REVIEW OF THE PROVISION OF WATER, SANITATION AND THEIR RELATED HYGIENE PRACTICES IN KPASSA TOWNSHIP OF NKWANTA DISTRICT, VOLTA REGION

BY

MICHAEL AYIVOR-VIEIRA

SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE

AUGUST 2003

MASTER OF PUBLIC HEALTH DEGREE

DECLARATION AND APPROVAL

I, MICHAEL AYIVOR–VIEIRA, do hereby declare that the work presented here was done by me through my own research while a student at the School of Public Health, University of Ghana, Legon, and that this same work has not been submitted anywhere for the same purpose.

Signed.....

MICHAEL AYIVOR-VIEIRA

(MPH RESIDENT2002/03)

ACADEMIC SUPERVISORS:

1.SIGNED.....

MR HENRY NOYE - NORTEY

(SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA, LEGON)

2.SIGNED.....

PROFESSOR EBENEZER LAING

(SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA, LEGON)

DEDICATION

This piece of work is dedicated to God to whom be the glory.

ACKNOWLEDGEMENT

I wish to render my sincere appreciation to certain personalities without whose generosity this study could not have been completed. First, I thank the Almighty God for giving me the strength and knowledge to complete the study.

I am greatly indebted to my academic supervisors Mr. Henry Noye-Nortey and Prof. Ebenezer Laing, School of Public Health, Legon for their guidance, encouragement and fruitful suggestions made towards the study.

I sincerely thank my field supervisor Dr John Koku Awoonor-Williams and the other members of the Nkwanta District Health Management Team for the logistics support and my welfare in Nkwanta.

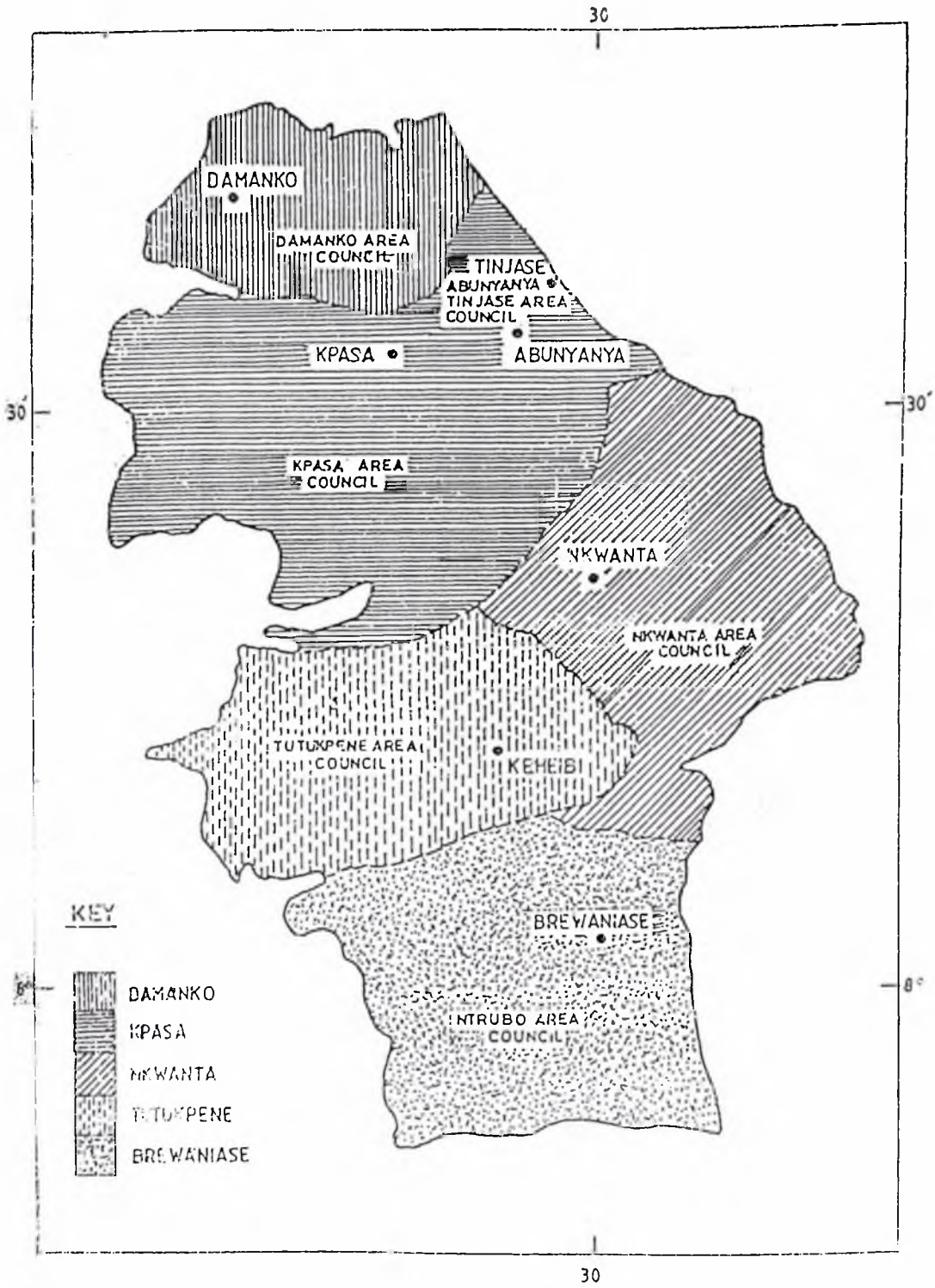
Special appreciation goes to Miss Rachel Tobey and Diana Ideidjo for the entire computer work during the study.

May I say a big thanks to all my lecturers at the School of Public Health, Legon, for the role they played and to my colleagues at the School of Public Health for their support during the study.

I also thank the research assistants and all those who helped in diverse ways to make this study a success.

DISTRICT MAP OF GHANA

NKWANTA SUB-DISTRICTS OF HEALTH



LIST OF ABBREVIATIONS

DDHS - **District Director Of Health Services**

EA - **Enumeration Area**

FGD - **Focus Group Discussion**

KVIP - **Kumasi Ventilated Improved Pit Latrine**

WHO - **World Health Organization**

OPD - **Out Patient Department**

UNICEF - **United Nations International Children's Emergency Fund**

TABLE OF CONTENTS

LIST OF TABLES **Page**

LIST OF FIGURES

Page

List Of Appendices

ABSTRACT

The study, which was conducted in July 2003 focuses on assessing the provision of water, sanitation and related hygiene practices in Kpassa Township in Nkwanta District. This will serve as an update on baseline data to be used for informing policy makers about water, sanitation and hygiene practices in the District. Both qualitative and quantitative methods were used in data collection. Sixty (60) households were interviewed and observed using the multistage approach to select the households. In addition two (2) focus group discussions were conducted separately for men and women, a general non-participatory observation by the researcher was conducted in the 6 enumeration areas of the township including the water sources and the communal sanitary facilities. The records of the health centre were reviewed from year 2000 to 2002 for the common diseases in the township. Findings show that the main source of drinking water for the township is the river, and the existing hygiene condition of this source was very poor posing a serious health problem to the township.

Another finding showed that majority of the households stored water for drinking in a covered container and claimed that they cleaned these containers every 2 – 4 days, but it was observed that 28.3% of the households had their containers not clean. There were only 2 communal toilets observed in the township. It was also revealed that 70% of the households interviewed did not have toilet facility and therefore the household members defecate in the bush. Children's faeces were disposed of openly in the backyard. While 96.7% of the households claim they wash their hands with soap and water, only 55.2% claim they wash their hands with soap before eating and 15.5% claim they wash their hands after attending to the babies faeces. Additionally only 58.6% claim they wash their hands after defecation and 46.6% claim they wash their hand with soap before cooking. Another finding was that 90% of the households think that faeces are harmful but it was observed that 20 to 25% of the households interviewed had faeces both inside and outside the compound of the households

Recommendations given were directed to:

1. The Nkwanta District Assembly to sink more boreholes and provide more communal toilets.
2. The Nkwanta District Director of Health Services to plan and implement hygiene promotion programmes to help the people to understand and develop good hygiene practices, so as to prevent diseases and promote a positive attitude towards cleanliness.
3. Environmental Health Officers to conduct periodic inspection of households to ensure that members of the community practice good environmental sanitation.
4. Community leaders to organize periodic communal labour to clean their surroundings

CHAPTER ONE

1.1 INTRODUCTION AND BACKGROUND

Environmental Sanitation comprises the provision of a safe and adequate water supply, disposal of waste, provision of good housing, food hygiene, control of animal reservoir of infection, control of insect vectors and other pests and elimination of other hazards.

Water and sanitation improvement in association with hygiene behaviour change can have significant effects on the population by reducing a variety of disease conditions such as diarrhoea, intestinal worms, guinea worm and skin diseases. These improvements can in turn lead to reduced morbidity and mortality. The expected reductions in morbidity can be substantial especially in areas with low levels of education. Modest improvement in Environmental sanitation such as provision of improved pit latrines will result in better health but major improvement such as flush toilets will result in even larger health benefits. Efforts that improve sanitation are worth undertaking as they have community - level effects as well as individual ones (Anker and Knowles1980).

It has been reported that over one-third of the world's population of nearly 2.5 billion people have inadequate access to sanitation and over 1 billion people do not have access to sufficient safe water. The above conditions combined with poor hygiene are largely responsible for the fact that 50 percent of the world's population suffers from debilitating diarrhoea diseases (example typhoid, cholera and dysentery). Of those affected 300 million people die each year. Over all polluted water affects the health of 1.2 billion people and it contributes to the death of 1.5 million children of age less than 5 years annually (Global Environmental Outlook Report 2000).

In Africa alone over 300 million people lack either sanitation or adequate water and frequently lack both. Diseases and mortality are not the only consequences of polluted and scarce water but less attention is paid to the fact that women and children bear much of the cost of dirty water and water shortages. Women and girls largely carry out the water collection and may spend long hours doing so. Women are most often the users, providers and the managers of water in the rural household and the guardians of household hygiene.

In Ghana less than 40 percent of the population have access to safe water and less than 11 percent has adequate sanitation

In the Volta Region 24% lack access to sanitation and 54% lack access to safe drinking water (Ghana statistics Services 2001).

1.2 JUSTIFICATION OF THE STUDY

Health problems associated with poor environmental sanitation include diarrhoea, dysentery, typhoid, bilharzia, cholera, worms, eye infection and skin diseases, and the annual report of the district for the year 2001 and 2002 indicated that diarrhoea, worms, skin diseases and eye infection were among the top ten diseases in the district.

The entire district has no pipe borne water system. The traditional sources of water are rivers, streams, boreholes and ponds. In the dry season, the quality and quantity of water drops down drastically. There are few public latrines. Indiscriminate defecation in the bush is very prevalent. Solid waste disposal is mainly crude dumping with no officially approved sites and majority of these sites are close to rivers and houses thus there is a possibility of contamination and transmission of infection that may lead to an epidemic.

1.3 STATEMENT OF THE PROBLEM

Inadequate water supply and poor environmental sanitation contribute to high rate of infectious diseases such as cholera, typhoid, dysentery and worms. Available information indicates that inadequate water supply and poor environmental sanitation are one of the public health problems identified by the District Health Management Team, Nkwanta (D.H.M.T) that need to be addressed immediately.

This study serves as an update on baseline data in use for intervention in programmes in the districts. This study will focus only on water supply and human excreta disposal (referred to as sanitation in the study).

1.4 OBJECTIVES OF THE STUDY

1.4.1 BROAD OBJECTIVE:

To review and evaluate the provision of water and sanitation and their related hygiene practices in Kpassa Township of Nkwanta District.

1.4.2 SPECIFIC OBJECTIVES:

1.4.2.1 WATER

- To identify and classify the sources of water supply

-To assess existing hygiene conditions of the water sources.

-To identify the water collection, storage and handling practices at the source, in transit and in the home.

1.4.2.2 SANITATION

-To identify and classify the existing sanitary facilities (domestic and communal) in the district.

1.4.2.3 HYGIENE PRACTICES

-To find out the reasons for adopting or not adopting certain hygiene practices.

-To identify domestic hygiene practices in the areas of:

- Disposal of children's stools

Hand washing at critical times (i.e. hand washing after defecation, after handling babies' faeces, before feeding, eating and preparing food)

-To determine individual knowledge of water and sanitation-related diseases

CHAPTER TWO

2.0 LITERATURE REVIEW

Access to safe water and adequate sanitation are among the basic human rights. Ensuring their availability would contribute immeasurably to health and productivity for development. It is reported that 3.4 million people mostly children die annually from water–related diseases and 2.4 billion people lack access to basic sanitation (Brundtland H. Gro. W.H.O 2002).

Sanitation service coverage is generally defined as the proportion of the population with access to at least adequate excreta disposal facilities that can effectively prevent human, animal and insect contact with excreta. Suitable facilities range from simple but protected pit latrine to flush toilet with sewerage (W.H.O 1996)

Water supply coverage refers to the proportion of the population with adequate access to safe drinking water. Reasonable access implies that the housewife does not have to spend a disproportionate part of the day fetching water for the family's needs. A distance of 200 metres is regarded as convenient (Resen and Vincent 1999).

Ramirez (1975) did a census on water supply and liquid waste disposal in Chile in 1970. The pattern of distribution of water and methods of liquid waste disposal led him to conclude that these are factors to be considered in contributing to the epidemiology of certain diseases such as typhoid, worms, cholera, etc.

Andrew Davis (WHO 1984) revealed that amoebiasis and hookworm are ranked among the 20 most fatal infections in Africa, Asia and Latin America from 1977–1978. Reasons attributed to this situation were ecological, souci-economic,

human behaviour and sanitation particularly in the tropical and subtropical areas. Ecological factors were over-population, deficient sanitary facilities leading to indiscriminate, unsupervised disposal of human waste, deficient or a lack of potable water supplies.

Ofusu (1984) in his search for measures to reduce intestinal worms stressed the importance of personal and food hygiene, effective excreta disposal and safe water supply.

In a review of more than 60 studies, Esrey et al (1985) found that the major benefits of service improvements in reducing diarrhoea morbidity were 25% from improved water availability, 22% from improved excreta disposal, and 16% from water quality improvements.

Berger et al (1986) dwelling on the health status of primary school children in Tanzania discovered that examination for helminths reveal a high prevalence rate with hookworm being the most prevalent between 7 –12 %. The high rate of infection corresponded with poor sanitary environment at school in which there was ineffective faecal disposal.

In recent years the historical emphasis on the water and sanitation facility improvement has been complemented by the increased attention given to the effects of hygiene behaviour rather than service improvement alone (Kolky 1993)

In policy terms, some of the emphasis has shifted to promotion of hygiene behaviour rather than service improvement alone (Varley et al 1986).

In adequate water, sanitation and hygiene accounts for a large part of the burden of illness and death in developing countries. Lack of clean water and sanitation is the second most important risk factor in terms of the global burden

of disease, after malnutrition. Approximately one sixth of the world's population is without water and two - fifth have no access to sanitation. Most of the unserved population lives in Africa and Asia, although even in Eastern Europe and Central Asia poor water sanitation and hygiene are among the ten most important risk factors for disease (Murray and Lopez 1997)

Improve hygiene (hand washing) and sanitation (latrines) have more impart than drinking water quality on health outcomes specifically reduction in diarrhoea, specifically reductions in diarrhoea, parasitic infection morbidity and mortality and increases in child growth (Esrey et al 1991 and hutley et al 1997)

The primary cause of contamination of water is inadequate or improper disposal of human and animal excreta, better water quality only improves health when sanitation is improve as well and the quality of water is sufficient (Esrey 1996). Constructing water supply and sanitation facilities is not enough to improve health, key human behaviours must accompany the infrastructure investments. However these behaviours with the greatest health impact have been identified by WHO and UNICEF as hand washing with soap after stool disposal and before preparing food, safe weaning food preparing, water handling and storage. A review of evidence found that 12 hand washing interventions in 9 countries achieved a median reduction in diarrhoea incidence of 25% (Hill Kirkwood and Edmond 2001)

2.1 Operational Definition of Term

Township: A division of a sub – district.

CHAPTER THREE

3.0 METHODOLOGY

3.1 STUDY TYPE

The study was descriptive utilizing both qualitative and quantitative methods of data collection. Data were collected questionnaires, non–participatory observation and focus group discussion. The principal investigator was assisted by two research assistants in data collection.

3.2 SAMPLING PROCEDURE AND SIZE

A sample size of 206 households with poor hygiene practices (Hand washing) will be required to obtained a 95% confidence interval of +/-5% around the expected percentage of 18%. However due to time and financial constraints sixty (60) households were selected for a household interview using the multistage sampling procedure. The Kpassa Township is divided into six (6) enumeration areas and ten households were selected from each enumeration area. The centres of each enumeration area were located using the enumeration maps provided by the Nkwanta district health directorate. A bottle was spun at the centre to determine the direction for the selection of the households. Every third household in the direction of the bottle was selected for interviewed until ten households were chosen from each enumeration area.

Two separate focus group discussions were conducted. One was conducted with six (6) women and the other with six (6) men from the Kpassa Township. A volunteer in the Township selected members for the focus group discussion from each enumeration area.

3.3 THE STUDY AREA

The study was conducted specifically in Kpassa, which is a sub–district capital of Kpassa sub-district. Kpassa sub-district is one of the 5 sub-districts of Nkwanta District in the Volta Region. The sub-district is a typical rural area, without large urban settlements.

3.3.1 LOCATION

Nkwanta occupies the northeastern part of Ghana and specifically the northern part of Volta Region. Nkwanta borders Togo in the east, the Northern Region in the north, the Volta Lake and Kete-Krachi District in the west and Kedjebi district in the south.

Kpassa Sub-District occupies the northern part of Nkwanta District. Damanko Sub –District, borders it to the north, Nkwanta and Tutukpene Sub-District borders it to the south, Kete Krachi district borders it to the west and Republic of Togo lies to the east of the Kpassa Sub-district.

3.3.2 POPULATION

The Kpassa Sub-District is one of the most populated of the five (5) sub-districts of Nkwanta having about 31.6% of the district's total population. The population is 49,872 (Census 2000).

3.3.3 ECONOMIC ACTIVITY

The main occupations of the people in Kpassa are farming, petty trading and cattle and goat rearing. The farming season is between the period of May to October. Major crops grown are yam, maize, groundnuts, cassava, beans and sheanut. The women additionally do gari processing in the district.

3.3.4 ETHNIC GROUP

The major ethnic group in the sub-district is Kokomba; the other groups include Basare, Kotokoli and Ewe. The paramount chief is a Kokomba. A peculiarity of the district is that Akan is spoken throughout the sub-district.

3.3.5 RELIGION

Many people in the sub-district practice traditional religion. In spite of this, Christianity is rapidly spreading. The sub-district has churches including Roman Catholic, Presbyterian and the Pentecostal Churches. The Kotokolis and some others like the Hausas practice Islam.

3.3.6 TRANSPORTATION AND TELECOMMUNICATION

Transport and telecommunication systems are poorly developed. The main road from Nkwanta through Kpassa to Damanko is in a very bad state, yet this road carries intensive traffic with seriously over-loaded trucks from the northern region to the southern part of the country. The bigger communities are linked to the sub-district capital by feeder roads; some are unmotorable during the rainy season. The main transport system is public transport. There are no postal

telecommunication services in the sub-district. Mail is brought via any reliable Hohoe-Nkwanta vehicle once a week.

3.3.7 EDUCATION

There are a number of schools in the sub-district. These include 12 kindergartens, 32 primary schools, 13 junior secondary school, and 1 senior secondary school.

3.3.8 ENVIRONMENTAL SANITATION

The approved public toilets in the sub-district are woefully inadequate to meet the increasing demand of the growing population. Sanitation is the sole responsibility of the district assembly. There are only two public toilets in the sub-district and both of these are only found in the sub–district capital. Indiscriminate defecation is prevalent. A potable water supply is a vital need of the people in the sub-district. The main sources of water supply are from rivers, ponds, wells, boreholes and sometimes rain harvests during the rainy season.
There is no refuse disposal site in the sub-district. Uncontrolled refuse dumping is generally practiced.

3.3.9 HEALTH INSTITUTIONS

The main health facility in the sub-district is a health centre run by the Government. The rest are run privately and these are Kpassa Maternity Home, Church of Pentecost Clinic and a clinic in Tinjase, a community near the Kpassa Township.

The top ten causes of OPD attendance in the sub-district are:

1. Malaria
2. Intestinal worms
3. Diarrhoea
4. Upper Respiratory Tract Infection
5. Skin Diseases
6. Burns
7. Ear infection
8. Measles
9. Eye Infection
10. Snake Bite

3.4 DATA COLLECTION TOOL AND TECHNIQUE

The principal investigator and his assistants used four days to collect all the data. A questionnaire containing 27 closed ended questions and 2 open-ended questions were administered. At the end of the each questionnaire there was an observation guide for the researcher to make his observation of the general situation of the household compound and also assess the water storage container and the water transport means to determine whether they were clean or dirty. The questionnaire took about 30 minutes to fill and 10 minutes for the observation of each household.

The general observation guide for each enumeration area contained about 20 different observation columns to be filled in by the researcher.

The focus group discussion guide contained 13 open-ended questions for discussion.

3.4.1 PRE-TESTING AND REVIEW OF QUSTIONNAIRE

The questionnaire was pre-tested at Korantang, a community about 3km from Nkwanta Township. There were some anomalies detected on the questionnaire during the pre-test and these were reviewed and finalized accordingly.

3.4.2 INTERVIEW IN THE COMMUNITY

The principal investigator and the research assistants conducted the interviews in the township for the four days scheduled for the exercise. Household heads were interviewed. However, where these heads were absent, The oldest adult in the household was interviewed.

3.4.3 NON-PARTICIPATORY OBSERVATION

The principal investigator conducted the non-participatory observation. The observation was done for each enumeration area from 6 am to 10 am and 3 pm to 6 pm each day. The hygiene conditions and the activities at the water source were observed using the observation guide. The sanitary facilities were also observed using the observation guide.

3.4.4 FOCUS GROUP DISCUSSION (FGD)

Two focus group discussions were conducted. One was conducted for six women between the ages of 30 to 40 selected from each of the six (6) enumeration areas, four (4) were farmers, one seamstress and the last a petty trader.

The second focus group discussion was conducted for 6 men between the ages of 28 to 41 also selected from each enumeration area. The men were all farmers except one who is a carpenter. The questions for the FGD included five (5) open-ended questions asked about water supply and 8 open-ended questions asked about sanitation. The FGD was conducted in Twi and later translated into English.

3.4.5 REVIEW OF HOSPITAL RECORDS

Records of the only Government Health Centre in the township were reviewed from the year 2000 to 2002. This is to determine the water and sanitation related diseases in the township.

3.5 QUALITY CONTROL CHECKS

The principal investigator randomly selected the completed questionnaires and checked for completeness, consistency and accuracy.

3.6 LIMITATIONS OF THE STUDY

The study was faced with some limitation that should be kept in mind when interpreting the findings. These include:

3.6.1 RESPONDENT BIAS

Some respondents could have answered questions to please assistants instead of telling the truth of the situation. The assistants' attention was drawn to this possibility.

3.6.2 OBSERVER BIAS

An observer error in the application of the observation guide at the tail end of the questionnaire is also likely given the subjectivity of the observation. It is hoped that this is minimal since the research assistants were well trained and their attention was also drawn on such occurrences.

3.6.3 SAMPLE SIZE.

A bigger sample size could have been used but due to time and financial constrains only 60 households were interviewed. A larger sample size could give more confidence to the researcher in generalization of the findings. Nevertheless it is hoped that the methods used so far will bring up the findings about the topic under the research.

3. 7 DATA PROCESSING AND ANALYSIS

All the questionnaires were coded after being checked once again for completeness and consistency. Data were sorted and entered into Epi info 2000 for analysis.

CHAPTER FOUR

4.0 STUDY FINDINGS

4.1 INTRODUCTION

A total of sixty (60) households were selected and a respondent from each household was interviewed from the 6 enumeration areas of the township. Six (6) non-participatory observations were also conducted in each enumeration area. Two (2) focus group discussions were conducted separately for males and females, and finally hospital records were reviewed from the year 2000 to 2002.The results were as follows:

4.2 BACKGROUND OF RESPONDENTS

TABLE 1: AGE GROUPINGS OF RESPONDENTS

Age	Frequency	Percent
15-24	12	20.0%
25-34	20	33.3%
35-44	14	23.3%
45-54	9	15.0%
55-64	4	6.7%
65- over	1	1.7%
Total	60	100.0%

Table 1 shows the age groupings of the respondents. Twenty (33.3%) of the respondents were between the ages of 25-34 years and only 1(1.7%) was over 60 years.

FIGURE 1: LEVEL OF EDUCATION OF RESPONDENTS

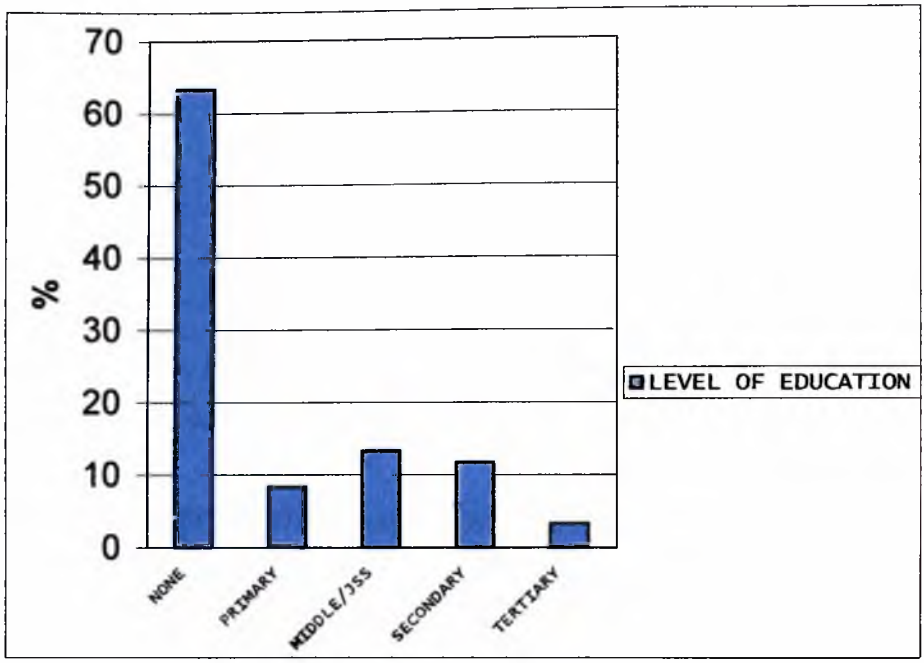


Figure 1 shows the highest level of education attained by respondents. Thirty-Eight (63.3%) did not have any formal education at all. Two (3.3%) had had tertiary education. Five (8.3%) had primary school education. Eight (13.3%) had junior secondary education. Seven (11.7%) had secondary education.

TABLE 2: SEX DISTRIBUTION OF RESPONDENTS

	Frequency	Percent
Male	8	13.3%
Female	52	86.7%
Total	60	100.0%

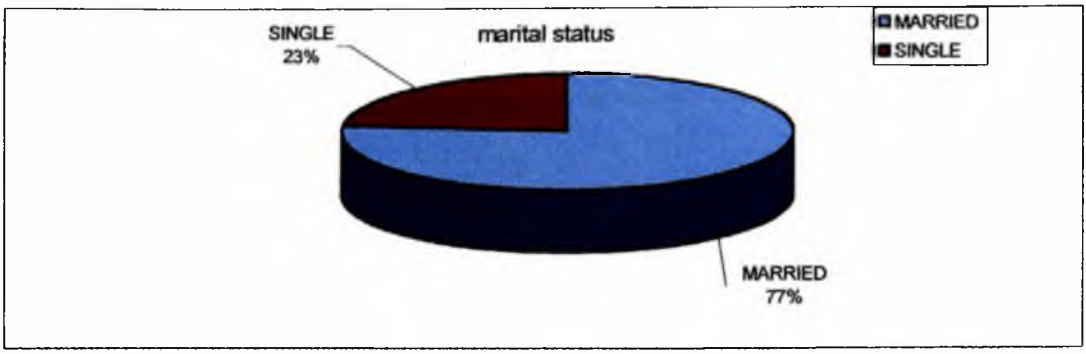
The table 2 shows the sex distribution of respondents. Fifty-Two (86.7%) of the respondents were females. Eight (13.3%) were males.

TABLE 3: RELIGIOUS AFFILIATION OF RESPONDENTS

RELIGION	Frequency	Percent
Christian	35	58.3%
Moslem	17	28.3%
No religion	8	13.3%
Total	60	100.0%

Table 3 shows the religious affiliations of respondents. Thirty-Five (58.3%) of the respondents are Christians. Eight (13.3%) have no religion. Seventeen (28.3%)are Moslems.

FIGURE 2: SHOWING MARITAL STATUS OF RESPONDENTS



The figure above shows the marital statuses of the respondents. Forty-Six (77%) of respondents are married. Fourteen (23%) are single.

TABLE 4: ETHNIC GROUPINGS OF RESPONDENTS

ETHNICITY	Frequency	Percent
AKAN	2	3.3%
BASARE	4	6.7%
KRACHI	3	5.0%
ADELE	2	3.3%
CHOKOSI	1	1.7%
EWE	5	8.3%
KOKOMBA	31	51.7%
ACHODE	2	3.3%
KOTOKOLI	10	16.7%
Total	60	100%

The table above displays the ethnic compositions of respondents. Thirty-One (51.7%) were Kokombas. Ten (16.7%) were Kotokolis. Five (8.3%) were Ewes.Four (6.7%) were Basaris.Three (5%) were Krachis.

TABLE 5: TYPE OF WORK OF RESPONDENTS

	Frequency	Percent
Self employed	54	90.0%
Government employee	2	3.3%
Unemployed	4	6.7%
Total	60	100.0%

The above shows the kind of work of respondents. The vast majority of the respondents are self-employed.

4.3 SANITATION

TABLE 6:TOILET FACILITIES USED BY HOUSEHOLDS

	Frequency	Percent
Household toilet	9	15.0%
Public toilet	10	16.7%
None (bush)	41	68.3%
Total	60	100.0%

The above table displays the toilet facilities utilized by respondents. Forty-One (68.30%) claim do not use any facility and rely on the bush. Nine (15%) use the toilet at home and ten (16.7%) use the public toilet.

TABLE 7: TYPE OF TOILET FACILITY USED BY HOUSEHOLDS

	Frequency	Percent
KVIP	10	52.6%
Pit latrine	9	47.4%
Total	19	100.0%

The above shows the type of facility utilized by respondents who do not use the bush. Ten (52.6%) use the KVIP and nine (47.4%) use the pit latrine.

TABLE 8: WHERE CHILDREN DEFAECATE IN THE VARIOUS HOUSEHOLDS

PLACE FOR DEFAECATION	Frequency	Percent
In the chamber pot	33	55.9%
On the floor /ground	6	10.2%
At the refuse dump	19	32.2%
In the bush near by the house	1	1.7%
Total	60	100.0%

The above shows where children defecate in the households. Over half defecate in chamber pots, a third defecate at the refuse dump and six (10.2%) defecate on the floor.

TABLE 9: WAYS OF DISPOSAL OF CHILDREN'S FAECES BY THE HOUSEHOLDS

WAYS OF DISPOSAL	Frequency	Percent
By burying	15	25.0%
Open disposal in the back yard	18	30.0%
Flushed /thrown into the latrine	14	23.3%
Do nothing about the feaces	13	21.7%
Total	60	100.0%

The above table shows the ways respondents dispose of their children's faeces. Eighteen (30%) practices open disposal in the backyard and a quarter disposes by burying. Fourteen (23.3%) dispose of by throwing it into the pit latrine and thirteen (21.7%) do nothing about it.

TABLE 10: RESPONDENTS' REASONS WHY FAECES ARE HARMFUL

	MENTION	NO MENTION	TOTAL
Cause Disease	54 (90.0%)	6 (10%)	100%
Smell Badly	11 (18.3%)	49 (81.7%)	100%
Disgusting	19 (31.7%)	41 (68.3%)	100%

The above shows the reasons why the respondents say faeces is harmful without them being prompted. Fifty-Four (90%) responded that they cause disease. Eleven (18.3%) responded they smell badly. Nineteen (31.1%) responded they are disgusting.

TABLE 11 INDIVIDUAL KNOWLEDGE OF ANY DISEASES RELATED TO FAECES

RESPONSES	Frequency	Percent
Yes	38	62.7%
No	22	37.3%
Total	60	100.0%

Table 11 shows respondents' knowledge of any diseases related to faeces. Thirty-Eight (62.7%) responded that they know of diseases related to faeces

while 22 (37.3%) responded that they do not know of any disease related to faeces.

TABLE 12: DISEASES MENTIONED BY RESPONDENTS

	Mention	No mention	Total
Cholera	19 (50%)	19 (50%)	58 (100%)
Malaria	12 (31.6%)	26 (68%)	38 (100%)
Diarrhoea	5 (13.5%)	32 (86.5%)	38 (100%)
Vomiting	4 (10.5%)	34 (89.5%)	38(100%)
Abdominal Pain	17 (44.7%)	21 (55.3%)	38 (100%)

The above table displays the diseases mentioned by respondents. Half of those who know of any disease mentioned cholera. Five respondents (13.5%) mentioned diarrhea, four (10.5%) mentioned vomiting and nearly half mentioned abdominal pain. Close to a third of respondents mentioned malaria.

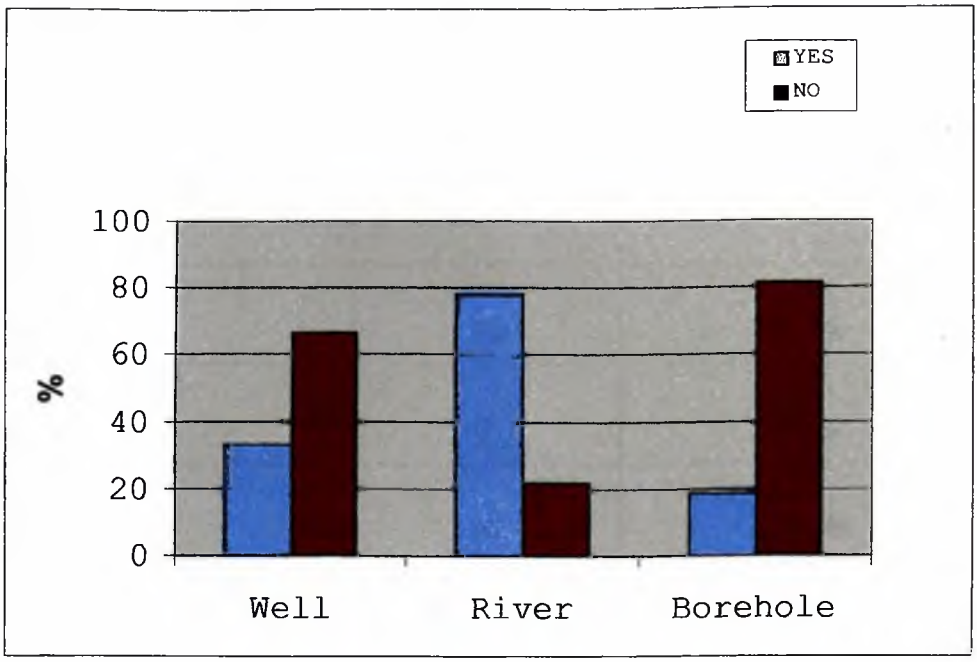
4.4 WATER

TABLE 13: SOURCES OF DRINKING WATER OF RESPONDENTS

WATER SOURCES	Frequency	Percent
Well	3	5.0%
River	46	76.7%
Borehole	11	18.3%
Total	60	100.0%

Table 13 above shows the drinking water sources of respondents. Forty-Six (76.7%) respondents reported drinking from the river. Eleven (18.3%) respondents reported drinking from a borehole. Three (5%) respondents reported drinking from a well.

FIGURE 3: TREATMENT BY WATER SOURCE



The figure above shows the percentage of respondents who treat their drinking water from the various water sources. For those who rely on the river for water, nearly 80% treat it. Among the respondents who use a borehole, only 20% treat the water.

TABLE 14: FREQUENCIES OF RESPONDENTS WHO WASH HANDS WITH SOAP

RESPONSES	Frequency	Percent
Yes	58	96.7%
No	2	3.3%
Total	60	100.0%

The table above shows the frequencies of respondents who wash their hands with soap. Fifty-Eight (96.7%) of respondents wash their hands with soap while two (3.3%)of respondents do not.

TABLE 15: WHEN DO RESPONDENTS WASH HANDS WITH SOAP

	Mention	No mention	Total
Before cooking	27 (46.6%)	31 (53.4%)	58 (100.0%)
After Defecation	34 (58.6%)	24 (41.4%)	58 (100%)
After handling babies faeces	9 (15.5%)	49 (84.5%)	58 (100%)
Before eating	32 (55.2%)	26 (44.8%)	58 (100%)

The table above shows the various times that respondents wash their hands with soap. Nearly half of those who indicated that they use soap responded that they use it before cooking. Over half responded that they use soap after defecation and before eating. Respondents were not prompted during the interview.

TABLE 16: REASONS WHY RESPONDENTS WASH HANDS WITH SOAP

	Mention	No mention	Total
To prevent Diseases	31(53.4%)	27 (46.6%)	58 (100%)
To make me feel Clean	47 (81%)	11 (19%)	58 (100%)

The table above shows the reasons respondents gave for washing their hands with soap. 53.4% responded they did it to prevent diseases. While 81% responded they did it to make them feel clean.

TABLE 17: STORAGE FACILITY OF RESPONDENTS

	Frequency	Percent
In a covered container	58	96.7%
In an uncovered container	2	3.3%
Total	60	100.0%

The above shows the storage facility for drinking water used by respondents. Fifty-Eight (96.7%) store water in a covered container. Two (3.3%) store in an uncovered container.

TABLE 18: HOW OFTEN RESPONDENTS CLEAN STORAGE CONTAINERS

	Frequency	Percent
Everyday	21	35.0%
Every 2- 4 days	32	53.3%
Every 5- 6 days	1	1.7%
Once a week	6	10.0%
Total	60	100.0%

The above shows how often respondents clean their water storage containers. Over half clean every 2-4 days and 10% clean once a week.

TABLE 19: GENERAL SITUATION OF THE HOUSEHOLD COMPOUNDS

	Yes	No
Faeces Inside Household	15 (25%)	45 (75%)
Faeces Outside Household	12 (20%)	48 (80%)

The table above displays the observation made by researcher on the households of the respondents. Faeces were observed inside in 15 (25%) of the households. Faeces were observed outside the households in 12 (20%) of the respondents' homes

4.5 RESULTS OF OBSERVATION MADE ON THE SIX ENUMERATION AREAS

TABLE 20: AVERAGE DISTANCE OF HOUSE FROM RIVER

	No. Of Enumeration Areas	Percent
100-499m	1	16.7%
500m-1km	3	50.0%
Over 1km	2	33.3%
Total	6	100.0%

The table above shows the average distance between each enumeration area and the river. Three (50%) of the enumeration areas have an average distance of 500-1km from the households. Two (33.3%) of the enumeration areas have an average distance of over 1km. One (16.7%) of the enumeration areas has average distance of 100 - 499m.

TABLE 21: AVERAGE DISTANCE OF HOUSE FROM BOREHOLE

AVERAGE DISTANCE	No. Of Enumeration Areas	Percent
100-499m	3	75.0%
Over 1km	1	25.0%
Total	4	100.0%

The table above shows the average distance of enumeration areas with boreholes. 3(75%) of the enumeration areas have an average distance of 100 – 499m. 1(25%) of the enumeration areas has average distance of over 1km.

TABLE 22: INFANT FAECES ALONG THE ROADS TO WATER SOURCE

	No. Of Enumeration Areas	Percent
Yes	2	33.3%
No	4	66.7%
Total	6	100.0%

The table above shows the presence of infant faeces along the road to the water source in the enumeration areas. Two (33.3%) of the enumeration areas have

infant faeces observed along the footpath. The remaining four (66.7%) has no infant faeces observed along the footpath to the water source.

4.5.1 NUMBER OF INFANT FAECES ALONG THE ROADS TO WATER SOURCE (RIVER)

A number of instances of infant faeces were observed along the roads to the water source. Ten (10) and seven (7) infant faeces were observed in the two enumeration areas where any faeces were observed.

TABLE 23: INFANT FAECES ALONG FOOTPATH TO WATER SOURCE (RIVER)

	Frequency	Percent
YES	6	100.0%
Total	6	100.0%

The above shows the presence of infant faeces observed along footpath to the water source (River). All six (6) enumeration areas have infant faeces observed along the footpath to the water source.

4.5.2 NUMBER OF INFANT FAECES OBSERVED ALONG FOOTPATH TO WATER SOURCE

A number of infant faeces were observed along the footpaths to the water source: Three (3) were observed in 2 of the enumeration areas; Six (6), ten (10), eleven (11) and eighteen (18) infant faeces were observed in the remaining 4 enumeration areas.

TABLE 24: ADULT FAECES ALONG FOOTPATH TO WATER SOURCE

	No of Enumeration areas	Percent
YES	6	100.0%
Total	6	100.0%

The above table shows the presence of adult faeces observed along footpath to the water source (River). All six (6) enumeration areas have adult faeces observed along footpath to the water source.

4.5.3 NUMBER OF ADULT FAECES ALONG ROAD TO WATER SOURCE (RIVER)

Numerous adult faeces were observed along the footpath to water source. One (1) adult faeces were observed in 2 enumeration areas; Ten (10), eleven (11) twelve (12) and thirteen (13) adult faeces were observed in the remaining enumeration areas.

4.5.4 NUMBER OF ADULT FAECES ALONG FOOTPATH TO WATER SOURCE

A number of adult faeces were observed along footpath to water source: Two (2) instances of adult faeces were observed along footpath of 3 of the enumeration areas; Four (4) were observed in 2 of the enumeration areas and five (5) instances were observed in the remaining enumeration areas.

TABLE 25: COMMUNAL SANITARY FACILITY IN THE ENUMERATION AREAS

	Frequency	Percent
Yes	2	33.3%
No	4	66.7%
Total	6	100.0%

Table 25 shows the availability of communal toilet facility in the enumeration areas. Two (33.3%) of the enumeration areas have communal toilet facility. The rest did not have any communal facility.

TABLE 26: WATER AND SOAP WITHIN 10 METRES FROM SANITARY FACILITY

	Frequency	Percent
No	2	100.0%
Total	2	100.0%

Of the 2 communal facilities neither of them had water and soap within 10m from the communal facilities.

TABLE 27: ACTIVITIES OBSERVED AT THE WATER SOURCE (RIVER)

	No. Of EA Where Activity was Observed	No OF EA Where No Activity was Observed
Washing Of Water Container	6 (100%)	NIL
Washing of self/ Bathing	5(83.3%)	1(20%)
Watering of Animals	5(83.3%)	1 (20%)

Table 27 shows the various activities observed at the river (main drinking water source) in the enumeration areas. As observed by the researcher during 3 hours of a single day. All the enumeration areas had containers being washed in the river. Washing of self and watering of animals was observed in 5 (83.3%) of the enumeration areas.

4.6 FOCUS GROUP DISCUSSION

The focus group discussion did not yield any different result from the questionnaires administered. In response to the question of why do they continue to fetch water from the river when they have been provided with boreholes, one woman answered:

"My farm is very far away and I must get there before the sun rises. Even though I like to fetch the borehole water, the queue there is very long and you can spend the whole morning there without even getting water at the long run."

In response to the question of why do you still use the bush when there are communal toilets in the township, one man answered:

"There are only two (2) communal toilets in the whole township and moreover they are very far away from those of us from the other side of the township. So if you don't take care, you can "finish the job" on the way before you get there." (to the communal facility)

4.7 REVIEW OF HOSPITAL RECORDS

The records for the top 10 OPD cases in the only government health facility in the town was reviewed from the year 2000 to 2002. The results are as follows:

Table 28: TOP 10 OPD CASES FOR THE YEAR 2000, 2001 and 2002

NO. OF CASES / YEAR

No	DISEASE	2000	2001	2002
1	Malaria	1886	1445	2772
2	Intestinal Worms	449	478	602
3	Upper Respiratory Tract Infection	242	375	130
4	Diarrhoea	215	606	364
5	Burns	133	174	50
6	Skin Infection	29	218	98
7	Measles	33	38	30
8	Eye Infection	22	49	23
9	Ear Infection	16	17	30
10	Snake Bite	12	44	5

Table 28 shows that apart from malaria diarrhoeal diseases and intestinal worms were among the leading conditions in the township.

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 DISCUSSION

In developing countries, inadequate safe water supply and lack of sanitation facilities represent two significant factors contributing to ill health and infectious disease. Indeed, the primary causes of many childhood illness and poor health in Africa are water related (Sharma et al 1996). This study reveals that there are both challenges and opportunities for Kpassa Township in the areas of water supply, sanitation, and hygiene practices.

Appropriate facilities for human waste disposal are the basic need of all communities. In the absence of such facilities, there is a high risk of diseases such as cholera, typhoid, dysentery, etc. This study revealed that most respondents (68.3%) defecate indiscriminately in the bush, and only 31% of respondents have toilet facilities in their homes. Additionally, only two communal toilets exist in the community, and respondents often saw these facilities as inconveniently sited. The focus group discussion and the direct observation confirmed that the deficiency of the sanitary facilities in the township is likely to have led to the indiscriminate defecation. This is a serious health problem because many diseases are caused by food, water and hands contaminated by organisms that come from faeces.

The study revealed that 95% of respondents claim that faeces are harmful. However, direct observation of the households showed children's faeces inside in 25% of household compounds and outside 20% of household compounds. This is very serious; such proximity of faeces increases risk of an outbreak in the township. This is an opportunity for the health workers in the township to teach community members to develop good hygiene and sanitation practices in the home and to understand the dangers of poor environmental sanitation.

A review of the hospital records from the year 2000 to 2002 confirmed that apart from malaria, diarrhoeal diseases and intestinal worms were among the leading conditions in the township. This is likely due to the poor environmental sanitation. Ramirez (1975) concluded in his study on water supply and liquid waste disposal in Chile that the pattern of distribution of water and methods of liquid waste disposal are factors contributing to the epidemiology of certain diseases such as cholera. In another study, Berger et al (1986) revealed that the high rate of infection among school children corresponded with the poor sanitary environment at the school. These examples combined with the results from this study point to an imperative for Government intervention to improve sanitation in the Kpassa community.

Because 90% of the respondents are self-employed as peasant farmers, it is unlikely that this low-income group will be able to afford to build toilets in their own homes. These results suggest that in order to reduce the risk of infectious disease in Kpassa, it is imperative for the district assembly to consider providing more communal toilets.

This study revealed that there exists substantial opportunity to improve hygiene practices in the community. Hand washing with soap and water is most critical after defecation, after cleaning a child who has defecated, and before eating or handling food. While 96.7% of respondents wash their hands with soap and water, only 55.2% claim that they wash their hands with soap before eating and 15% claim they wash their hands after attending to babies' faeces. Additionally, 58.6% claim they wash their hands after defecation, and 46.6% claim they wash before cooking. These results suggest that many respondents are not washing their hands with soap and water at the most important times (After defecation, after cleaning a child's buttocks, before eating, or handling food) in order to prevent disease. Indeed, proper hand washing is one of the most effective ways of preventing the spread of diarrhoeal diseases. This study reveals that there is

ample opportunity for health workers in the township to increase health education on the importance of hand-washing and proper techniques to prevent the spread of disease.

Because illiteracy was predominant among the respondents, with 63% having no formal education, any education material to the community should be targeted at an illiterate population. Education should emphasize that even though pathogens cannot be seen, soap and water are required to destroy pathogens on the hands and on utensils.

Access to safe water is a basic requirement for health, made more critical when water-bornes diseases threaten. Since contaminated water is the usual source of cholera and other infections, all efforts must be made to provide safe drinking water, as well as safe water for food preparation and bathing.

The study demonstrated that only 24.2% of respondents obtain water from safe water source like a borehole or a well. The river was the main drinking water source for most respondents. Direct observation revealed that the river was at high risk of contamination because of activities such as washing of self, washing of dirty water containers and watering of animals in the same place where drinking water was collected. This is also a serious problem because it poses a potential health risk and could lead to an epidemic. Even though 79% of respondents are treating the river water by filtering, this is not enough because observations revealed numerous instances of faeces along the roads and footpaths to the river. Additionally, the WHO recommends boiling as a superior method to filtering for water sterilization (WHO, 1993). It is important for the township to treat the water at home by boiling and filtering before drinking. Improvement in water-treatment practices reduces diarrhoea. Esrey et al (1985) found that the median level of diarrhoea morbidity was reduced 25% by improved water availability, 22% by improved excreta disposal and 16% by

water quality improvement. Controversy still rages in this area with several consultants questioning the role of water improvements in reducing diarrhoea morbidity. However, in a cross–sectional analysis involving eight countries (including Uganda), Esrey (1996) found that sanitation improvements conferred much larger benefits than water improvements. In Indonesia, Wibowo and Tisdell (1993) provided additional evidence of the efficacy of water and sanitation in improving health status. All the conclusions of these studies above further add to the point that the township faces a high risk of infection if nothing is done to improve both the sanitation and water supply situations. There is opportunity for the health workers to increase health education on water treatment, especially by boiling. However, the best long-term solution is for the district assembly to provide more boreholes in the community.

Another revelation from the study is that most households stored their drinking water in a covered container and majority also claims that they clean their storage containers every 2-4 days. However direct observation of storage containers of the respondents revealed that 28.3 % were not clean. This also calls for health education on the importance of cleaning storage containers and the risk of contaminating the water. Education of community members should be geared towards the importance of cleaning the inside of storage containers with either detergent or chlorine and the importance of handling water with clean hands.

5.2 CONCLUSION

Many diseases are caused by water, hands and food that are contaminated by disease-causing organisms or pathogens that come from faeces. This study shows that the hygienic conditions of the main water source for drinking (the local river) are very poor due to indiscriminate defecation on the roads, footpaths and also improper disposal of children's faeces on the roads leading to the river. Among the households who fetch water for drinking from the river, 79% treat this water only by filtering which is not adequate according to WHO recommendations. Indiscriminate defecation is very high and the situation is made worse because there are only two (2) communal toilets in the township which respondents saw as inconveniently far away. It is unlikely that the households would be able to afford to build toilets in their own homes since they are peasant farmers from a low-income group. Additionally, Many of the respondents wash their hands with soap and water but majority do not know the most important times for washing their hands with soap and water. Community awareness about water, sanitation and related hygiene practices is fundamental to promoting a healthier community. Without adequate knowledge about basic hygiene and sanitation, community members may misallocate their scarce resources available to improve both household and environmental sanitation.

Future research on this topic could improve upon this study in various ways. First, given greater resources and time, researchers should consider sampling a larger number of communities and households to further validate the findings of this study. Second, researchers should perform laboratory analyses of water samples in order to ascertain a better measure of water quality. Finally, while this study focuses on two specific areas of environmental sanitation, future studies should consider exploring all the areas of sanitation such as refuse, good housing, and food hygiene.

Despite these shortcomings, the findings suggest a number of recommendations for the district assembly, community leaders, Environmental Health Officers, and the District Health Director. Recommendations are listed below.

5.3 RECOMMENDATIONS

To achieve long-term improvements in health outcomes, the district assembly in collaboration with the District Health Management Team and community leaders should make efforts to create awareness in their community about the importance of water supply, proper sanitation and hygiene practices. Below are list of specific recommendations for the appropriate authorities.

5.3.1 District Assembly

1. Despite prohibitive cost, the District Assembly should provide communal toilets to the township. The toilets should be located in such a way to benefit all the people in the various enumeration areas in the township.

2. The District Assembly must provide more boreholes to the community to provide sufficient safe water in order to meet community needs.

5.3.2 Environmental Health Officers

1. Environmental Health Officers should conduct periodic inspections of households to ensure that members of the community practice good environmental sanitation and the importance of safe water supply.

5.3.3 Community Leaders

1. Community leaders can promote cleanliness in the households by regularly checking on the households and utilizing bye-laws to encourage household maintenance.

2. Community leaders should organize periodic communal labour to clean their surroundings.
3. Community leaders must encourage local teachers to incorporate proper environmental and personal hygiene practices into their lessons in the classroom.

5.3.4 Nkwanta District Director of Health Services (DDHS)

1. The DDHS should plan and implement a hygiene promotion programme that will meet community needs and also help the people to understand and develop good hygiene practices.

REFERENCES

1. Anker, R. & Knowles, J. (1980). An Empirical Analysis of Mortality differentials IN Kenya at the macro and micro levels. Economics Development and cultural change 29, 165-185

2. Almedom, A. M.; Blumenthal, U. & Manderson. L. (1997). Hygiene Evaluation Procedure: Approaches and Methods for Assessing Water–and Sanitation -Related Hygiene Practices. International Nutrition Foundation for Developing Countries.

3. Berger, I.B; Omar, S. (1986). Health Status of Primary School Children in central Tanzania. Journal Tropical Pediatrics, 32, 26-29

4. Bruntland Gro Harlem (2002). Facts and Figures, Global Burden Of disease from water, sanitation and hygiene. WHO Geneva.

5. Davis Andrew (1984). The wormy World in. World Health Magazine of WHO, P. 3.

6. Esrey, S.A.; Feachem, R. & Hughes, J.M. (1985). Interventions for the control of diarrhoeal diseases among young children: improving water supplies and excreta disposal facilities. Bulletin of World Health Organization, 63, 757-772

7. Esrey,S; Potash,J; Roberts, L & Shiff, C. (1991). Effects of improved water supply and sanitation on ascariasis,Diarrhoea,Dracunculiasis, Hookworm Infection, Schistosomiasis and Trachoma,WHO bulletin, 69,609-621

8. Esrey, S. (1996). Water, Waste and well- being: A Multi Country Study, American Journal Of Epidemiology 14, 608 – 623

9. Ghana Statistics Services (2001). Ghana Living Standard survey Report of the fourth round (GLSS 4), Accra

10. Hatley, S; Morris, S. & Pisana, V. (1997). Prevention of Diarrhoea in Young Children in developing countries, WHO Bulletin, 75,163-174

11. Hill, Z.; Kirkwood, B & Edmond, K. (2001). Family and community Practices that promote child survival, Growth and development: A review of the evidence, Public Health Intervention Unit. Department of Epidemiology and Population Health, London School of hygiene.

12. Howard, G.; Leshabari, M.J. (2002). Health Villages: A Guide For Communities and Community Health Workers. WHO Geneva

13. Kolky, P. J. (1993). Water, Sanitation and Diarrhoea: The limits of understanding transactions of royal Society of Tropical Medicine and hygiene.

14. Murray, C.J.L and Lopez (1997). Global mortality, Disability and the contributing risk factors. Lancet 349:1436- 42

15. Ofosu, A. (1984). Diseases in Sub-Saharan Africa - An Overview In: Disease and Mortality in Sub-Saharan Africa. R. Feachem and T. Dean (Eds.). A World Bank Publication, Oxford University Press.

16. Opoku, J.Y.(2000).A short Guide To Research Writing In The Social Sciences And Education Ghana University Press,Accra.

17. Ramirez, R. (1975). Some Epidemiological Factors, which favour intestinal parasitic infection in Chile, Bolestin-Chileno - e -: arasitologica.

18. Rosen, S. & Vincent, J. R. (1999). Household water resources and rural productivity in Sub-Saharan Africa: A review of the evidence Development discussion paper No 673 Harvard.

19. Sharma, N. P., Minjas, J.N. (1996). African Water Resources: Challenges and Opportunities for Sustainable Development. World Bank Technical paper No. 331. Africa Technical Department series, Washington.

20. Varley, R.C.G.; Tarvid, J. And Chao, D.N.W. (1998). A reassessment of the cost effectiveness of water and sanitation interventions in programmes for controlling childhood diarrhoea. Bulletin of the world Health Organization.

21. WHO/UNICEF (2002). Global Environment outlook report. WHO/UNICEF Joint Monitoring Programme, Geneva

22. World Health Organization (1996). Global Health for-all-Indicators. Online. Http:/www.whochlhst/hsp/globindi.html.

23. WHO (1993). Guidelines for Cholera Control. WHO Publication, Geneva

24. Wibowo, D. & Tisdel, I. C. (1996). Health, Safe Water and Sanitation. A cross sectional Health Production function for central Java, Indonesia. Bullentin of The World Health Organization, 71,237-245

APPENDIX I

WATER, SANITATION AND HYGIENE QUESTIONAIRE

NKWANTA DISTRICT

Please be specific and answer the questions as accurately as you can. Any information given will be treated as confidential.

Respondent Number: .....

Write or circle the appropriate answer provided.

1.Date:.....

2.Name of Village:.....

3.Name of Respondent.....

NO.	QUESTION	CODING CATEGORIES	SKIP TO
4	How old are you?	AGE IN YEARS 15-24.....1 25-34.....2 35-44.....3 45-54.....4 55-64.....5 65 – or above....6	
5	What is your highest level of education?	None.....1 Primary.....2 Middle/JSS.....3 Secondary..... 4 Tertiary.....5	
6	Sex	Male..... 1 Female..... 2	
7	To which ethnic group do you belong?	Akan .....1 Ewe .....2 Guan .....3 Kokomba .....4 Challa .....5 Adele .....6 Achode .....7 Kotokoli .....8 Ntrobo .....9 Basare.....10 Other _____ 11 (Specify)	

8	What is your religious affiliation?	Christian..... 1 Islam.....2 Traditional.....3 Other..... 4 No Religion.....5	
9	What is your current marital status?	Married.....1 Single.....2	
10	What kind of work do you do?	Self Employed..... 1 Government Employee..... 2 Unemployed..... 3	
	SANITATION		
11	What toilet facility do you use? *(Prompt them)*	Home toilet..... 1 Communal toilet..... 2 None (Bush)..... 3 → Other (State)..... 4	Skip to 14
12	What type of facility is the toilet you use?	KVIP..... 1 Pit latrine..... 2 Water closet..... 3 Bucket..... 4 Other...(specify)..... 5	
13	Are the children under age 6 able to use the toilet facility on their own?	Yes..... 1 → No..... 2	Skip to 16
14	Where do the children defecate?	In the chamber pot.....1 On the floor /ground..... 2 At the refuse dump.....3 Any other (State)..... 4	
15	How do you dispose of the faeces?	By burying ..... 1 Open disposal at the backyard..... 2 Flush/Throw into the latrine..... 3 I do nothing..... 4 Any other (state)..... 5	
16	Do you think human faeces are harmful in any way?	Yes..... 1 No..... 2 →	Skip to 18

17	Why are faeces harmful? (*Please list the other reasons If people mention them* *(Do not prompt them)*	**(Check the boxes if mentioned)** Cause disease..... ☐ Because they smell bad..... ☐ They are disgusting..... ☐ Don't know..... ☐	Skip to 19
18	Why are faeces not harmful? *(Please list all the other reasons)*	....	
19	Do you know of any disease related to faeces?	Yes..... 1 No..... 2 →	Skip to 21
20	What disease related to feaces are you aware of? *(Probe)*	**(Check the boxes)** Cholera..... ☐ Typhoid..... ☐ Dysentery..... ☐ Malaria..... ☐ Abdominal pain..... ☐ Diarrhoea ..... ☐ Vomiting..... ☐ Other (State)..... ☐ _____	
	WATER		
21	Where do you get your drinking water ?	Pond..... 1 Well..... 2 Stream..... 3 River..... 4 Borehole..... 5 Any other (State)..... 6	
22	Do you treat your water before drinking?	Yes..... 1 No..... 2 →	Skip to 24
23	If yes, how do you treat the water?	By filtering..... 1 By allowing it to settle ..... 2 By adding ash and allowing to settle. 3 By adding alum..... 4 By Chlorination..... 5 By boiling..... 6	
24	Do you wash your hands with soap and water?	Yes..... 1 No..... 2 →	Skip to 27

25	When do you wash your hands with soap and water? *(Probe for any other reason)*	Before cooking ..... ☐ After defecation ..... ☐ After changing diapers..... ☐ After the farm ..... ☐ Before eating ..... ☐ Any other (State)..... ☐	
26	Why do you wash your hands with soap and water? *(Probe for any other reason)*	Prevent disease..... ☐ Makes me feel clean..... ☐ Don't know..... ☐ Any other (State) ..... ☐	Skip to 28
27.	Why don't you wash your hands with soap and water? *(Probe for any reason)*	....	
28	How do you store your water for drinking?	In a covered container ..... 1 In an uncovered container..... 2 No container..... 3 →	Skip to 30
29	How often is storage container cleaned?	Everyday..... 1 Every 2 – 4 days..... 2 Every 5 – 6 days..... 3 Once a week..... 4 Once every 2 – 3 weeks..... 5 Once a month..... 6	
	OBSERVATION GUIDE	*Researcher makes Assessment*	
30	General situation of the household compound	Yes No Faeces inside house?..... 1 2 Faeces outside house?..... 1 2 House up swept?..... 1 2 House pest infested?..... 1 2 Rubbish in house..... 1 2	
31	Water transport means	Clean..... ..... 1 Dirty..... 2	
32	State of Storage Container	Clean..... 1 Dirty..... 2	

APPENDIX II

STRUCTURED OBSERVATION GUIDE

Name of Village.....

WATER

	TYPE OF WATER SOURCE	PROTECTED	AVERAGE DISTANCE FROM HOMES	ACTIVITIES AT THE SOURCE (Exclude Rain water)	TYPE FETCHING UTENSIL	CONDITION FETCHING UTENSIL	TREATMENT AT SOURCE
	Well.....1 Rainwater....2 Borehole.....3 Ponds.....4 River.....5 Others.....6	Yes... 1 No...2	< 100 m.....1 100-500m.....2 500-1km.....3 Over 1km.....4	*Please indicate which activities are occurring at the source by circling 1 for YES and 2 for NO.*	Calabash 1 Cup 2 Bowl 3 Bucket 4 Other 5 None 6	Clean 1 Dirty 2	*Please make tally of # people treating and not treating*
1				Y N Washing water container 1 2 Washing clothes 1 2 Bathing/washing self 1 2 Watering animal 1 2 Other_____ 1 2			*Treating tally* *Non tx tally*
2				Y N Washing water container 1 2 Washing clothes 1 2 Bathing/washing self 1 2 Watering animal 1 2 Other_____ 1 2			*Treating tally* *Non tx tally*
3				Y N Washing water container 1 2 Washing clothes 1 2 Bathing/washing self 1 2 Watering animal 1 2 Other_____ 1 2			*Treating tally* *Non tx tally*

SANITATION

Type of Contamination	Location of contamination	Yes	No	Number of Instances
Infant faeces	Along Roads	1	2	
	Footpaths 1		2	
Adult faeces	Along Roads	1	2	
	Footpaths 1		2	
Animal Faeces	Along Roads	1	2	
	Footpaths 1		2	
Other (State)_____	Along Roads	1	2	
	Footpaths 1		2	

COMMUNAL SANITARY FACILITIES

#	Type of Facility Pit latrine 1 KVIP 2 Bucket 3 Water Closet 4 Other State 5	Floor safe to stand on	Clean	Free from smell	Water/soap within 10m	Brush present for cleaning	Broom present for cleaning	Adequate privacy (Fully Covered)	Any other Problem
1		Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 _____ No 2
2		Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1_____ No 2
3		Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1_____ No 2
4		Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1_____ No 2
5		Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1 No 2	Yes1_____ No 2

APPENDIX III

FOCUS GROUP DISCUSSION GUIDE

Good morning/ afternoon and thank you for coming. We are with the District Health Management Team. My name is. .....and these are my colleagues ..... (let them introduce themselves). We are conducting several meetings with people like you to find out views about the water supply, sanitation and their related hygiene practices in your area.

There are no right or wrong answers and you do not have to agree with what some one else says. Everyone's contribution is valuable.

For us not to lose any information we would like to tape record the discussion. What ever you say will be confidential so feel at ease to express your opinion. Please speak one at a time.

Background information

No	Educational Background	Occupation	Ethnicity	Religion	Age

Questions to ask

WATER

1.Where do you get your water?
2.Do you treat your water before drinking?
3.When do you wash your hands with soap and water?
4.Why?
5.How do you store your water?

SANITATION

1.Do you have a toilet?
2.Are children under age 6 able to use the toilet on their own?
3.If not then where do they defaecate?
4.How do you dispose of their faeces?
5.Do you think faeces are harmful in any way?
6.Why?
7.Do you know of any disease related to faeces?
8.Mention the ones you are aware of?
9.Why do you defecate in the bush when there are public toilets?