY

TOWN ENVIRONMENTAL SANITATION DEVELOPMENT PLAN
- KISSI -

JULY 2007

EXECUTIVE SUMMARY

This report of the Kissi Town Environmental Sanitation Development Plan (TESDP) provides a non-technical summary of the various remedial actions required to improve on observed poor environmental services.

This plan derives much of its information and data, and therefore its focus from the preliminary results of the Environmental Sanitation Assessment and Audit sponsored by the Community Water and Sanitation Agency -Central Region (CWSA-CR) for three towns in three districts of the Central Region – Mankessim (Mfantseman District Assembly, MDA), Kissi (Komenda-Edina-Eguafo-Abirem, K.E.E.A) and Twifo Mampong (Twifo Heman Lower Denkyira, THLDA).

The TESDP closely follows the generic format prepared for use by cities under the first phase of the Urban Environmental Sanitation Project (UESP-I), aspects of the Guidelines for Preparing Waste Management Plans published by the Environmental Protection Agency (EPA) and MLGRDE, and the Operational Manual for Planning, Budgeting, Monitoring and Evaluation, for Water and Environmental Sanitation prepared by the National Development Planning Council (NDPC) and the Community Water and Sanitation Agency (CWSA).

Following basic tenets of strategic planning, this initial TESD planning is a dynamic process and the plan will evolve as experience is gained and the required accompanying institutional structures improve. At the time of preparing this report, The District Works Department (DWD) and the Environmental Health Management Department (EHMD) of the KEEA were not as functional as required by the Local Government Act, 1993 9Act 462).

This plan covers five main components of an integrated scheme for improving (i) storm-water drainage and sullage conveyance, (ii) excreta management, (iii) refuse collection and transport,(iv) wetland management and (v) management support for implementation.

The sub-projects to be considered under the first package of this plan form part of the iterative process of developing TESDP for Kissi. All sub-projects will be implemented by the KEEA through its relevant departments and units- the District Planning Coordinating Unit (DPCU and District Water and Sanitation Team, DWST) as well as the Environmental Health Management Department (EHMD), and District Works Department (DWD) and the Kissi Area Council.

The pilot under Excreta Management and will be facilitated by CWSA-Central Region and the drainage scheme will be facilitated by KEEA with support from the Hydrological Services Department (HSD) with inputs from the Department of Urban Roads (DUR).

The District-Based Water and Sanitation (DBWS) component of the GoG/Danida-Water and Sanitation Sector Support Programme Phase 2 (WSSPSII) will finance the pilot of Excreta Management up to US…as part of CWSA-CR's on-going work.

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1 INTROUCTION

The purpose of this strategic Town Environmental Sanitation Development Plan (TESDP) for Kissi, which covers the period 2007-2015, is to set out a strategy for improving Kissi's environmental conditions by gradually and incrementally reducing the poor environmental burden due to indiscriminate disposal and littering of refuse. The focus and direction of this plan is influenced by the results of the environmental sanitation and audit carried out in Kissi as part of preparatory activities. The TESDP is strategic in nature in the sense that it covers all the key categories of environmental sanitation and identifies the facilities needed to provide comprehensive services under each component; describes the implementation and financing arrangements for each component; and sets priorities for achieving the overall goal of the relevant sector policy, plan and/or programme. To implement this strategy the Komenda-Edina-Eguafo-Abirem District Assembly will (i) establish/strengthen its Environmental Health Management Department (and the District Water and Sanitation Team) to oversee implementation; (ii) systematically improve data gathering for development planning; (iii) promote provision of services by the private sector, where viable; and (iv) secure financing to improve drainage and watershed management, refuse management as well as for a mix of household, and public facilities to serve the town (about **4,000** people out of a total population of **5,715** by the year 2015).

The plan differs from a traditional District Water and Sanitation Plan (DWSP) or a master plan in that it (i) tailors recommended technical options to each type of housing area in the town, (ii) considers user preferences and willingness-to-pay, (iii) uses a planning horizon of 10-15 years, while emphasizing actions that can be taken now, and (iv) breaks the overall plan into project components that can be implemented independently but which together provide the whole range of environmental sanitation services to achieve the overall aim of health improvement. For this very first attempt at preparing a TESDP for Kissi, a planning frame of 2007 – 2015 is employed to be consistent with MDGs.

The intent is to gradually introduce a means of providing integrated interventions and begin to address the issues confronting Ghana's small and medium-large towns that have similar challenges as cities but hitherto do not receive adequate attention. The plan endorses the use of a range of proven technologies which address the needs of all segments of the urban population, recognizing resource constraints, and paying due attention to willingness and capacity of users to pay for improved services.

Box 1.1: **Strategic ESDP Elements**

- Medium term planning horizon 10 – 15 years
- Strategic focus to meet overall goal of policy, plan or programme
- Focuses on integrated development of interventions
- Defines priority interventions over short term for remedial actions and improving on plan requirements e.g. *start-up years'* (1-3 years) projects, studies and institutional restructuring
- Considers all related sectors under environmental sanitation and requires inter-agency collaboration, coordinating unit or department in DA responsible for environmental sanitation

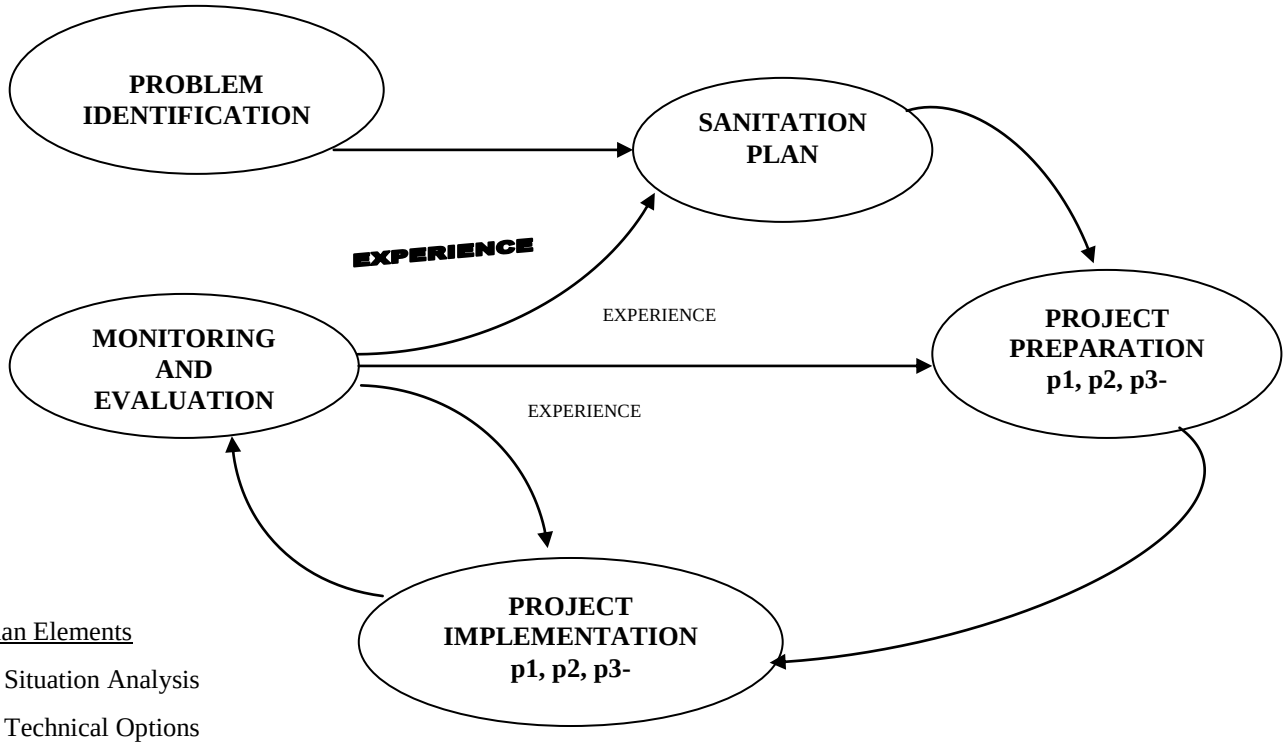
Box 1.2: **DWSP Elements**

- Short-term planning horizon typically 1-3 years, with annual roll-over delivery
- Focuses on single facility (commodity) e.g water and related hygiene and sanitation
- Developed/Facilitated by one sector agency to aid project specific outputs e.g. CWSA
- Project based and often end as plan for distribution of facilities based on demand
- Often Relies on project-type implementation for delivery of outputs e.g. DWST

Box 1.1 & 1.2: Comparison between elements of Strategic ESDP and DWSP

Priorities change with time and strategies will be redefined as experience is gained. Accordingly, the TESDP will be updated regularly with gradually improving data on services and coverage. This iterative process is shown in Figure 1.1.

Figure 1.1 THE STRATEGIC SANITATION PLANNING PROCESS



Plan Elements

- Situation Analysis
- Technical Options
- Financial Options
- Institutional Options
- Implementation Strategy

2 SITUATION ANALYSIS

PROFILE OF KISSI

2.1 Location

Kissi is located 20 km from Cape Coast and is the fourth largest town by population within the Komenda-Edina-Aguafo-Abirem District Assembly with a projected current population of about 5,715.

2.2 Institutions and Services

These include schools, a market, churches, health post, retail shops and mini bars

Table 2.1 Population Projection

Town	Growth Rate (%)	2000	2007	2015
Kissi	2.3	4,874	5,715	6,855

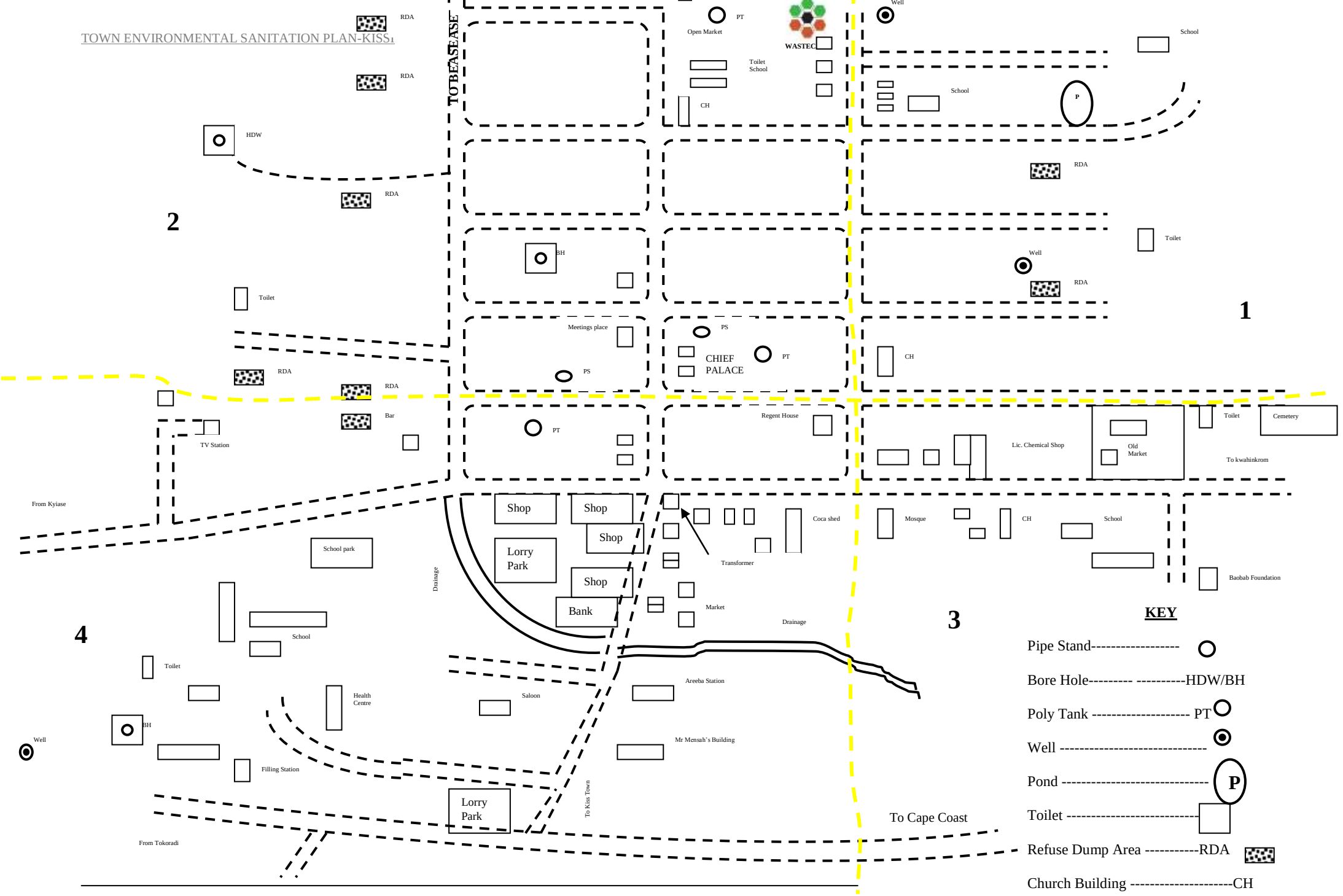
Table 2.2 Housing Characteristics

	Household Characteristics			Water Connections	Sanitation Facilities Total Number (percent of population served)			
Town	No Houses	HH per house	Persons per HH	Percent (7.56%)	WC/ST (0.0%)	Pit Latrine (2.6%)	VIP Latrine (9.4%)	Public Toilet (53.8%)
Kissi	655	6-10	4.0	50	0	17	62	352

HH = household WC/ST = WC/septic tank

Table 2.3 Kissi Community Profile

ENVIRONMENT CATEGORY	DESCRIPTION
WATER SHED MANAGEMENT	• Surface runoff into wetlands • Disposal of distillery waste water into wetlands
WATER SUPPLY	• Pipe borne but tap does not flow (6 Stand pipes) • Water tanker services provided by area council • Unprotected pond used by members of community pigs and ducks
WASTE WATER DISPOSAL	• No treatment prior to disposal • Disposed off through earth drains
LIQUID WASTE DISPOSAL	• 62 unit KVIPs provided in individual premises but schools have no facilities (under construction) • 4 public toilet facilities provided • Public KVIP in deplorable state • Defective chambers
SOLID WASTE DISPOSAL	• Indiscriminate dumping with the aim of reclaiming wetlands • Keeping of pigs at crude dumping sites • Indiscriminate defecation on crude dumps • No communal skips for secondary storage of refuse • No final disposal sites and sanitary sites
STORM WATER DISPOSAL	• Flooding due to dumping of solid Waste in drains • Lack of drains • Chocked culverts • Broken culvert preventing desludging of filled public toilet • Extensive erosion created by storm water runoff
PROMINENT FEATURES	• Poor layout • Akpeteshie distilleries • Erosion of foundation of buildings • Viable market • Final outfall of run off is Dutch-Komenda lagoon or konka lagoon • Old pond (unprotected) has been source of water supply for Kissi all these years. Also used as watering hole for animals (pigs)


TO BE LEASE
RDA
RDA
HDW
RDA
2
Toilet
RDA
RDA
Bar
TV Station
From Kyiase
School park
4
School
Toilet
Health Centre
BH
Well
Filling Station
From Tokoradi
Lorry Park
To Kiss Town
Drainage
Shop
Shop
Shop
Lorry Park
Shop
Bank
Market
Areeba Station
Saloon
Mr Mensah's Building
Drainage
Transformer
Coca shed
3
To Cape Coast
Open Market
PT
WASTEC
Toilet
School
CH
BH
Meetings place
PS
PS
CHIEF PALACE
PT
PT
Regent House
Well
School
P
RDA
Toilet
Well
RDA
1
CH
Lic. Chemical Shop
Old Market
Toilet
Cemetery
To kwahinkrom
Mosque
CH
School
Baobab Foundation
KEY
Pipe Stand----------
Bore Hole--------- ----------HDW/BH
Poly Tank ---------- PT
Well ----------
Pond ---------- P
Toilet ----------
Refuse Dump Area ----------RDA
Church Building ----------CH

3 OVERVIEW OF ENVIRONMENTAL SANITATION

3.1 Stormwater Drainage and Sullage (grey-water) Conveyance

One of the most pressing environmental sanitation problem, according to the chiefs, elders, opinion leaders and residents of Kissi is the need for drainage infrastructure to improve drainage and sullage conveyance around the new market and Lorry park area. Poor drainage leads to perennial flooding and inundation of premises and causes damage to properties and loss of property. The lack of conveyance of sullage and refuse-choked ditches exposes inhabitants to putrefied and foul smelling wastewater every rainy season.

None of the wastes generated in the town is properly collected. As a result wetlands and shallow depressions have been filled with refuse which causes blockage of the path of storm water during rains.

Plate 3.1: Circular culvert heavily silted with solid waste

3.2 Excreta (Faecal liquid waste) Management

From the Environmental Sanitation Assessment and Audit, about 12 percent of residences in Kissi have home latrines. 28.4 percent of inhabitants resort to the bush, 5.8 percent use facilities of their neighbours and 53.8 percent use public toilets.

Public latrines in Kissi are in a deplorable state due to poor maintenance. This situation explains the resorting to defecating in the bush which if not checked will further aggravate the already unhealthy situation.

In addition, schools have no dedicated sanitation facilities. CWSA-CR has sponsored the construction of 2 blocks of KVIP facilities.

Plate 3.2: Extensive erosion which has exposed the foundation of a building

Public Sanitation Facilities: A unique feature of sanitation in Kissi, as in other small towns, is the reliance on public latrines, as some 3,075 people (53.8 percent population) depend on these facilities. The types of public toilet facilities present are aqua privies and KVIP latrines.

School Sanitation: There are 2 public basic schools and 1 private school in Kissi. The lack of facilities does not provide a good platform for teaching hygiene and environmental sanitation awareness to pupils.

Plate 3.3: State of existing public latrine showing collapse of the holding tank

3.3 Watershed Management

The lack of drainage and conveyance facilities and a means of effective management of debris and silt from the undulating terrain of Kissi mean that all surface runoff, sullage and faeces, leachate from nearby refuse dumps all end up finally in the Dutch-Komenda Lagoon.

3.4 Solid Waste Management

Institutional, technical and financial constraints hinder efficient solid waste management in Kissi. Only ….% of solid waste generated per day is collected for disposal at the final disposal site. Uncontrolled dumping in gutters, along drainage channels and along the main wetland traversing the town, and on open community spaces is common. The formal system is based on communal collection using 15m^3 refuse containers. Heaps of sawdust from small scale sawmills is dumped on sites abutting wetlands.

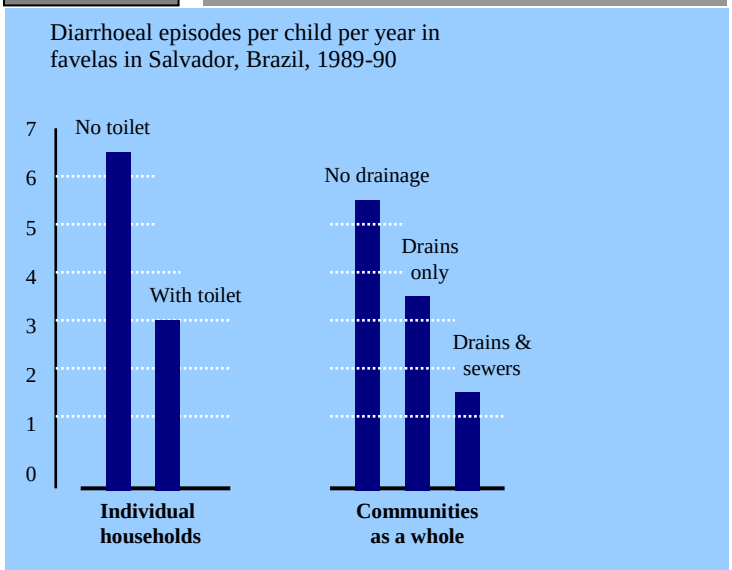
3.5 Water Supply

For the purposes of completeness, the status of water supply situation is described here (as captured by the environmental sanitation audit) to provide the outlook of Kissi town supplies with expected improvement and the consequent wastewater that will be generated.

3.6 Environmental Burdens and Public Health Impact

The indiscriminate littering and disposal of garbage in depressions and wetlands contributes to flooding in low-lying areas of Kissi, while the upper areas experiences erosion. During the rainy season, the main drain through the town floods because of siltation. The above situation contributes to the high prevalence of malaria in the town.

Figure **3.2** **The benefits of sanitation depend on household and community action**



Source: UNDP Human Development Report 2006 (Cairncross and others 2003)

4 SERVICES IMPROVEMENT PROGRAMME

4.1 Minimum Service Standards

The overall service goal is the provision of improved environmental sanitation facilities to serve the whole of Kissi. To reduce the environmental burden and enhance the quality of residents of Kissi, the following policies, guidelines and service standards as well as those to be developed by relevant authorities from time to time, will be adhered to:

Notes on Latrine Technology, October 1999, MLGRD
Environmental Assessment Regulations, LI1652, June 1999, EPA
Manual on Health Promotion, December 2001, MLGRD
Management of Environmental Sanitation Services Guidelines, March 2002, MLGRD
Manual on Prosecution, May 2002, MLGRD
Best Practice Environmental Guidelines Series No.1, Ghana Landfill Guidelines, July 2002, EPA/MLGRD
Best Practice Environmental Guidelines Series No.2, Guidelines for the Management of Health Care and Veterinary Waste in Ghana, July 2002, EPA/MLGRD
Best Practice Environmental Guidelines Series No.3, Manual for the Preparation of District Waste Management Plans in Ghana, July 2002, EPA/MLGRD
Manual on Environmental Health Inspections, October 2002, MLGRD
Management of Public Toilets Guidelines, January 2003, MLGRD
Environmental Sanitation Services Monitoring Guidelines, January 2003, MLGRD
Manual for the Operation of Septage Treatment Plants, May 2003, MLGRD
Operational Manual for Planning, Budgeting, Monitoring and Evaluation, Water and Environmental Sanitation, December 2004, NDPC/CWSA
Guidelines for Small Town Systems, 2005, CWSA

4.2 Drainage and Sullage (grey-water) Conveyance Improvement Scheme

In Kissi, the priority intervention is the expansion of the main culvert on the eastern section of the town and lining of the earth channel behind the main Kissi Market.

From field observations one of the critical factors of the poor drainage situation in Kissi is the lack of maintenance. There is therefore the need to institute a community-level operation and maintenance management services for storm-water drainage. A limited study of possible remedial actions for improving drainage will be carried out.

4.3 Excreta Management (faecal liquid waste) Improvement Programme

The Town Environmental Sanitation Plan is a comprehensive plan for providing improved household sanitation services to the entire Kissi township covering homes, institutions and public facilities

Home Latrine Promotion Programme: house owners in Kissi are already investing in household latrines and the progress already made will be assessed so lessons can be applied. Under this programme, household latrine construction by home-owners will be intensified through marketing by trained latrine artisans. Awareness raising and hygiene education will be supported through the Sub-district Environmental Health Office.

Funds for the training of artisans and the construction of squat slabs will be generated from special sanitation promotion fund to be created by KEEA from DACF and other sources. Other avenues of raising funds such as sanitation surtax on water will be explored. It is essential that the methods used in previous interventions be studied to afford copying for replication.

School Sanitation and Hygiene Education: as part of this programme an assessment of the SHEP programme will be carried out to find out its effectiveness in schools. The SSHE programme is aimed at improving the conditions and reinforcing proper sanitation and hygiene behaviours and attitudes through use of improved facilities. Therefore, immediate intervention will be the provision of improved facilities in selected schools. Based on the assessment of SHEP effectiveness, Teaching and Learning Materials will be provided as part of re-orientation training of SHEP facilitators.

Public and Neighbourhood Facilities Improvement Programme: This programme is aimed rehabilitating existing but dilapidated facilities and instituting efficient management of the facilities. To start, there is the need for the rehabilitation of the existing two 20-Units KVIP toilet located in Kissi. This will be complemented by the establishment of private management franchises, as already practiced, for sustainable operation and maintenance management. An estimated amount of US$45,000 is required for the programme.

4.4 Solid Waste Management Improvement Programme

Currently, secondary storage facilities are not available in Kissi. To prevent indiscriminate littering and the widespread dumping that compounds the poor drainage situation there is need for provision of communal storage facilities.

The immediate intervention is to evacuate refuse from communal dump sites and identify appropriate sites for secondary facilities (communal containers). Site improvement will be carried out at each of these sites including restoration of wetland pits.

There is need for the sitting of a communal disposal facility.

4.5 Improvement of Wetland Management

All the shallow green areas feeding into wetlands within Kissi have been filled with garbage. The effect of implementing the various programmes above will be to improve the ecological property of the wetlands.

4.6 Programme for Institutional and Management Support

The delivery of the various components of the Town Environmental Sanitation Development Plan and their management depends on improving the capacity of the front-line institutions responsible for the services. As a matter of strategy although financing of the various components may come from different sources, each of these sources will contribute to the implementation of a single, comprehensive and integrated capacity development programme anchored around the District Environmental Health Management Department (including DWST) of KEEA and Area Council covering Kissi. The immediate support will be to strengthen and improve the EHMD in KEEA including provision of equipment and refurbishment of offices and the provision of targeted training to its staff.

PROGRAMME PACKAGES UNDER THE KISSI ESDP (2007-2015)

Component 1: Drainage Improvement Scheme

-Phase 1: - Extension of roadside drain network around New Market and Lorry station area
- Provision of drain maintenance equipment
-Phase 2: Construction of drain to improve storm water conveyance from old market area

Component 2: On-site Sanitation Promotion Programme

Home latrines

- User education and establishment of community participation framework to build on existing appreciable levels of home latrine ownership.

School Facilities

Provision of Teaching and Learning Materials (TLMs) for hygiene promotion
Training of School SHEP facilitators

Public Facilities

- Rehabilitation of neighbourhood /public facilities (2 unit 20 Seater KVIP).
- Establishment of private management franchises for operation and maintenance and cost recovery.

Component 3: Solid Waste Management Improvement Programme

- Immediate evacuation of refuse from communal dump sites
- Identify appropriate sites for secondary storage facilities (communal containers) based on housing distribution;
- Provision of communal containers at selected sites;
- Identity and develop final disposal site for Kissi (and neighbouring communities)
- Establish improved collection scheme

Component 4: Improvement of Wetland Management

- Immediate evacuation of refuse from wetlands
- Plant Trees

Component 5: Management Support

Provision of Office equipment to DEHO-KEEA
Technical Assistance - including project(s) preparation
Training

5 INSTITUTIONAL ARRANGEMENTS

5.1 Komenda-Edina-Eguafo-Abirem District Assembly (KEEADA):

In line with National Policy, the KEEA will gradually move away from direct provision of environmental sanitation services, and instead will promote active involvement of both communities and the private sector in their delivery. As part of its functions, the KEEA will refine and periodically update the TESD Plan, mobilise resources to implement it, supervise the design and construction of the facilities, oversee service contracts, and set and enforce regulations on waste discharges.

5.2 District Environmental Health and Management Department

In line with Local Government Act, 1993 (Act 462) and the Environmental Sanitation Policy the KEEADA's Environmental Health and Management Department (EHMD) is responsible for Environmental Protection and Standards Enforcement, Food and Water Hygiene, Environmental Health Promotion, and Waste Management. The Liquid Waste section will manage the programmes for households (home latrine promotion), public facilities (neighborhoods, and commercial areas), and schools. And the solid waste section will manage the programme for solid waste improvement, sullage and drainage infrastructure. The responsibilities of the two section managers include planning, community liaison, monitoring and evaluation, and the supervision of service contracts. The environmental protection section will be responsible for improvement of wetland management while the environmental health promotion section handles hygiene education. The District Planning Coordinating Unit (DPCU) will coordinate and liaise with CWSA, development partners, NGOs other external agencies and facilitate the rolling out of these programmes during the initial period. The District Water and Sanitation Team (DWST) will assist the EHMD with management of the relevant sub-components of the TESDP such as Excreta Management. Ultimately, when a full District Works Department (DWD) is established, as envisaged under Act 462, all works will be managed by the DWD in cooperation with the EHMD.

5.3 Kissi Area/Town Council

The Kissi Area Council (KAC) will be the first-line institution responsible for dealing directly with the community. The functions, as stipulated, in the Establishment Instrument of the KEEA will include:

Validating data and designs; community mobilization; identification of needs and appraisal of applications for assistance; validating type of on-plot sanitation technologies and their suitability; soliciting community views and comments on capital and, O&M costs of facilities; responsible for managing franchises and quality of services by operators under guidance of EHMD; validate completion of projects and programmes; managing participatory monitoring and evaluation of programmes and projects.

5.4 Other Ministries, Departments and Agencies (MDAs)

In order to effectively coordinate the implementation of the various components of Kissi TESDP, there is need for the involvement of several agencies besides KEEA and CWSA-Central Region as initiators of this plan. As indicated under Section 5, the sources of financing for implementing the TESDP make this essential. The mandates and facilitation roles of CWSA-CR, EHSD (MLGRDE), and Department of Feeder Roads, and the central implementation responsibility of KEEA and its departments need to be presented clearly.

6 IMPLEMENTATION PACKAGES

The facilities required to provide immediate interventions are set out in Table 6.1. As the TESDP evolves and more data becomes available the subsequent years interventions shall be defined to cover up to 2015. The facilities under the various components are grouped into financing packages; the first of which would be what CWSA-CR will fund. The estimated cost of each package is also given in Table 6.3.

In summary, the total cost of the first package for the Kissi TESDP is estimated at **US$ 234,145** out of which **34.8%** would be for remedial intervention to improve drainage, **22%** for Excreta (liquid waste management) which includes Home Latrine Promotion (2.2%), neighbourhood and public facilities (19.2%), School Sanitation and Hygiene Education (0.6). Of the remainder **23.5%** will be for the Solid Waste Improvement Programme, **2.6%** for improvement of wetland and **17.1%** is for implementation and management support. It is expected that KEEA will seek financing through its share of DACF and HIPC fund, donor-supported programmes and internally generated funds including household levies.

Table 6.1 Facilities to be provided under the proposed TESDP Financing Packages

Component Description	Total	Package 1	Package 2	Package 3
1. Drainage and Sullage Improvement				
Road/Lane drains (m-length)	1000	300	350	350
Primary and Secondary drains (m-length)	1000	200	300	500
2. Excreta (Liquid Waste) Management				
Home Latrine Promotion				
On-plot sanitation (No.)	400	75	125	200
Artisan Training and Support to Sanitation Marketing (No.)	5	2	2	1
School Sanitation and Hygiene Educ.				
Provision of TLMs for hygiene promotion (No.)	20	10	10	
Training of SHEP Facilitators (No.)	5	2	2	1
Public Facilities Programme				
Neighborhood latrines (No.)				
Replace pan latrines				
Rehabilitate/Construct Aqua-privies		1		
Commercial Area latrines (No.)				
Replace existing facilities				
Construct new facilities	1		1	
3. Improvement of Wetland Management				
Immediate evacuation of refuse from wetlands				
Plant trees (No.)	200	200		
4. Solid Waste Management				
Develop improved collection programme (No. of Houses)	200	75	75	50
Provide Communal Containers (No.)	4	2	2	1
Upgrade Selected sites (No.)	4	2	2	1
Evacuate refuse and Plant trees				

6.1 DA-level Programme Management

While the TESDP is dedicated to Kissi Township there is need for close administration by the KEEADA. For the timely updating and further improvement of the TESDP, the KEEADA shall allocate program management resources to enable its departments bare the extra costs of managing the various components of the plan including hiring of specialist input for carrying out issue-specific studies, appraisals and timely technical and financial auditing. The KEEADA will ensure that institutional strengthening and capacity building is harmonized and comprehensive to allow specific programmes buy into it. An amount of $40,000 is earmarked for the start-up phase (2007) of implementing the TESDP.

Table 6.2 DA-Level Management Support (US '000)

Institutional Strengthening	Total	2007	2008	2009
Project Mgt Support (incl. Consultants)	**25**	10	10	5
Development/Review of TESDP	**30**	5	15	10
Capacity Devp. & Training	**25**	5	10	10
Community Management Framework	**15**	5	5	5
Refurbishment of EHMD and Sub-District Office	**20**	10	5	5
Provision of Office Equipment (EHMD/MTC)	**15**	5	5	5
Total	**130**	**40**	**50**	**40**

Note: Development/review of TESDP include preparation of drainage plan, developing Community Management Framework (for the MTC) & other studies

Specific Studies: as part of the implementation of the first package of the TESDP, a number of issue-specific studies will be carried out. To respond to the immediate needs of Kissi the following studies will be carried out. In addition the status of the various facilities and amenities listed under Annexes A-E will have to be updated regularly by the team responsible for the oversight of the update of the TESDP:

- Artisan Training and Sanitation Marketing Programme
- Community Management Framework and Roles of Kissi Area Council

To ensure proper ownership of the TESDP by KEEA, the Kissi Area Council and traditional authorities, it is essential that the gathering of data and update of the TESDP be done in a participatory manner involving all key stakeholders.

Table 6.3 Costs for Components Studies, Sub-projects, and Institutional Strengthening for Comprehensive Environmental Sanitation Coverage - Year 2015 (US$ 686,165)

Component Description	Total (US$)	Package 1	%	Package 2	Package 3
1. Drainage and Sullage Improvement					
Road/Lane drains around market and lorry park area	92,896	27,689	11.8	32,514	32,514
Primary and Secondary drains	218,579	43,716	18.7	65,574	109,290
Provision of Maintenace Equipment	30,000	10,000	4.3	15,000	5,000
Sub-total	**341,475**	**81,405**	**34.8**	**113,088**	**146,804**
2. Excreta (Liquid Waste) Management					
Home Latrine Promotion					
On-plot sanitation	20,000	3,750	1.6	6,250	10,000
Artisan Training and Support to Sanitation Marketing	3,250	1,300	0.6	1,300	650
School Sanitation and Hygiene Educ.					
Construction of New facilities					
Provision of TLMs	4,000	1,000	0.4	1,500	1,500
Training of SHEP Facilitators	1,250	500	0.2	500	250
Public Facilities Programme					
Neighbourhood latrines					
Replace pan latrines					
Rehabilitate Aqua-privies	45,000	45,000	19.2		
Commercial Area latrines					
Replace existing facilities					
Construct new facilities	25,000			25,000	
Sub-total	**98,500**	**51,550**	**22.0**	**34,550**	**12,400**
3. Solid Waste Management					
Provide Communal Containers	10,000	5,000	2.1	2,500	2,500
Upgrade Selected sites	100,000	50,000	21.4	25,000	25,000
Sub-total	**110,000**	**61,190**	**23.5**	**27,500**	**27,500**
4. Improvement of Wetland Management					
Evacuate refuse and plant trees	6,190	6,190	2.6		
Sub-total	**6,190**	**6,190**	**2.6**		
5. DA-Management Support	130,000	40,000	17.1	50,000	40,000
Sub-total	**130,000**	**40,000**	**17.1**	**50,000**	**40,000**
	686,165	234,145	100	225,138	226,704

6.2 DBWSC Financed Sub-Projects

As part of the District-Based Water and Sanitation (DBWS) Component of the second-phase of Danida Water and Sanitation Sector Programme Support (WSSPSII), the CWSA-Central Region will provide US$ 6,550 of the first stage implementation over a three year period to cover provision of aspects of home latrine promotion including artisan training. Counterpart funds for this include US$ 45,000 from the KEEA.

The DBWSC financed sub-projects will be carried out as part of on-going programmes by CWSA-Central Region and the actual sub-project items will be finalized with KEEA and actual work commenced during 2007. A separate report **"*Summary of Sub-projects and Financing Packages*"** presents the proposed items to be financed. The subprojects and activities related to the Excreta Management Component (home, school and public facilities) will be completed by the KEEA with the assistance of local consultants. CWSA-Central Region will facilitate the implementation process following the national procurement guidelines and CWSA's procedures.

6.3 Human Resources Development

The Environmental Health Management Department (EHMD): The EHMD, Kissi Area Council and private service operators are at the center of the TESDP. Consequently, it is important that the EHSD, Town councilors (including Assembly-members) and private operators (including artisans) are trained to carry out their responsibilities in implementing town-wide programmes.

Through the implementation of first stage sub-projects under Package 1, staff of EHMD, DPCU (and DWST) and private operators will gain experience in all aspects of managing and implementing the proposed TESDP. Key areas of specialization and resource persons for the component(s) will be identified and linked to KEEA staff (EHMD, DPCU and DWST) responsible, so they can obtain ongoing support from local experts. Key areas of specialisation for which the KEEA departments (with EHMD as the focus) are responsible and for which resource persons are needed include:

- Monitoring, evaluating and refining the TESDP.
- Financial management of the EHMD and accounting.
- Management of service/construction contracts.
- Management of the TESDP funds.
- Management and training of on-site construction contractors and inspectors.
- Management and training of service franchise managers for public latrines
- Monitoring wastewater discharges.
- Sanitation marketing and user education.

On-site sanitation construction artisans, contractors and inspectors: Artisans and selected contractors will be given the opportunity to participate in periodic workshops so that they can learn to build all types of household sanitation systems including single and twin-pit VIP latrines, pour flush toilets, septic tank systems, and treatment and disposal units. In addition they will be trained to market their services to individual households, to prepare design sketches and quotations, and to keep appropriate records. Staff of EHMD responsible for administering the funds for delivering of TESDP will be trained to review design proposals and cost estimates, process loan requests and inspect construction of household VIP latrines, public and neighbourhood facilities, and drainage systems.

- Public latrine managers: franchise managers of public and neighbourhood facilities will be trained to operate and maintain the facilities, to collect revenues, and to keep technical and financial records.
- Homeowners and residents: Households will be informed of the technical options, encouraged to upgrade their household facilities, and information provided on use and maintenance of facilities through meetings organized by the KTC and through local radio.
- School children: Selected teachers and health education extension workers will be trained in participatory/interactive training techniques and appropriate training and teaching materials provided. User education will focus on the proper use of latrines, including cleansing materials and hand washing, and procedures for keeping latrines clean. Hygiene education material to be produced will cover environmental cleanliness; excreta, sullage and solid waste disposal; personal hygiene and food hygiene. Special workshops will also be organized through Parent and Teacher Associations to encourage proper use and maintenance of school and household facilities.

6.4 Monitoring and Evaluation

Monitoring and evaluation is an important part of strategic environmental sanitation planning, since it is the means by which the TESDP is refined and updated. In the initial stages monitoring and evaluation will focus on implementation arrangements and quality control, but in the long run it must also include forward looking planning to ensure that the TESDP keeps up with changing circumstances in Kissi and that future financing is arranged well in advance. Monitoring and evaluation is the responsibility of the EHMD supported by the DPCU (and DWST), as each must track progress of the component for which the respective units (including DWD when it becomes established and functional) are responsible, identifying strengths and weaknesses of implementation strategy and modifying the approach as required. KEEA departments will be assisted in this by local consulting firms that specialise in urban environmental sanitation planning, the CWSA-Central Region's MOM unit, and by the EHSD (MLGRDE). The framework for Environmental Sanitation Assessment and Audit will be updated as elements become clearly defined through its routine application. In addition to ongoing involvement by each of these groups, it is important that periodically (e.g. every two years) the TESDP and its focus be appraised to bring emerging international experience to bear on implementation arrangements. The implementation packages of the TESDP need to monitored and evaluated periodically, including the following:

Public latrine programme

- Performance of franchise operators including condition of facilities, sludge levels, rehabilitation/repair work required, general operation and maintenance, record keeping, and feedback from operators and users.
- Performance of septage hauling operations, quantities of sludge collected, dumping practices, and costs of operations including treatment and disposal
- Revenue collection, record keeping, and payments to KTC and KEEADA.
- Periodic estimate of revenue and assessment of the financial viability of the franchise operator's business.
- Performance of twin versus single pit facilities, WC systems and user preferences for each.

Home latrine programme

- Quality of construction of each licensed artisan
- Contracting and construction management.
- Operation and maintenance of facilities.
- Number of persons using the facilities.
- Nuisance problems like flies and odors.
- Marketing and user feedback.
- Cost reducing measures.

School sanitation program

- Quality of construction.
- Operation and maintenance of facilities including condition of facilities, sludge levels, nuisance problems, and repair work required.
- User training and hygiene education.
- Number of pupilsusing the facilities.
- User feedback.

Environmental Health and Management Department

- Management capability and progress of each component.
- Accounting system and financing plan.

ANNEX A: **SANITATION TECHNOLOGY OPTIONS**

Description of Facilities

The strategic sanitation planning process emphasises mix of different types of technologies and levels of service instead of the selection of a single technology for the entire town. In reviewing options for selection, the following range of technologies was considered;
KVIP
WC/Septic Tank
Pour/flush toilet
Aqua privy
Vault chamber
Ecological sanitation options

Ventilated Improved Pit Latrines

A ventilated improved pit (VIP) latrine is a traditional latrine to which a vent pipe covered with a screen has been added to minimize odour and fly problems. In urban areas where available land is limited, an offset, double-pit design, fitted with either a squat plate or seat (KVIP), is recommended. Such a design can easily be retro-fitted into an existing house and is almost maintenance-free. When a pit is full, it is sealed for 18-24 months during which wastes undergo decomposition and pathogens are destroyed. The decomposed pit contents can then be removed manually without health risks and used as a soil conditioner.

The offset pit can be sized according to the number of users and enlarged at a later time if necessary. The usual usage population is 25-30 person or 5-6 households for a single-seater alternating twin-pit KVIP latrine and around 15 persons or 3 households for the ordinary VIP latrine. KVIP latrines are advantageous because no water is required for flushing and all kinds of anal cleansing materials can be used without threat of blockage. In addition, they can accommodate the water needed for anal cleansing if that is preferred. Wherever, a property has sufficient space to allow a detached latrine to be constructed and then moved when filled with solids, a single, deep-pit model will yield major savings as it is one-third the price of a twin-pit latrine.

Septic Tank and Drain Field Systems

Low volume flush toilets (WCs) with septic tanks are a relatively expensive but good option. Wastewater flows from the home by gravity to a septic tank which is usually a double-chambered, watertight, concrete tank where heavier solids settle to the bottom and accumulate as sludge, and grease and lighter particles rise to the surface and form a scum. The clarified effluent then flows to a drain field. Septic tank systems are particularly advantageous as they can accommodate both excreta and sullage. A properly designed system can provide many years of good service, however, the tank will become blocked with solids if it is not cleaned out every 3-4 years and wastewaters will surface if the drainfield is not large enough to accommodate the wastewater flow. It is important that drainfields (either seepage pits or gravel filled trenches) are sized to provide one square meter of infiltration area for every 10 to 25 liters/day of wastewater, depending on the soil permeability. A simple percolation test can be used to determine the proper design factor.

Factors that affect household choice of improved sanitation facilities
In reviewing the mix of technologies to match housing segments, each option is evaluated in terms of relevant technical, financial, social-cultural and institutional factors:

Technical considerations include the type of housing, water supply facilities, geological conditions and operations and maintenance requirements. Where premises connections of water supply is high (more than 85%), in *high housing -density areas* simplified sewerage may be the viable option, as there is insufficient open space for WC/septic tank drainfields, inadequate room on ground floors of buildings for VIP latrines. In the *medium-density indigenous area* household latrines (VIP and pour flush) and WC/septic tanks are viable technologies, sewers are not possible at this time because of low-levels (less than 60%) of households with water in-house supply connections. In the *estate* and *low-density, newly developing area* all technologies are viable (considering water-dependent options).

Financial considerations included construction cost, operations and maintenance cost, and willingness-to-pay. Costs are location specific, and from costs comparisons carried out as part of Willingness to Pay for Improved Sanitation in Kumasi, generally sewer costs are inversely proportional to the population density; on a per capita basis construction costs of simplified sewers have been estimated estimated to be between $25-30 in the high housing-density areas with multi-storey buildings, $35 in the medium-density areas with compound houses, $80-95 in typical Estate-type areas, and $230-250 in the low-density high-cost areas. Thus the capital cost of sewers in the low-density, high-cost area with large plots (50m x 50m) is nearly 10 times the cost of sewers in the high housing-density areas. Comparing all technologies VIP latrines at US$__ per capita tend to be the least cost option (except in high housing density tenement areas e.g Asafo and Asawasi in Kumasi, where simplified sewers at US$__ per capita are least expensive) while septic tanks at US$__ per capita tend to be the most expensive. Based only on technical viability and cost, VIP latrines are the best option in indigenous area, and septic tanks in the estate and newly developing (high-cost) areas.

These conclusions should then be checked against user preference and willingness-to-pay, and to the extent possible various options made available to individual households.

Socio-cultural considerations are based on user preference. The results of the household survey conducted as part of Environmental Sanitation Assessment and Audit showed that the majority of people using WCs, and pit latrines rate them as good or fair in terms of cleanliness, privacy and convenience and are satisfied with them. However, people are not satisfied with the privacy and convenience provided by public latrines. Preference for WCs and KVIPs was evenly divided. Those people that prefer the KVIP usually do so because WCs require water that is expensive and sometimes unreliable, and because WCs might break or clog. In the estate and newly developing areas all houses are currently served by either individual or household WC/septic tank systems. They consider their current system to be satisfactory.

The above are only indicative to aid developing financing cost implications of what will be adopted. All home-owners are free to use the technologies of their preference, provided they meet guidelines for the construction of sanitation facilities issued by the MLGRDE.

ANNEX B: **SCHOOL SANITATION FACILITIES**

List of schools and inventory of existing sanitary facilities in schools

- Name of school
- Facility ID number
- Location (sub-metro area or sector)
- Type of school (primary, junior secondary)
- Cluster (ID number of adjacent schools)
- Number of students
- Type of sanitation facility (WC, aqua-privey, pan latrine)
- Number of cabins
- Condition

ANNEX C: **PUBLIC SANITATION FACILITIES**

List of Public Facilities in Neighborhood

- Facility ID
- Location (sub-metro area or sector)
- Type (WC, aqua-privey, pan latrine)
- Number of cabins
- Average number of users
- Condition

List of Public Facilities in Commercial Areas

- Facility ID
- Location (sub-metro area or sector)
- Type (WC, aqua-privey, pan latrine)
- Number of cabins
- Average number of users
- Condition

Inventory of sites should also cover user analysis and scheduling of implementation of sub-projects under Packages.

- Sample Design of facilities and block layouts.
- Preparation of contract document for franchise operation of the public facilities and program to train franchise operators.