



United Nations Human Settlements Programme



UN-HABITAT

**LAKE VICTORIA REGION WATER AND SANITATION
PROGRAMME**

**APPRAISAL REPORT
BONDO TOWN**

July 2008



Satellite Image of Bondo Town

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1 INTRODUCTION

1.1 General Location

Bondo Town is the district headquarters of Bondo District located about 50 kms north-west of Kisumu in Nyanza Province. Bondo was established as a market centre in the early 1920's and attained municipality status in 1995. Bondo forms a town council with a population of 29,165 of whom 7,797 are classified urban (1999 census). The present population (2008) is estimated to amount to approximately 35,000 persons.

Bondo Town Council has five wards: Ajigo, Bar Kowino East, Bar Kowino West, Bondo Town and Nyawita. All of them are part of Bondo Constituency. It covers approximately 80 km². The town houses the offices of the District Commissioner, other District departmental heads, Municipal, County Council and offices of a few non-governmental organisations. The town is a major business convergence centre for the lakeshore and the fast growing fishing sector, especially on market days when urban visitation is at its peak.

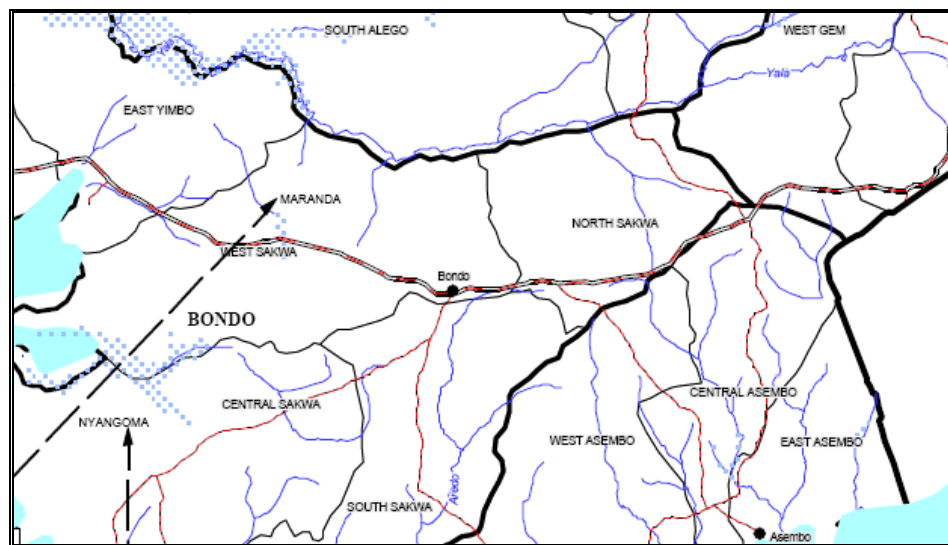


Fig. 1 – Location of Bondo Town

1.2 Infrastructure

Bondo is connected to Kisumu via a 70km newly rehabilitated tarmac that extends to the lake fishing villages at Usenge and beyond. The town is connected to Siaya Town (25km) and Misori fishing beach (33km) to the south by all weather murram roads. It has a good electricity power supply, fixed and two mobile telephone communication networks.

There is an open market in the town, an unpaved bus stage and a slaughterhouse. The town has no physical plan but is seat to several government departments, many of which are now reasonably well established. There is a District Hospital, two

commercial banks¹, three medium sized hotels, a large National Cereals Board grain warehouse and several shops. The central part of the town is a moderately spaced but poorly developed urban centre while the outlying areas are largely unplanned plots on which people have constructed rental low and middle income housing estates occupied mainly by tenants. There are no officially established industries apart from a number of informal sector enterprises, commonly referred to as ‘jua kali’, which include motor vehicle garages and fabricators run by individual entrepreneurs and community groups.

1.3 Socio-Economic Perspectives

The predominant community group in Bondo is the Luo, who occupy most of Nyanza Province and who practice fishing and small-scale farming. Growth of the town has been slow reflecting the development in the surrounding rural areas, which regularly receive funds from local people working away in towns and abroad. Local production has been limited resulting in little trade of locally produced goods in Bondo town.

The town has basic services both in public and limited private sectors and is the main commercial centre in the district. Due to poor water service delivery by the public utility, supply has been inadequate and residents rely largely on water vendors and other unsafe water sources, such as open ponds. It is notable that gender imbalance pervades the population, whereby men own and control the main resources and means of production, whilst cultural attitudes inhibit women’s progress in all sectors of the economy.

1.4 Population and Livelihoods

According to the 1999 population census, Bondo town had a population of 29,202 people, which is estimated to be about 41,000 people at present (2008) and projected to 54,000 people in 2015. Bondo became a district headquarters nearly 15 years ago but growth has been slow since most people trade from their homes. The result has been that the majority of population still live in the rural and peri-urban areas in low to middle income settlements. A considerable proportion of the small and micro-enterprise businesses as well as low income employees live in rented quarters.

Only an estimated 25% (7,200) of the township population of 29,202 were living within the intervention area of Bondo town (which is part of Nyawita), while the rest lived in the rural areas of Nyawita along the road towards Siaya, Bar-Kowino and Ajigo areas. (Table 1) Hence, majority of the people (about 75%) are part of the low and middle income sections of the rural population. The population of the town rises during the day, as people come to the market, hospital, and district administrative headquarters as well as on transit to Kisumu, Nairobi and other areas.

1.5 Institutions in Town

The town is located within an agricultural hinterland. The main activities in the central part of town are limited to business/economic activities, schools, hospitals and other health facilities, institutional offices and other essential social infrastructure. The town houses Bondo District Hospital, and several primary and secondary schools. Several new hotels have come up in town catering for the growing market for business people

¹ Kenya Commercial Bank has for long run a satellite branch of the Siaya Branch, while Equity Bank recently opened a branch (May 2008).
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and for workshops and conferences. Close to town, about 1 km to the west, the Bondo Teacher Training College is situated.

2 WATER SUPPLY

2.1 Institutional Background

The Siaya – Bondo Water Supply Company (SIBO) operates the Bondo water supply scheme, mainly still through the District Water Office. The overall responsibility for the operation is under the Lake Victoria South Water Service Board (LVSWSB), based in Kisumu. The existing water supply draws water from the Yala River about 6 kms north of the town along the Bondo Siaya road.

The responsibility for water resources management falls under the Water Resources Management Authority of the Lake Victoria South Catchment Area, also based in Kisumu.

2.2 Water Supply System in Bondo

Raw water is abstracted by low-lift pumps from the Yala River to the head of the treatment plant and then gravitates through the mixing chamber, sedimentation units, filtration units and onto the clear water tanks. The treated water is pumped through a 6.3 kms 6" uPVC pipeline to an elevated tank situated about 0.5 km north of Bondo Town centre. The outlying consumers in Maranda and Nyamira who are the farthest connected to their water supply are served by pressured system powered by the booster station fed through the old 3" AC pipeline. This is a very inefficient system of pumping, more so because the old AC pipeline is in a very poor condition and leaking at many places.

The existing water supply was constructed in the mid fifties (1956-1957). Since its construction, very little has changed from its original set-up apart from some modifications to the pipe-work and pump sets. In 1984, the Canadian International Development Agency (CIDA) undertook appreciable rehabilitation of some elements of the existing water supply.

The intake and treatment works are located on the Bondo-Siaya road, just upstream of the Bondo-Siaya river bridge. The original intake comprised of an open intake chamber size 0.6m x 0.6m x 2.0 m built at the riverbank. This served as the suction sump connecting the intake chamber to the river were two intake mains G.I pipes 100mm DN each. The existing intake arrangement comprises of twin G-I pipes of 75mm DN and about 20m long. The suction mains are supported on a reinforced concrete pillar before being bent downwards into the river, which was damaged by El Nino in 1997.

Two old circular masonry tanks of capacity 45m³ each provide storage of the clear water. Water gravitates from these tanks through a G.I. pipe 100mm DN to the high lift pumping station from where it is pumped to an overhead backwash water tank and on to the elevated service reservoir near Bondo Town Centre.

The high-lift pumping station comprises of two pumping units;

- *Intake low lift pump*: 1 x 44m³/hr x 20mhw pump, 7.5kW motor (2-year old); there was space for 4 pumps implying that only a third of the raw water capacity was in use;

- *High lift pumps:* 1 x 50m³/hr x 160mhw, 65kW/92.5Amp (new centrifugal pump yet to be connected) and 1 x 40m³/hr x 150mhw, 50kW (efficiency dropped by 25%);
- *Filtration units:* 3 x 25m³/hr filtration units (1 not in use) and 50m³ backwash tank;
- *Clear water tank:* 50m³ clear water tank capacity;
- *Rising mains:* 150mm x 6.5km uPVC and 100mm x 6.5km asbestos cement rising mains from the treatment works at River Yala to the 90m³ raised section steel tank;
- *Water tanks:* 1 x 90m³ raised sectional steel main reservoir storage tank in the town;
- *Gravity main:* 100mm uPVC main distribution line to town.

The pumps run alternately for 24 hours are used to lift water from the treatment-plant to the elevated 90m³ capacity Braithwaite service reservoir at Bondo Town.



Fig. 3 – Bondo Water Supply intake and treatment works at Yala River

The existing rising main has a total length of 4.4 kms of 100 mm DN AC pipes followed by 1.1 km of 100mm DN G.I. pipes.

There are several individual connections direct from this rising main, which reduces the efficiency of pumps, and results in loss of energy and reduces the amount of water getting into the storage tank. Recently, a new 150mm GI pipeline was laid parallel to the existing transmission main.

A Braithwaite Type sectional, steel tank of 90m³ capacity on a 6.5m steel tower is situated about 0.5 km north of Bondo Town. The tank is supposed to serve as the service reservoir of the distribution network for the town; thus regularizing flow of fluctuating demands and maintenance of minimum pressure in the system. However, for quite some time now, the reservoir has been bypassed, because the flow from the rising main is highly inadequate and the water goes now directly into the distribution network. The tank is also supposed to be used for filling a sump at a booster station about 1.4 km westward, which boosts water to the outlying consumers.

The total length of the network, including individual connections, has been estimated to approximately 5 kms of AC/GI/uPVC pipes. Due to the demand for treated water in Nyawita and Maranga, the existing water supply network had to be extended from the town in 1975 to reach those areas. A booster station had to be installed to boost water to consumers in Nyawita and Maranda.

The booster station constructed in 1975 was rehabilitated in 1984 comprises the following:

- Two sumps of 4m³ and 11m³.
- 9 m³/h against a lift of 50m pump with HRW 2A Lister, 26.5 hp diesel engine.
- Grundfoss 16 –stage centrifugal pump rated 9m³/h against a head of 50m with a 13 hp diesel Lister engine.

Water to the booster station flows by gravity through a 50mm DN uPVC pipe from the elevated storage tank in Bondo Town located 1.4 km eastward of the booster station. However, the storage tank hardly gets filled up these days.

2.3 Other Potential Water Sources

The Bondo Teacher Training College has its own independent water supply, drawing water also from the Yala River. No appraisal was made of this system as it seems to function properly.

Numerous attempts have been made to drill for groundwater. Unfortunately, the prospect for groundwater development is very low in this area, as the hydrogeological conditions in this area are very poor, due to the nature of the rocks underlying Bondo Town and its surroundings.

In the southern part of Bondo District a rural water supply was constructed by the Catholic Church more than 20 years ago: the South Sakwa Water Supply Scheme. It has an intake at Olago Beach including treatment works, a rising main to the storage reservoir on top of Serafwongo Hill, from where an extensive distribution network supplies many rural centres in South Sakwa Division. Initially it was intended the scheme would also reach Bondo Town, but this was never implemented.

In the northern part of the District, the North Sakwa Water Supply was constructed and completed about 15 years ago, but never actually commissioned due to irregularities. The scheme is now completely abandoned, has been vandalised and nothing much but a few ruins of the intake works are left at the Yala River.

2.4 Problems with the Water Supply

During the inspection, the following was noted:

- Inadequate raw water pumping capacity;

- Inadequate treated water high lift pumping capacity;
- Dilapidated and leaking composite treatment filters;
- Low levels of revenue arising from flat rate payments;
- The aging pumps are operating on low efficiency resulting in less output;
- Air blowers for the system have not been functional for a long time;
- Lack of working tools and protective gear for the staff at the treatment works; Water quality tests were limited to the jar test and residual chlorine;
- Inadequate revenue to due high levels of unaccounted for water; only 30% of the consumers are meters while all the rest are on flat rate charges (Kshs.250/month);
- Vandalism and illegal connections for livestock water—more pronounced in rural areas;
- Inadequate water storage capacity .
- Water production is not metered;
- Power outages are a serious problem
- Distribution pressures are low.
- Distribution network is very limited; very few public water kiosks;
- Very few metered connections (customers), revenue collection extremely low;
- Old Asbestos-Cement (AC) pipes are a health danger, are leaking and need to be replaced;
- Inadequate laboratory facilities to monitor the treatment process.

2.5 SIBO Water and Sanitation Company

Bondo Water Supply is managed by Siaya and Bondo (SIBO) Water and Sanitation Company (SIBOWASCO)², which has been in operation for the last 13 months. SIBO, which was responsible for managing the water supply system did not have employees but relied completely on the Government personnel under the District Water Officer (for Bondo Water Supply) and those from the Nyang’oma Catholic Mission (for South Sakwa Water Supply).

The average production of the two systems combined was approximately 26,000 m³ per month; this is equivalent to an average daily production of 866 m³/day. However, much of the water produced at the South Sakwa Water Project is used in the rural areas and only a small fraction reaches the town. Overall water coverage is estimated to be below 13% using the ‘low level’ of unaccounted for water that SIBO has reported on Bondo Water Supply. The situation is thought to be worse than this since the real level of unaccounted for water is suspected to be higher.

The water supply was running permanently at a loss as the revenue collected (*circa* Kshs.350,000—Table 3) was only adequate for payment of electricity bills, chemicals, minimal fittings and casual labour. The Government still regularly paid the staff

² SIBO is responsible for nine water schemes: three urban water supplies (Siaya, Bondo and Ukwala) and six rural water schemes (Sidindi Malanga, South Sakwa , Asembo Bay, Mauna Dam, Sega and Ugunja)
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salaries and the bulk of maintenance costs. The Ministry through the Regulatory Board sets and regulates the tariff structure.

In Bondo most of the consumers are billed on a flat rate. Currently there are 360 metered connections with 18% of the meters reported as faulty. The current structure is as follows:

0-10 m ³	Kshs. 20/=
11-30 m ³	Kshs. 25/=
31-50 m ³	Kshs. 30/=
51-100 m ³	Kshs. 45/=
101-300 m ³	Kshs. 75/=
More than 300 m ³	Kshs. 100/=

The cost of a new connection is KSh. 7,000. It is suspected that a fairly high percentage of the consumers have illegal connections; about 55% of the consumers default on payment.

The high level of unaccounted-for-water (UfW) in Bondo town can be attributed to leaking and burst pipes, inadequate coverage of connected consumers with water meters, illegal connections and vandalism. The support the government provides to cater for shortfalls in salary payments and maintenance of the installations perpetuates poor governance in terms of prudent economic management of water service delivery.

2.6 Water Supply in Low Income Areas

The current level of service coverage in the low-income areas for piped water supply is less than 1%, and hopelessly inadequate. The people in informal settlements depend mostly on shallow wells, water pans, and water vendors.

Water collection in the low-income households is the responsibility for women and children (girls). Payment has to be made of KSh 5/- before receiving a 20 litre container, which are commonly plastic jerry cans.

The cost of a new water connection is Kshs. 7,000. About 90% of people in informal areas are served by water vendors. Water treatment by consumers is not a common practice.

3 SEWERAGE AND SANITATION

3.1 Available Sanitation

No sewerage exists in Bondo, the only waterborne sewerage systems in town are found at Government Institutions and hotels in the form of septic tanks. With the exception of the Government Institutions, Bondo relies on on-site sanitation technologies. The overall per capita water supply to the town is only 18 litres per head per day. Until the water supply is augmented, through substantial expansion of either the gazetted scheme, there will be no wastewater disposal problems to be overcome in Bondo.

3.2 On -Site Sanitation

Bondo does not have water borne sewerage. Sanitation in the town is predominantly pit latrines, septic tanks (no exhauster service in the town) and a public toilet constructed near the market. Use of septic tanks is limited to a few well-to-do people, such as, hotel owners, business community who can afford their construction. A number of these types of people have also constructed ventilated improved pit (VIP) latrines.

The majority of the population in Bondo are low-income earners living in rented plots where the main sanitation facilities are pit latrines. A large section of this population has latrines provided by landlords who rarely maintain or replace them in time, mainly due to low levels of rent charged to tenants. Most of these latrines have been constructed with mud walls or using light gauge (GD 30) corrugated galvanised iron sheet walls that rapidly got corroded due to high levels of urea. The latrines are generally unclean squat areas and shallow pits that tend to fill up quickly in large yards, and hence pose a serious health hazards, as many were filled and unsightly. They do not provide the necessary privacy to users, particularly the women. This situation has forced several of the children who spent most of their day in the estates used nearby bushes for their sanitation needs.

3.3 Sanitation in Low-Income Areas

The current level of sanitation service coverage in the low-income areas for access to adequate sanitation facilities is less than 20%. The only mode of sanitation is on-site sanitation in form of pit latrines or relieving in the bush. The latrines are generally located within reasonable distance from the dwellings but are shared in most cases by 2 to 5 households.

3.4 Environmental hazards of poor sanitation

Environmental problems related to poor sanitation and wastewater disposal in the Bondo Town includes blocked drains, groundwater pollution, slaughterhouse waste draining into the stream near the Town.

4 SOLID WASTE AND DRAINAGE

4.1 Solid Waste

Bondo Municipal Council is responsible for management of solid waste in the Bondo Town. However, the majority of households (90%) dispose their household waste by dumping it in the backyard of the compound, dumping it in the street, or burning it in the open. There is a large amount of solid waste accumulation in the settlements and along the roads. Some facilities are available for solid waste collection, but there is only one tractor with trailer for garbage collection, which is clearly inadequate. Recently an abandoned quarry was designated as waste disposal site.



Fig. 2 – Waste disposal near the market in Bondo

Considerable garbage is generated in the market places and shopping areas. However, the amount of garbage produced daily far outstrips the collection and disposal capacity of the town council. Most of the garbage is strewn all over the town and can also be seen in garbage mounds that spring up in undesignated areas. The Town Council uses a standard tractor towing a non-tipping trailer constructed in mild steel, to transport solid waste to a fenced disposal site located. There is a lack of proper organisation and community involvement in the collection of garbage. The failure of proper management of solid waste may be attributed to the following factors:

- Negative attitude of the people at the point of generation of the solid waste;
- Inadequate systems of garbage collection and management;
- Improper and inadequate enforcement of the regulations relating to solid waste;
- Lack of enabling environment and motivation for segregation and recycling of garbage.

The method of dumping at the solid waste disposal site is not controlled. All the garbage is combined, including organic waste, commercial waste such as paper, plastics, polythene, ashes and other types of commercial waste. The site is fenced but lack of drainage results in the collection of run off water from the nearby road, which in turn enhances leaching into the highly permeable lateritic soils.

4.2 Urban Drainage

The municipal council is responsible for management and maintenance of the Bondo Town drains. The town as a whole lacks proper drainage in any direction. Provision of drainage is generally linked to the road network in the town, and is therefore lacking in those areas where official roads have not been constructed. Virtually all drains are earthen and not designed or maintained. Even in areas with constructed road drains, some of these have been buried under soils/silt and solid waste matter (garbage) after long periods of lack of maintenance and uncontrolled surface run-off. This was noted to result in heavy soil erosion leading to the destruction of land surfaces, foot paths and buildings as well as exposure of pipes and other services. Some of the areas are fairly flat, which result in water pools during the rains, and thus becoming breeding areas for mosquitoes and other types of disease vectors.

5 RESULTS OF THE URBAN INEQUITY SURVEY IN BONDO

5.1 Urban Inequity Survey (UIS)

The Monitoring Systems Branch and the Water, Sanitation and Infrastructure Branch, in collaboration with the Central Bureau of Statistics, has completed the implementation of Urban Inequities Survey in 17 secondary urban centres in Kenya (Migori, Kisii, Homa Bay, Siaya, and Bondo), Uganda (Ggaba, Mukono, Bugembe, Masaka, Kyotera, and Mutukula), and Tanzania (Mutukula, Bukoba, Muleba, Geita, Sengerema, Bunda, and Musoma) as part of LVWATSAN. For each urban centre, information is available to monitor Target 10 – water and sanitation, as well as Target 11 – slum upgrading of the Millennium Development Goals (MDG). This information addresses different components of improved sanitation adequate water, such as sufficiency, safety and acceptability, affordability and physical accessibility and integrates comprehensively a gender component. They also address different components of other human settlements issues such as durable housing, overcrowding, security of tenure, sources of energy, social capital, income and expenditure, demographic characteristics, education, migration, employment, environment, livelihoods, child morbidity and mortality, maternal and child health, women empowerment, in short, a comprehensive set of information on a majority of MDG indicators.

Thus, the objective of the Urban Inequity Survey is, to establish a detailed overview of baseline data, expressed as coverage of basic services (water and sanitation), needs in term of access to infrastructure and other related living conditions. This enables the LVWATSAN Programme to closely monitor the impact of the interventions implemented. As a consequence this survey was carried out before any implementation started, and will be repeated at a later date when interventions have been completed.

5.2 Presentation of the UIS Survey, Availability of Results for Bondo

The wealth of information collected has been entered into a database system and is available in table and reporting formats. A comprehensive report is being prepared by the Monitoring Systems Branch of UN-Habitat. Meanwhile it is the intention that these data will be made available for use at Bondo Town Council level for all interested parties. For that purpose a project office will be opened in Bondo and the required facilities installed. This would be combined with an integrated GIS system, which includes Physical Planning tools for the town.

5.3 Health of Children

One of the questions in the household survey provided some very relevant data on health. The question was: “Did your child – below the age of 5 years – have diarrhea in the previous two weeks?” The result showed (see Table 3.1.1 in Annex 2) that the prevalence of diarrhea among young children is very significant, with the highest percentage at the age of 2 years (24.6%) decreasing only at the age of 4 years when it drops below 10%. Evidently this can be related directly to the poor provision of clean water and poor sanitation. (The morbidity of children below the age of 5 in Nyanza Province is one of the highest in the world).

5.4 Orphans

Another very worrying fact coming out of the survey is the very high prevalence of orphanhood in Bondo. In the age group of 5 – 9 years, 21.4% has lost already one or both parents. In the age group 10 – 14 years this figure reaches 31%! These figures were corroborated during this appraisal, when data were obtained on the number of orphans at Bondo's primary schools. These were in most cases more than 20% of all pupils.

5.5 Results of the Water Supply Coverage Survey

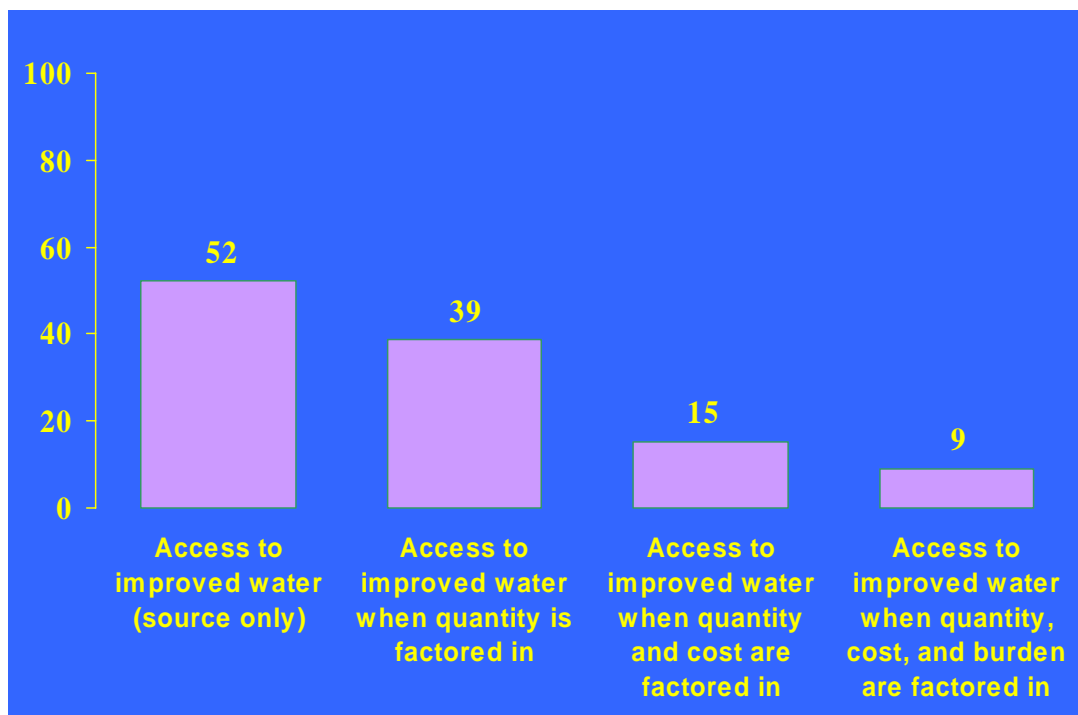
In Annex 2 a comprehensive set of tables is presented giving the amount of coverage with water supply for the residents of Bondo. These arranged per Sublocation, giving a detailed insight in the ways and means people are getting access to domestic water.

Below an interesting graph depicts the situation in Bondo. A household is considered to have access to improved water source if:

1. it has sufficient amount of water for domestic use,
2. at an affordable price,
3. it is available without excessive physical efforts and time.

It can be seen that access to improved water decreases dramatically when quantity, cost, and the burden of collecting water are considered, respectively. When considering only the availability of an improved source the coverage is 52%; when considering the factor whether the quantity is sufficient, this drops to 39%; when the cost is also factored in coverage drops to 15%; finally when all three factors are taken into consideration, quantity, costs and physical effort, the coverage drops to a very low of only 9%.

Water Supply Coverage in Bondo Township



5.6 Results of the Sanitation Survey

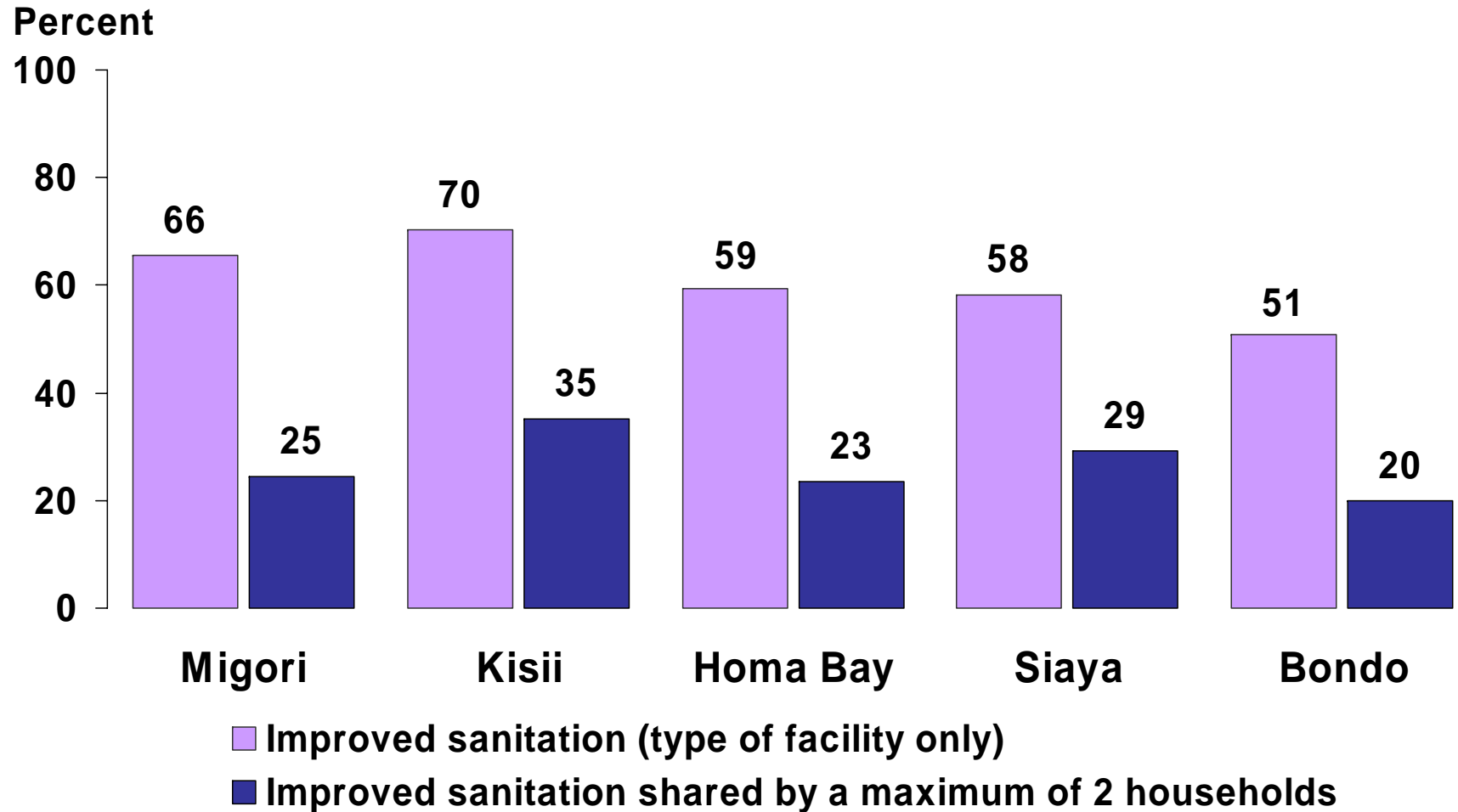
A household is considered to have *access to improved sanitation* if it has:

- An excreta disposal system, either a *private toilet* or a *public toilet* nearby
- Shares adequate sanitation with a reasonable number of people (maximum of two households), being available for all household members

The UIS Survey in Bondo clearly showed (see Annex 2) that access to improved sanitation decreases dramatically when the number of households sharing the facility is considered. This is shown in the graph below for all towns in Kenya covered by LVWATSAN. For Bondo (2006) it drops from 51% to only 20%. Even this last figure is not reflecting the reality that most of the pit latrines cannot be considered to be 'improved sanitation'. Other factors such as the type and quality of the slab covering the pit, presence of VIP vent pipe, quality and permanence of the superstructure, access, degree of privacy, and other factors dictated by local cultural customs, all play an important role.

Distribution of households by type of toilet facility, Kenya 2006					
Type of toilet facility	Migori	Kisii	Homa Bay	Siaya	Bondo
Flush to piped sewer system	1.9	10.3	17.7	4.6	0.6
Flush to septic tank	2.7	6.8	1.1	3.6	0.9
Flush to pit (latrine)	5.6	4.9	1.2	0.2	0.1
Ventilated Improved Pit latrine (VIP)	10.1	6.9	6.2	4.2	7.0
Pit latrine with slab	45.2	41.9	33.0	45.7	42.3
Composting toilet	0.1	-	0.9	0.1	-
Flush to somewhere else	0.1	0.2	0.3	-	-
Flush to unknown place/not sure/DK where	-	0.3	0.3	-	-
Pit latrine without slab/open pit	23.1	27.6	14.3	22.7	19.7
Hanging toilet/hanging latrine	0.8	0.2		0.8	1.3
No facilities or bush or field	10.8	1.2	26.2	18.8	29.1
Other	0.4	0.3	0.3	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0
Number of households	1,499	1,490	1,496	1,455	1,498

Access to improved sanitation decreases dramatically when the number of households sharing the facility is considered, Kenya 2006



6 URBAN PHYSICAL PLANNING

(Below are excerpts from Prof. Jossy Materu's report on Physical Planning in Bondo)

6.1 Earlier attempts at Physical Planning

The District Physical Planner informed the meeting that an exercise to prepare a Physical Development Plan for Bondo was initiated in 2005, but was later suspended for lack of funds to continue the exercise. He then went on to present the Draft Structure Plan that had so far been developed. Scrutiny of the Draft Structure Plan showed that it was flawed on a number of fronts. First, the Plan was not based on a well-articulated Concept for the growth and development of Bunda town. Second, the Plan dealt only with land use matters in isolation of other important matters facing the town such as environmental and socio-economic issues. Third, the plan did not take into account the issue of land ownership in the town. The demarcation of all lands, especially those, which are privately owned, is a precondition for any successful physical planning, exercise in the town.

Discussing key development issues facing the town of Bondo, it emerged that the town has been under privileged in resources allocation by successive governments just like other towns in South Nyanza, which has been the base of Government Opposition in Kenya. The land issue was also singled out as the main impediment for proper development and management of the town. Most of the land is privately owned and compulsory acquisition of land for urban expansion and uses has been strongly fought by land-owners. This suggests the need for immediate review of the land policy and land tenure systems in Kenya especially as it pertains to areas under jurisdiction of urban authorities. HIV/AIDS, income poverty, and lack of jobs for youth were other development challenges mentioned for the town.

6.2 Agreed Way Forward

- 1) All Layout plans and un-approved Sketches which have been used to guide spatial development for the town of Bondo will be scanned at the UN-HABITAT in Nairobi for the purpose of producing hard and soft copies
- 2) UN-HABITAT will avail Bondo town council with a hard copy of the satellite image for Bondo taken in 2005.
- 3) UN-HABITAT will identify a land surveyor who will undertake a demarcation of all lands in the town, and produce a map of all properties and their plot boundaries.
- 4) UN-HABITAT will provide technical assistance in the overlaying of the above maps and plans for the purpose of producing an up-to-date base map of the town showing the existing situation.
- 5) Based on the above, the urban planning exercise will begin with the production of issue and thematic maps, a complete profile of the town covering socio-economic, environmental, ecological, and structural characteristics, organization of a Stakeholder meeting for the town of Bondo to develop a shared future vision for the town, and translation of the shared future vision into a spatial form. This will entail formulation of Conceptual Plans and Final plans for the future of the town.

7 ORPHANS AND OTHER VULNERABLE GROUPS

(The following paragraphs were copied from Anne Malebo mission report, July 2007)

7.1 The Impact of the HIV/AIDS epidemic in Bondo

The AIDS pandemic has been serious far longer in Nyanza than in most parts of the country and Bondo is the most affected district in Nyanza. The high historical prevalence rates in Nyanza are commonly attributed to a mix of factors, including proximity to Uganda, where the AIDS epidemic peaked early relative to Kenya's; the major overland transport route to Uganda, which just bypasses Bondo to the north; the mobility associated with fishing; and the cultural tradition of wife inheritance. In Kenya over 2.2 million people are living with HIV and more than one million children have been orphaned by HIV/AIDS.

HIV/AIDS orphans are one of the most vulnerable groups in the area. They face numerous hardships resulting from poverty, insufficient food, low nutritional standards, poor housing and lack of access to basic services, such as water and sanitation. To compound these problems, they often live on the periphery of the towns where the institutions which cater to their needs, such as schools and health centers have no access to the town infrastructure and therefore lack basic amenities such as water and toilet facilities.

7.2 The Impact of HIV AIDS on Land Rights

With respect to widows

There is a pervasive sense of women's powerlessness in the face of profound gender discrimination. For examples women who are barely able to act in their own interests to prevent threats to their land rights. Even very elementary measures, such as consulting local authorities or educating themselves as to how the land office works, seem beyond their capacity. Widows appear isolated and dependent for information from men whom they do not even trust. Due to their place in society as well as lack of social capital, generally women are unable to address land problems. Many widows whose brothers-in-law, they don't maybe give them enough land especially those with HIV. It is possible that a woman may refuse not to be inherited then the brothers-in-law decide to take the piece of land.

With respect to orphans

In homes where all adults have died and the children are being taken care of by other relatives. Everything that belonged to that family will be taken by whoever is now taking care of the children. In most cases the children are left with the grandparents or with uncles. It is clear that to some extent land grabbing from widows and orphans and possibly from AIDS widows and AIDS orphans in particular it has become an accepted truth to which people subscribe, even in the absence of specific examples from their own experience or observation.

7.3 Existing Facilities in Bondo for Orphans

There are several poorly equipped public and private institutions in Bondo which are struggling to cater to the needs of orphans in terms of providing services and support such as food, clothing, education and health care. However, lack of access to sanitation and water supply poses severe constraints to these institutions and limits

their capacity to provide a habitable and hygienic environment for the orphans and other vulnerable persons, who are so dependent on them for their basic needs. There are several community groups such as women and youth groups

The number of orphans and other vulnerable children has increased in the recent years and it is estimated that there are currently 80,000 OVCs in Bondo District. Majority of these are found in Madiany and Rarieda Divisions of Rarieda Constituency; this situation is attributed to the following factors:

- Increased poverty level among families affected and infected by HIV/Aids
- Increased dependency i.e. increased number of household members due to influx of orphans left by relatives into families.
- Collapse of the traditional system for orphans and other vulnerable children support and care ie there is no longer sharing of orphans among relatives
- The impact of the current and previous high HIV/AIDS prevalence in the district (34% in 2003 and 27.4 in 2006)
- Food insecurity among families affected and infected by HIV/Aids due to poor weather conditions and low soil productivity.
- Poor health and living conditions due to lack of clean water proper sanitation and hygiene.

Following in-depth discussions with the different local leaders in Bondo, and some staff members in orphan centres, schools, and health centres and a guided tour of the area and institutions/facilities, the following needs and possible areas for UN-HABITAT intervention were identified:

1. Provide technical and financial supports to establish maintain and manage rain water harvesting tanks to orphanages, schools and health centres.
2. Provide technical and financial support to establish a micro credit /revolving fund to women groups supporting orphans to replicate the practice at household level

The focus of the project will be on the institutions, comprising mainly schools, health care centres and orphanages which are working to cater to the basic needs of the orphans and other vulnerable persons.

7.4 Recommendations for follow-up actions

- Mobilize support for and establish linkages with on-going programme work.
- Prepare a project proposal and small scale agreement of cooperation with a locally established NGO to support selected orphan institutions in constructing rain water harvesting schemes.



8 TRAINING AND CAPACITY BUILDING

Regarding the training and capacity building component, there has been an extended design process for LVWATSAN throughout the past 12 months, to address the training needs in an effective manner and to ensure that the training and capacity-building interventions are properly anchored in local institutions. In the meantime a ***Fast-track Capacity Building Programme*** for water utilities has been ongoing in four (4) towns: Kisii and Homa Bay in Kenya and Bukoba and Muleba in Tanzania. In Uganda, training will commence shortly. The overall objective of the fast track capacity building programme for utilities is to support the financial and operational sustainability of the capital investments being provided under the LVWATSAN Initiative. The issue of sustainable revenue generation was identified as a priority in this regard. The fast-track capacity-building has also laid the groundwork for a long term programme of capacity building in utility management and other areas. Over 120 staff of the utility companies have been trained and assistance is being provided to the utility companies in improving their operational systems, including billing and revenue collection, water demand management, customer care and mapping.

This same programme will shortly be initiated in Bondo for the SIBO water company.

Encouraging is the fact that the immediate interventions, including the training and capacity building, have already resulted in a significant improvement in the performance of the water utilities in the project towns. For example, unaccounted-for-water has been reduced from an average of 56% of water produced to 42%. Revenues have increased by an average of 65%. As more water has become available, the Utilities are now making efforts to increase the number of water connections. In fact, under their respective performance improvement programmes, an aggressive connection policy has been launched. Over 520 new connections have been made while about 450 previously dormant connections have been re-activated. With an improved financial performance and expanded customer base, three (3) of the participating utilities (in Kisii, Homa Bay and Bukoba) are now approaching 100% cost recovery in operational and maintenance expenditures (they are currently generating revenues amounting to an average of 94% of their operating costs). The objective is to further improve the financial viability of the utilities so that in the next three (3) years, they will be able to access loan financing to meet their further capital development needs. The achievement of cost recovery for operations and maintenance is a major improvement. The impact of interventions so far, has encouraged the stakeholders to fully engage in the long-term design process. The Multi-stakeholder Forums are playing a key role in all aspects of the programme governance.

Capacity building forms the basis of any sustainable developmental project. The strategy to be followed to achieve this goal varies for the different sectors involved in the water and sanitation issues. The requirements were identified as follows:

- Policy makers: Policy formulation, environmental issues, Institutional issues and water quality Management:
- Senior and Middle management: Technical, legal, environmental, financial and administrative areas.
- Technical Staff: Capacity building is required in utility mapping, water quality and supply management and O&M

- Community Development group: awareness creation, participatory approaches to water supply development environmental and sensitisation issues.

The District water office personnel can offer training locally and nationally in human resources, O & M, billing and water sector reforms. Particular lessons learnt from previous programmes in the district would be particularly useful for dissemination. Skills that are lacking which impact on the provision of safe water and sanitation among the technical group include chemical handling, O & M of plants, rehabilitation, water quality and environmental impact assessment. The community group needs strengthening in PR and awareness creation techniques while the Managerial group lacks financial, billing and legal skills.

9 IMPLEMENTATION OF THE INTERVENTIONS

9.1 Implementation strategy

The options proposed have aimed to use low-cost and high impact strategies. The contact holder will be the UN HABITAT. The administration of the contract would be done jointly by UN HABITAT, MOWI (LVSWBS) and the Bondo Town Council as the key implementing partners. The Lake Victoria South Water Service Board would collaborate with the Town Council and other authorities in ensuring sustainability of social and economic.

Three levels of project management will be put in place designed to foster the spirit of joint decision-making: (i) at the board or sub-basin level; (ii) at the town level; and (iii) at the stakeholder or community level. In order to ensure sustainability of investments installed, LVWATSAN will also support a comprehensive capacity building programme cutting across all the interventions.

9.2 Multi-Stakeholders Forum (MSF) or people's parliament

This is the most important project oversight organ in the town. They play a central role in expressing the needs of the town and guiding the decision making process in terms of the priorities of the town. The MSF will consist of:

- Civil leadership within the town
- Business community Chamber of Commerce and Industry
- NGOs active in water and environmental sanitation related activities (those contracted under the programme will not have voting powers in the MSF);
- CBOs active in areas likely to impact on water and sanitation
- Representatives of organised development groups
- Educational and other key institutions

9.3 Project Implementation Unit (PIU) at the town level

A Project Implementation Unit (PIU) will be established ahead of the start of implementation. It will consist of the technical officers of the agencies who will directly be involved in the implementation of the proposed water and environmental sanitation related interventions. The PIU will include at least the following officers:

- The Town Clerk (Chair)
- The SIBO Managing Director (Secretary)
- Chairman of the Multi-Stakeholders Forum (MSF)
- Municipal or Town Engineer
- The LVWATSAN Clerk of Works
- GOK District Environment Officer (DEO)
- District Public Health Officer (DPHO)
- District Physical Planning Officer (DPPO)
- District Environment Officer (NEMA)

9.4 Project Management Unit (PMU) at the board or sub-basin level

The LVSWBS in Kisumu is the statutory institution mandated with the development and management of assets related to water and sewerage services. It will therefore be the principle contracting party for all works related to the project. A Project

Management Unit (PMU) is already established and fully functional in Kisumu in the earlier phase of the programme for the ongoing development in Kisii and Homa Bay towns. This will consist of the following officers among others:

- Chief Executive Officer (CEO) of the LVSWSB (Chair)
- Chief Technical Services Manager (TSM) of LVSWSB (Secretary)
- UN HABITAT/LVWATSAN Chief Technical Advisor (Kenya)
- Water Resources Management Authority Regional Manager
- Town Clerks of the three towns (Kisii, Homa Bay, Bondo)
- Managing Directors of the three companies (SIBO, GWASCO, SNWSC)

9.5 Overall approach to implementation

Project implementation will be divided into immediate and long term interventions. The immediate interventions will aim to restore existing infrastructure to at least the original the design capacity using existing specifications. At this stage, the project will intervene in areas that do not require designs. On the other hand, the long term activities will be based on:

- feasibility studies and designs to be prepared;
- wide consultations with stakeholders; and
- preparation of an updated physical plan of the town.

The works will be broken down into small, yet complete packages as follows:

- water services infrastructure that only requires facilitation by the government offices, to be implemented through tender issued to commercial companies;
- sanitation and sewerage infrastructure requiring only government facilitation, to be implemented through tender issued to commercial companies;
- water and sanitation infrastructure that is linked to community capacity building and wider local level consultations to be facilitated by the MSF, to be implemented through cooperation agreements with non-governmental organisations;
- solid waste management, micro-credit and other activities to be implemented by CBOs facilitated or contracted through cooperation agreements signed with the Town Council and overseen by the MSF.

9.6 MSF and PIU in Bondo

The MSF and PIU for Bondo were constituted on 24 June 2008. The attendance during the elections was very good (43 persons representing various interest groups with a good gender balance). Three thematic groups within the MSF were also formed and chairpersons elected. It is worth noting that in the PIU, the Siaya/Bondo Water Company MD was not elected the Secretary, which was taken by the District Physical Planner. The two committees have started with a lot of enthusiasm and are ready to carry out their roles and responsibilities with regards to the LVWATSAN Programme. Currently they have embarked on working out the priorities for the Cooperation Agreement with UN-Habitat and are reviewing the proposed interventions as set out in this report.

A list with MSF members and participants of the meetings held is given on next page. It shows the participants represent very well the different parts of the Bondo community.

Members and Participants – Multi-Stakeholder Forum Bondo (July 2008)

	Name	Designation	Contact
1	Emmanuel Oyoo Ochola	MSF C/Person	0722 774062
2	Peter Otieno Ajwang	Secretary MSF (Youth Repr)	0724 146496
3	Catherine Mwau	Treasurer MSF	0723 262993
4	Valleria Kowitti	Gender MSF - NEPHAB	0726 241146
5	Omondi Markoyath	Capacity Building MSF	0729 230791
6	Dominick O. Misolo	MSF Environment (BTC)	0734 971748
7	Ouma G. S.	MSF Media Rep	0733 238036
8	Rashid Owino	SUPKEM, Member MSF	0721 646747
9	Doris Odinde Omolo	Okech Women Group	0724 733321
10	Cllr. Omolo Haya	Bondo Town Council (Chair)	0734 633883
11	Millicent Adipo	Business Group	0733 390335
12	Stephen Goma Onaya	Barkowino HBC Group	0728 030624
13	Rebecca Anyango Alogo	Konyoikenoi W Group	0713 705247
14	Prisca A Ouko	Barkowino West Dev. G	0735 229660
15	Alice O. Nyamanga	Barkowino East	0726 349777
16	Samson O. Akungu	Barkowino East	0734 563629
17	Joseph Olima	Slaughterhouse Bondo	0724 942987
18	Cllr Emmanuel Amata	Bondo Town Council	0738 996151
19	Cllr Maurice Otunga	Bondo Town Council	0733 534478
20	Jane Obwago	Bondo Town Council	0724 596302
21	William Agot	Nyawita	0734 641302
22	Judith A. Otieno	Cllr. Bondo Town	0722 179253
23	Cllr. Henry Ondete	Bondo Town Council	0726 541930
24	Cllr. John A. Orongo	Bondo Town Council	0720 282548
25	Nelson O. Juma	KNCC&I Bondo	0733 727974
26	Paul Omullo	Bondo Youth Initiative	0733 443231
27	Cllr Judith Achieng	Bondo Town	0722 179253
28	Benjamin Opondo	Cllr. Nyawita	0724 146496
29	Jane Oginga	SDA Bondo Town	0735 633899
30	Roddy B. Umayah	Works Officer Bondo	0722 243511
31	Cllr Peter Juma Okongo	Barkowino East	0722 821293
32	Maurice Ogutu	RID Water Tec	0724 011894
33	William O. Waringa	Water Bondo	0735 730044
34	Joseph Kwanya Adongo	P.R.O. PDDDG	0722 237426
35	Rosline Atieno Omware	Bondo St. Jude	0724 723737
36	Fredrick Onyango	Veterinary	0724 643646
37	Billy Obare Agot	Bondo Youth Initiative	0733 814717
38	Silverius Wakoli	Bondo CDF	0722 954351
39	Jared Odhiambo	Bondo Town	0735 767526
40	Lilian Akoth Ocharo	G Pary Rep Bondo	0729876308
41	James Ayaga Oling	KNCC&I, Bondo	0735 787838
42	Cllr. John Abeda	Barkowino West	0720 282543
43	Kodindo Richard	Bondo County Cnl	0722 593986

10 SUMMARY OF PROBLEMS TO BE ADDRESSED

The water facility installations are far from adequate, inefficient and economically unviable. An urgent intervention is needed to increase the effectiveness and sustainability of the system by improving the overall throughput and management. Many of the residential areas have no or poor sanitation, while the middle to higher income residents lacked water for flushing toilets. Solid waste is spread over large sections of the town while the surface drainage needs improvement. These problems may be summarised as follows:

10.1 Water supply

- The current level of water provision service coverage in the low-income areas for piped water supply is very unsatisfactory at less than 10%.
- Women and children are the main collectors of drinking water and they pay KShs 5-10 before collection of a container of 20 litres. Low service coverage (less than 20%) due to low production and distribution capacity;
- High levels of unaccounted for water officially reported at 45% but in reality estimated to be over 60% due to a high proportion of flat rate connection charges;
- High electricity and chemical costs which the revenue hardly meets;
- Heavy leakages and pipe bursts in rising mains and old dilapidated distribution system;
- Low levels of revenue that cannot finance operations and maintenance costs;
- Inadequate pumping hours due to power outages and low voltages.
- Bondo water supply lacks updated layout plans and detailed maps of pipe networks, drainages and other physical installations;
- The water utility does not have adequate human resource capacity and tools for efficient and effective management of operation and maintenance of the water system.

10.2 Sewerage and on-site sanitation

Bondo town has no sewerage system in place; 95% of sanitation is provided by on-site pit latrines. Most of these cannot be considered improved sanitation, in particular because in majority of cases these are shared between two or more households. In the urban environment it can also result in contaminated groundwater.

- From the UIS survey there appears to be a disturbing high percentage (10.7%) of people using the open field for defecation.
- Only 20% of the low-income population has access to adequate sanitation facilities.
- Simple pit latrines are the most common on-site sanitation form, located usually within the homestead, and are shared by about 10 to 15 people.
- Uncontrolled spillage of liquid waste from the slaughterhouse into a local stream is creating a serious environmental hazard.

10.3 Solid Waste Management

- Bondo Municipal Council is responsible for management of solid waste in the Town.
- From the IUS study it becomes clear that the majority of households (90%)

dispose their household waste by dumping it in the backyard of their compound, dumping it in the street, or burning it in the open.

- There is a large amount of solid waste accumulation visible in the settlements and along the roads.
- Recently an abandoned quarry was designated as waste disposal site.
- The town has a tractor for transporting the garbage to the dump site but the overall collection capacity for garbage is inadequate.

10.4 Drainage

- The municipal council is responsible for management and maintenance of the Bondo Town drains.
- A recurrent problem with drainage channels is blockage with solid waste and soil.
- In the low-income areas the lack of drainage leads to ponding.
- Bondo town's topography is quite flat or has very gentle slopes, leading to poor drainage and stagnant pools during rains.
- The network of drains is mainly earthen and tends to overgrow with grass, filled with garbage and is often blocked.
- Most of low income-income settlement are located in flat areas and are poorly drained.
- The market area has no drainage and no pavement. The whole area becomes very muddy and flooded during rains.

10.5 Advocacy and Awareness Raising

10.6 Capacity Building

Formulation /Updating of the Physical Plan and technical co-ordination of all services within the Municipality i.e. roads, drainage, physical planning, excavations should be worked out.

10.7 Gender Mainstreaming and Support to Vulnerable Groups

10.8 Physical Planning

10.9 Urban Catchment Management

10.10 Monitoring and Evaluation

11 RECOMMENDED INTERVENTIONS

11.1 Water supply:

The proposed immediate interventions aim to replace pumps, valves and pipelines to increase the overall throughput from the current 930m³/day to 2,700m³/day, which exceeds the present (2008) water demand of about 2,500m³/day. This can be achieved through the following:

Bondo Town Water Supply (intake at River Yala):

Increase the overall capacity of the system from the current 550m³/day to 2,250m³/day by:

- Construction of an additional composite filtration unit (KShs.1.5 million);
- Rehabilitation of one of the existing non-functional composite filtration unit;
- Installation of 2 No Low lift pumps;
- Installation of 2 No. High lift pumps;
- Rehabilitation of the 150mm x 6.5km rising main;
- Replacement of the 100mm x 6.5km AC pipe with uPVC;
- Construction of 2No. break pressure tanks on the 100mm gravity main to Nyawita area;
- Increase the storage capacity from 90m³ to 290m³ by constructing a 200m³ ground tank at the same site.
- Construction of an office and water quality testing lab (KShs.1.6 million);
- Construction of Grade 9 Staff house (one staff member is living in the store);
- Minimise the high levels of unaccounted for water (estimated to be more than 60%) by eliminating flat rate payments and reducing excessive leakages and improving the management of the water system.
- Capacity building of water service provider management staff through training and provision of tools, equipment, computers and transport facilities to enhance efficiency and sustainability.

11.2 Sanitation and Sewerage:

- Upgrading of the existing public toilets in Bondo town;
- Construction of a new public toilets in Bondo town, preferably through privatisation and suitable lighting and security in the vicinity of the toilets;
- Provision of efficient exhauster service;
- Develop and implement School Water and Sanitation Programme;
- Promotion of groups for the construction of school latrines and low cost yard and household latrines (sanplat).
- Study and develop preliminary designs of sewerage options for the town.

11.3 Solid waste:

- Setup of sustainable solid waste management system, which incorporates community participation.
- Provide 80 No. tipping bins in congested areas, specially designed refuse transfer stations, lightweight, truck-mounted self-tipping truck and tools to enhance collection and transportation efficiency.
- The current dump site is in good condition but needs to be dug out to provide an

additional storage of some 7,500m³ to achieve an overall total of approximately 27,000m³.

11.4 Drainage:

- No specific drainage interventions were preferred, pending the physical plan.

11.5 Physical Planning

- Production of maps and layout plans of physical infrastructure including water supply network and drainage.

11.6 Advocacy and Awareness Raising

- Formation of community organizations to manage water and sanitation services in informal settlements
- Support to local groups with information and education materials for dissemination and education of the public on water utility management as well as environmental sanitation.
- Community development and mobilization to sensitize the people on health and hygiene campaigns.
- Recruitment and training of community trainers in the peri-urban and informal settlements is necessary

11.7 Capacity Building

Formulation /Updating of the Physical Plan and technical co-ordination of all services within the Municipality i.e. roads, drainage, physical planning, excavations should be worked out.

11.8 Gender Mainstreaming and Support to Vulnerable Groups

11.9 Urban Catchment Management

11.10 Monitoring and Evaluation

12 PROPOSED IMMEDIATE and LONG-TERM INTERVENTIONS in BONDO

No	Area of focus	Intervention	Prior-ity	Cost (H)	Cost (M)	Cost (L)	Respons.	Remarks
1	ADVOCACY, COMMUNICATION AND AWARENESS CREATION							
		Prepare promotional material	H				JO/UN	
		Public awareness campaigns (radio, TV, press)	H				JO/UN	
		School health & hygiene education campaigns,	M		5,000		JO/UN	
		Identify communication focal points in town	H				MSF	
2	CAPACITY BUILDING							
		CA with 4 international partners	H				UN	
		Assessment of CB needs in Bondo	H				IHE	
		Identification of local partners	H				UN	
		Fast-track programme with WSP (NWSC)	H	60,000			NWSC	Starting August 08
		Pro-poor initiatives e.g. Micro-Credit	M	25,000			UN	
		LED initiatives	M				UN	
3	GENDER, VULNERABLE GROUPS							
		Gender equity assessment	H				UN/GWA	
		RWH programmes (NGO)	H	90,000			UN	
		Development of promotional materials	?					
4	URBAN PHYSICAL PLANNING							
		Planning needs assessment in the towns	H				UN/JM	Done
		Prepare Physical Plan (draft)	H				UN/JM	
		Stakeholder consultations	H				UN/JM	
		Set up physical planning unit in towns	M				UN/JM	
		Operationalise Physical Plan	M				UN/JM	
		Training for planning staff	M				UN	
5	URBAN INEQUITY SURVEY							
		Prepare report on results UIS Bondo	H				UN/OO	
		Maps, GIS system, data base, etc	M				UN/OO	
		Presentation of results in each town	H				UN/OO	
		Monitoring of MDGs	M				UN/OO	
6	PROGRAMME ORGANISATION							
		Initiate MSF	H				MSF	Done
		Initiate PIU	H				LVSWB	
		CA with Town Council	H				UN/TC	
7	DEVELOPMENT OF ALTERNATIVE ENERGY SOURCES							
	Micro-Hydro	Feasibility study on Yala River micro-hydro	L				UN	
		1 KW Micro-hydro power unit (5KVA)	L	2,000			UN	
	Bio-gas	Biogas converter	L				UN	

No	Area of focus	Intervention	Prior-ity	Cost (H)	Cost (M)	Cost (L)	Respons.	Remarks
8	URBAN CATCHMENT MANAGEMENT							
		Monitoring equipment, (incl. testing eq.)	M		30,000		UN	
		Design monitoring network	M		30,000		UN	
		Legislation and awareness campaigns	M		5,000		TC/PIU	
		Office facilities + hardware (catchment office)	M		20,000		TC	
9	SOLID & LIQUID WASTE MANAGEMENT							
	Solid waste	Procurement of 2 No. SWM (tractors & trailers)	M		100,000		UN/HK	
		Transfer stations (under CA with TC)	M		20,000			
		Landscaping of dump site	M		25,000			
		Support local initiatives (recycling, composting)	M		10,000			
	Liquid waste	Vacutug	H	20,000				
10	WATER AND SANITATION INTERVENTIONS							
1	Intake Works at Yala	Purchase and installation of 2 low-lift pumps	H	23,000			UN/JM	Preliminary designs + bid docs under preparation
		Purchase and installation of 2 high-lift pumps	H	72,000				
2	Rising Main	Separation of 6" uPVC, repair on 4" AC line	H	20,000			UN/JM	-do-
		Rehabilitate rising main, 6", about 6.5 kms	M		150,000			
3	Treatment Works at Yala River	Repair of composite filtration unit.	H	16,000				-do-
		Construction of 1 new filtration unit	H	24,000				
		Construct office and water quality testing lab	H	25,000				
		Construct 1No. Grade 9 Staff house	M		30,000			
		Equip laboratory for water quality testing	H	15,000				
		Construct 1 new composite filtration unit 750m3	H	30,000				
		Construct break pressure tanks	H	12,000				
		Other Rehabilitation works (misc.)	H	25,000				
		Detailed design for Bondo w/s	M		40,000			
		Construct new pump house at Yala	L			80,000		
		New flow treatment works at 2,500 m3/day	L			480,000		
		New rising main to Bondo	L			580,000		
		4	Storage tanks in Bondo	Additional masonry ground tank: (200 m ³)	H	110,000		
Additional storage 540 m3	L					170,000		
5	Water distribution network in Bondo	Expansion of distribution network (phase I) 10km	H	90,000				
		Expansion of network (phase II) 20 kms	L			175,000		
		Additional fittings and water meters	L			30,000		
6	South Sakwa Water Supply Scheme	Solve institutional problem on ownership	H	2,000			LVSWSB	
		Feasibility study to link to Bondo w/s	M		20,000		UN/JM	
		Additional 4 high-lift pumps	L			58,000		
		Pump house expansion	L					
		Rising main 3 kms length, 8"	L					
		New reservoir on ... Hill (400 m3)	L					

No	Area of focus	Intervention	Prior-ity	Cost (H)	Cost (M)	Cost (L)	Respons.	Remarks
		Transmission pipeline to Bondo 15 kms (6")	L					
		Additional storage reservoir in Bondo 200m3	L					
7	Distribution Mains	Replacement AC pipes (6.5km uPVC 110mm)	M		340,000			
8	Distribution system, (low-income areas)	New uPVC service lines: 20 kms service lines 50-mm, 40-mm and 25-mm.	M		40,000			
9	Metering (consumer)	Replacement of faulty consumer meters, and new connections (500 Nos).	M		20,000			
10	Reducing NRW (leakages, WDM)	Installation of bulk and zonal water meters	M		20,000			
		10No. Pressure regulating valves	M		7,000			
		Hydraulic modelling of distribution network	L			10,000		
11	Water kiosks	5 No. Public water kiosks	H	5,000				
		20 Nos. mini shop/single tap water kiosks, using micro-credit finance.	M		10,000			
		Facilitation costs UN-Habitat	M		10,000			
12	School water and sanitation programme	Construction of watsan facilities (10 schools)	H	50,000				
		Construction of RWH facilities at 6 schools	M		60,000			
13	Slaughterhouse	Construction of septic tank for liquid waste disposal	H	15,000				
14	Sanitation, public	Construction of public sanitation facilities at market, bus station, etc (5 nos.)	M		60,000			
15	Sanitation (SanPlats)	Support local groups to establish manufacturing of Sanplats	M		50,000			
16	Sewerage	Feasibility study for Sewerage system	L			30,000		
		Identify potential sources of funding	L					
		Design study, etc	L					
11	DRAINAGE							
	Drainage	Drains, 5 kms @ \$10 per m	M		50,000			
		Paving of market area	M		30,000			
12	ENVIRONMENT							
		Environmental Impact Assessment			10,000			
		Total Bondo						

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ANNEX 1 - Field visits / Observations

1. Bondo Water Supply Intake and Treatment Works at Yala River (several visits)

Bondo Water Supply was first built in 1953. The source is River Yala located 6.5km to the north of Bondo town. It serves most of the town and has the following characteristics:

- High costs of treatment due to large quantities of chemicals required;
- High costs of pumping from the river to the 90m³ high rise tank;
- Dilapidated infrastructure that causes heavy water losses;
- Owned by the government and has ample spare land.



Bondo water supply – Treatment works at Yala River; High-rise storage of 90 m3 in Bondo



More than 50 years old.....

2. South Sakwa Intake Works

South Sakwa Water Supply: This was developed in the 1970s by the Catholic Church for the Nyang’oma Catholic Mission and the surrounding community. The intake is located along the shores of Lake Victoria some 17km to the south west of Bondo town at Olago Bay. The system serves the rural parts of Bondo town generally to the west and is characterised by:

- Intake and treatment works are in good shape, some minor repairs and replacement are needed;
- Low chemical treatment costs due to the good quality of Lake water at the intake;
- A large part of the project serves rural areas through water kiosks, however, sections of the pipeline towards Bondo (Got Abiero Hill) were not completed.
- Management of South Sakwa water supply scheme was taken over by SIBO Water Service Provider. Institutional issues have to be sorted out, relating to ownership, since the project was developed by the Catholic Church.



Intake structure for South Sakwa w/s



Treatment works at Sakwa

3. North Sakwa Intake Works at Yala River

North Sakwa Water Supply: The development of this project was started around 1995 with funding from the Freedom From Hunger Council of Kenya. Project implementation was done in collaboration with the then Provincial Water Office (Kisumu) and the District Water Office (in Siaya). In addition to other areas, it was meant to serve some of the eastern parts of Bondo town and the rural northern areas of Nyawita Sub-Location. The following highlights are relevant:

- The project was never completed and heavy investment is needed to reach Bondo;
- The intake is located approximately 14km upstream of the existing location of the Bondo Water Supply intake at the Yala River;
- Installations included: Incomplete intake structure; 25m³/hr composite unit 40% complete; 100m³ clear water tank 50% complete; 4No Grade 9 attendants houses vandalised; 200mm x 4km (estimated) rising main laid, partially vandalised; pump house 40% complete; 2No diesel engines and pumps—low lift and high lift, were used for only two weeks and later taken to Bondo to avoid theft.



North Sakwa – what is left of the intake structure

4. Market in Bondo

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

- Old market is congested; no provisions for solid waste disposal; no adequate drainage; no paving; very muddy during rains;
- New market site has adequate space, though part of it is used for solid waste dumping;
- New market stalls (60 nos.) under construction; it is said to have stalled due to lack of funds. Funded by Urban Development Department (UDD) of the Ministry of Local Government.
- A public Toilet (3 doors and a urinal) has been constructed and will be leased out to a women group to manage.



Present market in Bondo

5. Bondo Bus Station

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

- The Bus Park is not paved, but of gravel (murrum);
- A public pit latrine constructed (3 doors, 1 bathroom and a urinal), managed by a youth group;
- Solid waste management is poor, but was reported to be periodically collected and dumped at the new market transfer station;
- Public water stand pipe (kiosk), with an adjacent car wash, also managed by a Youth Group.



Public stand pipe, car wash (high pressure!) and public toilet at bus station

6. Visit to some of the low-income areas

- Very poor housing
- No water in compound
- Poor sanitation shared by many households



7. Visit to the Solid Waste Dump Site

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

- Recently allocated, old quarry; it is private land, but has been leased for 10 years;
- Very good access – murrum road, 1.5 km from town, and is well fenced with poles and barbed wire, but some landscaping needs to be done;
- No EIA has been carried out.



Solid waste dump site for Bondo

8. Visit to the animal slaughter house

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

- Town Council owns the land; site sufficiently large and is fenced;
- A reasonably new slaughter house exists, and is currently used; the old structure is dilapidated and currently used for the slaughter of pigs only.
- Liquid waste is led into a lagoon via a drainage channel. Lagoon is not functioning well, as it is not properly kept or maintained. Overflow goes into the surface water;
- Solid waste is put in adjacent waste pit;
- Water pipeline is connected to the site, but there is no reliable water supply. A plastic storage tank (2,300 litres) has been installed at the facility, to which water transported by vendors is stored. There is potential for roof catchment (RWH) system.



Bondo slaughterhouse



Sink pit for liquid waste of slaughterhouse

9. Visit to District Hospital

District Public Health Officer (Mr. G. O. Nyabola)

- The department has seconded a Public Health Officer to the Town Council.
- No water supply to the hospital – there is no pumping due to power cut at the WS intake. Patients are making their own arrangements through water vendors, while theatre operations at the time of the visit were suspended due to lack of water. The problem was more compounded by the reported cases of cholera outbreak in the district/town.
- Sanitation needs are high in the town – safe and clean latrines. Sewerage system would be the long term solution.
- Bondo Town lacks cemetery
- Need for improved water supply to the town. These could be complemented by roof catchments storage tanks. Currently the hospital has got funding for a high level storage tank and construction is in progress.
- All the toilets in the wards are not operational due to lack of water. The inpatients are forced to use pit latrines which are inadequate and are located far from the wards.
- The hospital is being expanded, and construction is on-going. The new construction has incorporated a large septic tank.
- Incinerator for the hospital is in good condition and operational.



Water storage at Bondo District Hospital; pit latrines in right-hand corner.

10. Visit to Bondo Primary School

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

Head Teacher Mr. George Akun, Deputy – Mr. Tom Nyakwaka
Enrolment 1, 016 pupils, 21 teachers.
Orphans and vulnerable pupils: 184 (80 boys, 104 girls)
IDPs 69

Water

- 1500 litres plastic tank drawing water from the roof catchment
- School connected to Bondo Water Supply system, but the tap has been dry for the last one month;
- The school needs about 18,000 litres per day, hence the need to have adequate storage, as well as exploit the available high potential of the roof catchments system.

Sanitation

- Existing – 3 doors and a urinal for over 400 boys, and 6 doors for over 600 girls, and 2 doors for the 21 teachers. The latrines are well separated (located) for the boys and girls.
- Required- additional 18 door latrines to cater for the recommended ratio of 30 boys/closet and 25 girls/closet. A bathroom for girls and a proper urinal for boys are also needed.
- Currently, a 3 door latrine is under construction for the boys



11. Visit to Gobei Primary School

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

Head Teacher – Mr. John Ooko Oloo
Enrolment – 558 pupils (294 boys, 264 girls), 9 teachers.
Orphans and vulnerable pupils– 156,
IDPs - 40

Water

- A 5,000 litres ferro-cement tank drawing water from the roof catchment, but leaking
- School is not connected to Bondo Water Supply system
- The school needs about 10,000 litres per day, hence the need to have adequate storage, as well as exploit the available high potential of the roof catchments system.

Sanitation

- Existing – 3 doors for 294 boys and 3 doors for 264 girls, of which only 2 pit latrines are permanent. The latrines are well separated (located) for the boys and girls.
- Required- additional 10 door latrines (6 for girls and 4 for boys) to cater for the recommended ratio of 30 boys/closet and 25 girls/closet. A bathroom for girls and a proper urinal for boys are also needed.



Sanitation at Gobei Primary School

12. Visit to Gobei Secondary School

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

Head Teacher – Mr. Tobias Omondi

Enrolment – 256 pupils (boys and girls), mixed day and boarding

Water

- 2 nos. ferro-cement tanks (20,000 litres) drawing water from the roof catchment
- School is not connected to Bondo Water Supply system
- The school needs about 40,000 litres per day, hence the need to have adequate storage, as well as exploit the available high potential of the roof catchments system.

Sanitation

- Existing – 5 doors for boys, and 5 doors for girls, and 2 doors for the teachers. The latrines are in good condition and are well separated (located) for the boys and girls.
- Required- bathrooms for boys and girls and a proper urinal for boys



Roof tank for Gobei Secondary School

13. Visit to Jaramogi Oginga Odinga Secondary School

Conducted by the Bondo Town Council Chairman, Town Clerk, Public Health Officer, and Councillors

Head Teacher – Mr. George Akacha
Enrolment – 100 pupils, 6 teachers

Water

- 3,000 litres cement tank drawing water from the roof catchment
- School not connected to Bondo Water Supply system, but there is a line nearby which is taking water to Nyamira Girls Sec School. Students depend on a nearby water pan for most of the time.
- The school needs to have adequate storage, as well as exploit the available high potential of the roof catchments system.

Sanitation

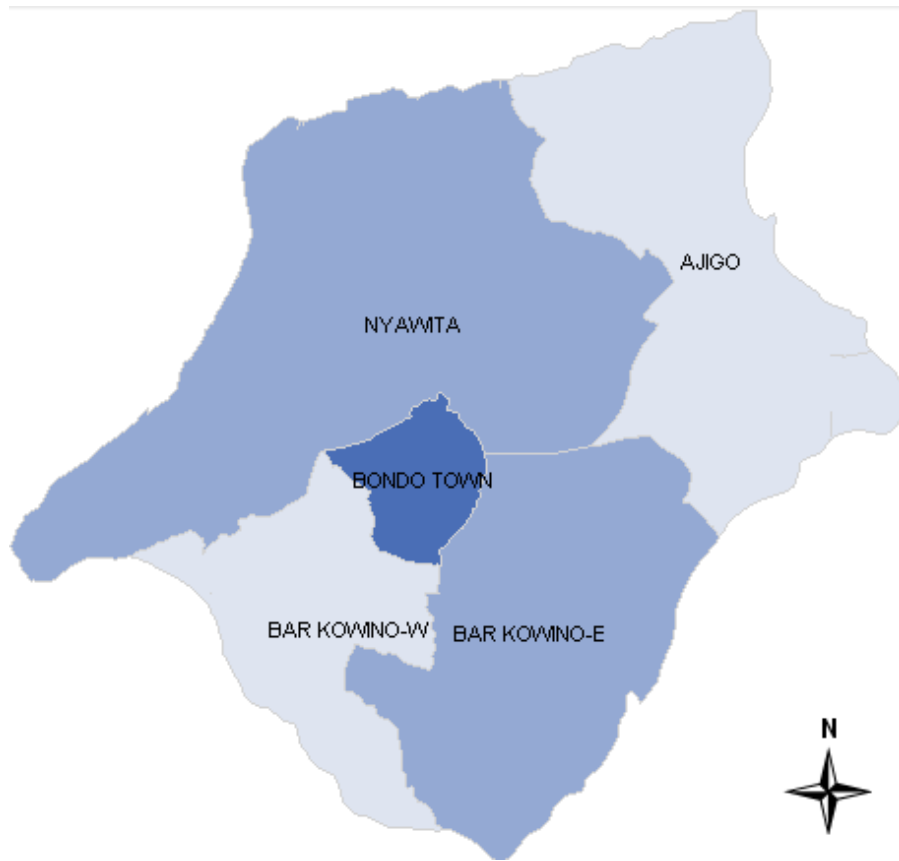
- Existing – 2 doors for boys and 1 door for girls, and 2 doors for the teachers. The latrines are not well separated (located) for the boys and girls, as they are constructed in the same place.
- Required- additional latrines to cater for the recommended ratio of 30 boys/closet and 25 girls/closet. A bathroom for girls and a proper urinal for boys are also needed.



ANNEX 2

RESULTS OF THE URBAN INEQUITY SURVEY

(TABLES)



Sub-divisions of Bondo Township

WATER SUPPLY

Table 1.1: Distribution of households by Sources of drinking water, LVWATSAN UIS, Bondo town, Kenya, 2006

		Sources of drinking water												Number of households		Percentage of households using improved water	Households with improved water
		Piped into dwelling	Piped into yard/plot	Public tap/standpipe	Tube well/Borehole	Protected well	Unprotected Well	Unprotected Spring	Rain water	Water Vendors	Surface water	Bottled water	Other sources	Total	Number of households		
Sublocation	AJIGO	0.4	0.4	2.9	2.2	0.4	1.8	0.4	3.3	0.4	88.0			100.0	275	9.5	26
	BAR KOWINO-E			4.1	4.6	0.5			8.7	1.5	77.4		3.1	100.0	195	17.9	35
	BAR KOWINO-W		2.5	17.2	0.8				4.1	0.8	59.0	1.6	13.9	100.0	122	24.4	30
	BONDO TOWN	3.6	18.1	61.6	0.6	0.6			1.7	1.0	2.5	0.2	10.1	100.0	524	85.8	452
	NYAWITA	1.6	6.6	52.8	0.3	0.3			2.1	0.3	34.2		1.9	100.0	377	63.5	240
Slum condition (without secure tenure)	Slum households	1.0	7.4	37.2	1.3	0.4	0.4	0.1	2.8	0.8	42.7	0.2	5.8	100.0	1,423	49.9	713
	Non-slum households	17.1	27.1	42.9	1.4				11.4					100.0	70	100.0	70
Total		1.7	8.3	37.4	1.3	0.4	0.3	0.1	3.2	0.7	40.7	0.2	5.6	100.0	1,493	52.2	783

UIS Lake Victoria Water and Sanitation Initiative

Table 1.2: Distribution of households by duration of collecting water, LVWATSAN UIS, Bondo town, Kenya, 2006

		Average time in minutes to get water and comeback to the household					Number of households		No burden for water collection	Households with no burden in water collection
		Water on the premises	Less than 15 minutes	15-29 minutes	30 - 59 minutes	60+ minutes	Total	Number of households		1.00
Sublocation	AJIGO	3.6	0.4	10.9	18.2	66.9	100.0	275	33.1	275
	BAR KOWINO-E	12.2	7.7	15.3	29.1	35.7	100.0	196	64.3	196
	BAR KOWINO-W	10.6	21.1	19.5	22.0	26.8	100.0	123	73.2	123
	BONDO TOWN	29.0	25.9	17.0	17.3	10.9	100.0	525	89.1	525
	NYAWITA	13.0	18.0	19.8	27.8	21.4	100.0	378	78.6	378
Slum condition (without secure tenure)	Slum households	14.2	16.4	17.0	22.9	29.5	100.0	1,427	70.5	1,427
	Non-slum households	64.3	17.1	8.6	4.3	5.7	100.0	70	94.3	70
Total		16.6	16.4	16.6	22.0	28.4	100.0	1,497	71.6	1,497

Lake Victoria Water and Sanitation Initiative

Table 1.3: Distribution of households by people who collect water, LVWATSAN UIS, Bondo town, Kenya, 2006

		Person fetching water						Number of households		Location of source of water is safe for women and children
		Adult woman	Adult man	Female child (under 15)	Male child (under 15)	No specific person	N/A or delivered at home	Total	Number of households	
Sublocation	AJIGO	57.8	12.5	1.9	2.3	20.2	5.3	100.0	263	67.4
	BAR KOWINO-E	68.5	10.1	0.6		17.9	3.0	100.0	168	27.5
	BAR KOWINO-W	61.7	13.1		2.8	21.5	0.9	100.0	107	62.5
	BONDO TOWN	61.9	20.8	0.8		15.4	1.1	100.0	370	80.3
	NYAWITA	61.0	15.5	3.0	0.6	17.1	2.7	100.0	328	78.1
Slum condition (without secure tenure)	Slum households	61.7	15.5	1.6	0.9	17.6	2.7	100.0	1,211	68.6
	Non-slum households	60.0	16.0			24.0		100.0	25	54.8
Total		61.7	15.5	1.5	0.9	17.7	2.7	100.0	1,236	68.3

Table 1.4: Distribution of households by water disruptions, LVWATSAN UIS, Bondo town, Kenya, 2006

		Disruption frequency					Has any disruption for the last 2 weeks	Duration of water disruption				Number of households	
		Daily	Intermittent most days	Intermittent several days	Occasional	Don't know		Several hours at a time	More than a day	More than a week	No water in the last two weeks	Total	Number of households
Sub location	AJIGO		33.3	33.3	33.3		3.1	33.3	66.7			100.0	3
	BAR KOWINO-E		100.0				2.5			100.0		100.0	1
	BAR KOWINO-W		12.5	50.0	25.0	12.5	8.4	28.6	71.4			100.0	7
	BONDO TOWN	11.7	46.9	4.2	36.4	0.8	47.0	35.3	59.2	4.6	0.8	100.0	238
	NYAWITA	6.1	21.2	9.1	63.6		19.1	21.5	69.2	7.7	1.5	100.0	65
Slum condition (without secure tenure)	Slum households	9.2	40.1	6.2	43.5	1.0	22.2	31.5	61.9	5.9	0.7	100.0	289
	Non-slum households	20.0	48.0	12.0	20.0		37.0	40.0	56.0		4.0	100.0	25
Sources of drinking water	Piped into dwelling	40.0	20.0		40.0		58.5	66.7	33.3			100.0	15
	Piped into yard/plot	9.0	47.8	7.5	35.8		55.0	50.0	47.0		3.0	100.0	66
	Public tap/standpipe	7.7	49.7	8.3	32.6	1.7	33.9	27.9	63.1	8.9		100.0	179
	Tube well/Borehole						2.0						
	Protected well	100.0					51.0	100.0				100.0	3
	Unprotected Well						2.0						
	Unprotected Spring						2.0						
	Rain water		50.0	50.0			6.1	50.0	50.0			100.0	2
	Water Vendors		100.0				10.9		100.0			100.0	1
	Surface water						2.0						
	Bottled water				100.0		34.7		100.0			100.0	1
Other sources	6.5	2.2		91.3		57.5	8.7	87.0	2.2	2.2	100.0	46	
Percentage of households using improved water	Not improved	6.1	6.1		87.8		8.9	8.2	87.8	2.0	2.0	100.0	49
	Improved water	10.8	47.0	7.8	33.2	1.1	35.7	36.6	56.6	6.0	0.8	100.0	265
Total		10.1	40.7	6.6	41.6	0.9	22.9	32.2	61.5	5.4	1.0	100.0	314

Table 1.5: Distribution of households by Primary method of treating water, LVWATSAN UIS, Bondo town, Kenya, 2006

		Primary method of treating water						Number of households	Treat water to make it safe to drink
		Boil	Add bleach/ chlorine	Sieve it through cloth	Use water filter	Others	Don't know	Total	
Sublocation	AJIGO	43.8	47.1	1.3	5.2		2.6	100.0	55.6
	BAR KOWINO-E	28.5	52.8	17.1	1.6			100.0	62.8
	BAR KOWINO-W	41.8	43.3	14.9				100.0	54.5
	BONDO TOWN	50.0	49.7		0.3			100.0	57.1
	NYAWITA	55.0	41.5	2.9		0.6		100.0	45.2
Slum condition (without secure tenure)	Slum households	45.6	47.3	5.0	1.4	0.1	0.5	100.0	53.8
	Non-slum households	51.1	48.9					100.0	65.7
Sources of drinking water	Piped into dwelling	33.3	66.7					100.0	92.3
	Piped into yard/plot	58.1	41.9					100.0	60.5
	Public tap/standpipe	50.8	47.7	1.5				100.0	47.8
	Tube well/Borehole	57.1	28.6	14.3				100.0	35.0
	Protected well	50.0	50.0					100.0	33.3
	Unprotected Well								0.0
	Unprotected Spring								0.0
	Rain water	50.0	50.0					100.0	33.3
	Water Vendors	50.0	50.0					100.0	72.7
	Surface water	40.7	46.4	8.9	2.7	0.3	1.1	100.0	61.1
	Bottled water								33.3
Other sources	40.0	57.5		2.5			100.0	48.2	
Percentage of households using improved water	Not improved	41.1	47.3	7.8	2.6	0.2	0.9	100.0	59.2
	Improved water	51.2	47.5	1.3				100.0	49.9
Total		45.9	47.4	4.7	1.4	0.1	0.5	100.0	54.4

Table 1.6: water cost for household connected with piped water, LVWATSAN UIS, Bondo town, Kenya, 2006

		Percentage of households that pay for water	Type of payment of water for household connected with piped water			Number of households	
			Don't pay	Monthly	According to monthly consumption	Total	
Sublocation	AJIGO	100.0		50.0	50.0	100.0	2
	BAR KOWINO-W	100.0		66.7	33.3	100.0	3
	BONDO TOWN	84.5	14.7	50.5	34.9	100.0	109
	NYAWITA	89.7	10.3	24.1	65.5	100.0	29
Slum condition (without secure tenure)	Slum households	83.3	15.9	47.8	36.3	100.0	113
	Non-slum households	96.7	3.3	36.7	60.0	100.0	30
Percentage of households using improved water	Improved water	86.1	13.3	45.5	41.3	100.0	143
Sources of drinking water	Piped into dwelling	96.2	3.8	42.3	53.8	100.0	26
	Piped into yard/plot	84.6	15.4	46.2	38.5	100.0	117
	Public tap/standpipe	0.0					
Total		86.1	13.3	45.5	41.3	100.0	143

Access to improved water => Number 1

Table 1.7: water cost for household not connected with piped water, LVWATSAN UIS, Bondo town, Kenya, 2006

		Percentage of households that pay for water	Type of payment of water for household not connected with piped water				Number of households	
			Don't pay	Pay per jerrycan	Flat rate each month	Other	Total	
Sublocation	AJIGO	5.17	94.8	4.8	0.4		100.0	271
	BAR KOWINO-E	12.76	87.2	11.7		1.0	100.0	196
	BAR KOWINO-W	31.67	68.3	31.7			100.0	120
	BONDO TOWN	92.81	7.1	91.7	1.2		100.0	410
	NYAWITA	58.38	41.4	56.9	1.7		100.0	343
Slum condition (without secure_tenure)	Slum households	48.47	51.7	47.3	0.8	0.2	100.0	1,301
	Non-slum households	77.50	23.1	74.4	2.6		100.0	39
Percentage of households using improved water	Not improved	13.90	86.2	13.4	0.1	0.3	100.0	711
	Improved water	88.87	10.8	87.4	1.7		100.0	629
Sources of drinking water	Piped into yard/plot	66.67	20.0	40.0	40.0		100.0	5
	Public tap/standpipe	96.42	3.3	95.3	1.5		100.0	551
	Tube well/Borehole	65.00	35.0	60.0	5.0		100.0	20
	Protected well	66.67	33.3	66.7			100.0	6
	Unprotected Well	0.00	100.0				100.0	5
	Unprotected Spring	0.00	100.0				100.0	1
	Rain water	14.89	85.1	14.9			100.0	47
	Water Vendors	81.82	18.2	81.8			100.0	11
	Surface water	0.99	99.2	0.5		0.3	100.0	604
	Bottled water	100.00		100.0			100.0	3
	Other sources	95.18	4.8	94.0	1.2		100.0	83
Total		49.33	50.8	48.1	0.9	0.1	100.0	1,336

Table 1.8: water cost, LVWATSAN UIS, Bondo town, Kenya, 2006

		% households that pay for water	Monthly water cost									Number of households	
			0	1-100	101-200	201-300	301-400	401-500	501-700	701-1000	1001+	Total	
Sublocation	AJIGO	5.9	94.5	0.4	1.1	1.5	0.4	1.1	0.7	0.4		100.0	272
	BAR KOWINO-E	12.8	88.1		0.5	2.1	2.6	2.6	2.6	1.0	0.5	100.0	194
	BAR KOWINO-W	33.3	66.7	1.6	7.3	12.2	4.1	4.1	2.4	0.8	0.8	100.0	123
	BONDO TOWN	91.4	8.8	9.1	22.4	20.6	14.6	11.3	6.6	5.3	1.4	100.0	514
	NYAWITA	61.2	39.6	3.3	17.8	18.0	4.6	9.3	3.0	3.6	0.8	100.0	366
Slum condition (without secure tenure)	Slum households	51.3	49.3	4.2	12.9	12.9	6.9	7.0	3.6	2.4	0.8	100.0	1,400
	Non-slum households	85.7	14.5	4.3	17.4	21.7	10.1	10.1	5.8	14.5	1.4	100.0	69
Percentage of households using improved water	Not improved	13.9	87.0	0.6	2.4	3.8	2.4	1.4	1.8	0.4	0.1	100.0	705
	Improved water	88.8	11.4	7.6	23.0	22.0	11.3	12.4	5.5	5.4	1.4	100.0	764
Sources of drinking water	Piped into dwelling	95.8	4.2	4.2	37.5	33.3		8.3		12.5		100.0	24
	Piped into yard/plot	84.2	16.2	19.7	23.1	21.4	7.7	3.4	0.9	3.4	4.3	100.0	117
	Public tap/standpipe	96.8	3.3	5.8	23.8	24.0	13.4	15.4	7.1	6.2	1.1	100.0	551
	Tube well/Borehole	65.0	36.8	10.5	15.8		10.5	15.8	10.5			100.0	19
	Protected well	66.7	33.3		33.3	16.7	16.7					100.0	6
	Unprotected Well	0.0	100.0									100.0	5
	Unprotected Spring	0.0	100.0									100.0	1
	Rain water	14.9	85.1		8.5	4.3		2.1				100.0	47
	Water Vendors	81.8	22.2			33.3			33.3	11		100.0	9
	Surface water	1.2	99.5			0.3			0.2			100.0	602
	Bottled water	100.0				33.3	33.3		33.3			100.0	3
Other sources	95.1	4.9	4.9	21.0	24.7	19.8	12.3	8.6	2	1.2	100.0	81	
Total		52.9	47.6	4.2	13.2	13.2	7.0	7.2	3.7	3.0	0.8	100.0	1,465

Table 1.11: Distribution of households by Sources of cleaning, washing and bathing water, LVWATSAN UIS, Bondo town, Kenya, 2006

		Sources of cleaning/washing/bathing water											Number of households			
		Piped into dwelling	Piped into yard/plot	Don't know	Don't know	Don't know	Unprotected Well	Unprotected Spring	Rain water	Water Vendors	Surface water	Bottled water	Other sources	Don't know	Total	Number of households
Sublocation	AJIGO	0.4				0.4	2.2	0.4	0.7		92.4				100.0	275
	BAR KOWINO-E			4.1	5.1				2.6	1.0	82.6		4.6		100.0	195
	BAR KOWINO-W		2.5	6.6	0.8				2.5	2.5	82.0	1.6	0.8	0.8	100.0	122
	BONDO TOWN	4.0	18.0	59.4	0.8	0.6			1.1	1.0	6.1	0.2	8.8		100.0	522
	NYAWITA	1.6	6.4	31.5	0.3	0.8	0.3		2.1	0.5	55.7		0.5	0.3	100.0	375
Slum condition (without secure tenure)	Slum households	1.1	7.3	29.5	1.5	0.5	0.5	0.1	1.3	0.8	53.2	0.2	4.0	0.1	100.0	1,420
	Non-slum households	18.8	27.5	40.6	1.4				8.7		1.4		1.4		100.0	69
Total		1.9	8.2	30.0	1.5	0.5	0.5	0.1	1.6	0.8	50.8	0.2	3.9	0.1	100.0	1,489

Lake Victoria Water and Sanitation Initiative

Table 1.12: Distribution of households by usual place of bathing, LVWATSAN UIS, Bondo town, Kenya, 2006

		Where usually bathe							Number of households	
		Private bathroom	Private latrine	Public/communal bathroom	Public/communal latrine	Open air	At the stream	Other	Total	Number of households
		Count Percent	Count Percent	Count Percent	Count Percent	Count Percent	Count Percent	Count Percent		
Sublocation	AJIGO	32.7	1.1	6.9		58.5	0.7		100.0	275
	BAR KOWINO-E	33.0	1.0			51.5	4.6	9.8	100.0	194
	BAR KOWINO-W	31.7	0.8			64.2		3.3	100.0	123
	BONDO TOWN	68.4	3.0	20.0	0.6	6.1	0.6	1.3	100.0	525
	NYAWITA	47.4	1.9	4.0		40.7	4.5	1.6	100.0	378
Slum condition (without secure tenure)	Slum households	46.7	1.9	9.5	0.2	36.9	2.2	2.5	100.0	1,425
	Non-slum households	92.9	2.9	4.3					100.0	70
Total		48.9	1.9	9.3	0.2	35.2	2.1	2.4	100.0	1,495

Table 1.13: Distribution of households by Disposal of dirty water, LVWATSAN UIS, Bondo town, Kenya, 2006

		How dispose off water which has been used for cooking						Number of households	
		Disposed into soak-away	Disposed into storm drain	Disposed into street surface	Disposed/carry to garden	Disposed by re-use in washing toilets	Disposed by re-use in mopping floor	Total	Number of households
Sublocation	AJIGO	0.4	0.4	89.3	8.5	1.1	0.4	100.0	272
	BAR KOWINO-E	10.8	0.5	56.7	25.8	6.2		100.0	194
	BAR KOWINO-W	50.4		37.4	11.4	0.8		100.0	123
	BONDO TOWN	31.9	7.5	51.1	0.2	4.2	5.2	100.0	523
	NYAWITA	7.2	2.1	77.0	7.0	3.5	3.2	100.0	374
Slum condition (without secure tenure)	Slum households	17.9	3.3	65.0	8.1	3.1	2.7	100.0	1,416
	Non-slum households	35.7	2.9	48.6		10.0	2.9	100.0	70
Total		18.7	3.3	64.2	7.7	3.4	2.7	100.0	1,486

SANITATION

Table 2.1.: Distribution of households by type of toilet facility, LVWATSAN UIS, Bondo town, Kenya, 2006

		Kind of toilet facility									Totals		Facility location			Number of households with facility
		Flush to piped sewer system	Flush to septic tank	Flush to pit (latrine)	Ventilated Improved Pit latrine (VIP)	Pit latrine with slab	Pit latrine without slab/open pit	Hanging toilet/hanging latrine	No facilities or bush or field	Other	Total	Number	Flush/non-flush to sewage system	In Dwelling-yard-compound	Outside	
Sublocation	AJIGO		0.7		1.8	22.5	29.8	0.7	44.4		100.0	275	25.1	92.7	7.3	151
	BAR KOWINO-E		0.5		4.6	13.3	16.3	0.5	64.8		100.0	196	18.4	98.5	1.5	68
	BAR KOWINO-W		0.8		0.8	22.0	22.8	5.7	48.0		100.0	123	23.6	98.2	1.8	57
	BONDO TOWN	0.9	1.3	0.4	12.1	73.8	7.2		3.8	0.4	100.0	527	88.6	89.3	10.7	505
	NYAWITA	1.1	0.5		6.9	34.5	25.5	2.7	28.6	0.3	100.0	377	42.9	90.7	9.3	258
Slum condition (without secure tenure)	Slum households	0.2	0.6	0.1	6.2	41.5	19.3	1.4	30.5	0.2	100.0	1,428	48.5	90.7	9.3	969
	Non-slum households	8.6	7.1	1.4	24.3	58.6					100.0	70	100.0	98.6	1.4	70
Total		0.6	0.9	0.1	7.0	42.3	18.4	1.3	29.1	0.2	100.0	1,498	50.9	91.2	8.8	1,039

Use of improved sanitation => Number 2

Table 2.2.: Distribution of households by facility status, shared or not, LVWATSAN UIS, Bondo town, Kenya, 2006

		Facility shared	Number of households sharing facility						Facility public or not			Pay to use facility	Facility used day and night	Flush/non-flush to sewage system	Improved sanitation, not shared with 3+...	Payments for use of toilet		Totals	
			Not shared	2	3-5	6-9	10+	DK	Not shared	Private	Semi-private					Don't pay	501-1000	Total	Number
Sublocation	AJIGO	51.0	48.7	12.7	31.3	6.0	1.3		73	76	1	0.0	98.0	25.1	100.0	100.0		100.0	153
	BAR KOWINO-E	14.7	85.3		14.7				58	10		0.0	100.0	18.4	100.0	100.0		100.0	69
	BAR KOWINO-W	15.8	85.7		10.7		3.6		48	7	1	0.0	98.2	23.6	100.0	100.0		100.0	63
	BONDO TOWN	82.2	17.7	8.7	31.0	23.1	18.7	0.8	89	379	35	0.2	97.8	88.6	100.0	99.8	0.2	100.0	506
	NYAWITA	50.4	49.2	8.6	30.5	9.0	2.7		126	128	2	0.0	97.3	42.9	100.0	100.0		100.0	268
Slum condition (without secure_tenure)	Slum households	65.3	34.5	8.0	30.8	15.4	10.9	0.4	332	592	39	0.1	97.9	48.5	100.0	99.9	0.1	100.0	989
	Non-slum households	11.4	88.6	11.4					62	8		0.0	97.1	100.0	100.0	100.0		100.0	70
Total		61.7	38.1	8.2	28.8	14.3	10.2	0.4	394	600	39	0.1	97.9	50.9	100.0	99.9	0.1	100.0	1,059

Use of improved sanitation => Number 2

Table 2.3.: Distribution of households by facility status, shared or not, LVWATSAN UIS, Bondo town, Kenya, 2006

		Mixed facility	Number of households with women and with shared toilet	Children under 5 using same facility	Number households with facility and kid <5	Stools of young children							Number of household with Kids <3
						Child use toilet	Thrown into toilet	Thrown outside the yard	Thrown into garbage	Buried outside the yard	Not disposed	Other	
													1.00
Sublocation	AJIGO	100.0	73	20.4	49		97.4			2.6			39
	BAR KOWINO-E	90.0	10	3.3	30	22.6	77.4						31
	BAR KOWINO-W	87.5	8	5.6	36	71.8	28.2						39
	BONDO TOWN	95.1	411	9.6	230	1.5	96.6			1.0	0.5	0.5	205
	NYAWITA	97.7	128	11.0	91	2.4	81.2	1.2	1.2	7.1		7.1	85
Slum condition (without secure tenure)	Slum households	96.1	622	9.6	406	10.7	84.3	0.3	0.3	2.4	0.3	1.9	375
	Non-slum households	87.5	8	20.0	30		100.0						24
Total		96.0	630	10.3	436	10.0	85.2	0.3	0.3	2.3	0.3	1.8	399

Use of improved sanitation => Number 2

Table 2.4.: Distribution of households by facility hygiene status, LVWATSAN UIS, Bondo town, Kenya, 2006

		Facility cleaned	Frequency of facility clean						Sanitation facility drain					Facility make problem	Facility make problem		Place of hand washing	Number of households with facility
			Never	Daily	Several times week	At least once a week	Less once a week	DK	Soak-away	Cesspit	Septic system	Public covered sewer	Other		Pooled sewage around house	Bad smell		Number
																		Number
Sublocation	AJIGO	49.0	3.9	42.9	22.1	29.9	1.3		74.8	1.3	0.7		23.2	6.6		100.0	2.0	151
	BAR KOWINO-E	13.2	10.0	30.0	40.0	20.0			76.5	2.9	5.9		14.7	13.2		100.0	1.5	68
	BAR KOWINO-W	10.5	25.0	62.5	12.5				94.7				5.3	1.8		100.0	0.0	57
	BONDO TOWN	76.0	7.5	67.1	11.8	12.3	0.7	0.7	96.0	0.8	1.8	0.2	1.2	11.5	6.9	93.1	4.8	505
	NYAWITA	39.5	18.0	38.3	24.2	18.8	0.8		85.5	1.6	0.8	1.6	10.5	7.8	5.0	95.0	3.5	258
Slum condition (without secure tenure)	Slum households	58.5	9.4	58.1	16.0	15.2	0.8	0.5	90.2	0.8	0.7	0.3	8.0	9.7	4.3	95.7	2.5	969
	Non-slum households	11.4	11.1	33.3	11.1	44.4			72.9	5.7	12.9	2.9	5.7	5.7	25.0	75.0	18.6	70
Total		55.3	9.4	57.7	16.0	15.6	0.8	0.5	89.0	1.2	1.5	0.5	7.8	9.4	5.1	94.9	3.6	1,039

Use of improved sanitation => Number 2

Table 2.5.: Distribution of households by waste disposal, LVWATSAN UIS, Bondo town, Kenya, 2006

		How dispose off waste that is not composted									Neighbourhood smoke, bad smell	Totals
		Collected by local government	Collected by community association	Collected by private company	Dumped in the yard	Dumped in the street	Dumped in the latrine	Burnt in the open	Buried	Other		Number
Sublocation	AJIGO		0.4	0.4	56.7	19.3		20.0	0.4	2.9	8.0	275
	BAR KOWINO-E		0.5		18.4	32.7		28.1	12.2	8.2	12.2	196
	BAR KOWINO-W				22.0	26.8		48.8	1.6	0.8	10.6	123
	BONDO TOWN	0.8			15.6	30.4	2.3	41.1	4.4	5.5	13.7	527
	NYAWITA		0.3	0.3	31.6	32.4	1.3	26.5	1.6	6.1	7.9	378
Slum condition (without secure tenure)	Slum households	0.3	0.2	0.1	28.7	29.9	1.1	30.7	3.7	5.3	10.6	1,429
	Non-slum households				14.3	8.6	1.4	68.6	4.3	2.9	12.9	70
Total		0.3	0.2	0.1	28.1	28.9	1.1	32.5	3.7	5.1	10.7	1,499

Use of improved sanitation => Number 2

Table 3.1.1: Distribution of children with Diarrhea and ARI in the last two week by housing components, LVWATSAN UIS, Bondo town, Kenya, 2006

		Had diarrhea in last two weeks		Received fluid from ORS packed	Recommended homemade fluid	Prepackaged ORS fluid	Other fluid	All children
		diarrhea	Number	ORS	hmadef	pre_ors	otherf	Number
Sex	Male	19.8	162	53.1	34.4	6.3	0.0	32
	Female	18.2	148	48.1	37.0	7.4	7.4	27
Age of child	< 6 months	17.6	34	66.7	16.7	0.0	0.0	6
	6-11 months	21.7	46	20.0	40.0	10.0	10.0	10
	12-23 months	24.6	69	58.8	35.3	5.9	0.0	17
	24-35 months	22.5	71	50.0	31.3	12.5	6.3	16
	36-47 months	14.3	49	71.4	57.1	0.0	0.0	7
	48-59 months	7.3	41	33.3	33.3	0.0	0.0	3
Mother's/Caretaker's Education	Primary	18.3	218	52.5	40.0	10.0	5.0	40
	Secondary	19.8	81	56.3	25.0	0.0	0.0	16
	Higher	33.3	3	0.0	0.0	0.0	0.0	1
	Non-standard curriculum	0.0	1					0
Slum condition (without secure tenure)	Slum households	19.5	298	50.0	36.2	6.9	3.4	58
	Non-slum households	8.3	12	100.0	0.0	0.0	0.0	1
Sub-location	AJIGO	28.6	28	25.0	50.0	0.0	0.0	8
	BAR KOWINO-E	27.3	44	41.7	25.0	8.3	8.3	12
	BAR KOWINO-W	11.1	18	0.0	100.0	0.0	0.0	2
	BONDO TOWN	17.7	158	60.7	25.0	3.6	3.6	28
	NYAWITA	14.5	62	66.7	55.6	22.2	0.0	9
Total		19.0	310	50.8	35.6	6.8	3.4	59

Table 7.4: Prevalence of Orphanhood, LVWATSAN UIS, Bondo town, Kenya, 2006

		One or both parents dead	Mother and Father both dead	Mother dead (or both dead)	Mother dead, Father alive	Father dead (or both dead)	Father dead, Mother alive	Number of children
Sex	Male	15.7	4.0	5.1	1.1	14.6	10.6	1,263
	Female	18.8	4.4	7.0	2.6	16.2	11.8	1,246
Age	0-4 years	7.4	0.5	0.8	0.3	7.2	6.7	779
	5-9 years	21.4	4.3	7.2	2.9	18.5	14.2	724
	10-14 years	31.0	9.8	13.0	3.2	27.8	18.0	713
	15-17 years	0.0	0.0	0.0	0.0	0.0	0.0	297
Age	<2	5.1	0.0	0.0	0.0	5.1	5.1	311
	2-4 years	9.0	0.9	1.3	0.4	8.5	7.7	468
	5-9 years	21.4	4.3	7.2	2.9	18.5	14.2	724
	10-14 years	31.0	9.8	13.0	3.2	27.8	18.0	713
	15-17 years	0.0	0.0	0.0	0.0	0.0	0.0	297
Sublocation	AJIGO	22.2	8.7	9.9	1.1	21.1	12.4	436
	BAR KOWINO-E	20.3	6.5	8.9	2.5	17.8	11.4	325
	BAR KOWINO-W	24.8	4.3	5.6	1.3	23.5	19.2	234
	BONDO TOWN	8.5	1.4	1.7	0.3	8.2	6.8	879
	NYAWITA	21.6	3.8	8.0	4.2	17.4	13.6	639
Slum condition (without secure tenure)	Slum households	18.0	4.3	6.2	1.9	16.0	11.7	2,377
	Non-slum households	5.1	2.2	2.2	0.0	5.1	2.9	136
Total		17.3	4.2	6.0	1.8	15.4	11.3	2,513