

# Environment and Health International



*Magazine of the International Federation of Environmental Health*



# INTERNATIONAL FEDERATION OF ENVIRONMENTAL HEALTH

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Cover Photograph:

*Vancouver - venue for Council Meeting in 2005  
and 2010 World Congress*

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**Many thanks to all contributors to this  
issue of Environment and Health  
International**

**Deadline for submission of articles for the  
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1st February 2006**

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## PRESIDENT'S COMMENTS

**Jerry Chaka**

Two Board of Directors' meetings have been held since the beginning of this year. The first was held in Dublin, Ireland in January and the second meeting was held at Chadwick Court, London, in June.

The Dublin meeting afforded members of the Board of Directors an opportunity to conduct an inspection in loco of the Trinity College, venue for the 9th IFEH World Congress. The meeting also enabled EHOA colleagues to brief the Board about progress made thus far regarding preparations for the World Congress. Preparations are advancing well and the venue is conducive for the hosting of the World Congress. Member organizations are requested to market this World Congress in their respective countries to ensure its success. Bids will be invited during the Vancouver Council meeting for the 2012 World Congress, which will be considered in June 2006 during the Dublin Council meeting. Member organizations that intend to host the 2012 Congress are urged to prepare their bids in line with IFEH policy.

A project is underway to reconstruct our website to be more user friendly and to be on par with other well developed websites. The Danish Association, FMK, have signed an agreement with a consultant, on behalf of IFEH, to assist us in the reconstruction. The work of the consultant will be supervised by the Webmaster. It is my belief that all member organizations should make inputs regarding the reconstruction, so that IFEH has a product that will be suit its needs. We will ensure that we have a system in place that will allow all to input in the process. Ray Ellard will co-ordinate this work on behalf of the Board.

The German Association of Food Control Officers, BVLK, continue to represent us in the Codex Alimentarius Commission. The Hon. Secretary sent a note to all full member organizations and associate member organizations to identify individuals who could assist us in terms of contributing to the Commission work. The view is that the contributions will be made electronically and that no expenses be paid to the volunteers. It is critical for us to contribute, in the interest of

global health. All member organizations are urged to participate. More IFEH participation will enhance our influence on the work of the Commission

I had the opportunity of attending the 15th Biennial Conference of the Association of Public Health Officers of Kenya held on 17-20 August 2005 at Mombasa, Kenya. The Conference was the largest gathering of environmental health professionals I have ever attended, slightly over a thousand delegates. The conference was also attended by the Zambian Association, ZIEH, the Tanzanian Association, CHAMATA, the African American Association of Environmental Health and the Northern Center of CIEH, represented by Les Milne. The Africa Group managed to have their meeting during the conference. The conference, with the theme 'Enhancing a healthy environment' addressed a number of topical issues pertinent to environmental health services delivery, namely health law enforcement in substance abuse, radioactivity, contamination of food, food handlers transmittable diseases, Malaria situation in Kenya, sanitation and waste, emerging and re-emerging diseases, etc. A representative of the Deputy President of Kenya opened the conference and the closing address was given by the Assistant Minister of Health. The conference was a resounding success and it was worth attending. My gratitude goes to the leadership of the Association of Public Health Officers (Kenya) and the conference organizing committee for the well organized conference.

The Africa Group resolved to hold an all Africa conference on environmental Health in Nairobi, Kenya, in 2007. The aim is to attract as many African countries as possible to this conference through the African Union Health desk and the Afro WHO office, to share African problems related to environmental health and to develop a common way of resolving these problems. It is hoped that many African countries will be recruited to join IFEH at this meeting.

Let us all make the growth of IFEH our concern. Cavett Roberts wrote 'True success is a journey, not a destination'. We all have to take this journey to achieve a successful well represented IFEH.

# **INDUSTRIAL SOLID AND LIQUID WASTE POLLUTION IN THE LIMBE RIVER, MALAWI.**

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## **ABSTRACT**

Waste from commercial centres and industry in Blantyre, often lands in the Limbe River in Malawi. During a three-month period, on five separate occasions, five industries and three commercial centre clusters had water samples ( $n = 330$ ) collected from solid and liquid waste polluted sites along the Limbe river in Blantyre. Analyses were conducted for phosphates, nitrates, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total coliform count and total dissolved solids (TDS). In general, sample results showed no statistical significant difference between mean influent and effluent phosphate and nitrate concentrations. High BOD's were recorded in industrial waste polluted samples, and total coliform concentrations did differ significantly between influent and effluent in different areas, (with commercial centre clusters showing relatively higher mean total coliform concentration in all clusters). Highly significant statistical differences ( $p < 0,05$ ) between mean influent and effluent COD concentrations were also demonstrated for 80% of the industries.

With regard to TDS concentrations which were obtained from commercial water sampling points, results from 7% ( $n=2$ ) of the industries involved illustrated values higher than the established WHO and Malawi water quality guidelines of 500 mg/l. Therefore, although nitrate and phosphate pollution does not seem to pose a serious problem, the pollution of the water of the Limbe river as a result of poor waste management at industries and commercial sites

along the river, is clearly demonstrated by research findings.

Based on these findings an integrated waste management system is therefore recommended for the City Council of Blantyre in order to reduce further waste pollution of the Limbe river.

## **INTRODUCTION**

In Malawi's urban centres, as a result of industrial growth and street vending, there is an increase in waste production. Such waste eventually finds its way into urban water bodies- leading to pollution thereof. The literature provides that in Malawi waste management which encompasses waste generation, storage, collection, transportation, treatment and disposal is far behind as compared to the cities of the neighbouring countries of Zimbabwe and Zambia (Yap, 1999. Matope, 1999., Chinyama & Madhlopa, 1999).

The latest data on amount on waste generation for the city of Blantyre indicate that 0.37 kg of waste is generated per person per day (Blantyre City Council, 1995). Considering the population of Blantyre which is at 640,000 (National Statistical Office, 2000), it means that over 237 tonnes of waste is being generated everyday, out of which 12% is said to be dumped into the city's rivers. Waste collection in both industrial and commercial centres is less than 11% of the total amount of waste generated. There was a drop of 89% in waste collection vehicles provided by the Blantyre City Assembly between 1994 and 1999 whereas vehicle breakdown was estimated to be 50% per week (Blantyre City Council, 1995, Matope, 1999).

Concentrations of inorganic nutrients (phosphate and nitrate), Biological Oxygen Demand (BOD), microorganisms, Chemical Oxygen Demand (COD) and Total Dissolved Solids (TDS) in the rivers of Blantyre city prevail in mild and serious forms (Matope, 1999). Phosphate and nitrate concentrations of 2.20 mg/l and 4.2 mg/l respectively (phosphate greater than the established WHO and Malawi water quality guidelines) have been reported on the Limbe river while BOD and microbiological concentrations have been attributed to both waste and sewage discharges. In the case of COD and TDS, values of more than 250 mg/l and 500 mg/l respectively (recommended WHO and Malawi values), have

also been documented (Mvuma, 1994). This study was conducted to determine the level of pollution of the Limbe river due to commercial and industrial waste and further recommend the development of an integrated waste management system for the city of Blantyre so that further pollution of the river could be averted.

## MATERIALS AND METHODS

The study was done on the Limbe River in Blantyre City, Malawi, a country in the southern hemisphere. The river runs along the industrial and commercial centres of the Limbe Township.

Water samples ( $n = 330$ ) were obtained from the river at: three commercial centre clusters within the vending community and five industrial sites along the Limbe river. In the case of the commercial centre, three clusters were identified based on the location of the solid waste holding point and liquid waste discharge points close to the river and believed to be polluting the river water. The clusters were subsequently named as: City Assembly Waste Holding Cluster (C1), Vendors' Cluster (C2) comprising second-hand clothes, groceries and hardware vending activities and Restaurant Cluster (C3). With regard to industries, five industries i.e. Royale Chemicals (RC), Grain and Milling (G&M), Lever Brothers (LB), Kadewere Garage (KG) and Motor Care Garage (MCG) were randomly selected from a population of 12 industries. From each industry, a site was identified where solid or liquid waste was being discharged either directly or indirectly into the river.

At each commercial centre cluster and industrial site, two water-sampling points were identified. Water samples were then collected upstream and downstream, i.e. before and after waste discharges into the river and they were respectively named as influent and effluent water samples. The samples were collected, transported and analysed using the standard methods for phosphate (Ammonium Molybdate spectrometer), nitrate (Sulfosalicylic acid), BOD (Electrochemical Probe), COD (British International standard 6068), total coliform (Detection and enumeration of coliform organisms: thermotolerant and presumptive) and TDS 2540c (APHA, 1995., Argent et al, 1991. BSI, 1988., Lewis, 1987).

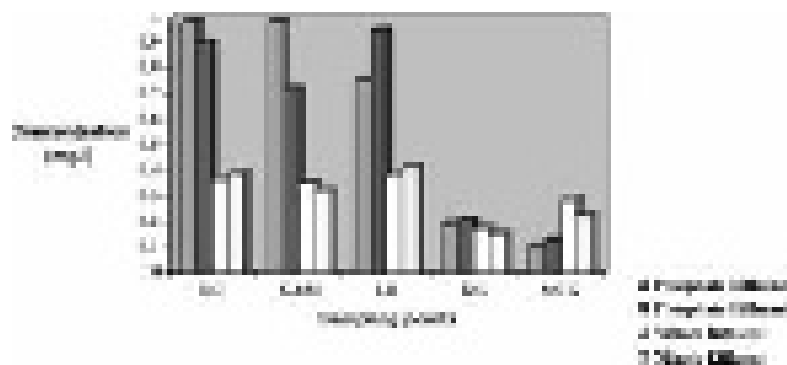
Samples for phosphate and nitrate analysis were collected from industrial waste polluted sites while TDS analysis was done on commercial waste polluted samples. In the case of total coliform count, only ten samples were collected from the industries.

Data for the analysis of the differences between the mean influent and effluent concentrations at each sampling point were obtained by a parametric paired t-test using the SAS program. Levels of  $p > 0.05$  were taken to be non-significant. In the case where the t value was negative, it was concluded that the mean influent concentration was greater than the mean effluent concentration. As for the calculation of phosphate and nitrate concentrations, regression equations were developed using both SAS and Epi-Info programs (CDC, 1994). Concentrations were used to evaluate the level of pollution for all the parameters measured. Comparisons were made between influent and effluent concentrations at each sampling point. A higher effluent concentration meant that waste pollution had occurred at that particular sampling point.

## RESULTS

The presence of phosphate and nitrate influent and effluent concentrations from the industrial sites are shown in figure 1. Mean influent phosphate concentrations ( $n = 25$ ) ranged from 0.11 mg/l to 0.98 mg/l while mean effluent phosphate concentrations ( $n=25$ ) ranged from 0.13 mg/l to 0.95 mg/l. In the case of nitrate, mean influent concentrations ranged from 0.17 mg/l to 0.38 mg/l. No statistical significant difference was found between mean influent and effluent concentrations for both phosphate and nitrate. However, 60% and 40 % of the industries depicted higher effluent phosphate and nitrate concentrations respectively.

Figure 1





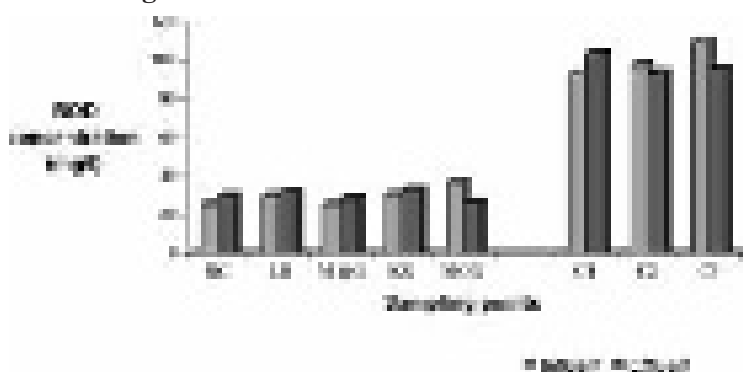
Influent and effluent water samples (n = 80) from both commercial centre clusters and industrial sites were collected and processed for BOD concentrations. Of the commercial clusters, 33% reported high effluent BOD concentrations while 80% of the industrial sites showed high effluent BOD values (Figure 2). The Blantyre City Waste holding Cluster showed a high statistical significant difference between its mean influent and effluent concentrations ( $p=0.0320$ :  $df = 4$ ). As summarised in Table 1, a high statistical significant difference between mean influent and effluent concentrations in the industrial samples was observed at Lever Brothers ( $p = 0.0349$ :  $df=4$ ).

**Table 1: Statistical summaries of mean influent and effluent BOD concentrations from both commercial and industrial waste polluted sites**

Sampling point	df	Mean influent (mg/l)	Mean effluent (mg/l)	t	p-value
Royale Chemicals	4	26	30	1.38842	0.2373
Grain & Milling	4	26	29	1.094887	0.3351
Lever Brothers	4	30	32	3.137858	0.0349*
Kadewere Garage	4	31	33	0.740233	0.5003
Motor Care Garage	4	37	27	-4.70415	0.0093
Waste Holding Point	4	93	104	3.229711	0.0320*
Vendors Cluster	4	98	99	0.374701	0.7269
Restaurant Cluster	4	110	96	-3.23748	0.0317

\* High statistical significance

**Figure 2**



The mean effluent COD concentrations in most samples were high, with 67 % (2 of 3) of the commercial centre clusters and 100% of the industries having high effluent concentrations. The highest concentrations were observed in industries whose waste was discharged into the river directly. A high statistical significant difference between mean influent and effluent COD concentration was shown in 60% of the industries whilst commercial waste sampling points showed a high statistical significant difference ( $df = 4$ ;  $p = 0.0094$ ) between mean influent and effluent concentrations at only one cluster. (Table 2).

**Table 2: Statistical summaries of mean influent and effluent COD concentrations from both commercial and industrial waste polluted sites.**

Sampling point	df	Mean influent (mg/l)	Mean effluent (mg/l)	t	p-value
Royale chemicals	4	179	182	0.329513	0.7583
Grain & Milling	4	179	203	3.91625	0.0173*
Lever Brothers	4	194	223	4.71624	0.0092*
Kadewere Garage	4	207	228	4.41276	0.0116*
Motor Care Garage	4	232	246	2.155132	0.0974
Waste holding point	4	251	264	1.4498067	0.2085
Vendors cluster	4	251	268	4.688423	0.0094*
Restaurant cluster	4	285	280	-0.24766	0.8166

\* High statistical significant difference

Total coliform concentrations in the samples were consistently high in all cases (Table 3) However, the concentrations from the industrial waste polluted sampling points were lower than those of commercial waste polluted samples with a mean maximum of  $23 \times 10^5$  cfu/10ml. The situation regarding samples from commercial sampling points however, was different. An extreme value of  $101 \times 10^5$  cfu / 10ml (exceeding the WHO and Malawi drinking water quality guidelines of 0 cfu /10ml and 5 cfu /10ml respectively) was recorded at Restaurant cluster.

**Table 3: Statistical summaries of mean total coliform concentrations from both industrial and commercial waste polluted sites.**

Site	Sample Size (n)	Range (cfu/10ml)	Variance	S.D	Mean (Cfu/10ml)
Industrial In	5	(7; 20)x105	448x105	669328.02	18x105
Industrial Ef	5	(5; 23)x105	565x105	7516664.82	18x105
BTCity Ass In	5	(20; 37)x105	737x105	8564487.04	27x105
BTCity Ass Ef	5	(18; 42)x105	76x105	871779.79	32x105
Vendors Cluster In	5	(21; 44)x105	1.012x105	1005982.11	33x105
Vendors Cluster Ef	5	(26; 50)x105	1.287x105	1134460.22	35x105
Restaurant Cluster In	5	(18; 94)x105	1.4622x105	3823872.28	50x105
Restaurant Cluster Ef	5	(20; 101)x105	9.573x105	3094026.50	50x105

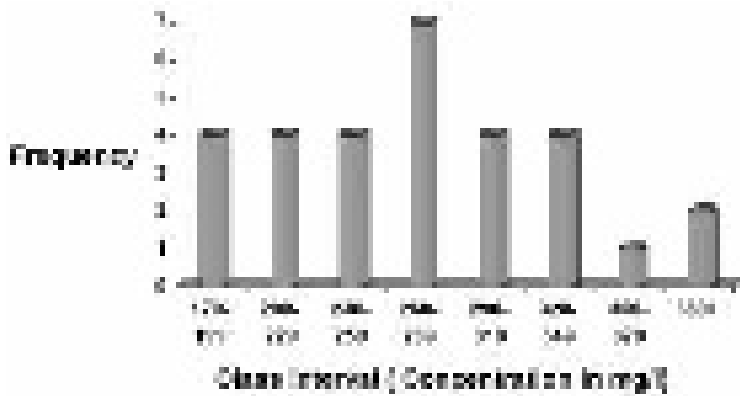
In = Influent

Ef = Effluent

BTCity Ass = Blantyre City Assembly waste holding point

Results with regard to TDS concentrations were only obtained from commercial water sampling points. The mean concentrations ranged between 179mg/l and 662 mg/l. Only two samples showed COD values which were higher than the established WHO and Malawi drinking water quality guidelines of 500mg/l (APHA, 1995.,Mvuma, 1994), the highest having been recorded at Vendors cluster, specifically the Day 4 sample. Day 4 and 5 samples provided expected results, i.e. effluent concentrations being higher than influent concentrations (Figure 3).

Figure 3



## DISCUSSION

In Malawi, as in most developed countries urban river pollution is positively associated with waste discharges. The present study, however, suggests that the degree of pollution differs according to the type and composition of the waste. Industrial waste has been found to significantly increase the level of BOD, phosphate and COD pollution. On the other hand commercial waste has been attributed to high BOD, TDS and total coliform concentrations (Chinyama & Madhlopa, 1999).

The mean effluent phosphate concentrations for the industries included in the study period were higher than the mean influent phosphate concentrations, results that are similar to those conducted by other researchers (Harding, 1992, Koning & Roos, 1998). One of the samples collected after a heavy downpour depicted an extremely high phosphate concentration (1.28 mg/l). In addition to industrial waste discharges, other sources like fertiliser washed from nearby maize fields and human waste could have contributed to this high phosphate level. However, this maximum phosphate concentration was lower than that detected by Mvuma (1994) on the same river. The high values detected by Mvuma could have been due to discharges of phosphate from rainfall runoff since some of his samples were collected during the rainy season. This, together with the fact that effluent phosphate concentrations exceeding the acceptable standard set by WHO of 0.1mg/l were detected leads to the conclusion that phosphate pollution does occur in the Limbe river.

In regard to nitrate, most of the effluents depicted low values. Only Lever Brother's effluent samples were shown to be higher than the influent samples. It was observed that the liquid waste from this industry was rich in foam, and this was

attributed to detergents. Soap, oils and households chemicals are some of the products that are manufactured at this industry. These, therefore, could have contributed to the high nitrate concentrations. The non-significant difference between all the mean influent and effluent samples and the low concentrations which were less than the established WHO and Malawi drinking water quality guidelines of 10 mg/l, lead to a conclusion that nitrate pollution is not a serious problem in the Limbe river.

There appeared to be a little difference between the mean influent and effluent BOD concentrations for commercial waste polluted water samples. Only Blantyre City waste holding cluster might have contributed to waste pollution as evidenced from its high effluent concentrations. At this cluster, there were over-filled refuse skips whose wastes were being blown into the river. Sewage from a broken sewer-line was also observed to be spilling into the river. The above sources therefore, could have contributed to the high effluent BOD concentration. In the case of Restaurant cluster, lower effluent concentrations were demonstrated, contrary to the expectations. At both sites illegal toilets and broken sewer lines were observed near the influent sampling point and these could have contributed to the high influent values. It was therefore, difficult to attribute the pollution from direct commercial vending activities. Surprisingly, most of the industrial effluents (80%) had higher values than the influent. One would expect fewer BOD's in industrial waste as compared to commercial waste polluted water samples. BOD is often associated with organic waste and therefore, it could be said that the industrial wastes were rich in organic waste.

In contrast to the BOD, COD concentrations recorded for the Limbe river during the study period showed a marked increase for both industrial and commercial sites with most of the industrial sites (60%) depicting a statistically significant difference between influent and effluent concentrations. The study results are also in agreement with those of Mvuma (1994). Although most of the results in this study indicated COD levels of <250 mg/l, the WHO recommended drinking water quality guidelines, it can be concluded that industrial wastes are polluting the Limbe river. Most industrial activities generate more inorganic wastes like oils, acids and grease and these could be attributed to

the high COD results. In the case of the commercial site, the high COD results at the Vendors cluster could be from hardware vendors who are very much involved in selling second-hand car spare parts which contain oils, acids and grease.

Total coliform results were consistently high in all cases. However, the concentrations from the industrial waste polluted sampling points were lower than those of commercial waste polluted samples with a mean maximum of  $23 \times 10^5$  cfu/10ml. All the effluent samples were extremely high (above the recommended WHO and Malawi values of 0 FC/ 100ml and 50FC/100ml for drinking water) especially at Restaurant cluster where a mean maximum concentration of  $101 \times 10^5$  cfu/10ml was recorded on Day 4 sample. Previous researchers on the same rivers and in other countries reported results which are similar to the current studies (Wyer *et al*, 1998., Mvuma, 1994). The presence of total coliform and *E. coli* which are not generally harmful themselves indicate that other harmful bacteria could be present in waste polluted river waters. The high values depicted in this study, therefore, lead to a conclusion that the water in the Limbe River is heavily contaminated with harmful micro-organisms. No wonder that during the rainy season, some of the communities, which heavily depend on its water, are infected by cholera.

Total dissolved solids are primarily cations of magnesium, sodium, potassium, phosphate and nitrates and anions of bicarbonate, carbonates, sulphate and chloride being present in surface waters (United States. Geological Survey, 1990). These concentrations in surface water would mostly be due to human activities such as cultivated fields which can increase levels of potassium in surface water as a result of runoff containing ions from fertilisers as well as water from industrial and public wastewater treatment facilities. In general, the results fell within the same range as those reported on the same river from June to August 1993-1994 by Mvuma (1994). In studies conducted on surface waters of the Kansas, West Fork Big Blue, Black Vermilion and Delaware rivers in the United States, by United States. Geological Survey (1990), TDS concentrations of 340, 120, 150, 200 and 270 mg/l were respectively reported and the results correspond with the findings of the present study. However, in the study carried out in twenty streams in Piedmont in United States (United

States. Geological Survey, 1990), Total Dissolved Solids (TDS) concentrations ranged between 15 and 61 mg/l and these results were lower than those reported for the present study. High values in the current study could be attributed to the already mentioned human wastes. In developed countries urban sanitation is highly advanced as opposed to urban developing countries like Malawi.

The higher TDS reported for Day 4 and 5 commercial waste polluted samples could be due to a heavy storm runoff that washed away pollutants from the commercial area and discharged them into the river. Phosphate and potassium from fertiliser washed from the maize fields established along the riverbanks could further have contributed to the high levels of TDS. This scenario is supported by the fact that samples from the Vendors cluster showed the highest TDS concentrations and grocery vendors from this cluster were found selling pre-packed fertiliser sachets. The incineration of solid waste produces ash, which if it is released into water bodies, can increase the total dissolved solids (United States. Geological Survey, 1990). Some of the waste discharges produced by the vendors were being treated by incineration and eventually disposed of near the river.

It should be noted that this was an academic study that was faced with a lot of limitations. In some circumstances sample collections like phosphate and TDS were limited to one source because of financial problems. Samples were also collected during summer (within a short period) when most of the wastes, which could increase pollutants in the samples, were not yet washed into the river by rainfall runoff. Therefore, the results of this study are not exhaustive.

The study has demonstrated that there is massive generation of waste from both commercial and industrial areas, which is poorly managed. As a result, such waste finds its way into water bodies through direct and indirect discharge. The composition thereof is varied and therefore, the degree of pollution of the water of the Limbe river also varies. Inorganic pollution and BOD have been shown to be severe in industrial waste polluted sites. The waste released by vending activities is highly organic in nature and is therefore contributing to high microbiological contamination. The continued discharges of sewage are aggravating the pollution of the river. It is recommended that an integrated waste



management system should be implemented in both industrial and commercial centres. This will include firstly, waste minimisation where industries must control the raw materials, intermediate products, final products and associated waste streams within their premises. They should only purchase materials that will be needed at a specific time. Excessive materials must be disposed of to avoid such materials from becoming expired and eventually becoming unwanted and expensive waste. Stocking of unwanted materials by vendors should also be discouraged. Secondly, city authorities need to encourage the kerbside waste collection system in both industrial and commercial areas. The sorted waste that is recyclable should be placed in a container for easy collection. Introduction of measures that can reduce waste generation can help to make recycling effective. In the long run secondary materials (recyclable) will compete more fairly with original raw materials.

In addition to the above, pollution prevention through rehabilitation of the sewer network which is close to the river, establishment of effluent discharge permits, protection of river catchment and onsite treatment of wastewater should be compulsory for new industries and the level of major toxic substances should be pre-determined.

**Acknowledgements** - Mr Adam and Kumkundi for assisting in sample collection and analysis, Miss Lacante for typing of the manuscript, Drs, Kululunga and Chingakule for professional advice, The University of Malawi for sponsoring the study, and the Tshwane University of Technology (Pretoria, South Africa) for technical assistance.

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# **ENVIRONMENTAL HEALTH CONDITIONS IN LESOTHO PRISONS: THE CASE OF MASERU DISTRICT**

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## **ABSTRACT**

The study was carried out in Maseru District. It was aimed at exploring and describing the environmental health conditions of the prisons in the District. The Central, Female and the Juvenile Prisons were conveniently selected since they are the only prisons in the District. The data were collected using an observation checklist and an interview schedule. Inmates and staff were randomly selected from the stations for interviews. The observations were centred on five areas- dormitories, ablution, toilets, kitchen and dining as well as the surroundings. These were assessed on the basis of cleanliness, number of inmates in cell, the size of the cell, the fitness of the physical structures and state of repair of fittings. The adequacy of both lighting and ventilation as well as the presence of pests was also investigated. The study revealed that, the conditions in the prisons were unsatisfactory more especially at the Central and Juvenile Prisons. However, the conditions at the Female Prison were relatively satisfactory.

## **INTRODUCTION**

Prisons contribute tremendously to the safety and prosperity of society by taking custody of those who contravene the law. While in prison appropriate reformatory measures are put on such outlaws. Even if such persons will have committed crimes, for which punitive measures have to be taken, the physical environment and their general well-being while in prison are very important to their overall health. The primary health care (PHC) concept, which has been adopted by many developing countries advocates for health promotion for all citizens in their countries. Despite the nature and severity of their offences, prisoners remain citizens and their health and environment matter also.

Prisons serve a variety of objectives to different societies. While some are more correctional in their overall philosophy, others are punitive inclined. Levy (1997) documented that incarcerating people means that their personal freedoms are denied - "loss of choice over sanitation, diet, recreation, cellmate to name a few." As crime rates continue to escalate, the capacities of most prisons are limited. The Asian Crime Prevention Forum (1996) observed that there seemed to be a problem of prison overcrowding in many countries today. As a result, there is also a gross inadequacy of essential facilities such as sanitation, water for bathing and washing, medical and recreational facilities. Such a state of affairs was found by Squires (1996) to be a major cause of morbidity and mortality among the prison population.

One of the major tasks of prisons is the rehabilitation of inmates. This led to a change in philosophy from one of punitive to correctional. Through rehabilitation and reformation, prisons seek to rectify the behaviour that led to imprisonment. In order to realize this goal, prison authorities must ensure that the environment is conducive for living in and for health promotion. Haghud, et al.(1996) argued that one's place of residence and the environmental conditions in that place are important in determining one's health.

Environmental health is only one aspect of the integrated health care delivery programme and a component of PHC. The World Health Organization defines it as "the control of all those factors in mans physical environment which exercise or may exercise a deleterious effect on his physical development, health or survival." It is concerned with the detection and control of environmental hazards that affect human health (Basset 1997). It includes among other things: the management of waste, food, sanitation, housing, epidemiological control, occupational health and safety, water quality monitoring and control as well as educational activities. Ehlers and Steel (1950) noted that houses or buildings that have dampness, poor ventilation and overcrowding contribute a great deal to the spread of diseases. These are just some of the problems that can be encountered in a place with poor environmental health conditions.

Pineo, et al. (1981) cited that the unsafe environment is the single greatest barrier to a productive and healthy population. So it is

important for everyone who is involved in penal work to think critically about the environment and health conditions in general, to which offenders entrusted in his/her care are subjected.

The researchers observed among other things that, the number of inmates in prisons in Lesotho is increasing, particularly in the Maseru central prison. This is an indication that in the long run, carrying capacities of the prisons will be exceeded and as a result there will be overcrowding. Through observation and complaints received from inmates, the researchers also gathered that some prisons are infested with rodents, cockroaches and lice. These pests are known for their notorious effects on human health. According to the Mississippi State Health Department (1998), they may bite or sting, contaminate and even transmit infectious diseases. One of the most observable of all things in most prisons in the country is ageing buildings. Some of these buildings were built during the colonial era and may not meet the health standards as required by rule ten of the United Nations (UN) standard minimum rules for the treatment of offenders. This being the case the researchers can hypothetically say that the environmental health conditions in Lesotho prisons are not satisfactory.

The researchers realised that no study has ever been carried out on health related issues in any of the prisons in Lesotho. The researchers also noted that there were reports on prevalent communicable diseases endemic to some prisons in the country. Some of these diseases were tuberculosis, chicken pox, sexually transmitted diseases, as well as diarrhoea especially in summer seasons.

As environmental health professionals, the researchers felt it as an obligation to carry out a study that explored the environmental health conditions inmates are subjected to in the prisons within the Kingdom of Lesotho.

The broad objective of this study was to explore and describe the living conditions prisoners are subjected to in the prisons of Lesotho. The specific objectives were:

- To determine the prisoner population with regard to available space in the cells
- To determine the adequacy and fitness of existing structures for human habitation.
- To assess the hygiene status of yards and surroundings.

- To determine the level of awareness, attitudes and practices of both inmates and staff towards health issues.
- To elicit suggestions on how best the environmental conditions of prisons in Lesotho could be improved.

It was envisaged that the study would benefit the Department of Prisons and the country as a whole, as it would reveal all the existing environmental health conditions in prisons and the problems faced by people living or working therein. Thus the state of affairs is known by the relevant authorities and proper action taken where necessary towards improvement.

It was expected that the findings of this study would be very useful in the prevention of disease in prisons and in preventing prisons from becoming reservoirs of infections which may not only be deleterious to inmates' health but also to that of the entire prison community, families of inmates and the general public.

It was also thought that, the study would provide a good basis for informed decision- making, as it was to provide factual data based on empirical evidence. One of the objectives of the Department of prisons is to make prisons well-ordered communities with no danger to life or health; this study therefore, was envisaged to be a useful tool in the endeavour to achieve this goal.

## LITERATURE REVIEW

Deplorable environmental conditions in prisons have been reported in many countries around the world. As observed by Human Rights Watch (2002) in almost all countries all over the world, prison populations are continuing to rise every day. This rise in number of prisons has resulted in overcrowding in prisons and detention facilities. The report further went on to reveal that inadequate sanitation, lack of medical care and decaying physical infrastructure are some of the major problems existing in prisons.

These harsh prison conditions have been observed in Bolivia (Bureau of Democracy, Human Rights and Labour, 2004). Dissel (1994) revealed that in South Africa up to about 50 inmates were held in dormitories designed for 29 prisoners. She observed that this resulted in the shortage of cell furniture forcing other inmates to sleep on floor mats. Alon (2001) revealed that these deplorable

sanitary conditions were also present in Hasharon detention centre in Israel. He wrote that there were no closets, no ventilation and there was poor lighting. Detainees, he continued, slept on wet mattresses on the floor due to leaking water pipes. In Haiti the conditions were described as “dreadful” (National Coalition for Haitian Rights, 2003). The coalition indicated that in many detention centres of Haiti the cells are lacking in size and light, and that there was not enough water for bathing.

According to Human Rights Watch (2002), the spread of communicable diseases in numerous prison systems was the predictable result of overcrowding, malnutrition, poor ventilation, lack of potable water, inadequate sanitation and lack of medical care. The report also shows that in most prisons including the developed countries health care and medical services were poor to non-existent.

### **Effects of Poor Sanitation**

Mason (2002) observed that about 40% of the world’s population is affected by poor sanitation. He argues that 80% of diseases occurring in most developing countries are due to a synergistic effect of poor hygiene, contaminated water and poor sanitation. Diseases such as dysentery, cholera, typhoid and typhus fever are some of the diseases he said occur as a result of poor sanitation. Poor sanitation has been noticed in prisons (correctional institutions) in some parts of Eastern Europe and was implicated as one of the contributing factors to the occurrence of diseases (Partridge, 1998).

Blackett (1997) observed that sanitation plays a major role in the contamination of food grown in contaminated soil. She argues that although a sustainable water source does reduce the transmission of diseases, the major transmission routes such as via soil and flies cannot be broken down unless faeces are removed from the environment. She further added that adequate sanitation can protect surface and groundwater supplies.

Although the provision of safe water has greatly reduced the incidence of communicable disease, diseases associated with contaminated water still pose a major health risk to most of the world’s population (Warner, 1997). He observed that diseases causing agent can be ingested with drinking water and contaminated food. The ingestion of these faecal pathogens, he claims, can

cause diarrhoeal diseases, cholera, intestinal worm infection and typhoid fever. World Health Organization (1996) supported this and further went on to show that more than 5 million lives are lost every year as a result of illnesses related to unsafe drinking water and poor sanitation. According to Tumwine, et al. (2002) diarrhoea is the main culprit. About four billion cases of diarrhoea occur each year with 2.2 million deaths. Perez and Reddaway (1997) also added that diarrhoeal diseases are the major cause of death in children and warned that adults are also at risk.

Several interventions have been cited by different authors. The promotion of personal and domestic hygiene according to WHO (2002) can greatly reduce the effects of poor sanitation on human health. Other measures cited include washing of hands after defecation and before eating. Carr and Straus (2002) mentioned the importance of personal and domestic hygiene. Awareness creation which involves sanitation education in schools and in adult literacy programmes have been suggested (Shenkut, 1998).

### **Pests and their Health Effects**

The presence of pests in the house has been closely linked with the transmission of pathogens that cause illness in humans. Boulder County Environmental Health Division (2002) noted that rodent fleas play a significant role in the transmission of bubonic plague. Flies, cockroaches, lice, and mites have been implicated in the transmission of diseases. Rosendaal ((1997) observed that mites cause scabies. He continued to say that cockroaches play a significant role as mechanical carriers of intestinal diseases. Diarrhoea, typhoid fever, and cholera are some of the diseases he listed. Cockroaches may also play a role in passing on worms and pathogens of poliomyelitis, hepatitis A and leprosy. Other pests such as bedbugs and head lice, he said, are of lesser importance in the transmission of diseases. However, Rosendaal (1997) indicated that their biting can be a serious nuisance. North Carolina University (2003) added that stinging often affects the comfort and health of people. Bedbugs are also known for their characteristic and unpleasant smell (WHO and UNEP, 1991). The adult when disturbed, the organizations revealed, emits a very bad odour from its stink gland. This unpleasant odour together with the smell of their excreta in damp conditions can lead to discomfort of people in the house.



Rosendaal (1997) observed that allergic reactions and weariness have been reported as a result of toxic saliva that lice inject into human skin. He continued to say that the body louse has a close link with the transmission of trench fever and typhus fever. This was also supported by WHO and UNEP (1991) who reported that infection of louse borne typhus occurs by exposure of wounds or the conjunctiva and mucous membranes to the faeces of body lice. The report also indicated that lice often infect people living in crowded conditions. They said that body lice infestation is usually the result of poor personal hygiene. Other persons in regular close contact with infested persons may also be infested, the report continued.

According to Rosendaal (1997) and WHO and UNEP (1991) flies, because of their high preference for decaying organic material, also pose a major threat to human health. They feed freely on human food and filthy matter and can easily transmit germs carried on their feet to food (Rosendaal). Flies may also cause infection as they also favour moist skin surfaces such as the mouth, sores and wounds (WHO and UNEP, 1991). Enteric infections such as cholera and typhoid fever as well as eye infection like trachoma have been attributed to flies (Rosendaal, 1997 and WHO & UNEP, 1991).

Rats and mice are also among pests of public concern. They have been described by many as reservoirs of infection and also associated with the spread of plague, murine typhus and leptospirosis (WHO & UNEP, 1991). They contend that fleas transmit pathogens from infected rats to people through bites. They also noted that salmonellosis can be transmitted through food contaminated with faeces or urine from infected rats. Illinois Department of Public Health observed that house mice transmit salmonellosis by contaminating food-preparation surfaces with faeces that contain the bacteria. The department also recognized that damage to property and structures can result from their constant gnawing. Fire accidents can also occur as a result of exposed electric wires.

Rodents eat away the insulating material of such wires (Timm, 2004). Washington State University (2002) pointed out that rats and mice have a tendency to infest crowded, unsanitary areas and old buildings, and cited poorly managed waste as the attraction.

### **Effects of Poor Housing**

Several health effects associated with poor housing have been observed by many researchers.

According to Evans and Bennett (1998) there is a direct link between poor housing and illnesses such as respiratory and infectious diseases, psychological problems and accidents. They also point out that poor general health as well as mortality may also result from poor housing. Wilkinson (1999) mentions that home accidents are a leading cause of death and injury especially to young children and the elderly. This has been supported by Brandon (2002) who argues that the inadequate shelter does not only put the quality of life at stake but life itself. He also revealed that one of the major environmental health problems associated with housing is lead poisoning. He said that high levels of lead content in blood were attributable to older housing painted with lead based paints. On the Move Limited (2000) claims that living in damp and cold houses greatly affects people's health. In addition to illnesses cited by Evans and Bennett (1998), On the Move Limited (2000) also mentions other ailments such as heart disease and stroke as well as depression. United Nations (2002) was also in support of the claims made by other authors who linked poor living conditions with poorer health status and increased mortality. Bryant (2004) recognized that shelter is a pre-requisite to health. He pointed out that inadequate housing leads to stress which also affects physical health. Other problems associated with poor housing included dampness in the form of rising or penetrating dampness which can also result from plumbing defects and long-term condensation (Energy Saving Trust, 2004). The Trust continued to show that dampness has a direct link with mould effects. Dust Mites are also known to thrive well in damp and poorly ventilated dwellings. Their faecal pellets, according to the Trust, can lead to and exacerbate respiratory problems. Evans and Bennett (1998) added that dampness also leads to an increased level of fungal spores in the house.

### **Indoor Air Quality**

According to Boston University (Undated) the quality of air we breathe at home and at work has gone largely unnoticed. The University says that people suffer from illnesses and discomfort which are caused or aggravated by poor indoor air quality. The University further states that we breathe in Oxygen and replace it with Carbon Dioxide. This can make occupiers drowsy in poorly ventilated and overcrowded rooms which lack enough fresh air supply to keep the Carbon Dioxide concentration levels low. The University mentions that some materials used in buildings



may contain 'volatile' chemicals that may cause problems such as allergic reactions e.g. Formaldehyde. It also highlighted that excess moisture causes moulds which may cause adverse reactions ranging from eye and sinus irritation to even more pronounced allergic reactions. According to US Environmental Protection Agency, Montana State University and US Agriculture Department (1999) other factors that affect health include temperature, relative humidity, noise, ventilation and lighting, second-hand smoke, radon, mites, mould spores and volatile organic compounds (VOCs). They recommend that humidity should be between 35 and 50%.

Effects of poor indoor air quality were mentioned by EPA et al (1999) and Vesilind (1997), and include irritant or allergic conjunctivitis, dryness and irritation of the throat, rhinitis, chronic sinusitis, rash, asthma, hypersensitivity pneumonitis, headaches, fatigue and poor concentration. They mention that mites may cause allergic rhinitis and asthma while second-hand smoke may lead to increased risk of cancer and other lung infections. Carbon monoxide is said to cause brain damage and heart problems by binding to haemoglobin and thus reducing oxygen that reaches tissues and organs (Vesilind 1997). According to EPA et al humidity as well may lead to growth of moulds and bacteria which can cause diseases. It is mentioned by the Boston University that if indoor temperatures are above comfort zones occupants may feel uncomfortable. This is true even for winter temperatures which are said to dehydrate the skin and mucous membranes causing painful throats and sinuses. The University mentions that other factors that can contribute to poor indoor air quality include improper workplace design and poor or inadequate lighting.

## Problems Associated with Overcrowding

Many authors have highlighted a number of problems brought about by overcrowding in dwellings. (WHO, 1993) revealed that overcrowding increases the risk of infections and respiratory diseases. Bandon (2002) observed that overcrowding increases and also exacerbates most respiratory infections. Overcrowding also has been linked with mental health problems (Marshy, 2003). According to The John Howard Society of Alberta (1996) overcrowding has been closely linked with stress in inmates. The society contends that withdrawal, aggression or depression may be

the result of trying to deal with stress. The report also showed that overcrowding resulted in illness complaints and high blood pressure. Higher rates of suicide and other forms of violent deaths have been found in overcrowded prisons. It continued to say that overcrowding creates competition for limited resources and increased recidivism. Overcrowding is thought to increase vulnerability to airborne infections (Brandon, 2002). He also showed that enteric diseases occur very frequently in overcrowded houses. Health problems such as malaria, tuberculosis and others mentioned earlier were observed in many houses in Dar Es Salaam (Lugalla, 2000). Lugalla claimed that there is a close link between overcrowding and the above-mentioned health problems. He continued to indicate that respiratory problems have been associated in many studies, with overcrowding and inadequate ventilation. He contended that overcrowding is a health hazard as it assists the easy transmission of communicable diseases.

Marshy (1999) observed quite a number of problems associated with overcrowding. He indicated that overcrowding puts a burden on toilets and kitchens and causes rapid deterioration of such facilities thus increasing health risks. He said the increased risk is mainly due to unhygienic conditions resulting from being overcrowded. Psychological effects are also very much noticeable in overcrowded places, he concluded.

## METHODOLOGY

The study was carried out in the Maseru district at Central prison, Female prison and Juvenile Training Centre (JTC). Maseru, besides being one of the ten districts is also the capital city of Lesotho. This study adopted an exploratory and descriptive quantitative approach in which the researchers merely explored and described the environment within which prisoners in Lesotho live. According to Burns and Grove (1997) quantitative research is a formal, objective, systematic process in which data are used to obtain information. This type of study is conducted to describe and examine relationships, and determine causality among variables

Mouton (1996) wrote that an exploratory study is that which seeks to establish a new explanation about a given situation or phenomenon. He further added that "it is a study that breaks new ground." It is applicable in this study since prisons in Lesotho have hitherto enjoyed very limited attention in so far as research is concerned.

Moreover no such study has ever been carried out in the country, and to the researchers' knowledge no such study was done in any of the neighbouring countries.

Descriptive studies according to Selltitz et al. (1976) and Burns and Grove (2001) present accurately a portrayal of characteristics of a particular situation. Burns and Grove also added that this type of a study generates new knowledge about topics with limited or no research having been conducted before. Because there is very little known about environmental health conditions in prisons the researchers saw fit to use a descriptive approach in conducting this study since they want to generate new information and describe the existing conditions.

As observed by Okolo (1990) and Brownlee et al. (1984) there are two basic sampling methods: Probability sampling method and non probability sampling method. In probability sampling, the chances that an element in a target population will be selected are known. As a result, the sample is representative of the population. It includes simple random sampling, systematic sampling, stratified random sampling and cluster or area random sampling (Oyster, 1987). Conversely, in non-random sampling the chances that an element in a target population will be selected are unknown. Therefore the sample is not representative of the population. It includes among others accident or convenience sampling, network or snowball sampling, purposive or judgement sampling as well as mixed sampling design.

The juvenile training centre, female prison and central prison were conveniently chosen for the mere fact that they were the only prisons in Maseru. One hundred and one inmates were randomly selected at central prison, ten from Juvenile training centre and six from female prison. Eleven staff members were selected from central prison, three from juvenile training centre and four from female prison.

The researchers together with four assistants administered the collection tool. Each station was given at most two days of data collection. The first day was for interviews and the second one for an inspection tour. The data was collected using two interview schedules, one for inmates and the other for staff members, and an observation checklist. The data collected from central prisons was marked by the letter C, that

from Juvenile training centre was marked JTC, female prison marked F.

The identity of all respondents was concealed. Care was taken to ensure that after the interview even the researchers' were unable to match notes taken during the interview with the interviewees. The collection tool was pre-tested in the Sidwashini correctional institution in Swaziland with the aim of determining its validity and reliability. The data were analysed using SPSS computer programme.

## RESULTS, DISCUSSION AND INTERPRETATION

### Inmates' responses.

All the respondents (100%) reached at central prison were males. The same applies to Juvenile Training Centre. The results agree with the expected outcome as both of them are male institutions. A similar situation was noticed at female prison where all respondents were females as expected.

**Figure 1**

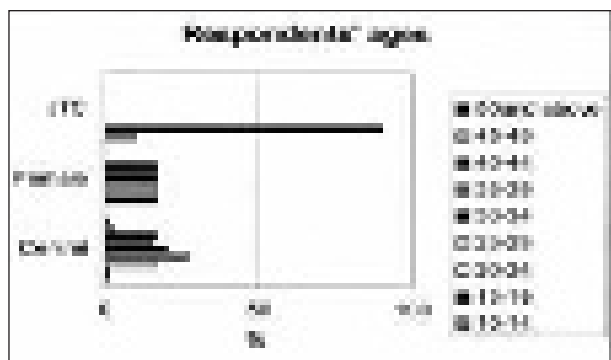
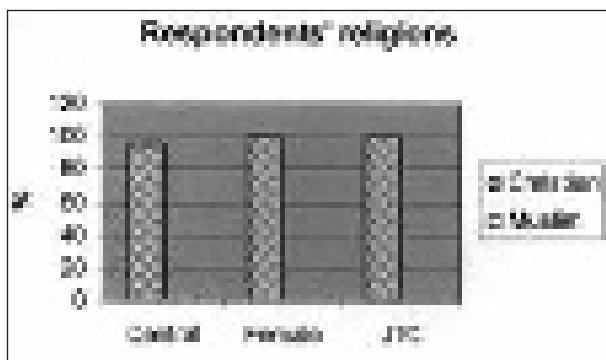


Fig 4.1.1 indicates that the majority of the respondents at central prison (26.7%) were in the age group 25– 29. It also shows that 19.8% of the total respondents were around the age of 30-34, 14.9% were around 35 - 39, 2% 45 – 49. Age groups 50 -54 and 15 – 19 constituted only 1% each to the total. Only 1% was in the age group 10 – 14. Practically no one below the age of 18 is supposed to be detained at central prison as he is considered a Juvenile. It is likely that the person will be abused physically and even sexually by older inmates. It would be proper to ensure that such an individual is transferred to Juvenile Training Centre. It can be observed again that respondents at JTC were aged between 10 and 19 years. 90% of them were in the age group 15 – 19 and the other 10% were between 10 and 14 years. At female prison the respondents were evenly

distributed among the age groups 15 – 19, 20 – 24, 25 – 29, 30 – 34, 35 – 39 and 40 – 44. Each age group constituted 16.7% of the total respondents. One may have some questions about 15 – 19 age group. It is highly possible to have inmates in that age group or even below the lower limit of that age group since female prison has a young offenders section.

Figure 2



The graph indicates that the majority of respondents were Christians (96%), 3% were Muslims and 1% did not respond to the question. 100% of all respondents at both Juvenile Training Centre and female prison were Christians. Religious beliefs and cultural norms may influence certain behaviours and practices which may have deleterious effect on an individual's health.

Figure 3

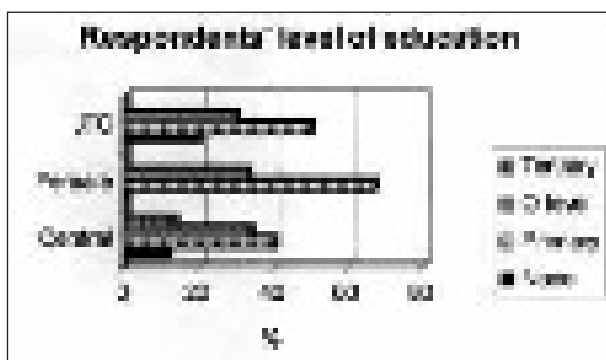
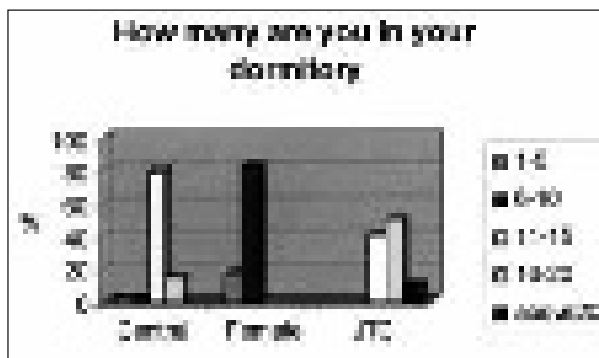


Figure 4.1.3 shows that 40% of the respondents only went as far as primary school, 33% had high school education and 13% went beyond O level. The graph also shows that 12% never attended school at all. It also shows that 50% of the respondents at JTC went as far as/ or were still in primary school. 30% of them reached high school or went through O level. The remaining 20% did not receive any formal education whatsoever. It was also learnt that 67% of the respondents at female prison received primary education only while the other 33% reached high school level.

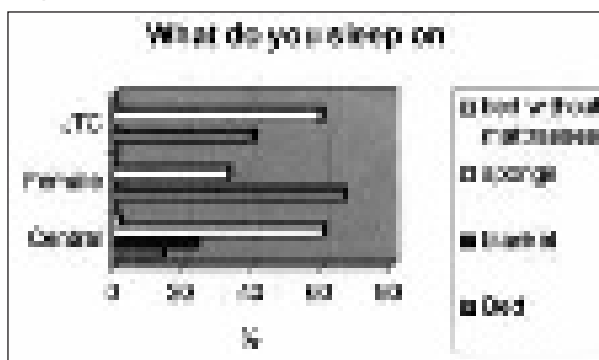
An individual's level of education can have a great influence on the way he views things and on his understanding of health related issues. From the data above one expects the level of understanding of inmates about matters pertaining to health to be high.

Figure 4



The graph shows that 78% of the respondents at central prison indicated that there were between 11-15 inmates in their respective dormitories. 14% showed that there were about 16-20 inmates in their dormitories. Those who said they were between 1 and 5, as well as those who said there were 6-10 each constituted 3% of the total respondents. Only 1% (1) said they were above 20 in their dormitory. At female prison however, 83% of the respondents showed that there were about 6-10 inmates in their dormitories. The remaining 17% indicated that the number of inmates in their dormitories was between 1 and 5. 50% at JTC indicated that they were between 16 and 20 in their dormitories, 40% said 11-15 while the other 10% showed that they were more than 20 in their dormitory.

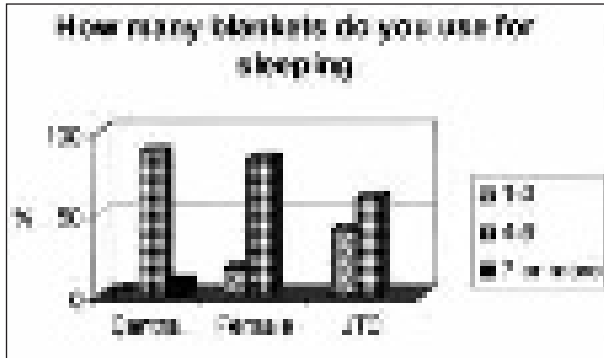
Figure 5



The graph shows that 60% of the respondents at central prison slept on sponges, 24% on blankets, 13% used beds and 2% indicated that they sleep on beds without mattresses. This then implies that quite a number of inmates at central prison were exposed to cold given that temperatures in

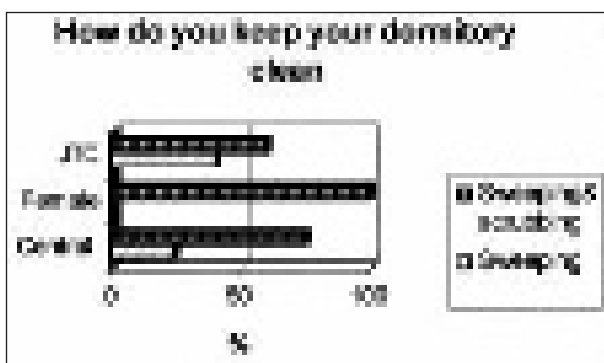
winter can get below freezing point. It also shows that 60% of the respondents slept on sponges and 40% slept on beds. 67% of the respondents at female prison slept on beds while 33% slept on mattresses on the floor

**Figure 6**



The graph shows that the majority of the respondents (87% central, Female 83% & JTC 60%) used between 4-6 blankets for sleeping. 89% (central) indicated that they use 7 or more blankets whereas 4% used between 1 and 3 blankets. At JTC used 1-3 blankets. 17% at female prison used between 1 and 3 blankets for sleeping. These blankets may be enough in summer but may not be adequate in winter when one has to use some for sleeping on. This also might have an influence on the health of inmates if they have to use some of their blankets for sleeping on a concrete slab type of floor especially in cold weathers.

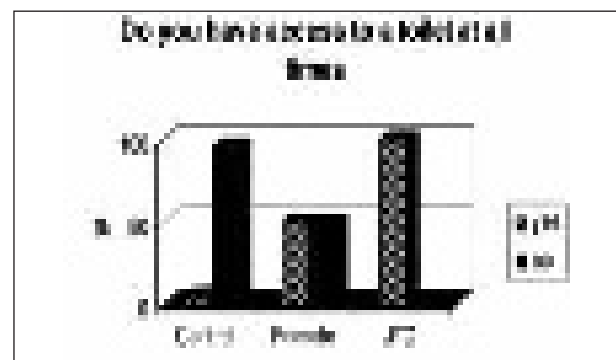
**Figure 7**



75% of the respondents indicated that they sweep and scrub their cells while 23.8% showed that they keep their dwelling places clean only by sweeping, while 1% other. 45.5% of the respondents also showed that they clean their dormitories on daily basis, 23.8% twice a week, 22.8% other and 7.9% once a week. In this kind of institution one would expect to see some uniformity in the way things are done, and that uniformity can be brought about by proper

supervision. 91.1% of the respondents also indicated that they are not provided with cleaning equipment and only 8.9% said yes they are provided with such. Out of the 8.9% of the total respondents, 5% indicated that they receive cleaning equipment only once a month, 2% said fortnightly, 1% weekly and another 1% said they receive equipment only once in a long time (after two or even three months). At JTC they kept their dormitories clean by sweeping and scrubbing (i.e. 60%) and 40% said no scrubbing was done. However all respondents agreed that cleaning of dormitories is done daily. 50% said cleaning equipment is provided while the other 50% said no. Those who said yes further went on to show that cleaning equipment was provided weekly (30%) and the other 20% said it was provided monthly. All respondents at Female prison indicated that they keep their dormitories clean by sweeping and scrubbing. This was done on a daily basis. Asked on whether they are provided with cleaning equipment, the respondents indicated that they are issued with cleaning equipment monthly (67%) and 33% said weekly. The information above shows that dormitories in all the three stations were cleaned on a daily basis although some inconsistency was detected in the provision of cleaning equipment.

**Figure 8**

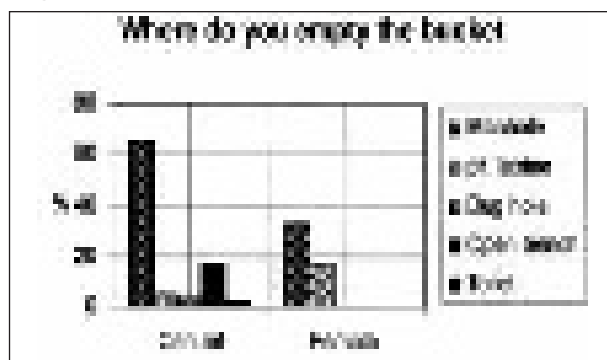


At JTC all respondents had access to a toilet both day and night. 95% at central prison had limited access to a toilet and only 5% said yes they do have access at all times. 73% of those who said no to the above question said such inaccessibility is mainly at night since they do not have toilets in their dormitories, the other 22% said any time when circumstances force them to be indoors, be it at night or during the day. 92% of those who indicated that their access to toilets is limited showed that at such times when they cannot access the toilets they use a bucket. The other 3% indicated that they wait for a chance to avail itself for them to go to toilet.

They further went on to show that the bucket is emptied in the morning (91%) whilst 1% said the bucket is emptied when it is full. It should be noted that the other 7.9% did not respond to the question. 50% at the Female prison indicated that their access to toilets was limited to day time, whereas the other 50% agreed to have access at all times. They revealed that they use a bucket during such time and also said they empty those in the morning.

From the information above it is clear then that the inmates still use the bucket system. It can be observed again that they spend all their nights with a bucket full of human excrement which is likely to produce unpleasant odours. This also increases the risk of faecal oral route infections.

**Figure 9**

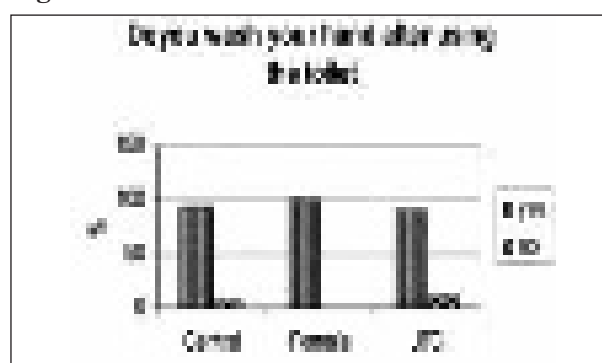


The majority (65% Central & 33% Female) of the respondents indicated that they empty the bucket into a manhole. 17% at Central emptied their buckets in an open trench, 3% said in a dug hole and 5% pit latrine.

Although the majority showed that buckets are emptied into a manhole, a significant number of them showed that some are emptied in an open trench. If this is the case, chances are high that there'll be stagnant water with human waste in such trenches. That will result in breeding sites for flies which may transmit disease causing organisms from the waste to food and maybe drinking water.

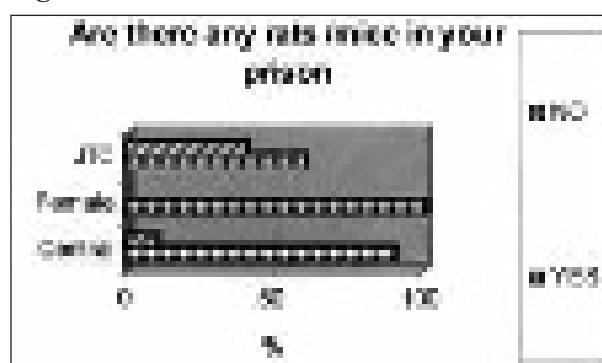
Once there are pools of sewage/ excreta, biodegradation (decomposition) will take place and when it happens some unpleasant odours are produced, thus polluting the air and creating unsightly conditions. The other 17% at female prison said that they empty their buckets into a pit latrine.

**Figure 10**



The majority of the respondents (94 %Central, 100% Female, 90% JTC) showed that they do wash their hands after using the toilet. Only (6%Central & 10%JTC) did not wash their hand after using the toilet. This could have been because of lack knowledge of the importance of washing hands after defecation or just a negative attitude towards the washing of hands after using the toilet.

**Figure 11**



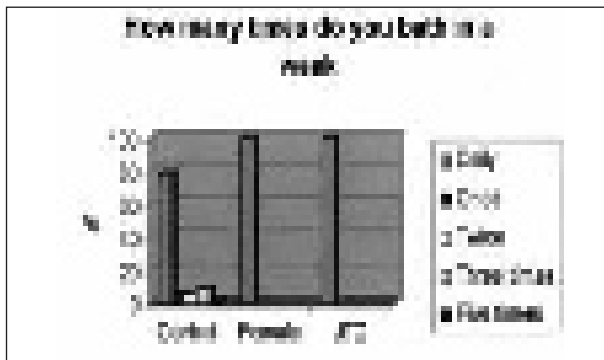
90% Central prison, 100% female prison, and 60% JTC all acknowledged the presence of rats. Others (10% Central, & 40% JTC) said there were no rats in the prison. Asked about the presence of cockroaches, 86 % at Central prison, 60% at JTC and 100% at Female prison said that there are cockroaches in their prisons, while others said they have not seen any(14 % Central& 40% JTC). Respondents at both JTC (100%) and Central prison( 97% )said there were inmates with body lice in their institutions while the other 3% (Central) and 100% (Female) indicated that there were no such people in their prisons. On bed bugs 65% at central prison said yes and 34% (Central) 100% (JTC & Female) said no.

Although the extent of the infestation can not be quantified, it can be seen from the above statistics that there are infestations of rats, cockroaches and bedbugs at central prison. These pests are known to have an effect on the transmission of some infectious diseases and may be a result of



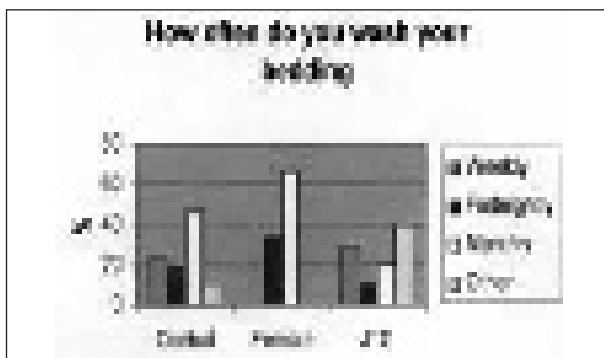
unsanitary conditions. Out of the 65% of those who said there are infestations in the prison at central prison, 31% indicated that they just kill the pests when they see them. 30% indicated that they report such to warders; the other 5% do not bother themselves about such. All the respondents at JTC and Female prison reported the existence of all infestations.

**Figure 12**



The graph shows that all respondents at Female prison and JTC as well as 78% at Central prison bathed on a daily basis, 10% three times a week, 6% once and another 6% twice a week. Only 1% indicated that they bath five times a week. When asked about the presence of hot water inmates at both JTC and Female prison revealed that they had no hot water. 63% at central prison showed that hot water is available at all times and the other 37% said it is not always that hot water is available. Looking at the above data one gets the impression that the level of personal hygiene is quite high. The availability of hot water and soap are essential in promoting personal hygiene and discouraging the incidence of some of the water related diseases.

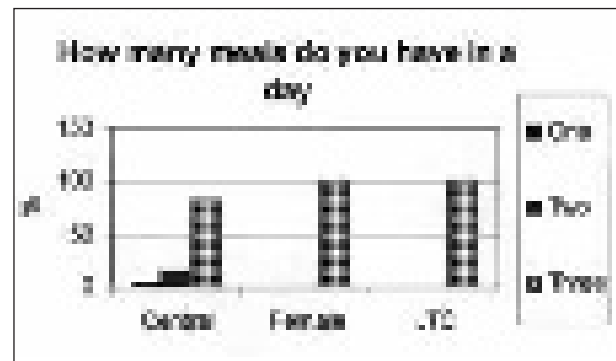
**Figure 13**



The graph shows that 47%(Central) 20% (JTC) and 67%(Female) washed at least once every month, 25%(Central) 30% (TJC) on a weekly basis, 18%(Central), 10%(JTC) and 3%(Female) washed after every two weeks and the other 11%

said when they deem it necessary to do so. Among the remaining 40% at JTC some said every two months and others said after five months.

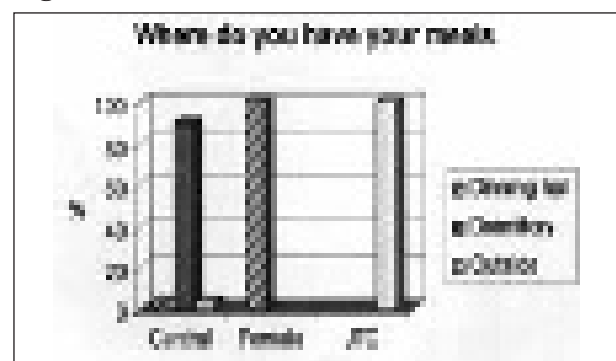
**Figure 14**



On the issue of meals 100% (Female prison & JTC) and 81% at central prison indicated that they have 3 meals every day, 15% said two and those who said they have only one meal constituted 4% of Central prison's total respondents. Asked on who provides the food, All at JTC, 88% at Central and 83% at Female prison indicated that their meals are provided by the prison, 8%(Central) indicated that they get food from both prison and relatives. The other 4% (central) and 17% at Female prison said their meals were provided by relatives.

Food is important and essential for every human being to survive and to keep healthy. It is important therefore to ensure that everyone, free or incarcerated, is provided with clean and healthy food that the body needs for growth, strength and also for protection against diseases. From the above data it can be observed that the department of prisons does provide inmates with food and that there is a privilege given to inmates to also receive food from their relatives.

**Figure 15**



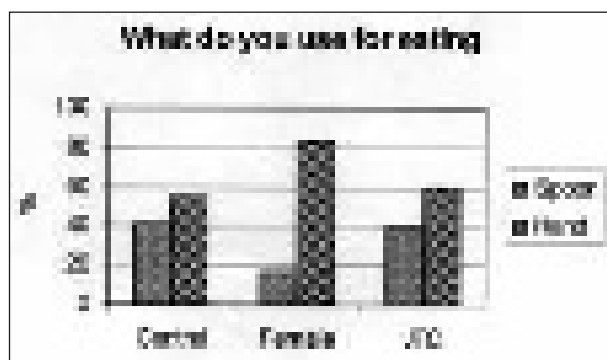
At least 99% of the respondents at Central prison answered this question. 90% of them showed that they have their meals in their dormitories, 4% said outside, another 4% said dining hall and the other

1% said at times they eat outside and at times in the dining hall. At Female prison they had meals in the dining hall while at JTC they ate outside. Asked on whether they are allowed to keep food, 71% (Central), 17% (Female) and 70% (JTC) indicated that they are allowed to keep food. The remaining 29% (Central), 30% (JTC) and 83% at Female prison said no. They all indicated that they keep their food in their dormitories.

It can be observed that the inmates at Central prison have their meals in their dormitories and have the opportunity to also keep the food for later use. This could be one of the reasons why there are cockroaches and rodents in the prison. It was observed earlier on that, the inmates use buckets when they do not have access to a toilet. It is clear therefore, that, they keep food and eat in the same place where there is also a bucket of excrement. This practice besides being a health hazard is also degrading to human dignity.

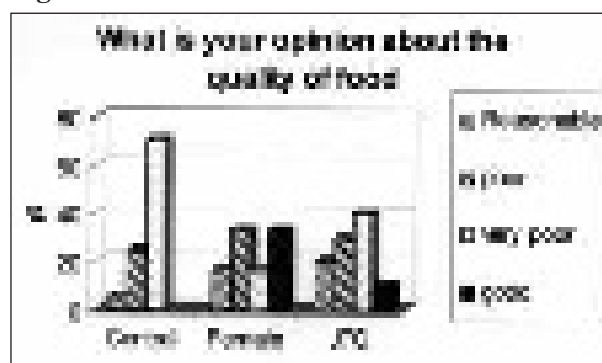
Figure 4.2.6 below shows that 55%(Central prison), 83% (Female) and 60% (JTC) of the respondents used their hands for eating, 42%(Central), 40% (JTC) and 17% at Female prison used a spoon for taking their meals, the other 3% at Central prison said they use plastic spoons.

Figure 16



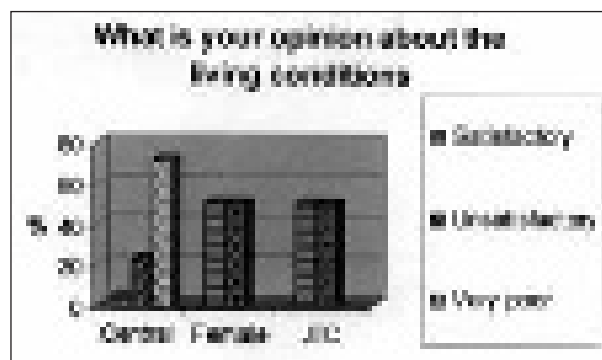
Asked on whether they wash their hands before eating, 90% at female prison said yes and the remaining 10% said, they do not wash their hands before eating. Looking at the above information, it can be realized that a better part of the inmates wash their hands before eating. This is a good practice that has a great significance in the transmission of diseases through oral faecal route. Washing of hands before eating reduces the chances of getting an infection due to filthy hands which may also contaminate ones food.

Figure 17



The majority of the respondents, 70% (Central), 17% (Female) and 40% (JTC) said the food given to them is of a very poor quality. 25% (Central), 33% (Female) and 30% said the quality is poor. Others 5% (Central), 20% (JTC) and 17% (Female) said the quality is quite reasonable. 33% at Female prison and 10% at JTC said the food was good. Considering that the majority of the respondents were not satisfied with the quality of food given in prisons it can be deduced that the food is bad. Poor quality food is likely not to have all the essential nutrients at quantities needed by the body. It is also likely that some individuals may choose not to eat when the food is not well prepared and that may lead to malnutrition reduced body's resistance to diseases.

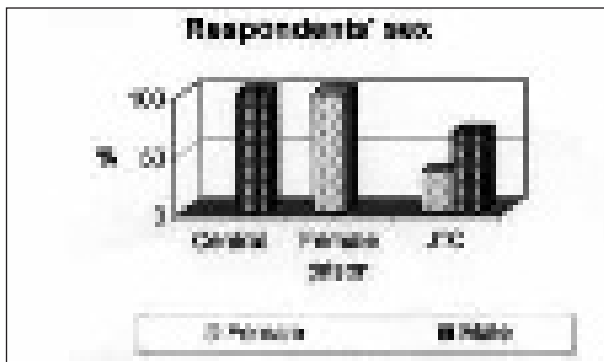
Figure 18



Majority of the respondents at central prison (71%) said the conditions in which they live were very poor, 23% indicated that the conditions were unsatisfactory. Those who said the conditions are satisfactory constituted only 5% (central), 50% (both Female & JTC) while 1% did not respond to the question. From the graph it can be observed that quite a number of inmates were not very happy with the quality of food and the living conditions in the prison. This therefore tells us that the necessary measures should be taken to address the issue of poor living conditions as well as the poor quality of food.

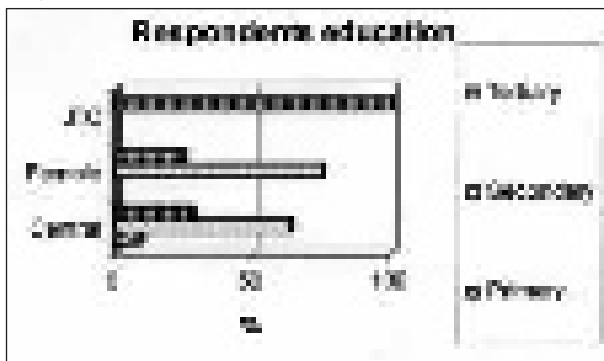
## Staff Responses.

Figure 19



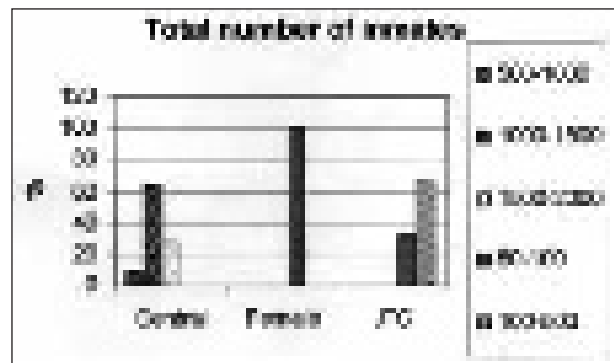
All the respondents picked at central prison were males. 27% of them were in the age group 35 – 39. The other age groups; 20 – 24, 25 – 29, 40 – 44 and 45 – 49 each constituted just 18% of the total respondents. At JTC 67% were males and the other 33% were females. Most of them were in the age group 25-29 (67%) and the rest in the age group 35-39. All the respondents at Female prison were females aged between 25 and 49. About 5% were in the age group 40 – 44, 25% in age group 25 – 29 and the other 25% in the age group 45 – 49.

Figure 20



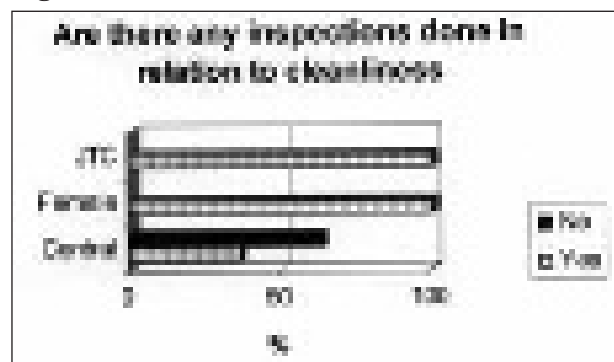
All the respondents at JTC had tertiary education. The graph also indicates that most of the respondents at Central prison (64%) went as far as high school level, 27% went beyond O level to different tertiary institutions and the remaining 9% only received primary education. At female prison 75% reached high school and 25% received tertiary education.

Figure 21



The majority of the respondents (64%) indicated that there were 1000 and 1500 inmates at central prison. 27% said there were between 1500-2000 inmates at central prison. There were between 50-100 inmates at female prison 100% of the respondents said. The respondents at JTC indicated that there were more than 100 inmates while the other 33% said there were about 50-100. Asked on whether there is enough space for the inmates, 100% of all the respondents said there is not enough space. 64% (Central) suggested that more prisons should be built to overcome the problem of space. 36% (Central prison), 50% (female prison) and 67% (JTC) said other alternatives to imprisonment (e.g community service) should be used. 33% at JTC and 25% at Female prison suggested that more dormitories should be built. The remaining 25% at Female prison suggested that some should be given conditional release.

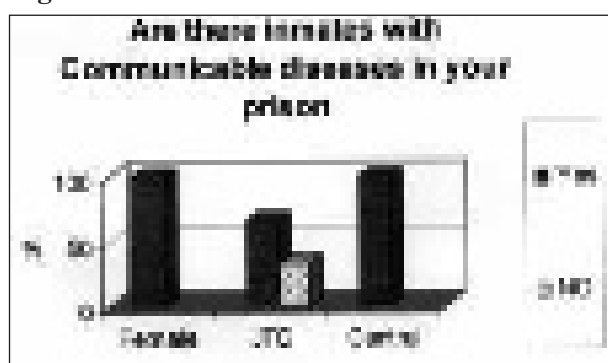
Figure 22



The respondents' major group, 67% (Central) showed that no inspections are done at central prison. On the other hand 100% of the respondents at both Female prison and JTC said yes, such inspections are done. Of those who said yes, (8.7%) (Central), 75% (Female) and 100% (JTC) said that the inspections are done by staff. Others 25% (Female), and 8.7% at Central prison said inspections are carried out by the ministry of health. 75% at both Central and

Female prisons, and 33% (JTC) showed that the inspections are done every week. 25% said once a year (Central prison), 33% (JTC) said they were not done sequentially and 25% at Female prison said they were done on a daily basis. The inspections are important in that all hazardous things can be identified in time and proper action can also be taken in order to ensure that the health and lives of people are not threatened.

Figure 23



At both Female prison and central prison all respondents revealed that there were inmates with communicable diseases. At JTC however 33% said there were no such diseases. The respondents indicated that TB, chicken pox, diarrhoea and sexually transmitted disease are common at central prison, sexually transmitted diseases were said to be the commonest at both JTC and Female prison. They further indicated that these diseases are always present (endemic) in the prisons. The respondents showed earlier that there is not enough space at central prison. If that is the case it means the place is over populated or likely to be. Overcrowding could have a bearing in the transmission of droplet infections such as TB since every breath counts when it comes to this disease.

73% of the responses at Central prison indicated that the inmates only get medical attention when there is a visiting doctor. The other 27% showed that such inmates get medical attention on the same day they reported sick. 54% showed that inmates got treatment in a nearby hospital, whereas the other 46% indicated that such treatment is received in prison. Asked on how often a doctor visits, the respondents showed that the doctor usually comes once a week (55%).

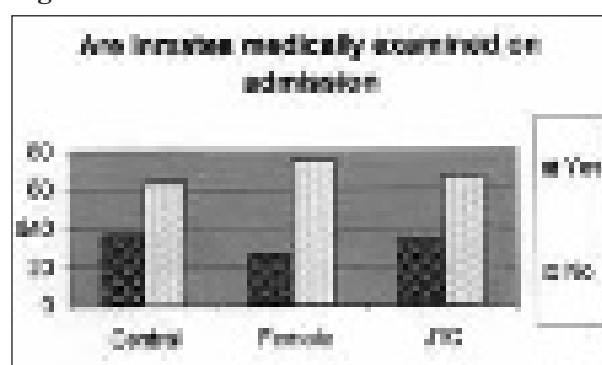
Others (18%) said once or twice a week.

82% of the respondents showed that there is a special accommodation for sick inmates. On the other hand 18% said there is no such accommodation for sick inmates.

All the respondents (Central) indicated that they

do or have received reports of sick inmates. Asked on what action they take after receiving such reports 64% indicated that they inform their superiors while 36% showed that they call a doctor. (75% at Female prison) said they get medical attention when there is a visiting doctor whereas 25% said on the same day she reported sick. 75% also showed that consultation with a doctor occurs in the prison. 25% also indicated that these inmates receive treatment in a nearby hospital. 100% of those who said consultation occurs in prison indicated that the doctor only visits once a week. Again all respondents revealed that there is no special accommodation for sick inmates within Female prison. At JTC inmates received treatment on the same day they reported sick at a nearby hospital. There was no special accommodation for sick inmates.

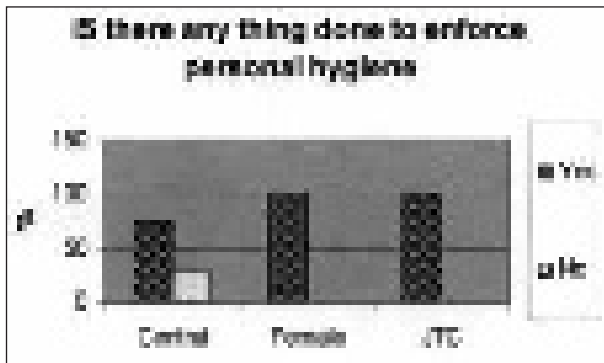
Figure 24



The figure shows that 64% (Central), 67% (JTC) and 75% (Female) of the responses were saying the inmates are not medically examined on admission. However, 36% (Central), 25% (Female) and 33% indicated that there is medical examination done on admission. 75% (Central) of those who indicated that there is medical examination done on admission, showed that inmates who are found sick are put on treatment, while the other 25% said they are isolated. At both JTC and Female prison, it was revealed that those who are found sick are given treatment. The majority of the respondents showed new inmates with poor personal hygiene are made to clean up before they mix with others. On the contrary though, it was discovered later that this is not always the case especially at Central prison.

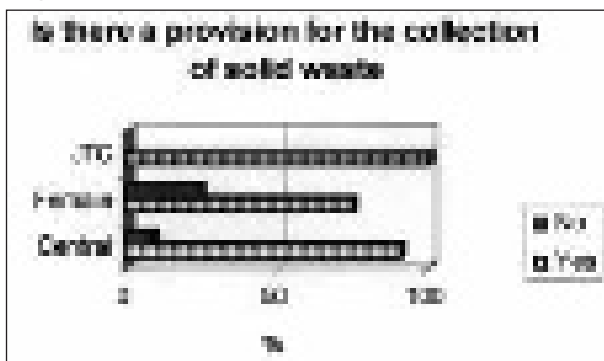
73% (Central) and 100% of the respondents at both Female prison and JTC reported that inmates were encouraged to keep clean. The other 27% said nothing is done to enforce personal hygiene among inmates. At central prison 73% of the respondents showed that the

Figure 25



inmates wash every week while the other 18% said that they wash only twice a month. 91% of these respondents also indicated that there are measures taken to ensure that they do wash but the other 9% said no, nothing is done. At Female prison inmates washed every week (75%). The other 25% said every week provided water and soap are available. 67% at JTC said inmates wash every week whereas the other 33% said they wash daily.

Figure 26

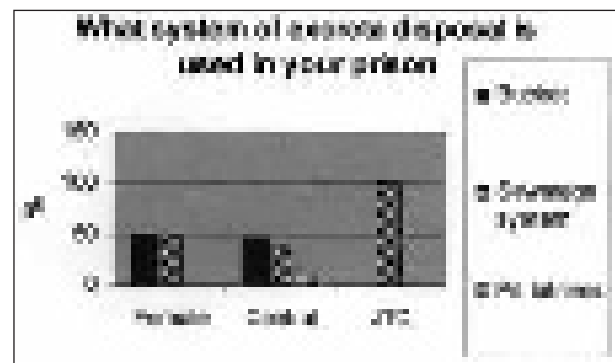


The graph shows that 91% (Central), 100% (JTC) and 75% (Female) indicated that there is a provision for waste collection and only 9% (Central) and 25% (Female) said there is no provision for the collection of solid waste produced in the prison. These respondents further indicated that waste is collected on a daily basis (40%), the other 40% said that waste is collected fortnightly, whereas the remaining 20% at Central prison and 25% at Female prison said the waste is collected twice a week. Another 25% at Female said waste is collected once a week. Waste is collected by prisons, (90%) (Central) and 100% (Female), 10% (Central) indicated that the waste is collected by the local authority.

100% (Central) of those who indicated that there is a collection system in place for refuse also indicated that after it has been collected; this waste is dumped outside the prison. At Female prison it was discovered that waste is burned

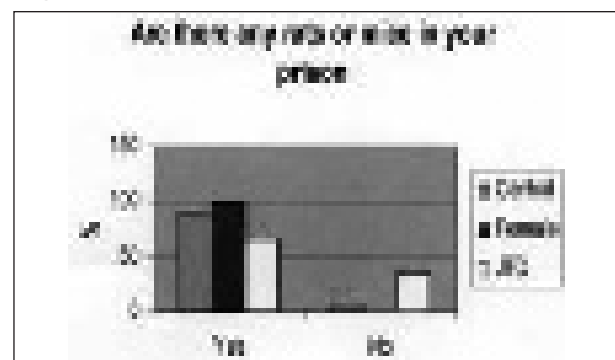
onsite. Improperly managed waste may contribute to the presence of rodents in the prisons. Fly paper, plastics as well as ashes are likely to create unsightly conditions thus creating a nuisance for neighbouring communities. Unpleasant odours arising from crude dumps can also be a nuisance to both prison community and their neighbours. These dumps are likely to encourage the breeding of flies and provide harbour for many other vectors of diseases, posing a threat to the health and wellbeing of both inmates and staff.

Figure 27



The graph shows that the respondents (46% Central and 50% Female), reported that bucket system is the one being used for excreta disposal. 36% at Central prison, 100% at JTC as well as 50% at Female prison indicated that there is a sewage system in place. The remaining 9% at Central prison indicated that pit latrines are being used as a method of excreta disposal. However it was discovered later that all the three systems are used interchangeably at central prison. It was gathered again that all buckets are emptied into the local drainage system through a manhole.

Figure 28

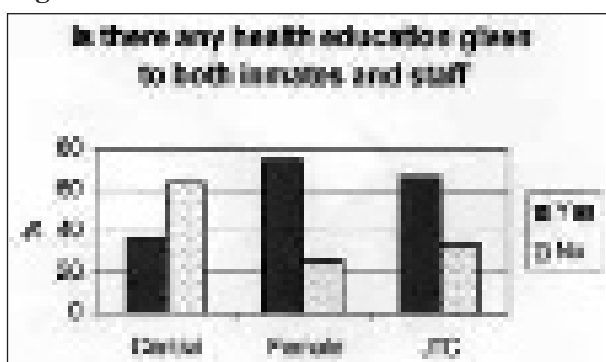


100 % at Female prison agreed that there were rodents and cockroaches in the prison. 91% at Central prison and 67% at JTC indicated that there was a rodent infestation in both institutions. Only 9% (Central) and 33% (JTC) said there were no rats or mice in the two institutions. 91% at central



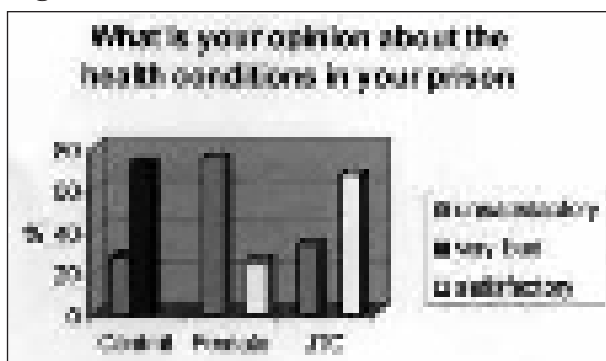
prison 33% at JTC revealed that there were cockroaches in the prisons. Others disputed the presence of cockroaches in their institutions. 64% (Central), 33% (JTC) and 25% (Female) also indicated that all the three places were also infested with bedbugs. 25% at Female prison, 67% at JTC also acknowledged the presence of human lice in those institutions. It was revealed by 73% (Central), 67% (JTC) and 100% (Female) that spraying and baiting was done as a measure of dealing with the infestations. Others (18% from Central prison and 33% from JTC) however, indicated that there is nothing done to address the issue of infestations.

**Figure 29**



It was indicated in this regard, by 64% from Central prison, 33% from JTC and 25% from Female prison that no health education was given to either inmates or staff. However 36% (Central), 75% (Female) and 67% (JTC) reported that there was health education given in the prisons. The above information indicates that there is very little health education given if any or it could be that it has not been given for a long time that is why others are saying no. Education is one of the most effective and powerful tools that can be used to raise awareness about diseases and how they can be prevented. Health education should therefore be intensified if prisons are to be made safe for both inmates and employees.

**Figure 30**



73% of the respondents at Central prison indicated that the conditions were very bad. The other 27% also agreed but however preferred to categorize the conditions as unsatisfactory. Most of the respondents at Female prison showed their dissatisfaction by categorizing conditions as unsatisfactory. The other 25% said the conditions are satisfactory. At JTC 67% said the conditions satisfactory and the other 33% said they were unsatisfactory.

### OBSERVATION RESULTS:

During an observation tour of the three stations (Central Prison, Female Prison and Juvenile Training Centre) a number of areas within these institutions were checked. These areas included dormitories (or cells), kitchens and dining halls as well as the surroundings (or yards). Several aspects were evaluated bearing in mind the objectives of the study.

The evaluation was done through the inspection of dormitories with particular focus on the size of each dormitory and the number of inmates it held at the time of the study. Other factors included types of material used, ceilings, walls, floors, the adequacy of both natural and artificial lighting and ventilation. In toilets, ablution rooms, kitchen and dining hall, in addition to the above mentioned factors the state of repairs of fittings furniture and general cleanliness were observed. The availability of refuse receptors was ascertained together with the general cleanliness and aesthetics of surroundings.

### Dormitories

Generally, the type of roofing material was corrugated iron. In all the three stations it was categorized as sound. This according to the checklist implies that the roof had minor defects which are normally correctable by regular maintenance. The defects observed included signs of corrosion on many areas in all stations. The roofs were all old. In some dormitories signs of leakage could be noticed on the ceilings and on walls. Most of the cells at central prison did not have ceilings; others had a ceiling made of iron sheets. Some of the defects noted include sagging, broken and rotting ceiling (Female Prison and Juvenile Training Centre).

The absence of a good ceiling implies that the insulation that it is supposed to offer is non-existent. Occupants are, therefore, exposed to the extremes of temperatures. In winter the heat is easily lost while in summer the heat can easily be radiated into the inside.

Walls in all the three stations were categorized as sound. Minor defects such as small cracks, poor paint work and broken plaster (especially along door frames) were noticed. In almost all the dormitories walls were painted in green and that affected the natural lighting. Small holes due to nails hammered into the walls for hanging clothes and other belongings were also eminent. At Female Prison and Juvenile Training Centre (JTC), signs of weathering bricks and missing air bricks could be noticed.

Floors in all prisons were concrete slab types. At Female Prison all floors were carpeted with PVC carpet. Some at Central Prison had PVC tiles while others were just bare cement sand screed. At JTC only minor patches of what looked like a PVC carpet were seen. In some of these dormitories cracks along the walls and dampness from the ground were noticed. Literature has shown that dampness can have deleterious effects on occupants and that some disease vectors of public health importance may find harbourage in cracks on floors and walls.

Ventilation at Female Prison and JTC was categorized as sound. At Central Prison ventilation was categorised as bad. There were about 14-17 inmates in each cell of about 16 square meter floor area with two windows that were unable to be opened in some cells. The doors that open into the corridors only came into assistance during the day when there are virtually no people in dormitories. Poor ventilation encourages the transmission of many airborne infections and exposes occupants to other indoor air pollutants such as tobacco smoke and lead from lead based paints.

Lighting at Central Prison was found to be poor. However, in Female Prison and JTC it was found to be adequate. Poor lighting affects the eyes and may lead to accidents and can also cause stress.

The dormitories were generally kept clean in all the three stations; Female Prison being exceptionally ahead of the other two. However, cobwebs and dust were seen on walls and windowsills. In some the walls were covered with posters and were unsightly.

### **Ablution Facilities**

All the ablution facilities in all the three stations did not have any ceiling. Partition walls at Central Prison were covered with a black slimy layer of dirt. At JTC the paint on the walls was flaking and pipes severely corroded. In some the plaster was also broken.

Floors were generally still intact with minor cracks and chipping noticed at Central Prison and

JTC. These multiple minor flaws created a lot of small ponds on the floor. However, this was not the case at Female Prison where floors were impressively clean and in good condition.

All the ablution facilities in all the three stations were poorly ventilated. At Central Prison the shower rooms did not have any form of ventilation except the entrance. Those at Female Prison and JTC had windows which were no longer operable. Unpleasant smells could be detected from these facilities especially Central Prison where inmates had started using the showers for urinating. The showers at both JTC and Female Prison had no hot water. They were all poorly maintained.

In so far as lighting is concerned; Female Prison and JTC had fairly lit shower rooms with windows. At Central Prison, however, there was totally no provision for natural lighting and the artificial lighting provided was inadequate.

The facilities were very unhygienic and were likely to impact on the inmates' health. The showers at Central Prison are a health hazard.

Wet floors encourage the growth of micro organisms and may cause accidents. The debilitating conditions can also discourage inmates to bath hence reducing the level of persona hygiene.

### **Toilets**

Central Prison had both Ventilated Improved Pit latrines and Water System Closets, while at JTC and Female Prison they have only Water System types of toilets.

Roofing material were the same all over. In some signs of corrosion could be noticed. The paint on walls was flaking at JTC and at Central Prison. The plaster on both the inside and the outside of the walls was falling off as a result of the overgrown grass.

The pipe works in the toilets in all the three stations were poorly maintained. There were ponds of water on floors. Some had no cisterns and others had broken pans. Most of the remaining pans were blocked and full of excrement. They were poorly lit and ventilated except for Female Prison. The poor conditions in toilets are likely to become the source of infection especially enteric diseases.

### **Kitchen and Dining**

The kitchen at Central Prison was quite bad. The corrugated iron sheets were rotten. The ceiling and walls painted in a green colour were also covered in soot. A larger part of the ceiling was

also broken. The floor was flawed and encouraged water to stand. It was also dirty with food residues seen clogging the drain. Kitchens at JTC and Female Prison had more or less the same conditions even though the one at Female Prison was cleaner than the former. At Central Prison there were broken windows. The natural ventilation was inadequate. Unprepared vegetables were put on the dirty floor and there was no proper flow and no preparation tables. The bad conditions in kitchens are likely to encourage the contamination of food and assist in the spread of enteric diseases. Accidents are also very likely in these poorly lit and poorly ventilated kitchens, which are full of smoke. Cooks are also exposed to the adverse effects that result from the combustion of coal.

### GENERAL OBSERVATION

The surroundings in all the three stations were not very satisfactory. At both JTC and Female Prison refuse was dumped and burned outside. This created unsightly conditions. At Central Prison it was collected and dumped outside. There were overgrown grasses, pools of storm water mixed with waste water from ablution facilities. B Yard at Central Prison was the worst with leakages from the toilets forming a pond filled with cans, plastics and faeces. The main drainage system was also malfunctioning hence waste water was flowing into the open and the prison garden. This resulted into the air around being filled with unpleasant odours. These unsanitary conditions can attract disease vectors such as rats, mice and flies.

### CONCLUSION AND RECOMMENDATIONS

#### Conclusion:

It can be concluded that the conditions at Central Prison and Juvenile Training Centre are not satisfactory. This can be seen by the number of inmates in dormitories with respect to the sizes of the dormitories. This is also confirmed by the conditions found in kitchens, ablution facilities and toilets. The ablution facilities were small in number. For instance at Central Prison one Block had seven showers some of which were not working, yet it accommodated more than 300 inmates. Despite the unhygienic conditions noted in some areas, it was discovered that the buildings in all the three prisons are still fit for human habitation.

Although there were quite a number of defects noted at Female Prison, it can safely be concluded that the conditions there were satisfactory. This,

however, does not rule out the fact that improvements need to be made so as to lift the standard of health and the environmental health conditions in prisons.

#### Recommendations:

An inspectorate and maintenance team/section should be established for early detection and correction of any defects and irregularities. The Department of Prisons should have its own doctor or doctors or alternatively request that a doctor be seconded to the Department. This will be helpful in ensuring early detection and treatment of diseases.

Inmates should be medically examined on admission and should not be allowed to mix with others prior to examination. It should not matter whether the person has already been convicted or not. This can only be possible if there is a resident doctor working in prisons.

Some staff members should be trained as health workers so that they can attend to the day-to-day health needs of the prison community.

Health Education Programmes should be intensified so as to increase awareness about health related issues.

Alternatives to imprisonment such as community service should be put in place so as to address the problem of space and to control population growth in prisons.

In order to minimize pollution and inmates' exposure to the effects of coal burning, it would be advisable to replace the coal stoves with electric or gas cookers.

Smoking in dormitories should be banned so as to minimize the effects of poor indoor air quality. The Officers-in-charge of all prisons should take more responsibility for monitoring the health conditions in prisons.

Prison staff should also take upon themselves the responsibility for ensuring that prisons are kept clean and that the living conditions are no danger to human health. They can achieve this by proper supervision of inmates.

Local authorities as well as the Ministry of Health should take responsibility for monitoring the health conditions in prisons.

The waste dumps found in the three prisons should be removed. A proper and clear solid waste management system should be established. This involves proper storage of waste, collection and transportation, and final disposal.

The bucket system should be phased out and suitable pans and cisterns should be installed so that inmates can have access to a toilet at all times

and thus reduce the risk of faecal oral route infections. This has been done in Botha-Bothe prison and a similar system can also be introduced in Maseru (i.e. Central and Female Prisons, and JTC).

Central Prison should switch to renewable energy resources by replacing the old coal fired geysers with solar powered geysers.

Good personal hygiene should be enforced on inmates and all new arrivals should be made to clean up before they are allowed to mix with other inmates. This can help to control human lice infestations in prisons.

The role of police holding cells in human lice infestations should be investigated and proper control measures implemented.

### ACKNOWLEDGEMENTS

We would like to extend our special gratitude to the Director of Lesotho prisons for granting us permission to carry out this work. We also extend our word of thanks to the Commissioner of Swaziland correctional services and the staff and inmates of Sidwashini correctional services for allowing us to pre-test the research tool in their institution. The staff and inmates at Maseru central prison, Female prison, and Juvenile training centre are thanked for the co-operation they accorded us during the time of collecting data.

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### THIRD COMMONWEALTH PROFESSIONAL FELLOWSHIP

Peter Minhinnett, Principal Environmental Health Officer, Daventry District Council, Northamptonshire and Vice-Chairman of the NGO Daventry Friends of Iganga, is pleased to advise that they have been successful in obtaining another Commonwealth Professional Fellowship for the third consecutive year.

This year Peter applied to the Commonwealth Scholarship Commission on behalf of David Mwebaze, Health Inspector with Mukono Town Council (a large town in central Uganda), who had been nominated by the Ugandan Public Health Officers Association.

David arrives in the UK at the beginning of October 2005 and will immediately commence his study period in the Environmental Health Department at Daventry DC. In addition to his time at Daventry, David will also spend time with other Local Authorities across the East Midlands, being Leicester and Nottingham City Councils. Following the recent visit to Uganda by Members of the East Midlands Centre of CIEH, several more offers of assistance with David's visit have been received from Members of that trip working for Local Authorities in Northamptonshire.

It is hoped that David Mwebaze will be able to meet many Members of the East Midlands Centre during his 3 months in the United Kingdom and further develop the professional links between the UK and Uganda.

### THE ENVIRONMENTAL HEALTH WORKERS ASSOCIATION OF UGANDA

The Environmental Health fraternity in Uganda is undergoing a transformation and since the 3rd of August 2005, the name has changed from the Public Health Inspectors' Association of Uganda (PHIAU) to Environmental Health Workers Association of Uganda (EHWAU).

The main reason for changing the names was the fact there are three basic levels of training now in Uganda, The Certificate holders (Health Assistants) the Diploma Holders (The Health Inspectors) and the Bachelors degree holders (The Environmental Health officers). The former name was not all encompassing. It was technically leaving out the certificate holders as well as the degree holders.

It was therefore agreed at our last annual general meeting that the name be changed to suit all the members. And so on the 3rd August 2005, the registration certificate in the above name was acquired.



## STUDY TOUR TO UGANDA

by Peter Minhinnett

Peter Minhinnett PEHO of Daventry DC, supported by his recently retired Daventry colleague David Walsh, advertised a proposed Study Tour to Uganda for the summer of 2005. Peter, who originally hoped to take some 10-15 people, was inundated by interest and finally found he was leading 29 people, of which 20 were practicing Environmental Health Practitioners for a 17 night trip in May 2005. The party had an age range of 23 to 67 years.

Arriving in Uganda very early on a Friday morning after a direct 8 hour flight from the UK meetings immediately started in Kampala with the Ugandan EHO students at Makerere University and a 2 hour meeting was enjoyed by all, especially the introductory speeches of all, YES ALL the 100 people who attended! The students were all very interested in the many job vacancies in the UK and methods they could use to get on training courses at UK Universities and get further qualifications.

This was followed on the first afternoon by the first full meeting with the Ugandan Association of Public Health Officers to confirm the official link between the East Midlands Centre of CIEH and the Uganda Association. This meeting included an exchange of gifts and greetings. In the evening a celebratory party held in the Grand Imperial Hotel had more networking between the two groups of professionals and the Deputy British High Commissioner supporting the visit.

The party then travelled to Iganga, a small town some 100 miles to the east of Kampala. Iganga linked with Daventry for 10 years was the main reason for the visit and from Monday morning the party started the Projects they had come to assist with and work on.

By the end of the visit the party was amazed to find they had:

- *protected 3 water sources to provide clean water to at least 10000+ people for the first time*
- *refurbished the old Iganga Town Council Offices and converted them into a Health Centre badly needed by the local community*
- *helped with financial assistance towards re-roofing a school and painting classrooms*
- *repaired two damaged water pumps*
- *further developed a public open space 'Freedom Square'*
- *helped to build a 3 roomed dormitory for 20 street children/Aids orphans*

The 3 water sources which had been found during

previous visits by Peter and David were open unprotected wells where the good quality natural spring water from underground supply was being contaminated at the collection point by the methods used to draw the water and being open to birds and other animals. Village meetings were held with the local community led by their village chief and in return for the financial cost of the work the local people agreed to carry out most of the physical work required and also to carry out improvements to their village including the provision of more latrines, house improvements and improved refuse control.

Before arrival in Uganda the party had been able to raise funds from various sources including £500 from each of the Charity Water for Kids, Colwall(Gloucestershire)Rotary club also through WFK and the Northamptonshire Branch of the CIEH. The total cost of protecting all 3 sources was approximately the £1500 raised. It is estimated that the 3 sources were providing water for up to 10,000 people, which at 15p per person is good value for money. In addition 2 broken water pumps were repaired. Members of the party also took the chance to carry out water sampling and testing using equipment donated to Iganga under a previous health project. Results showed that the water quality was surprisingly good and that the protection was all that was needed to ensure a good quality water supply for a large number of people. Hopefully the local health staff will find a reduction in local illness due to stomach upsets. *Before our arrival the local hard working health assistants had been able to carry out village inspections and although time was limited for the party to study the findings, it is hoped that this information will later be studied to see what improvements follow this visit.*

The party had all contributed at least £100 each to funds for the visit and another £1500 was spent converting the recently vacated old Iganga Town Council Offices into a Health Centre. This included many repairs, cleaning and painting and involved several members of the party in some interesting and creative ideas to get simple jobs done considering the location and tools available. At the same time many of the Ugandans joined in the work parties and many friendships were made. More Ugandans volunteered and were employed to carry out further improvements and by the end of the time spent in Iganga the work was almost complete and there was a big party and celebration on the last day when a very happy send off took place. The group included 2 nurses who spent time working with the Ugandan Health workers at the small existing clinic

and learnt of their problems and needs. Following this, equipment no longer being used in the UK has been found and it is hoped this will be sent out as soon as possible to help with the equipping of the clinic.

If all the above Projects were not enough the party also helped with the building of a large 60 foot long dormitory consisting of 3 rooms for a local street children group of 20 orphans which has been supported by the Daventry Friends for some years. This involved members of the party in the moving of bricks and mixing of cement and helping Ugandan brick layers to get the building up to roof level before the party had to leave for home. It is pleasing to know that the building is now almost complete and the extra space available is being well used by the children and their carers. Foundations were also laid for further rooms and this will be more work for next year's visit (see below). *One evening the whole party joined with the street children, their friends, neighbours and the local ladies drama group for an evening of dancing and singing with local food and home made beer making the evening something special under the African starlit sky.*

If that was not enough, efforts were also made to continue the good work previously carried out in the development of Freedom Square, an open space providing a beautiful green space for local Igangans to relax. Here members of the party, when not planting more flowers and shrubs, were able to relax and meet young Ugandan students studying and doing their homework.

Funds were also handed over for the re-roofing of a school to repair recent wind damage and, when completed, members of the party helped to clean and paint a classroom to give the children a more comfortable place to study. The school also received a complete new football kit for the school team. Before the visit was over 2 other schools received football kits and a wide selection of small gifts the party members had been able to squash into their suitcases.

It was not all work and no play as before completing the trip the party were able to spend a short weekend walking on Mount Elgon at 10,000ft above sea level on the Kenyan border, enjoy the bird life both around Iganga and on Lake Victoria and generally soak up the beauty of such a lovely country and the friendship of so many people.

All members of the party stated how they felt the trip was a great success and had been so worthwhile in what they had been able to achieve, such that several hope to return possibly next year when a similar trip is already being planned. If you wish to be considered to join that trip for which many have already shown their interest contact Peter on [pminhinnett@daventrydc.gov.uk](mailto:pminhinnett@daventrydc.gov.uk) or 01327 302549

In the meantime party members are able to report that since they have returned to work in the UK, they now have a different attitude to life and have the will to go back and make a difference, next year or sometime in the future.

**They can say that they ..... really DID IT!**

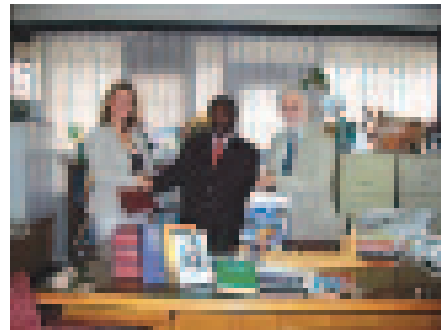


*Attendees at the  
2005 Council  
Meeting in  
Vancouver*

# News from Kenya



Roy Emerson, President of the Northern Centre Chartered Institute of Environmental Health was presented with a copy of Clays Handbook of Environmental Health from Councillor Liz Coulson, Chair of Derwentside District Council.



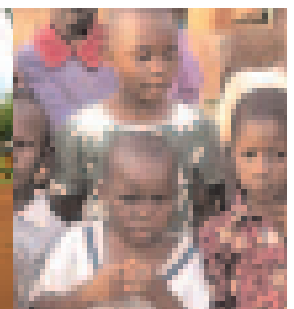
As part of the Northern Centre delegation Vicki Jackson-Hopps and Les Milne presented the book along with other publications to Alfred Lang'at, Chief Public Health Officer of Kenya

Vicki and Les presented a paper on "Enhancing the Environment" to over 1000 delegates at the 15th Biennial Conference of the Association of Public Health Officers which was held in Mombasa. A formal presentation ceremony took place on the last day of the conference where Saul Ooro was given gifts from Derwentside, including a pennant, tie and pen. In return they both received Kenyan tea and coffee.



Following the conference Vicki and Les returned to Nairobi where they picked up a vehicle and drove to Ndhiwa, in western Kenya, via the Masai Mara National Park. As with all intrepid explorers the trip was not without delays, mainly due to vehicle breakdowns including a puncture and broken fan belt on the edge of the "Mara" resulting in 2 hours being spent in a typical Masai village being entertained by the locals and "persuaded" to buy their handicrafts!

Once in Ndhiwa visits were made to the Acorn Community Hospital and local schools to enable an environmental health needs assessment to be carried out.



On Saturday 17th September Vicki held a garden fete to raise funds for the CIEH twinning with APHOK and the Acorn Project. The event was a huge success and raised over £730.

