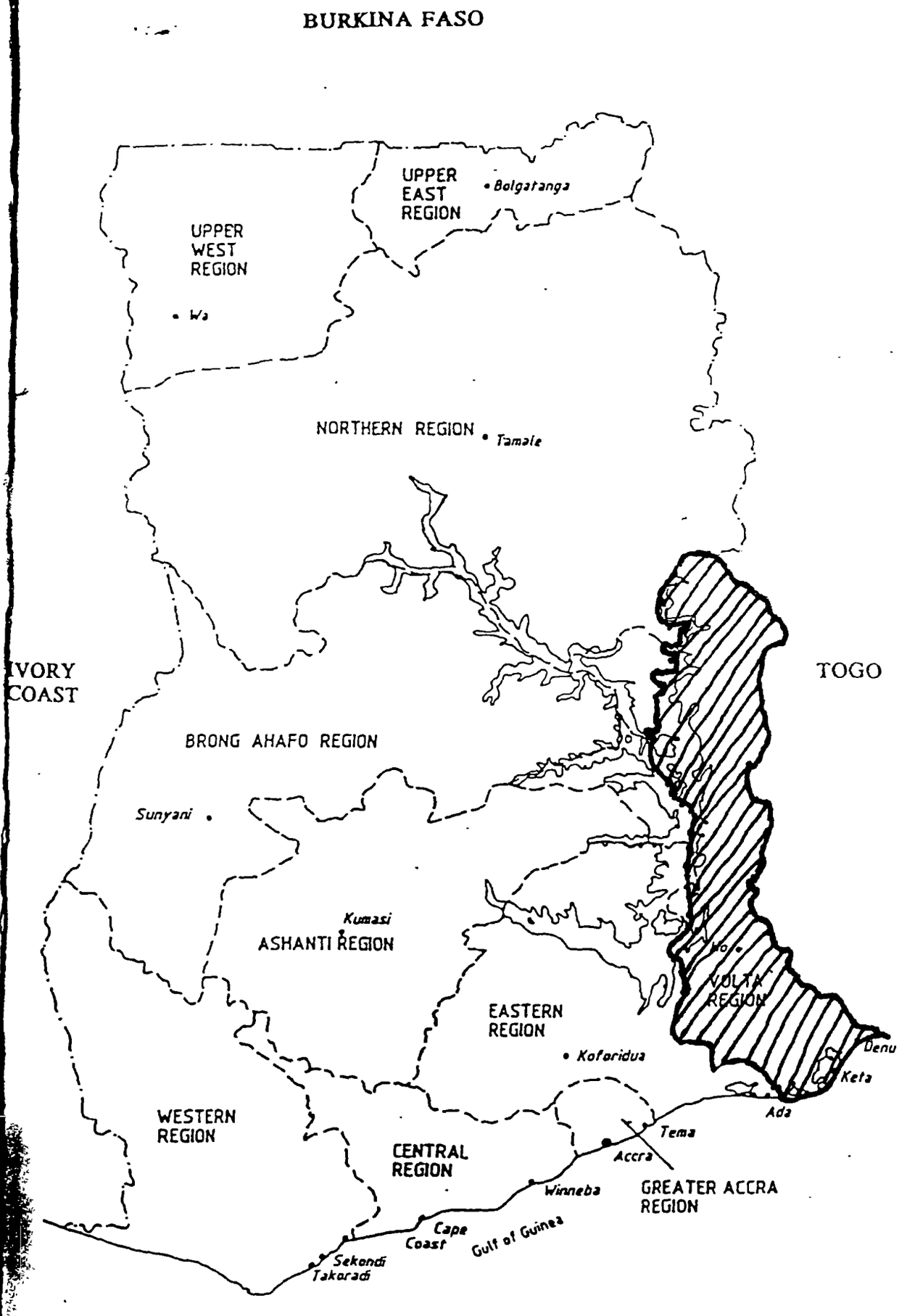
REPORT

In the

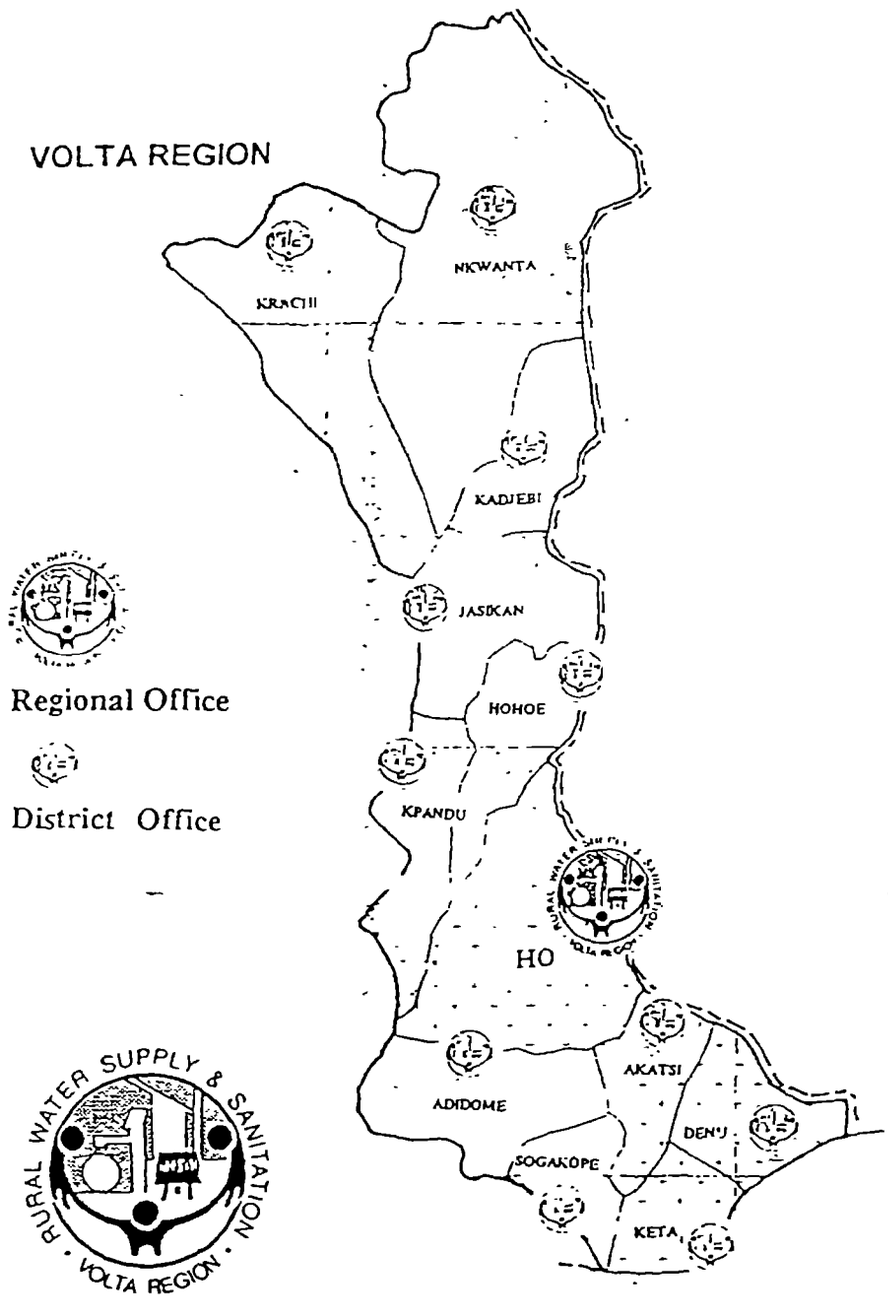
Volta Region – Ghana

July 1997

Figure 1



MAP OF GHANA WITH REGIONAL AND INTERNATIONAL BOUNDARIES



RURAL WATER SUPPLY & SANITATION · VOLTA REGION ·

PROJECT ORGANISATION

LIST OF ABBREVIATIONS

AESC	Architectural Engineering Services Corporation.
AMURT	Ananda Marga Universal Relief Team
AO	Administrative Officer
CDS	Community Development Staff
CSIR	Centre for Scientific and Industrial Research
CWSD	Community Water & Sanitation Division
DANIDA	Danish International Development Assistance
DMC	District Management Committee
DWST	District Water and Sanitation Team
DWSS	Drinking Water Supply & Sanitation
EPA	Environmental Protection Agency
EHA	Environmental Health Assistant
EHO	Environmental Health Officer
GWSC	Ghana Water & Sewerage Corporation
GIMPA	Ghana Institute of Management & Public Administration
GOG	Government of Ghana
ICWE	International Conference on Water and Environment
IDA	Irrigation Development Authority
IWSD	Institute of Water and Sanitation Development
IRC	International Water and Sanitation Centre
ITN	International Training Network
KVIP	Kumasi Type Ventilated Improved Pit
MDPI	Management Development and Productivity Institute
MLGRD	Ministry of Local Government and Rural Development
MOWH	Ministry of Works and Housing
NETWAS	International Training Network for Water and Waste Management
OECD	Organisation for Economic Co-operation and Development
PAID	Pan African Institute for Development
PO	Partner Organisation
RPO	Regional Project Office
TREND	Training Research and Networking for Development
UST	University of Science & Technology
UNDP	United Nations Development Programme
VRA	Volta River Authority
VRWSSP	Volta Rural Water Supply and Sanitation Project
VIP	Ventilated Improved Pit
WHO	World Health Organisation
WRC	Water Resources Commission
WRRI	Water Resources Research Institute.
WRIS	Water Resource Information Services

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

FIGURES

Executive Summary

Ghana affirmed its commitment to the International Drinking Water Supply and Sanitation Decade (1981-1990) and participated in the 1990 New Delhi Global Consultation on Water for All by the Year 2000.

The Government of Ghana (GOG) gives priority to improvements in water and sanitation, especially in rural areas. This is reflected in the country strategy Ghana-Vision 2020. Ghana-Vision 2020 advocates low-cost and low-maintenance technologies; emphasis on the role of women and the need to address gender issues; need for private sector involvement and the need to combine water, sanitation and health issues. Ghana-Vision 2020 underlines decentralisation and democratisation aspects, thus favouring the decision making at the lowest appropriate level.

Water Resources Development constitutes the single most important area of Danish Development Co-operation reflecting the importance attached to providing access for poor people to safe and reliable sources of water as a means of improving their health and living standards.

Hence, since the inception of the Volta Rural Water Supply and Sanitation Project it has tried in diverse ways to assist the people of the Volta Region of Ghana in improving upon their standard of living This is being done through the provision of safe water, institutional and household latrines, integrated with hygiene education.

This project, which started in 1993, is a ten-year project. Its goal is to assist 50% of the rural communities in the Volta Region to improve their water supply and sanitation facilities. The primary target group is communities between 150-5000 people.

The IRC International Water and Sanitation Centre together with the United Nations Development Programme (UNDP) initiated this assessment project.

The Project, "Promising Water Resources Management Approaches in the Drinking Water Supply and Sanitation Sector" is designed to:

Assess, document and disseminate project experiences with the principles agreed in Dublin related to water resources management. The project's underlying aim is to contribute to improve WRM practices.

In fulfilling its mandate, the Assessment Team in consultation with project management selected three communities in the project area for the study. The team reviewed available literature, interviewed appropriate stakeholders and employed participatory methods such as mapping exercises, stakeholder analysis by matrix, focus group discussions and environmental observation.

The summary of the highlights for each of the principles addressed is as follows:

1. Water source and catchment protections are essential.

- In some communities, water collection points for domestic use are carefully protected from animals, bathing, washing and other potential sources of pollutants.

-Most communities have by-laws and taboos regarding water source protection. Where these by-laws are respected, the catchments areas are adequately protected

At Mafi Tedeapenu, (see Figure 5), a dam impoundment being developed to serve ten communities was found to receive a lot of surface water from the surrounding environment. Besides, several human activities such as fishing, washing of clothes and, washing of vehicles in the water have rendered the quality of the water unacceptable and a potential source of gastro-intestinal infections.

2. Adequate water allocation needs to be agreed upon between stakeholders within a national framework.

- So far, where the project has completed water systems, allocation issue is not a major issue. This is due to the absence of any conflicting requirements for water use since it is used for domestic purposes only. In the dry season when most water bodies are dry as happened this year, the water is regulated and opened at periodic hours only..

- In the Mafi Dekpoe/Tedeapenu area, there are multiple agencies for different water uses all depending on one source - a dam. Cattle drink from the dam, littering the banks with their droppings, which eventually get into the water. One person was found using water from the dam for irrigation purposes but on a small scale, hence not much water is used.. At the time of this study, members of the communities that depend on the dam are worried, as an Israeli investor has approached the district Assembly for the use of the dam for large-scale irrigation.

3. Efficient water use is essential and often an important water source.

- Capacity building by the project at the community level has enabled WATSAN committee members and caretakers to maintain the water systems at a satisfactory level. There was no leakage in all the communities visited

- Overflows from reservoirs directed to waste need to be channelled into an irrigation scheme or extended to neighbouring communities with no reliable and safe water.

4. Management needs to be taken care of at the lowest appropriate levels

- The project is actively involving the communities in the overall management and maintenance of the water and sanitation facilities.

- Each beneficiary community forms a Water and Sanitation (WATSAN) committee who is responsible for tariff collection, fund raising, health education and managing of the water supply facility.

- Communities have a bank account exclusively for Water and Sanitation activities.

- WATSAN committees see to the enforcement of by-laws in the community. In certain areas the legality and authority of the WATSAN committee is being challenged.

- Some WATSAN committee members have relaxed in the performance of their duties because of insults from others and fear of being charmed.

5. The involvement of all stakeholders is required.

- The project is collaborating with sector ministries and NGOs in the water and sanitation sector.

- The active involvement of WATSAN committees at the community level and District Management Committees (DMCs) at the District level in the implementation of the project is good in that it provides a means of sustainability as well as creating forum for information sharing and decision making.

- For integrated water resource management, there is the need for enhanced collaboration at the National level with other organisations producing and utilising water for irrigation, and hydroelectric power. This is because, currently there is no single institution responsible for water resource management. What exist now are fragments of various organisations and departments whose authorities are not well defined and can therefore not enforce any control on the activities of users of rivers, lakes and lagoons in the country.

6. Striking a gender balance is needed as activities related to different roles of men and women.

- Positive attempts were made to involve women. This did not, however, always result in meaningful involvement of women in decision-making process in some communities. Very few women were given executive positions. This is a cultural issue that will take time to change.

- At the project level, conscious efforts are being made to get a balance of men and women on positions at regional, district and community level committees.

- At the National level, the Community Water and Sanitation Division (CWSD) acknowledges the need for main streaming gender issues into the sector activities.

- On the project, gender aspects are an integral part of all training at regional, district and zonal level.

7 Capacity building is the key to sustainability.

- Training needs of all categories of staff, government and private sector operators involved in the project activities were assessed and appropriate training mechanisms put in place.

- Over 80% of persons who had training through the programme are using the skills acquired.

- In the districts, training offered to DMCs and District Water and Sanitation Teams (DWSTs) have upgraded their knowledge about low cost technologies, selection

criteria, procurement and management of contracts and skills in management of water supply and sanitation services at the district level.

- At the community level, WATSAN committees are established in all project communities and some have been trained. The training has equipped them adequately with skills and knowledge to enable them co-ordinate the community' contribution towards project implementation. They provide leadership and oversee the day-to-day operation, maintenance and management of water and sanitation facilities in the communities.

- The knowledge and skills base of the private sector operators has improved tremendously. Artisans, trained have since their training constructed over 1500 latrines in their communities. Most of the contractors have also constructed a number of water systems and sanitation facilities in the project communities..

- There is the need to organise periodic refresher courses for WATSAN committees, artisans and caretakers.

- Most of the mechanics trained have not yet been equipped with tools.

8. Water should be treated as having an economic and social value.

- Since the project strives on a demand-driven approach, communities are able to pay their contributions to capital cost for any given facility. However, they find it difficult to pay money for the operation and maintenance of facilities.

- Some reasons for unwillingness or refusal to pay for operations and maintenance are;

  * lack of accountability on the part of the WATSAN committee.
  * limited income earning opportunities in the villages
  * no measures are taken against defaulter to ensure payment.
  * traditional beliefs in some communities that water like air, is a freely available commodity which should not be charged for.This project,

ACKNOWLEDGEMENTS

This assessment was initiated by IRC after the Preparatory Workshop in The Hague, The Netherlands in November 1996.

The support of management of the Volta Rural Water Supply and Sanitation Project is acknowledged with gratitude for financing the trip to the Preparatory Workshop as well as the study.
In the Netherlands, special thanks are due to the staff at IRC and members of the Advisory group who gave support during and after the preparatory workshop. Secondly,I record my unfeigned gratitude to the External Advisor, Gerrit van Vuren, IRC project staff Esther de Lange and Peter Bury for their useful comments and editing.

The author especially thanks Mette Baekgaard, E.M. Fiagbe, Albertha Nyaku and the staff at the Regional project office for their encouragement, advice and expert opinions. Special thanks also go to Richard Agyako and Alexander Obuobisa, district engineers for Hohoe and Adidome respectively for their support and expert opinions offered during the survey.

The heartfelt cooperation of the District Management Committees, in the Hohoe and Adidome Districts, the District Water and Sanitation Teams, WATSAN members in the three research villages, Consultants, and other Organisations made the assessment an exciting experience. Thank you for taking time out of your busy schedule for answering questions and giving your suggestions and recommendations. You made the exercise a rewarding one.

Lilian Aganu, Simon Dzisah, Martin Ofosu, B.K. Akiti, Cudjoe Azumah, E.S.Q. Gbeve, Veronica Galley, Celestine Kudolo, Philip Gawuga, and J.K.Baidoo assisted the field surveys. Mette Baekgaard edited the first draft. All these assistance is gratefully acknowledged
Last but not least gratitude is extended to Grace Asempah and Letsa Dzidefo who assisted with the typing and production.

E. T. Nyavor
July 1997
Ho - Ghana

1 INTRODUCTION

1.1. Background

Freshwater is a finite commodity in every country and an indispensable resource that ensures sustenance of life. There can be no development without water, a commodity that has for a long time been taken for granted (Charles Anson-Lawson 1997).

Present realities, however indicate that we are likely to face water crisis in the 21st century unless we take firm action to conserve the scarce water resources. An example of how mismanagement of water and land resources can affect human health and economic development is that of depletion and degradation of freshwater resources throughout the country this year. For example the two main water sources for the Kumasi Municipality - Owabi and Barekese dams, the water source of the Koforidua municipality and the Weija dam which is the main water source for parts of Accra, the Nations capital were all reported to be polluted by human activities making it difficult to use them for domestic purposes (see appendix F). The Eastern Regional Minister, Ms Patience Adow on the occasion of the World Environment Day at Nsawam, a busy commercial town in Ghana said " Densu is dying, for this is not the river I knew in the 60s." Unless a more serious attitude is shown towards the preservation of the water sources, the situation might get out of control.

The UNESCO Director General Federio Mayor, speaking at a World water forum of scientists and experts from 50 countries on 22nd March 1997 called on the International Community to implement a "new water ethic to rationalise the use of water to avoid dramatic shortage". Mayor said the world was at a turning point and action must be taken to avert any disaster.

"The warning signs are clear ..... severe water scarcity in many regions of the world, falling watertables, shrinking rivers and lakes, widespread pollution and creeping desertification", he said.

There is therefore an urgent need to improve water resources management. Action has been called for by a range of fora dating back from 1977 in Mar del Plata, where water resources management was globally discussed for the first time, and the January 1992 International Conference on Water and Environment (ICWE) in Dublin as well as the June 1992 World Summit in Rio de Janeiro.

To give guidelines for the implementation of Chapter 18 from agenda 21 (the action programme of the Rio de Janeiro Conference) and improve co-ordination, there was Ministerial Conference in Noordwijk in 1994 followed by another meeting organised by Organisation for Economic Co-operation and Development (OECD) also in 1994 in Paris. These meetings challenged existing sector oriented management practices of water resources as being unsustainable from an economic and environmental perspective, and have set out a number of principles and recommendations for integrated water resources management (see Box 1).

In response to these developments, the IRC International Water and Sanitation Centre, together with the United Nations Development Programme (UNDP), initiated the project "Promising Water Resources Management Approaches in the Drinking Water Supply and Sanitation Sector".

Box 1
THE EIGHT WRM PRINCIPLES SELECTED

Principle 1:	**Water source and catchment conservation and protection are essential**
Principle 2:	**Adequate water allocation needs to be agreed upon between stakeholders within a national framework**
Principle 3:	**Efficient water use is essential and often an important water source**
Principle 4:	**Management needs to be taken care of at the lowest appropriate levels**
Principle 5:	**Involvement of all stakeholders is required**
Principle 6:	**Striking a gender balance is needed as activities relate to different roles of men and women**
Principle 7:	**Capacity building is the key to sustainability**
Principle 8:	**Water is treated as having an economic and social value**

The aim of the UNDP/IRC project on promising WRM approaches is:

- to assess, document and disseminate project experiences with the selected principles.
- to contribute to improve Water Resources Management at various levels of intervention.
- to clarify how internationally recognised WRM principles and recommendations can be implemented in the DWSS sector.

1.2 NATIONAL COMMUNITY WATER AND SANITATION SECTOR STRATEGY

The National Strategy for Rural Water and Sanitation has been developed as a follow-up of the recommendations on the Kokrobite Conference in 1991. The National Strategy calls for the rural communities to participate in planning, paying, managing and maintaining their water facilities. The approach is demand driven based on active community and district participation while the role of Government is to facilitate the process. The capacity building aspects at both community and district level are crucial elements of the national strategy. With focus on long term sustainability women are to play key roles in planning and managing the facilities. The strategy highlights the role of the private sector, including Non-Governmental Organisations.

As part of the national sector policy, the Government of Ghana has under Ministry of Works and Housing established a core sector institution, Community Water and Sanitation Division (CWSD) to facilitate the implementation of the national strategy. The CWSD is at present a Division under Ghana Water and Sewerage Corporation (GWSC).

The key elements of the national strategy are as follows:

- communities to show their demand for improved services by contributing to the capital costs;
- community ownership and maintenance;
- a central role for the District Assemblies in supporting community management;
- the government is to focus on a facilitative role by promoting service provision,
- a role for the formal and informal private sector in provision of goods and services;
- ensuring equity and widespread coverage through targeted subsidies supporting basic service levels;
- a demand-driven programme, with self-selection and clear commitment by communities to enhance sustainability, and
- a special focus on women, as both the users of water as well as planners, operators and managers of community level systems.

1.3. **Description of the project area**

The Volta region of Ghana forms the south-eastern boundary of the country. It covers a surface area of 20,330 sq.km. (8.5% of the national). It is bounded on the east by the Republic of Togo, on the west by the Volta Lake which in addition to being a source of food, is a source of infection with bilharzia; on the south by the sea; and on the north by the Oti river, which is also a source of infection with Onchocerciasis (fig. 1).

It has three distinct ecological zones each with different topography and climatic conditions. The climatic conditions vary from the south to the north, as does the soil conditions and vegetation; hence the lifestyles of the people. The coastal and mid belt have two rainy seasons while the north has only one rainy season. The vegetation is characterised by three distinct types. The coastal area, which extends about 320 kilometres inland is mainly of shrubs and grassland vegetation with coconuts, nim, baobaad, oil and wild palms. Although it is subjected to extensive flooding during the rainy seasons, it is generally dry with limited sources of ground water. The middle belt is mainly wet semi-equatorial forest with dense undergrowth, abundant vegetation and trees such as odum, mahogany, ofram, and wawa. The rainfall is heavy (mean annual of 178cm.). The northern belt is mainly of savannah land with drought resistant trees such as baobad, shea nut and dawa dawa. The mean annual rainfall in this area is relatively low (about 127 centimetres per annum).

The resulting mean annual rainfall in the Volta Region is shown in appendix B.

1.4. **Administration and Development**

The region is divided administratively into 12 districts. Each district has its own capital and district assembly, responsible for local affairs. The regional capital is in Ho in the southern part of the mid belt.

1.5. **Demographic Characteristics**

The Volta region has the fourth largest population of the 10 regions in Ghana. The 1990 estimated regional population was 2,038,778 with an annual growth rate of 1.8%. 21% of the population live in 24 towns of more than five thousand whilst the remaining 79% live in approximately 5,086 villages (Letsa 1992). The age/sex distribution is shown in table 1.

Table 1 Age/Sex Distribution of the population of the Volta Region

AGE	MALES		FEMALES		BOTH SEXES	
GROUP	NO.	%	NO.	%	NO.	%
< 0 - 1	21176	3.0	22939	1.8	44115	2.2
1 - 4	94325	12.7	102184	7.9	196509	9.6
5 - 14	175814	23.7	190467	14.7	366281	18.0
15 - 44	264363	35.6	286395	22.0	550758	27.0
45+	185982	25.0	695133	53.6	881118	43.2
TOTAL	**741660**	**100**	**1297118**	**100**	**2038778**	**100**

Source: Sunu-Doe, 1991 (Modified to include percentages)

1.6. Socio-Economic Situation

Most of the communities in the region are subsistence farmers who supplement their income by some cash cropping. The types of crops grown vary by area and include maize, cassava, plantain, palm oil, cocoa, coffee, rice, groundnuts, peppers, tomatoes, onions, okra, yams, pineapple, papaya, avocado, oranges, bananas, coconuts, colanuts, sugarcane.

In some areas fishing is an important activity, and in all areas, marketing is a principal source of income, especially for women Handicrafts and wage labour are important for some households Specialised occupations such as masons, carpenters, weavers and blacksmith are found in certain areas.

Sheep, goats, chicken and pigs are kept throughout the region, but the number of livestock increases as one goes northward.

There are many ethnic groups in the Region, especially in the northern part, but most of the population understands Ewe or Twi. Muslims, Christians and traditional worshippers are found throughout the Region and often within the same community.

Household structure is traditionally male-headed but a large number of female headed households exist.

In the southern area 41 percent of all households are headed by women, with 32 and 13 percent headed by women in the central and northern areas respectively.

Women's role in the communities varies widely, but in general women play important role in the community informal decision making network (VRWSSP 1992).

1.7 Overview of Water Resources

Fresh water resources of Ghana is derived from the following sources:

- rainfall
- rivers, streams, springs and creeks
- natural lakes
- impoundment
- groundwater from various aquifers

(Ghana Environmental Action Plan Vol.1).

Thus in its natural form water is an abundant resource in Ghana.

However, the resources are unevenly distributed over the country and shortages are often experienced during the dry seasons. Again, though the quality of water is generally good, there are localised cases of agricultural, industrial and domestic waste discharges into water bodies, which are causing serious pollution. (CSIR, Feb 1995)

1.7.1. **Water Resources in the Volta Region**

1.7.1 (a) **Surface Water**

The Volta Region is effectively drained by a rather uniform network of small streams of which the prominent ones are the Kappa river (a tributary of the Oti river) in the north; the Dayi, Asukawkaw, Wurenu and Tordzie in the central area; and the Akan Agblala and Tordzie in the extreme southern zone.

Most of the drainage system flows into the Volta river and Lake Volta. The Volta river drains water from the lake at Akosombo into the Gulf of Guinea at Dzita.

The flow of water from a number of streams has been gauged and monitored since 1950. Most of the streams have a maximum discharge rate of 39l/s during the wet season, July/August, but they are seasonal and therefore unreliable water sources (WRRI 1993).

While the Lake Volta is the only Lake in the region, there a number of lagoons along the southern coastal belt. The water in these lagoons is too saline for human consumption.

195 Springs and stream sources and a number of water falls exist in the central zone (source: WRRI report on flow monitoring). 52 Of these sources had trace flows and 24 perennial streams were identified. 21 Of these sources have since been developed into gravity-piped schemes.

According to a report by the Water Resource Research Institute, at the end of the International Drinking Water Supply and Sanitation Decade in 1990, the Regional coverage for drinking water supply was 43%. The rural coverage varied from 54% in the northern districts to 58 % in central and 6% in the southern districts.

1.7 1 (b) **Water Resources - Groundwater**

The Voltaian formation which underlies the north-western part of the region, Krachi district and eastern half of Nkwanta district, consists of sandstones, shales, mudstone and limestone. The primary porosity of the rocks is low, however, fracture zones with good prospects for utilizing groundwater resources are frequently found.

The overburden of lateritic topsoil covering sandy clays is in most places not very thick, but offers some prospects for hand dug wells, provided proper siting techniques including test drilling are used.

The Buem formation and the Togo series of sedimentary sandstones and mudstone and metamorphosed rocks covering the rest of the region north of Ho has excellent possibilities for groundwater extraction. Many medium deep boreholes are drilled into the fracture zones, which are very frequent in the whole area.

According to the study report by the WRRI, the Dahomeyan formation south of Ho, consisting of gneiss and schists, which is not fractured to any significant extent, is a problem

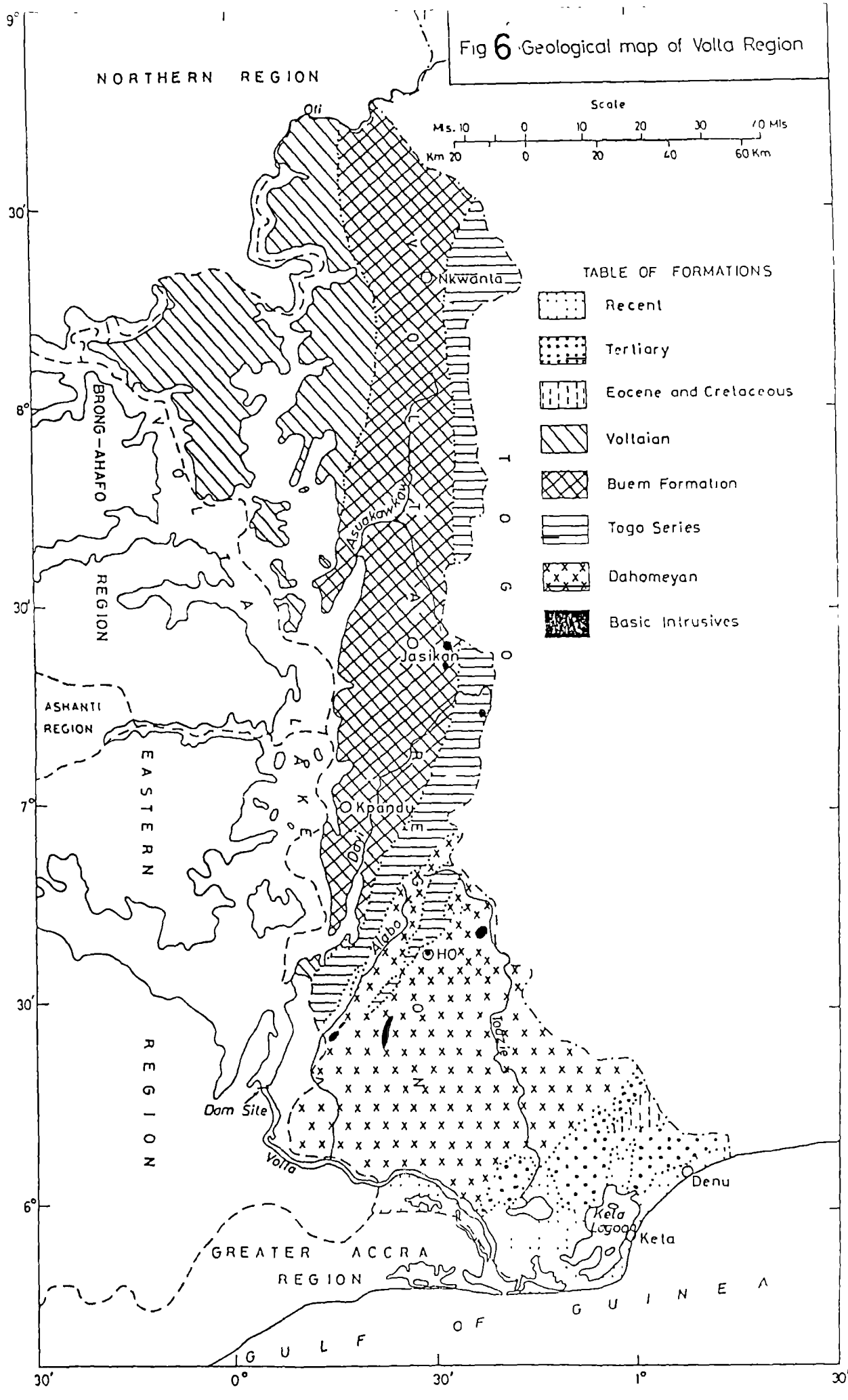


Fig 6 Geological map of Volta Region
NORTHERN REGION
Oti
Scale
Mls. 10 0 10 20 30 40 Mls
Km 20 0 20 40 60 Km
TABLE OF FORMATIONS
Recent
Tertiary
Eocene and Cretaceous
Voltaian
Buem Formation
Togo Series
Dahomeyan
Basic Intrusives
Nkwanta
BRONG-AHAFO REGION
Asuokawkaw
TOGO
Jasikan
ASHANTI REGION
EASTERN REGION
Kpandu
Dayi
Afabo
HO
Dam Site
Volta
Denu
Keta Lagoon
Keta
GREATER ACCRA REGION
GULF OF GUINEA
9°
30'
8°
30'
7°
30'
6°
30'
0°
30'
1°
30'

area with regard to water resources. Approx 100 boreholes have been drilled and only 20 holes were successful. The rest were dry or with saline water.

Shallow well digging in the area has not been very successful, but proper surveys including geo-electrical surveys to determine the thickness of the overburden, and test drilling with hand drilling equipment prior to the digging of a well could improve the success rate.

The recent formations of unconsolidated sand, clay and gravel along the coast have a potential for very shallow wells in the thin fresh water lens above the saline water. Further inland, water quality problems in the lagoon area are severe.

The southern part of the region is underlain by eocenecretaceous marine deposits of sands, clays, shale and limestone, which is an excellent freshwater aquifer. The depth to the aquifer is shallow in the Dzodze area but the strata slopes towards the sea to depths of up to 300 metres in the Denu - Keta area. Exploitation of the deep aquifers could be the only viable solution for supply of water to larger communities in the area, but high drilling cost is a limiting factor.

The WRRI well survey located over 5000 hand dug wells all over the region and proved that in general shallow groundwater aquifers in the overburden can be exploited in most areas.

In the northern districts the well depth does not exceed 10 metres in general, but in the south especially in the areas around Akatsi the wells are as deep as 30 metres.

A Geological map of the Volta Region is shown in Fig.6

1.7.1 (c) **Water Problems:**

Out of the Volta Region's projected population of 1.6 million in 1991, 52% representing 838,000 had access to potable water. In the rural communities, only 46% (574,000) in out of a total population of about 1.2 million has potable water. The GWSC operates 37 water supply systems in addition to 932 boreholes equipped with handpumps in the Region. (A.E. Amoah ,1996). On the ground however, most of the boreholes have broken down. Most of the big rivers such as the Oti and the Volta are heavily polluted as a result of human activities such as domestic effluents, unhealthy environmental practices by people along the route of rivers, farming and felling trees close to river banks. These culminate into situations where rivers cannot store enough water leading to shortage of water during the lean season. The drought this year was so prolonged that most water sources got dried up. At the time of this study, several women and children were seen walking between 5-15 kilometres searching for water, most often from polluted sources prone to water-borne diseases such as typhoid, dysentery and guinea worm.

In 1990, four of the leading causes of hospitalization directly relate to water and sanitation. Malaria, the leading cause of morbidity and mortality, is endemic. Intestinal worms, tetanus, diarrhoeal diseases, anaemia(probably due to repeated malaria attacks and worms), bilharzia, guinea worm, yaws and skin diseases are prevalent. Table 2 shows the 10 top diseases, which were presented at the treatment centres in the region in 1990.

WATER PROBLEMS

A. Guinea Worm Emanating from a victims foot.

B. Women queing for water at the only functioning borehole in a community of 3,600 people

Table 2: Major causes of Morbidity: Volta region, 1989 and 1990

DISEASES	NO. OF CASES		PERCENTAGE OF TOTAL	
	YEAR		YEAR	
	1989	1990	1989	1990
1. Malaria	134208	129520	39.3	37.6
2. Diarrhoea diseases	19574	23125	5.7	7.4
3. Upper Resp.Infections	25240	23324	6.8	5.2
4. Skin Diseases(including ulcers)	17851	16805	4.9	43.9
5. Road Traffic Accidents (Trauma)	13174	14752	4.3	4.4
6. Intestinal Worms	15152	13860	4.0	4.4
7. Pregnancy with Complications	15190	12609	3 7	2 5
8. PUO (not malaria)	8512	9728	2.8	2.3
9 Anaemia	7705	6167	2.7	3.2
10. Rheumatism/joint pains	10826	8292	2.4	

Source: MOH Annual Report, 1991

1.7.1 (d) Administration and legal aspects of sustainable use of water

Though laws prohibiting pollution of water bodies exist, the lack of enforcement of these laws is detrimental to national water management. The government has therefore realised the need to have in place one identified body charged with the control, management and regulation of water resources in order to move away from the current situation where various agencies and institutions regulate and manage different aspects of the subject. Hence, the establishment of the Water Resources Commission. The Water Resource Commission (WRC) is being given overall water resources obligations as part of the Water Resource Commission Bill. The Bill has been passed in parliament and the Ministry of Works and Housing (MoWH) has initiated the preparatory work towards the establishment of the Commission. (For further details, see page 30).

The Commission have a broad representation from all involved parties. It chaired by the Deputy Minister for MoWH and include representatives from Ghana Water and Sewerage Corporation (GWSC); organisations producing hydroelectric power; organisations producing potable water; organisations producing and utilising water for irrigation and agricultural purposes; Volta River Authority (VRA); Irrigation Development Authority (IDA) ; Water Resources Research Institute (WRRI); the Meteorological Services; Hydrology Division of the Architectural Engineering Services Corporation (AESC); Environmental Protection Agency (EPA); Forestry Commission; Minerals Commission; a chief; and two other persons at least one of them shall be a woman (Water Resources Commission Bill, May 1996).

1.8 PROJECT DESCRIPTION

1.8.1 Background

In the light of several problems existing in Ghana related to shortage of potable water and poor sanitation the Government of Ghana has entered into an agreement with the Government of Denmark (DANIDA) concerning co-operation on the Volta Rural Water Supply and Sanitation Project (VRWSSP). The project was started in March 1993 and it is a ten-year project under the National Community Water and Sanitation Programme of GWSC.

Implementing bodies of the project are the CWSD of GWSC and COWI Consult Associates, a Danish consulting engineering firm.

Under the agreement, the Danish government is providing USD 58.9 million with the Government of Ghana contributing USD 1.2 million.

1.8.2 Objectives

The development objectives of the project are:

to contribute towards better living and health conditions of the rural population in the project area through:

a. The provision of reliable and easily accessible potable drinking water, which are managed and sustained by the community.
b. The reduction in water and excreta related diseases through health education and household adoption of improved latrines.

1.8.3 Strategies

The project is being guided by some principles, which are:

- Community ownership and management as well as operation and maintenance of the facilities provided.
- A "demand-driven approach" where the community is given the option to select a facility of their choice.
- Sustainable institutional development at district level in line with government policy
- Close co-operation with the target communities and communities approval of each major step in the process.
- Active involvement of women in all aspects of decision making and facilities management
- Private sector involvement in implementation and maintenance.
- Integrated effort in water, sanitation and hygiene education.

1.8.4 **Operations**

To achieve its objectives the project is assisting 50% of the rural communities in the region to improve their water supply and sanitation facilities.

The primary target group for the project consists of communities between 150 and 5000 people.

It assists the construction of technologies for water and sanitation facilities.

The water supply installations available are:

- Hand-dug wells with pump
- Boreholes with hand pumps
- Piped water supplies from springs or stream source (gravity water systems)
- Electrical pumping systems
- Rain-water harvesting system

Subsidies are given by the project for both household and institutional sanitation facilities.

Some of these latrines are:

- The sanplat type
- Mozambique slab-type lined/unlined
- VIP lined/unlined
- KVIP latrines

2. OVERALL ASSESSMENT METHOD

2.1. Methodology

As a starting point for the assessment, a special round table seminar to explain the aim of the assessment, select cases and identify stakeholders to be involved was held at the Regional office for the regional project staff in December 1996.

A similar seminar for some staff in the two districts, Adidome and Hohoe where communities are involved in the assessment was held at the district offices in the second week of February 1997. It involved some members of the District Management Committee (DMC), District Water and Sanitation Team (DWST) and two Water and Sanitation (WATSAN) committee members from each of the selected communities.

The study was carried out in three stages: preparation, field survey and analysis The preparatory phase lasted from late December 1996 to mid February 1997 and the field-survey was carried out from third week in February to March 1997. The field survey phase employed participatory methods such as mapping of water resources, matrix to identify stakeholders for different water uses, focus group discussion, semi-structured interviews, and observation.

2.2. Selection of cases

Following initial consultations with Project management and some staff at the district level, and taking into account the estimated time for this assessment, three communities in the project area have been selected (see location maps in fig. 2 and 3).

Below is the criterion for selecting the cases:

Mafi Dekpoe/Tedeapenu dam

This is a multi – purpose water source and the first joint intervention by the project and an NGO- AMURT. It is also chosen in order to assess the second principle on water allocation needs since the water systems in most of the project area are used for domestic purpose only.

The area of study is a distressed area under severe yearly recurring condition of water shortage and hardships. The area is not endowed with natural water resources such as springs and surface water sources (rivers, lakes) except a few shallow watercourses, which develop into streams during the rainy season and dry up soon in the dry season. The dam impoundment reservoir is therefore the only reliable source in the area for a long-term water supply. It is used for domestic supply, livestock, small-scale irrigation and fishing. Many communities within and beyond the project are increasingly depending on this source for survival in the very prolonged dry season both for drinking and livestock.

There are indications presently and in the near future of more demands on this reservoir for domestic supply and economic activities. Construction of a slow sand filtration plant at Dekpoe with the intake from Tedeapenu dam reservoir by ten communities is completed awaiting electrical installations for pumping into the communities reservoirs.

Nyagbo Emli Israel and Santrokofi Bume

The two communities are all in the Hohoe district. All have pipe gravity systems. The system at Santrokofi is stream fed while that of Nyagbo Emli Israel is a spring fed. They were the first water systems constructed and the communities have since been managing the facilities.

Figure 2a

MAP OF ADIDOME SHOWING STUDY AREA

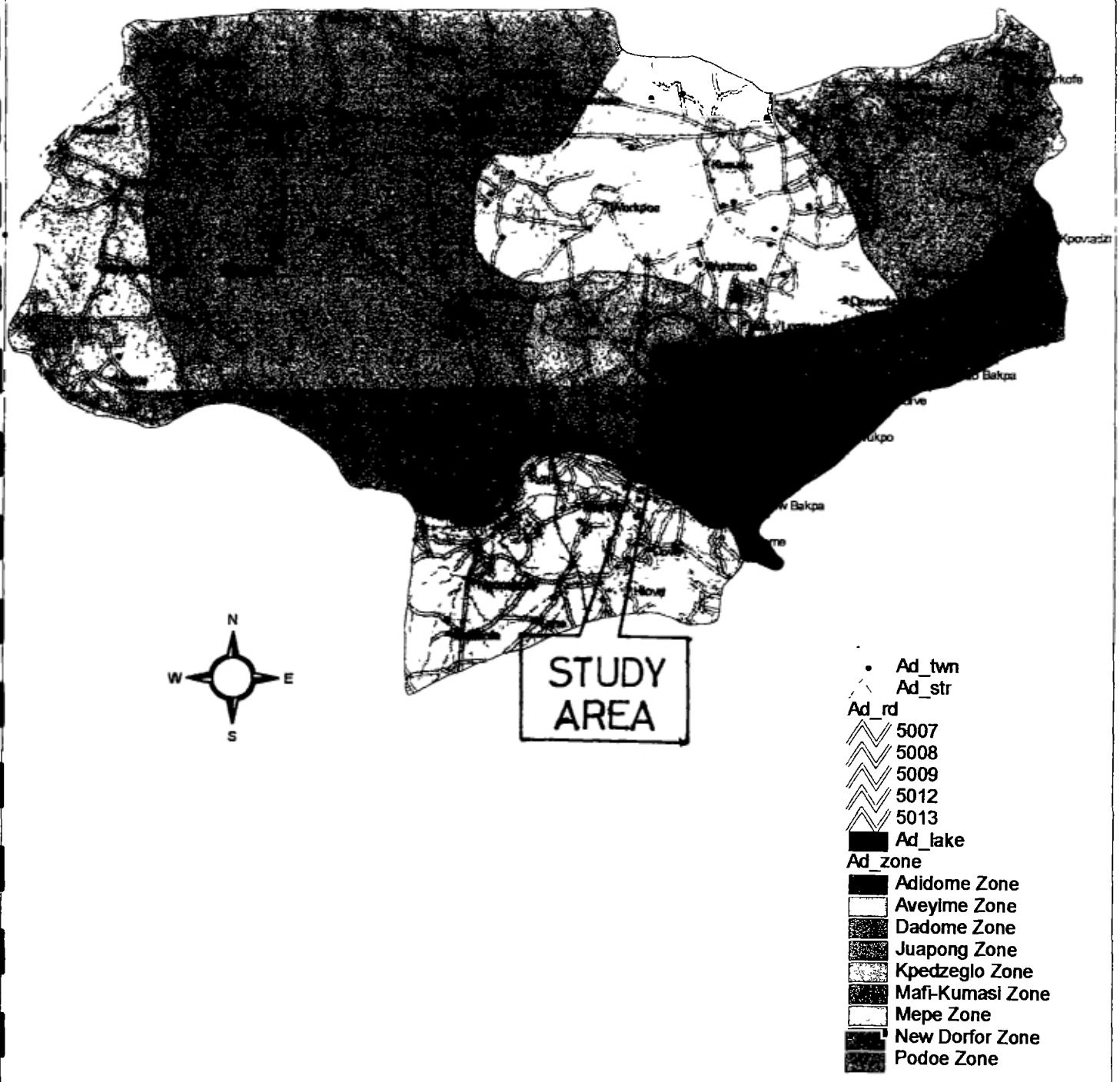
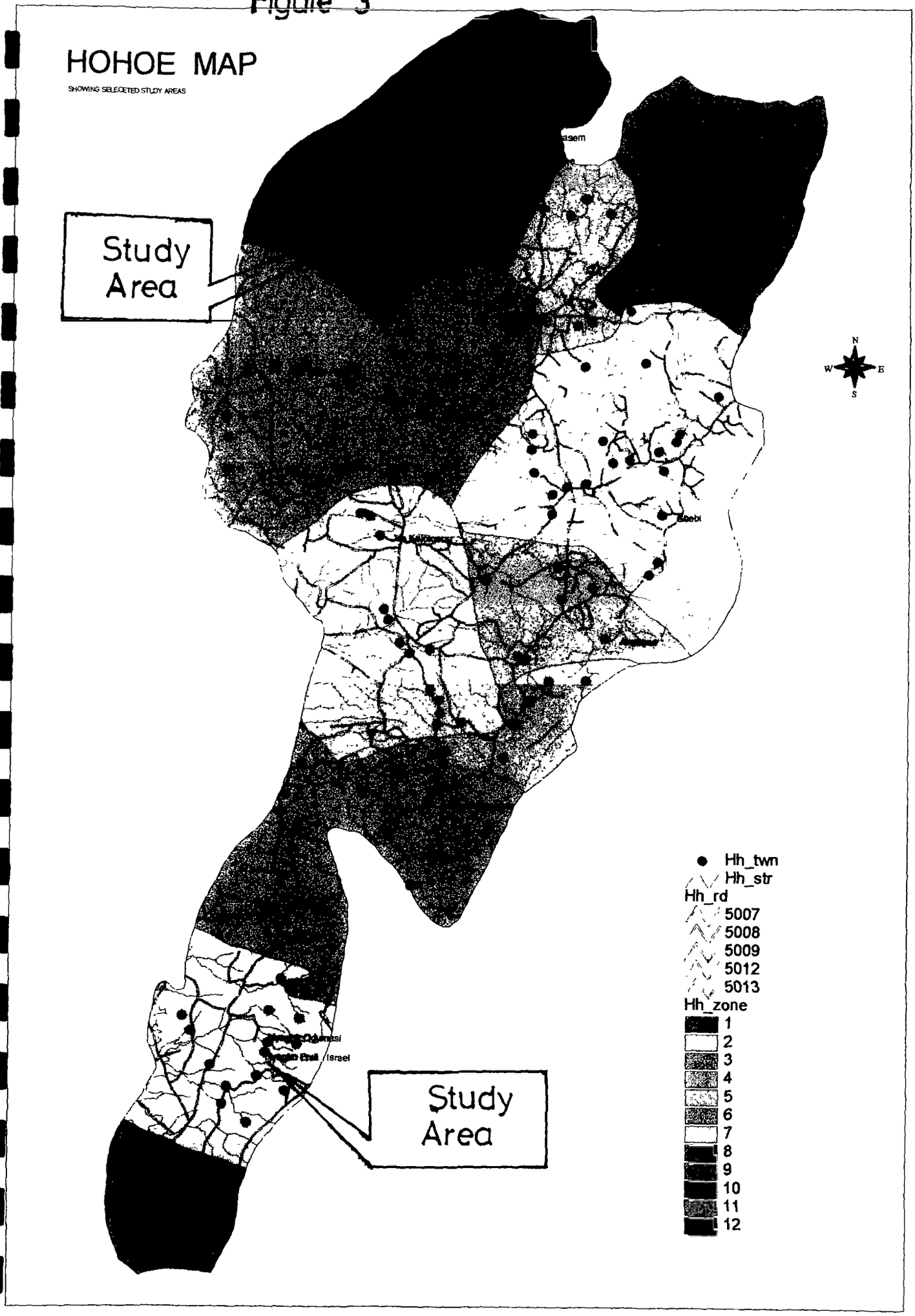


Figure 3


HOHOE MAP
SHOWING SELECETED STUDY AREAS
Study Area
Study Area
N
W
E
S
Hh_twn
Hh_str
Hh_rd
5007
5008
5009
5012
5013
Hh_zone
1
2
3
4
5
6
7
8
9
10
11
12

They were chosen to assess the community management concept vis a vis management at the lowest appropriate levels, gender balance, capacity building and water's economic and social value.
The districts and communities selected are documented in table 3

Table 3: Selected Communities

DISTRICT	COMMUNITY	WATER RESOURCES
Adıdome	Mafi Tedeapenu	Dam Impoundment reservoir used for domestic supply, livestock, irrigation and fishing. No reliable water source in the area. Hence dam is being developed to serve 10 neighbouring communities. AMURT has completed the construction of a slow sand filtration plant at Dekpoe with the intake at Tedeapenu. (See fig.2b. for the communities being served). The VRWSS is undertaking the distribution. Pipes have been laid and reservoirs under construction. Each Community has a WATSAN. There is also a central steering Committee made up of 3 representatives each from a community. Plans are advanced in forming a dam management committee. The project is estimated to be completed by June 1997
Hohoe	Nyagbo Emli Israel	Gravity fed spring with 2 standpipes serving a population of 460. the water system was completed and handed over to the community in March 1995
Hohoe	Santrokofi Bume	Gravity fed stream with 6 standpipes serving a population of 1305. The first water system by the project was commissioned in this community in September 1994

2.3. **Limitations**

Time constraints did not allow for interview with most stakeholders at regional and national level.

A complete assessment would have involved organisations such as the Volta River Authority, Volta Lake Transport Company, and Hydrology Division of the Architectural Engineering Services Corporation and the Minerals Commission.

Because of the short duration of the exercise coupled with its training dimension and the different water systems in the various communities, it was not possible to address all the eight principles in one community.

See table 4 for principles addressed in each community

Figure 2b

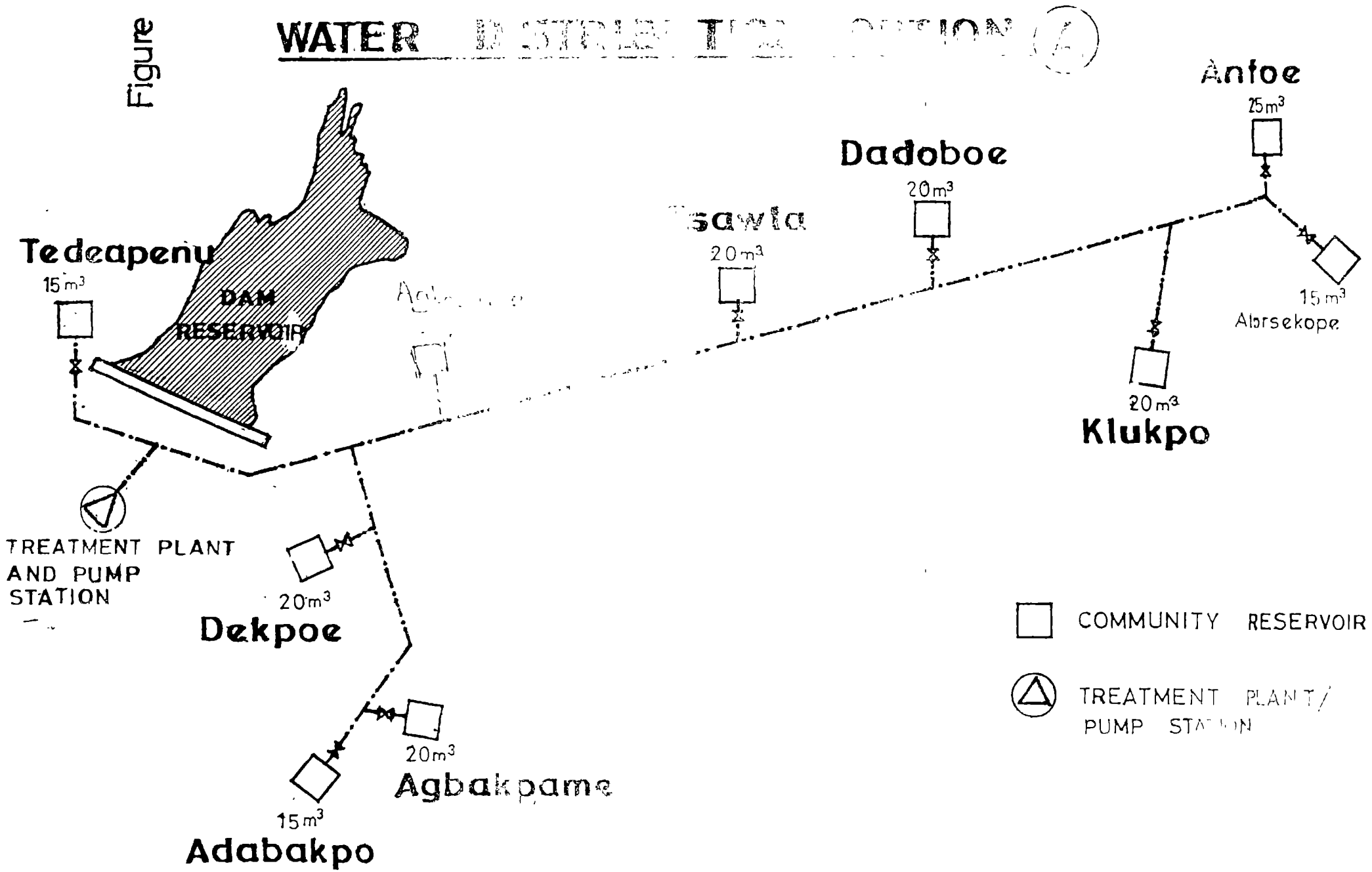

WATER
Antoe
25m³
Dadoboe
20m³
Tsawla
20m³
Tedeapeny
15m³
DAM
RESERVOIR
15m³
Abrsekope
20m³
Klukpo
TREATMENT PLANT
AND PUMP
STATION
20m³
Dekpoe
20m³
Agbakpame
15m³
Adabakpo
COMMUNITY RESERVOIR
TREATMENT PLANT/
PUMP STATION

Table 4: Principles Addressed in Communities

Community	Principle Addressed
Mafi Tedeapenu	1,2,5, and 6
Nyagbo Emli Israel	1,3,4,7, and 8
Santrokofi Bume	1,3,4,6,7,8

The visits to each village had duration of 2 days. It is worth noting that all the members of the Assessment Team have been working in these communities for over two years now. Hence, they have a profound knowledge of the communities prior to the survey.

The selected visiting days were taboo days, which are days the community is not allowed to carry out any work. The visits included village walk, mapping, environmental observation, focus group discussions and interviews with selected key informants and water users. The selected key informants were:-

Members of district management committees

Watsan committee members

Members of dam steering committee

Consultant (Afrowood)

A representative of AMURT (an NGO)

Village chiefs,

Queenmothers

Farmer's representative

Representatives of fishermen

Cattle owners representative

School teachers.

3. WATER RESOURCE MANAGEMENT PRINCIPLES ADDRESSED

3.1 PRINCIPLE 1: Water source and catchment conservation and protection are essential

3.1.1 Background

The types of catchment in the region are: -

a. spring
b. stream/dams
c. borehole/handdug well

Some of the mismanagement practices associated with these sources over the years are:

1. Farming in catchment area using agro chemicals. This leads to chemical contamination when a surplus of pesticide and fertilisers is washed into the source

2. Human settlements in the catchment area by people without proper environmental sanitation and hygiene habits resulting in bacteriological contamination.

3. Siting of sanitary facilities close to water sources resulting in ground water pollution

4. Pollution of water bodies by cattle using same sources with humans especially in the south.

5. Along the Volta Lake and the Oti river in the North, the Volta Lake Transport Company and local communities pollute water bodies through the use of chemicals in fishing and the discharge of human excreta into the water.

3.1.2 Water source development and management in the Volta Region

As the development objective of the project is to contribute towards better living and health conditions of the target population in the project area through provision of reliable and easily accessible sources of safe drinking water, great importance is attached to the protection of water sources and catchments. Hence, during the project formulation preparations, the WRRI was engaged to take an inventory and assess all perennial springs and streams as well as the potential of hand dug wells in the region. It was also required to monitor the flows of springs and streams, undertake water quality analysis as well as sanitary surveys on all water resources.

The following are some of the general findings by the WRRI.

- Source protection structures were observed in Ho, Hohoe and Jasikan districts during the survey.

- The water quality studies show that the springs are generally physically and chemically good for human consumption as they meet the WHO guidelines values for potable water. However, pH is low in some springs and nitrate is significantly high. For example all the sources in Nkwanta district had pH values below 6.5, the low limit

- of WHO standard for domestic water supplies. High nitrate concentrations were also observed in three sources in two districts. This may imply pollution from either farming activities or dead organic matter (WRRI 1993).

3.1.3 **Methodology Used**

To address the principle of Water source and catchment protection, a "village walk" to the water sources and around the communities was undertaken by the Assessment Team together with the WATSAN committee members in all the three communities. The walk established contact with the community members and also acted as a launch pad for the mapping exercise. The community members drew the maps. At Nyagbo Emli Israel, the Chief who is also the chairman of the WATSAN committee took active part in the mapping exercise.

3.1.4 **Results**

From the WRRI report it is clear that long before project intervention, some measures had been taken by the community members recognising themselves as decision makers and managers of their water resources in protecting them.

Besides source protection structures, most communities have local by-laws and taboos regarding water source protection.

To avoid the risk of source pollution by human activities, the project staff with the active involvement of the community undertakes feasibility studies before the siting of any facility. Some of the technical measures applied are·

- Only tapping spring up stream of habitation and no agricultural activities in the catchment area.
- Not encouraging the construction of latrines in the immediate vicinity of shallow wells
- Promotion of a general environmental awareness.

One major constraint is with areas with big water bodies. In the case of rivers, because it flows through many communities, it suffers serious pollution. Human activities such as farming along the riverbank posses a serious threat to the existence of this water bodies. The sad part is that majority of the people who live within the catchments or along the bank of rivers and utilise resources from such rivers do not know the effect of such actions on their health, the country and the future.

3.1 4 (a) **Identifying water source protection as a need**

Historical records and observation of the water resources of the two communities with spring sources indicate that the community members identified the need to protect their water resource. According to Togbe Dadra IV who is also the chairman of the Nyagbo Emli Israel Watsan committee, ownership of the catchment is vested in the stool. The catchment area is a sacred groove. Hence it is a taboo for any human activity to be carried out within the catchment. The chief and his elders ensure that the community's water resource is protected against misuse and pollution. For example traditional laws and taboos were agreed upon by the entire community to protect spring sources from deforestation and pollution from agro chemicals and human waste. Some of the traditional laws and taboos given by the community members includes:-

HUMAN ACTIVITIES POLLUTING WATER BODIES

Vehicles being washed in the Lake Volta, which is the only source of water for the people of Dzemeni, a very busy marketing centre in Kpando District of the Volta Region.

-Ditto-

Children fishing in the dam at Mafi-Dekpoe.

- "Stepping in the water is not allowed"
- "Women in their menstrual period should not go to the source"
- "No farming activity within the catchment area"
- "Disposal of wet and dry refuse forbidden within the catchment".

Similarly, long before project intervention, the people of Santrokofi Bume saw the need of protecting their stream. It was tapped from the source into a reservoir in town where it was fetched. Farming activities within the catchment was not allowed.

In Mafi Tedeapenu, though the steering committee members said they have identified water source protection as a need, it was realised after the mapping that this was not put into practice. According to the secretary of the steering committee, Mr. E S.Q. Gbeve, the original plan of AMURT was to protect the dam by involving the community in afforestation Consequently, an afforestation committee was formed but could not function. During the village walk, some tree seedlings earmarked for planting along the dam were seen rather planted elsewhere.

3.1.4 (b) **Activities that have negative influence in catchment areas**

Asked if the catchment areas are negatively influenced by any activities, the overwhelming response from members present at Nyagbo Emli Israel was " NO". "The spring source and its environs is regarded as a sacred groove, no farming activities is permitted", they remarked. The secretary to the Watsan, Mr Godwin Divine Mensah in his explanation said because of the strict adherence to the laws and taboos regarding water source from time immemorial, they have never experienced any reduction in flow or deterioration of the water quality. According to Madam Abrah Tusah, a member of the Watsan even during the severe drought in 1983, when most water bodies got dried up, "we were still having sufficient water and all neighbouring communities come to us for water". Turbidity level during rainy periods was said to be very low. This was attributed to the vegetation cover and the rocky nature of the catchment area. The Environmental Health Assistant in charge of the zone, Mr. Simon Dzisah, confirmed this. Results of the mapping exercise are transcribed in fig 4.

However, in the case of the Tadeapenu dam, community members confessed that several human activities are going on within the catchment. The results of the mapping exercises are documented in fig 5.

Participants in Mafi Tedeapenu felt that the following activities negatively influence the dam impoundment: -

- livestock drinking from the dam and littering the banks with their dung.
- stepping into the water to fish.
- washing of vehicles in the water or drawing water
- washing of clothing in the dam
- stepping into the water to fetch
- dust from road on dam embankment
- felling of trees for firewood in catchment area
- farming activities around the dam

Respondents at Santrokofi Bume identified farming activities at the top of the catchment as an activity that have a negative influence on the catchment area.

Figure 4

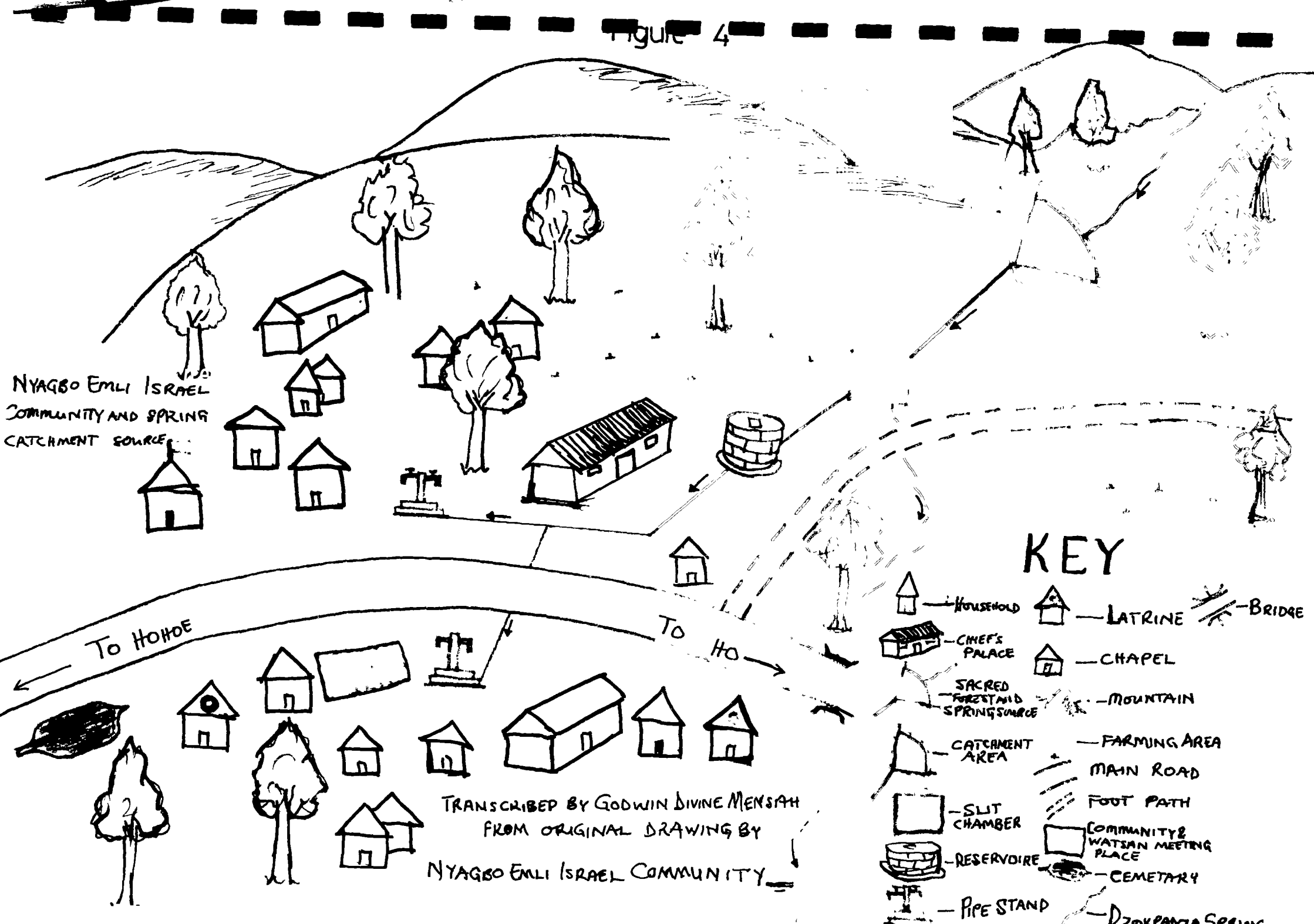
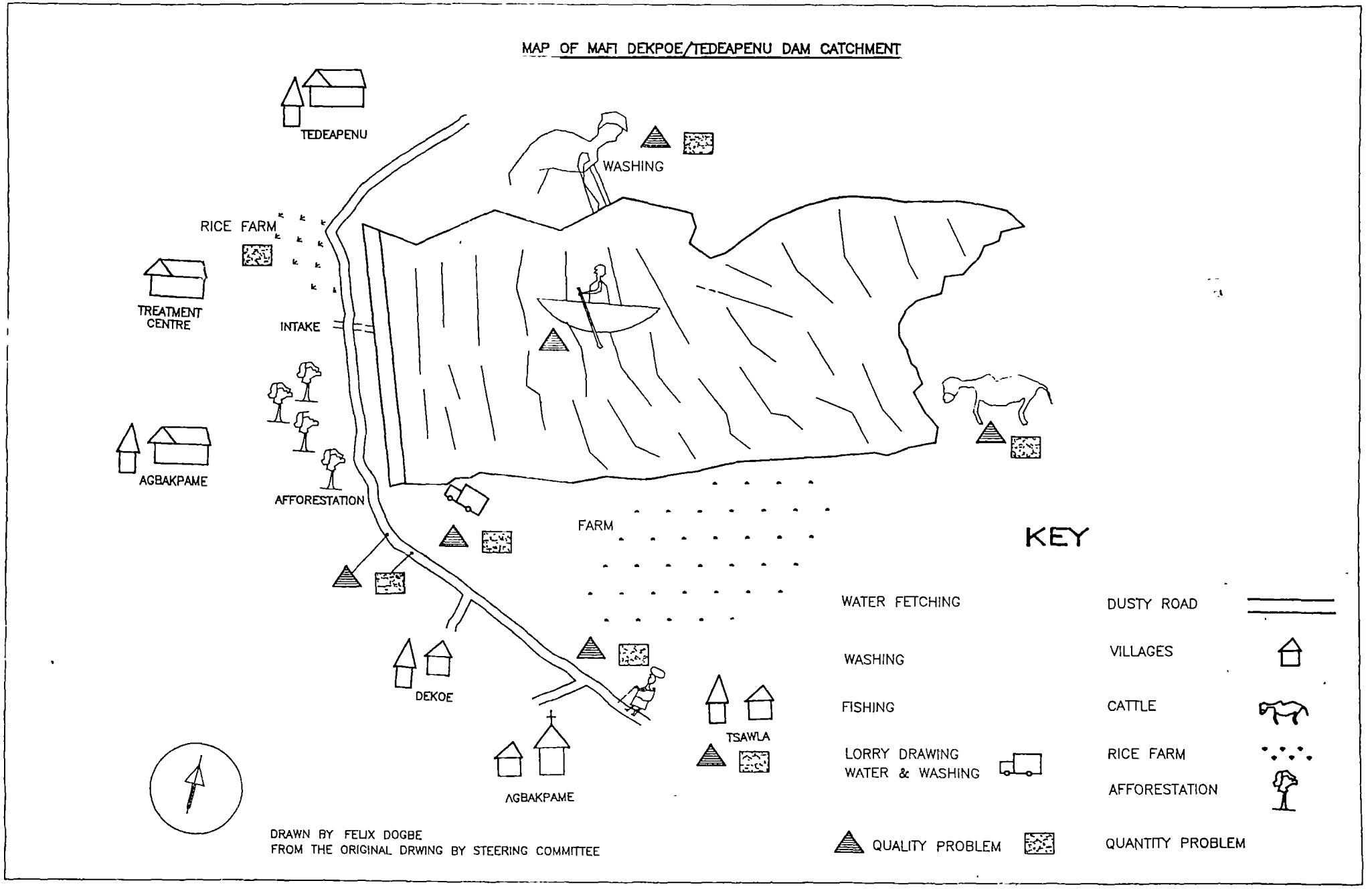

NYAGBO EMLI ISRAEL
COMMUNITY AND SPRING
CATCHMENT SOURCE
TO HOHOE
TO HO
KEY
HOUSEHOLD
LATRINE
BRIDGE
CHIEF'S PALACE
CHAPEL
SACRED FOREST AND SPRING SOURCE
MOUNTAIN
CATCHMENT AREA
FARMING AREA
MAIN ROAD
FOOT PATH
SLIT CHAMBER
COMMUNITY & WATSAN MEETING PLACE
RESERVOIRE
CEMETARY
PIPE STAND
TRANSCRIBED BY GODWIN DIVINE MENSAH
FROM ORIGINAL DRAWING BY
NYAGBO EMLI ISRAEL COMMUNITY

Figure 5


MAP OF MAFI DEKPOE/TEDEAPENU DAM CATCHMENT
TEDEAPENU
WASHING
RICE FARM
TREATMENT CENTRE
INTAKE
AGBAKPAME
AFFORESTATION
FARM
DEKOE
TSAWLA
AGBAKPAME
KEY
WATER FETCHING
WASHING
FISHING
LORRY DRAWING WATER & WASHING
QUALITY PROBLEM
DUSTY ROAD
VILLAGES
CATTLE
RICE FARM
AFFORESTATION
QUANTITY PROBLEM
DRAWN BY FELIX DOGBE
FROM THE ORIGINAL DRWING BY STEERING COMMITTEE

3.1.4.c) Threats to water source and catchment area protection

To get an answer to the question what are the threats to water source and catchment area protection, the same mapping exercise was used as above. Participants then wrote cards with the various uses of water systems and the surrounding land that affects the water source system. The results of the analysis indicating whether the use has an impact on the quality or quantity or both are documented in Table 5

Table 5: Activities that negatively influence catchment area protection

ACTIVITY	QUALITY	QUANTITY	ENVIRONMENTAL DEGRADATION
1. Farming	X	X	X
2. Fishing	X		
3. Vehicle Washing	X	X	
4. Clothes Washing	X		
5. Wading in Water	X		
6. Dust from Vehicles	X		X
7. Tree felling	X	X	X
8. Livestock dung	X		X

Source: Mapping exercise by Mafi Dekpoe/Tedeapenu Dam Steering Committee

Further discussion with some of the members of the Dam steering Committee and a representative of AMURT revealed that the steering committee was formed quite recently. Prior to that there was no by - laws regulating the use of the water source.

According to the two caretakers at Santrokofi Bume, after severe rains, the filter medium gets blocked completely with silt. This prevents water from flowing into the reservoir. They have to go up and wash the filter medium before water could percolate.

From Nyagbo Emli Israel there are no activities that have any negative influence on the catchment area. The sacred groove provides a good shade on the reservoir. In addition, community members adhere strictly to traditional laws and taboos.

3.1.4 (d) Protection activities being undertaken.

Asked what protection activities are being undertaken, the members of the Tedeapenu dam reservoir steering committee said with the extension of water now to 10 communities and the arrival of an Israeli investor coming to undertake large scale farming project, there is the need to regulate its utility and protect the catchment. As a result, a dam management committee comprising all stakeholders was formed recently. The committee is to advise on the use of the dam, its reservoir and catchment areas.

Other suggestions made by several members were:

" We want to undertake community afforestation and plant trees along the dam"

" If the slow sand filtration plant starts working, we would fence round the dam and construct water impoundment at vantage points for cattle watering"

" We intend meeting the farm owners at the upper part of the catchment to discuss with them not to cultivate any new farms or use agro chemicals"

With regards to the poor operation of the slow sand filtration system at Santrokofi Bume, the WATSAN committee said" we have written to the District Engineer to move the catchment upwards and redesign the filter".

3.1.5 **Lessons learned**

Positive customary practices such as the reverence of the sacred groove at Nyagbo Emli Israel which is also the water source is an efficient way of managing water and land resources.

With the exception of the Nyagbo Emli Israel spring catchment, the rest have activities going on within the catchment, which negatively influence the source. The most serious one occurring in the dam catchment at Mafi Tedeapenu.

Most communities have identified the need for water source protection and some have taken some measures to protect the source. Others too have now realised the need to protect their water source and are considering measures to protect the sources.

3.1.6 **Successes**

1. Danida recognised the need for water source protection. At the National level it contributed immensely in the establishment of the Water Resource Commission.
2. The government, the private sector, NGOs and the media are educating the masses especially communities living within the catchment area of water bodies to desist from activities, which threaten the existence of the river.
3. Assistance is provided to WRRI to monitor water resources in the region.
4. Advising communities on potential environmental problems inherent to water projects. This includes protection of the sources of water: spring catchments/streams for gravity schemes are prone to pollution from farming activities and changes in land use. The approach is by educating the communities on the issue and helping them to develop bye-laws to the effect
5. To prevent pollution of water of boreholes and handdug wells field staff and Watsan committees are educated to enforce minimum distances between sanitary installations, waste dumps and the water points.

3.1.7. **Failures**

As seen in Mafi Tedeapenu, the unprotected dam receives a lot of surface water from the surrounding environment and in general the water sources are highly influenced by human activities, as for example occupational and recreational activities and washing of clothes, utensils or vehicles. This means that the quality of water often is unacceptable and there is a risk of transmission of gastro-intestinal infections.

The chiefs and opinion leaders whose communities are within the catchment (or along the banks of the river) do not carry out any surveillance or enforce by-laws to regulate the proper use of the water source.

At Santrokofi Bume, efforts were not made during the feasibility studies to locate the concrete weir and catchment at a point devoid of human activities. Hence less than one year after handing over, problems start cropping up with the siltation

3.2 PRINCIPLE 2: Adequate water allocation needs to be agreed upon between stakeholders within a national framework

3.2.1. Background

In the project communities, especially in the central zone, water is used mainly for domestic purposes. Hence there is no competition and conflict over water use In the rainy season, the taps are open and water is always available. However, in the lean season (between November to February) water is regulated in most communities and opened at periodic hours only. The national strategy states the basic service level for communal water supply as follows:

> *The basic service level for communal water provides each person in the community with 20 litres of potable water at a distance not exceeding 500 meters from their house and serving not more than 300 persons.*

During these periods most people do not meet this requirement as many man-hours are wasted daily in search of water.

In the southern sector however, although the area is not endowed with natural water sources such as springs and groundwater, there are multiple agencies for different water uses. In the zone where this study was conducted, the only reliable source of water which over ten communities and the different water users are competing for is a dam impoundment reservoir. At the time of this study, a dam-impounded reservoir is being developed and a slow sand filter built by AMURT with the VRWSS project assisting with the distribution to ten communities. An Israelite investor was around during the time of the study and was finalising negotiations with the District Assembly and the landowners for the acquisition of large areas of land including the dam catchment for an irrigation project.

3.2 2 Methodology Used

A focus group discussion with all identified stakeholders followed by stakeholder analysis. The results are presented in table 6.

Table 6: STAKEHOLDER ANALYSIS; INDICATING WHETHER THEY USE AND/OR CONTROL THE WATER USED

	District Assembly	*WATSAN Committee*	*Cattle Owners*	*Fisher-men*	*Small farmers*	*Large Scale Farmer (investor)*	*AMURT*	*Land Owners*	*Men*	*Women*	*Children*
DOMESTIC (Drinking, Cooking)		** □	□ **	**	**	**	** □	□	**	**	**
FISHING		□		**	**	**	□	□**	**	**	**
CATTLE WATERING		□	** □		**	**	□	□	** □		**
IRRIGATION	□	□			**	□ **	□ **	□	**	**	

LEGEND *Managing, Deciding* □
User **

3.2.3. **Results**

Records of the construction of the dam could not be traced but from reliable sources, the Soviet Union built it. The Tedeapenu dam impoundment reservoir appears to be the only reliable source in the area (Kolly Dorcoo 1995). It is used for domestic supply, livestock, irrigation and fishing. Many communities are increasingly depending on this source for survival in the very prolonged dry seasons both for drinking and livestock. Though there is no water allocation mechanism presently, there seems to be much harmony between the different water users from the various communities. However, at the time of this study, there are more demands on this reservoir for domestic supply and economic activities, which has put some fear in the original users. The presence of an Israelite investor in the district who is in the process of acquiring large acres of land including the dam and its catchment for a large scale

irrigation project is seen by many as a big threat to domestic use. Statements showing the fear of the community members included:

> "Now that this water is being piped to ten communities, we are afraid there will be shortage especially in the dry season if this same water is used for large scale farming project"
>
> " Where will our cattle graze if he acquires the whole land?"
>
> " Why can't he connect the water from the Volta lake for his irrigation?"
>
> "Irrigation rapidly depletes water sources!"

3.2.4. Positive Institutional Arrangements for dam management

There are different interest groups as far as the Mafi Dekpoe/Tedeapenu dam impoundment source is concerned. Those identified currently have been listed in the stakeholder analysis in table 6.

However, the District Assembly being the highest political authority at the district level is making efforts to ensure that all parties is satisfied.
According to Dr. Yeriel Ben – Yehuda, the Israelite investor who was present at the stakeholders meeting, his plan is to build organic experiment of farms and a tourist village. He intends adopting a system of irrigation known as "drip system" developed in Israel. With this system, little water is used targeted for each plant instead of flooding the whole land. This in a way saves water. He expressed his readiness to interact with all stakeholders and be part of the existing dam management committee.

District Assembly

The Local Government Act, 1993 (Act 462) designates each district Assembly as the District Planning Authority for its area. The district level represents the plan formulation stage in which the principal functions carried out by the District Planning Co-ordinating Unit (DPCU) are: -

- Initiate public discussion on policy proposals for district-wide and sub-district development plans, local actions plans and settlement plans;
- Co-ordinate these plans (including social, economic, spatial, environmental and population/ demographic policy proposals);and
- Monitor and evaluate the implementation of approved development plans, programmes and projects in the district.

Act 480 makes provision for conflict resolution in the development planning process between: -

An individual, community or an Area Council on one hand and the District Assembly on the other.

It therefore follows that the decentralisation process has opened wide the channels of communication.

The Adidome District Assembly in whose jurisdiction the dam is located is very deprived in terms of social and economic development. Its doors are therefore opened to investors to help

open up the district and offer employment. Nevertheless, it does not loose sight of its obligation to provide water to the inhabitants. According to the Assembly man for the area and the District planning officer who are both members of the dam management committee, the assembly will take the necessary steps to ensure that safe and adequate water is available to all the rural dwellers and other users of dam.

Based on the concern expressed by the communities using the water and the governments grave concern on the need to protect and conserve water bodies since water is one of the most important life support systems, it is hoped that when the irrigation project commences, the District Assembly will closely monitor the use of the water in order to protect it from pollution and degradation.

3.3 PRINCIPLE 3:Efficient water use is essential and often an important water source

3.3.1 Background.

Water is an economic good, therefore each unit of water should be used wisely and equitably. In the words of Robert Ambroggi, a hydrologist, "the time is coming when water must be treated as a valuable resource, like oil, not a free one like air."

Since the project aims at the long term sustainable use of water and sanitation installations, a lot of emphasis is placed on capacity building at the community level in order to enable the users to take up the responsibility for satisfactory operation and maintenance of the provided water and sanitation facilities.

In each project community, WATSAN committees are responsible for the management and operation and maintenance of all completed facilities. Caretakers are appointed per water point and responsible for keeping the water points neat and undertake routine maintenance. Together with the WATSAN members they also maintain order at water points to avoid wastage. Any leakage in the water supply system is reported to the committee members for repairs. Small contractors are being identified and trained to carry out annual inspection of piped schemes and carry out repairs as per need upon the request of the WATSAN committees.

3.3.2. Methodology Used

Two methods were used to assess this principle at Nyagbo Emli Israel and Santrokofi Bume.

i. Sanitary surveys conducted by the assessment team and caretakers.
ii. Interview with WATSAN committee members, caretakers and District Engineers

3.3.3. Results

The catchment, silt chambers and reservoirs were critically inspected. The pipelines, standpipes and some valve chambers were also inspected. Although there are no leakage along the lines, valves or the taps, a common inefficiency in water use was identified in both communities. Overflows were provided at the reservoirs to avoid a build-up of pressure at the spring outlet. These overflows are directed to waste whereas less than a kilometre from both communities are other communities facing severe water problems.

Following series of negotiations by the Hohoe District assembly and the project staff the people of Nyagbo Emli Israel have agreed to the extension of their excess water to a

neighbouring community, Nyagbo Odumase. A separate reservoir was constructed for the community and the members have access through standposts.

They also have in mind bottling the water for sale. The physical and chemical properties of the waters were found to be acceptable. For the laboratory reports on the waters from the two sources see appendix C and D.

However, a similar idea of extending the excess water at Santrokofi Bume to the people of Santrokofi Benua was vehemently opposed by the community.due to a conflict between them.

Extension of water from one community to the others is not only most often fraught by conflicts between communities but also traditional and regional boundaries. For example, Sanga is a small community in the Kpado District of the Volta Region with a viable spring source. With the consent of the owners of the water source. The excess was extended to Tsiyenu a community five kilometres away whose only water source was a guinea worm infested pond. Both communities have separate reservoirs capable of holding 10,000 litres of water per day. Yet, there is excess overflow sufficient enough to serve a third community, Asikuma. Unfortunately, this community is in the Eastern Region of Ghana and as such fall outside the project area. Since funds from donors are meant specifically for identified areas it need serious negotiations at higher levels for such extensions to other regions.

3.3.4. Success:

- Training given to caretakers has equipped them to handle minor repairs. Hence, no leakage observed at the time of study. Their efforts are being augmented by the area mechanics that have also been trained and supplied with tools to carry out repairs beyond the scope of the caretakers.
- For the effective and efficient use of water, children under the age of four years are not permitted to fetch water from the standpipe.
- Users are educated not to leave taps open
- To improve leak detection efforts, community members have been urged to notify the WATSAN committee members or caretakers about where these exist.
- The District Water and Sanitation Team periodically gives back up support to the WATSAN.

3.3.5. **Failures**

Water is a limited resource. Hence, the large volumes of water lost through the overflow particularly after heavy rains could be directed to a basin such as animal trough or clothes washing watercourse or channelled into an irrigation scheme or extended to a neighbouring community..

There is the need for the Regional Co-ordinating Councils, District Assemblies and the Donors to find way of overcoming the problem of traditional and regional boundaries.

3.4. PRINCIPLE 4: Management needs to be taken care of at the lowest appropriate levels

3.4 1. Background

The Ghana Water and Sewerage Corporation was created by an Act of Parliament (Act 310) in 1965 as the main sector public institution to develop and manage delivery of water and sewerage sanitation services in Ghana.

Prior to the incorporation of GWSC, a number of pipe-borne water supply and hand-pump systems were operated and maintained by local councils, religious bodies and communities. Simpler technologies such as hand-dug wells spring catchments (e.g.Henderson boxes), and dugouts (dams) were managed by the communities themselves. However, due to financial constraints and lack of maintenance, most of these systems broke down and had to be taken over by GWSC under government directives. Government then provided funds to GWSC to rehabilitate and improve them and subsidies to operate them. A few systems are still operated by district assemblies today.

The GWSC as the main public utility entity charged with the responsibility of providing and managing water supply depends on tariff revenue for operation and maintenance of the services so provided. While tariffs could not be increased rapidly enough to match inflation and meet operation and maintenance costs, user compliance with stipulated tariffs was low and diminishing. The main reason being limited involvement of these beneficiary communities in provision and management of their facilities. It therefore became necessary in the mid 1980s to explore methods and management of their own facilities.

3.4.1 (a) Community Ownership and Management

The issue of Community Ownership and Management is one of the key features of the national strategy of the Community Water and Sanitation Programme. It is an accepted fact world-wide that, sustainability of development projects is enhanced when the management and ownership of the facilities are vested in the beneficiary communities. It is on the basis of this axiom that, in 1991 it was agreed during the formulation of the national strategy for rural water and sanitation at Kokrobite that community management and ownership of water and sanitation facilities be made one of the key elements of the strategy.

3.4.1. (b) Enabling Institutional Arrangement

- **District level:**

The Volta RWSS Project has in line with the government's decentralisation policy, established institutions and structures in all the twelve districts and the communities for the planning, implementation and management of water and sanitation facilities. District Water and Sanitation Teams (DWST) have been created in each district and equipped with skills in community development; hygiene education; sanitation and water supply. Furthermore, District Management Committees are formed to operate as sub- committee of the various Assemblies to see to the planning and implementation of project activities in the districts.

- **Community level:**

An important aspect of the demand-driven approach is community ownership and management of the facilities. To achieve this, the project has designed very useful strategies at the community level to assist in sustaining community interest and participation in the project.

One of the very useful structures is the WATSAN.

The Water and Sanitation committee is a community level team elected by the community members at a general meeting. The members are to fulfil a variety of tasks ranging from managing the water supply facility through fund raising to health education. A WATSAN committee has normally the following members:

- chairman
- secretary
- treasure
- organiser
- others

Committee members number between 7 and 12 out of which always about 3 or more were female.

The long-term objective of these structures is to enable the district assemblies to implement and facilitate community management of all water and sanitation facilities at the community level and to ensure their sustainability.

3.4.2. **Methods used**

As part of the study method to assess management at the lowest appropriate levels, focus group discussions were held with male and female leaders in ten communities in two districts (Ho and Hohoe) where water and sanitation facilities have been completed and handed over to the community.

3.4.3. **Results**

To ensure the maximisation of the gains of the project and its sustainability, the VRWSS Project is actively involving the communities in the overall management and maintenance of the Water and Sanitation facilities.

Each community has a WATSAN committee that is responsible for the management of water and sanitation facilities in the community. They have been managing the systems since they were handed over to them in 1994 to date.

These committees were formed with the inception of the project in 1993. As the communities are to pay 5 per cent towards the capital cost of the facility, it was the committee, which mobilised the community to collect the initial deposit and also contribute towards the capital cost. For scheme repairs and future extension, the committee established a WATSAN account, which is used exclusively for water and sanitation.

The day to day management is the responsibility of the caretakers. In all the communities, there are two caretakers who were trained by the contractor during the construction and given

some basic tools such as shifting spanner and pipe range to undertake minor repairs. All the caretakers trained are in the community and operating satisfactorily. Some have even undertaken extension work in the community.

The waterpoints are operating satisfactorily but there are problems with silt blocking the filter medium in two communities when it rains.

A major emphasis is given to by-laws in the programme. Each WATSAN committee in the Project area is encouraged to write a set of water use and hygiene by-laws as a way of compelling people to follow recommended environmental practices. The by-law on public water of one community reads:

> *"Any body found fouling public water i e washing of vehicles, clothing, bathing should be arrested and fined Cedis 1000."*

NB. US$.1 = Cedis 2,000

In few communities, WATSANs do actually arrest and charge defaulters, but in most cases the legality and authority of the WATSAN to arrest and charge defaulters is being challenged. This situation is happening because some WATSANs have not presented their by-laws to the District Assembly for endorsement.

i) The composition of all the WATSAN committees have not changed since their creation. The meeting frequency as found on inspecting the minute's books is low. In most of the communities, only the secretary and in some few cases, the chairman seem to play any specific role. However, in 60 percent of the communities, members expressed satisfaction with the level of management. At Nyagbo Emli Israel community, evidence of the good work of the WATSAN committee especially in the maintenance of the water source, reservoir and standposts was seen in the remarks made by both local and foreign visitors in the visitors book after visiting the water source. (See appendix E).

ii) The DMC manages and supervises Water supply and Sanitation Programmes at the policy level on behalf of the District Assembly and the people. The DWST facilitates the relationship between the WATSAN and the private sector by advising them and assisting them with the management of the private sector contracts.

iii) In response to the question: does existing legislation facilitate this principle, the overall response was "NO". Reasons were that the Unit committees were created by a legislative instrument (instrument 1589,1994) as the lowest level of legal decision making in the decentralised government decision making structure; with the responsibility to implement bye-laws. It is therefore expected that the WATSAN committees become a sub committee of the unit committees. This has not been done. The results are conflict between WATSAN and unit committees and duplication of functions in some communities.

3.4.4 **Success**

Beneficiary communities of water and sanitation facilities are the owners and managers of the facilities put in place. They are in full control and make decisions on how the water system is to be maintained.

Caretakers trained during construction of the water systems are performing efficiently. Most of the water points are in good working condition and safe water is available all the time.

Over eighty percent of community members find the WATSAN committee members active and appreciate the concept of WATSAN.

3.4.5. Weaknesses

WATSAN committees created to ensure sustainability of the initiatives started by the project, at present have no legal backing within the decentralized system. Thus WATSAN would only be able to implement by-laws if they function as a sub-committee of Unit Committees.

Although all the WATSAN tendered to have regular monthly meeting some committees met very infrequently, and 2 have not met for over a year. The major cause for the absence of meetings was attributed to misunderstanding between the WATSAN members. In one community it was between the chairman and the secretary while in the case of the other WATSAN, the members were inactive except the secretary and caretaker.
In some cities there is a conflict on the perception of the WATSANs role in management of the water facility. It was evident that in some communities it has been assumed that because the WATSAN was singled out for training so it was its responsibility to manage the facility without the community participation.

Other problems identified with the operations of the WATSAN include;

The inability or willingness on the part of some WATSAN committee members to make their accounting procedures transparent. A case in point is some communities in the Hohoe district where the WATSAN find it extremely difficult to collect water tariffs from a section of the members, not because they cannot afford it but just outright refusal to pay due to lack of accountability on the party of the WATSAN committee.
WATSAN committee dwells more on management of water facilities, while the hygiene and sanitation is relegated
Community apathy towards some WATSAN members is also making it extremely difficult for them to operate successfully. This factor could be attributed to the fact that, some communities for some reasons chose the wrong people to serve on these important committees. Changing them does not seem to be feasible and therefore chose to ignore them and their activities instead
In certain cases community members insult WATSAN members in course of performing their normal duties.
In some communities, there is no co-operation between traditional leaders and WATSAN committees.

Lessons learned

- Communities are capable of managing their facilities if they are trained and supported
- Success with management at the community level depends on a variety of factors:
  - -unity within the community, often adversely affected by disputes over traditional leadership, inter-ethnic rivalry
  - -a progressive community leadership
  - -the extent to which the community has a sense of ownership of the new water system
- For WATSAN to be able to implement by-laws they should be made responsible to the District Assemblies by functioning as sub-committee of Unit Committee.

3.5. PRINCIPLE 5: The Involvement of all Stakeholders is required

3.5.1. Background

Sector water policies are found for GWSC, the Irrigation Development Authority (IDA), Volta River Authority (VRA), Volta Lake Transport Company (VLTC), Minerals Commission, Hydrological Division of AESC, the Water Resources Research Institute (WRRI), the Institute of Aquatic Biology (IAB), the Environmental Protection Agency (EPA) and Local Government Administration (CSIR, 1995). However, presently there is no comprehensive overall water resource management policy and no agency exists to undertake this task of coordinarting water resources information activities.

Adequate and reliable data for the monitoring and assessment of water resources are lacking. Future rational and non-conflicting water resource management decisions depend to a large extent on the availability of improved high quality water resources data as well as on strengthening capabilities to perform data processing, analysis and assessments.

From on-going discussions between the Ministry of Works and Housing (MoWH), the Danish Embassy and Danida a need has been identified for support to strengthen the Water Resource Information Services (WRIS). A pre-appraisal of possible Danida support was carried out in February-March 1994 to identify possible areas for support. The final report was submitted in January 1996. A feasibility study was carried out January-February 1996, with the final report submitted august 1996.

In the Danida Project Proposal for Strengthening the Water Resource Information Services in Ghana April 1994, it was also proposed to provide support to the planned establishment of a Water Resource Commission. In July 1996, a Water Resources Commission Bill was placed before Parliament and was passed into law late October 1996 and a draft proposal for Danida support was prepared November 1996 (PEM Consult 1996ii)

In June 1996, the Ministry of Works and Housing initiated a Water Resources Management Study with a number of building blocks including an Information Building Block, which is financed by Danida. The study is on going and the results are expected to be implemented by the Water Resources Commission

3.5.2. Methodology Used:

In addressing this principle, different stakeholders were identified using interviews. The interviews focus on the level of involvement in management of water resources and to find out existing platforms for decision making.

a) Focus Group Discussion with Women's Group at Mafi Dekpoe.

b) Focus Group Discussion with Dam management Committee Members at Mafi-Dekpoe

c) Interview with WATSAN members at Santrokofi-Bume.

3.5.3. **Results**

3.5.3 (a) **Collaborators at National level**

At the National level, the major stakeholders are the Ministry of Works and Housing (MOWH), Ministry of Local Government and Rural Development (MLGRD) and the Water Resource Research Institute (WRRI). The establishment of a body to regulate and manage water resources in the country has been in the pipeline for a number of years and water Resources Commission Bill was passed into law at the end of October 1996.

Quotes from the water Resources Commission Bill, 31st May 1996.

"The purpose of this bill is to establish a body to regulate and manage water resources in this country The government has realised for some time now the need to have in place one identified body charged with the control, management and regulation of water resources in order to move away from the current situation where various agencies and institutions regulate and manage different aspects of the subject "

"The commission shall be responsible for the regulation and management of the utilisation of water resources, and for the co-ordination of any policy in relation to them."

Membership of the commission includes representatives from the Ghana Water and Sewerage Corporation; organisations producing potable water; organisations producing hydroelectric power; organisations producing and utilising water for irrigation and agricultural purposes. Others are the Volta River Authority; Irrigation Development Authority; Water Resources Research Institute; the Meteorological Services; Hydrology Division, AESC; Environmental Protection Agency; Forestry Commission and Minerals Commission. (Water Resource Commission Bill, 1996).

3.5.3 (b) **Regional level**

The concept of community-managed water supply and sanitation is relatively new in Ghana. This implies a re-definition of roles and responsibilities of the key players in the provision of water and sanitation in the rural areas. At the Regional level, the project is collaborating with the Ministry of Health, Department of Community Development, the District Assemblies, the Regional Administration, the private sector, Non- governmental Organisations in the water and sanitation sector, Statal and Para-statal organisations and other identifiable organisations. Periodically, collaborative meetings are held with local NGOs and the regional and district heads of departments.

At a just ended collaborative meeting attended by local NGOs and officials from CWSD head office, the Volta Regional Co-ordinator of the Community Water and Sanitation Division, Mr. Edem Asimah, requested NGOs to establish sector networking mechanisms and also come up with strategies and procedures for uniformity in information dissemination.

3.5.3 (c) **District level**

The District Assemblies in each district have established a District Management Committee (DMC). The DMC is the highest authority concerning the activities of the VRWSS Project in the District. The membership includes representatives from:

- Infrastructure Sub-committee of the District Assembly
- Social Services Sub-committee of the District Assembly

- Relevant decentralised departments (e.g. Ministry of Health, Department of Community Development, Ghana Water and Sewerage Corporation and Ghana Education Service)
- District Water and Sanitation Team representatives
- Relevant women's organisation at District level
- Other projects or organisations involved in water and sanitation.

The duties of the DMC includes:-

- Co-ordinate water supply, sanitation and health education activities in the district in co-operation with the District Water and Sanitation Team
- From time to time inform the District Assembly and District Administration about project activities
- Make sure that decisions made by the District Assembly, the Regional Management Committee and Project Management are carried out as expected and on time
- Monitor water and sanitation work in the district, identify day-to- day problems and help solve them.

With this institution at the District level it is ensured that all involved get access to information through periodic meetings and minutes of meetings, which are circulated to all, concerned.

In each of the 12 districts district Water and sanitation Teams are created. At the zonal level there are field officers called Environmental Health Assistants (EHAs) who are all mobile. They are a link between the District project office and the community. Part of their duties includes monitoring of existing water sources in collaboration with the WATSAN committees. Any new development that might adversely affect the quality or the quantity of the water is immediately reported to the DWST for immediate action.

3.5.4. **Success:**

There has been active collaboration with Ghana Education Service through the School Health Programme and Sector Ministries like Ministry of Health and Department of Community Development. There is an on-going collaboration with training institutions like School of Hygiene, Ho Polytechnic, Institute of Adult Education, Tsito and St. Prosper's Secretarial College in the training of Project Staff and other Stakeholders.

To maintain an overview of water related developments in the region the Water Resources Research Institute was contracted by the Project to monitor the water source in the region.

The project recognised the need to involve stakeholders. It has therefore been organising collaborative meetings with the key players in the water and sanitation sector.

Information dissemination about the project and other water and sanitation related issues in the Region is effectively done though the project's quarterly news letter, "WATSAN NEWS" which is given out freely to all stakeholders.

3.6. PRINCIPLE 6: Striking a gender balance is needed as activities relate to different roles of men and women

3.6.1. Background

The many different ways in which water is used and managed often have distinct implications for male and female users. Use, access and control over natural resources such as land and water, and tasks, means and responsibilities are highly gender specific and may vary considerably for different water users. However, gender awareness varies widely across the different water sectors, and no concerted attempts have been made in the past to consider the gender perspectives in integrated way (SIDA, 1994)

Right from the beginning all the stakeholders recognised the need to give greater attention to gender issues in the new National Community Water and Sanitation Programme (CWSP). It was seen as critical for the efficient provision and maintenance of water supply sources in communities. In particular, women 's participation in water committees was to be promoted.

At the National level, the Community Water and Sanitation Division (CWSD) acknowledges the need for mainstreaming gender issues into sector activities and the National Strategy (CWSD) highlights the following principles:

- Special focus on women, as both users of water as well as planners, operators and managers of community level systems (including gender balance in WATSAN committees and as pump caretakers).

- Active participation of women in all sector activities

The Volta Rural Water Supply and Sanitation project has since its inception in 1993 put in a lot of effort into improving the gender balance at all levels. This is done through encouraging women to take up positions and the incorporation of gender issues in all training materials as well as conducting special gender workshops for staff on gender.

3.6.2. Methodology:

Three methods were used in assessing this principle:

i. female and male focus group discussion
ii. review of available literature
iii. voting by pocket chart

3.6.3. **Results**

3.6.3 (a) Women's Representation on the VRWSS Project

Representation at the Regional Project Office (RPO)

Efforts to promote women and their interest in project activities on the project start at the regional project office. About 20 percent of the staff at the RPO are women. All the female staff are with the software and administration. They include the Software Advisor, the Health and Sanitation Specialist, the Public Relations Officer and the secretary. Presently there is no gender specialist but the project is in the process of employing an Extension Officer to be responsible for gender and Watsan activities

Most of them are able to participate in decision making on the project.

In other units where technical skills are required such as the technology unit, there are hardly any female workers. Recruitment to this unit is limited by the difficulty in finding women with the requisite qualification and skill in technical fields. Table 7 gives a summary of the composition of staff at the RPO.

Table 7 Male /Female Representation by Units at the RPO

UNIT	Male	Female	Percentage Male	Female
ADMINISTRATION	29	4	88	12
MANAGEMENT	2	0	100	0
SOFTWARE GROUP	4	6	55	45
TECHNOLOGY GROUP	5	0	100	0
3000 WELL GROUP	7	0	100	0
TOTAL	47	10	443	57

Representation at the District Offices

Nine out of the 12 districts have got women in decision-making positions. They comprise of Community Development Staff and Extension Supervisors. All the four extension supervisors on the project are women. The ratio improves at the zonal level where out of 135

Environmental Health Assistants (EHAs), 35 are women. Table 8 gives a summary of the composition of Extension and Technical Teams in the districts.

Table 8: Male/Female Representation in Extension and Technical Teams in the districts

Category	Male	Female	Percentage Male	Female
ENGINEERS	13	0	100	0
EHOs	21	0	100	0
CDS	8	5	62	38
EHAs	100	35	74	26
AOs	12	0	100	0

Women 's representation on the watsan committees varies from one community to the next. To some extent this is influenced by the local perceptions about women's public life and whether or not it is desirable to increase their participation. It is also affected by the extent to which women are involved in selecting their representatives. Men still dominate decision-making roles in the committees, while women often do not go beyond supervisory positions in the watsans. Table 9 describes the involvement of women in four WATSANs in Kpando and Hohoe districts.

Table 9 Male/Female Composition of WATSAN committee members at Nyagbo Emli Israel, Santrokofi Bume, Sanga and Peki Dzake.

Community	Male/Female	percent	Key roles of women	Key roles of men
Nyagbo Emli Israel	Female 3 Male 7	30 70	Treasurer Member	Chairman Secretary Caretakers
Santrokofi Bume	Female 4 Male 8	33 67	Porter Member	Chairman Secretary Caretakers
Sanga	Female 3 Male 8	27 73	Treasurer Porter Member	Chairman Vice chairman Secretary Caretakers
Peki Dzake	Female 4 Male 7	36 64	Member	Chairman Secretary Treasurer Advisor

3 6.3 (b) Percentage of men and women that are satisfied with the influence of their gender group in decision making

To get the percentage of men and women that are satisfied with their influence, focus group discussions followed with a voting by pocket chart was held with opinion leaders, men and women in 4 communities. They comprised of 60 members of which 20 were women.

Out of the 40 men interviewed, 15 men (37.5%) expressed satisfaction with their representation and influence over decision making on the WATSAN while 25 (62.5%) felt women are under represented and most often not holding any executive position or consulted on decision making.

In the case of the women's group, all expressed dissatisfaction with their influence and representation in decision making. According to one woman, she holds the title treasurer but she has never kept any money before. "The chairman keeps the money". When the chairman was contacted he confirmed but explained that the treasurer is an illiterate.

Asked why their low influence and representation, the women's reasons given for this were as follows:

"we are too tired after returning from the field, searching for water before cooking. It is an additional burden taking up responsibility on this committee."

" You are envied and insulted by other community members in the course of your duty

" You or members of your family are attacked spiritually ("juju") if you are vocal and try to enforce by-laws

Table 10: Results of influence of gender decision-making

Category	Satisfied Percentage	Not Satisfied
Women	0	100
Men	37.5	62.5

3.6.3 (c) **Meeting schedules**

The committees have three types of meetings:

a. routine meetings held once a month.
b. emergency meetings
c. general community meetings - when it becomes necessary to pass on information to the community members.

Two-thirds of the meetings are fixed in most communities to suit both men and women. The Secretary of the steering committee of Mafi Tedeapenu, Mr. E.S. Q. Gbeve admits:

"The women were formerly not attending our meetings. It coincided with market days Since we changed it to a non-marketing day, their attendance now is great"

In some communities, meetings are fixed on taboo days when villagers don't go to farm. Emergency meetings are called by chance.

Informants in the Hohoe districts indicated that women were often late to meetings even though the timings were suitable. The reasons given by one WATSAN member was:

"For us it takes us longer time to make ourselves presentable", man can put on a covercloth and attend the meetings, whereas women takes a longer time to get ready on completion of the household chores".

3.6.3 (d) Gender specific activities

To assess the gender specific activities for men and women, an exercise on the kind of work that men and women do with regards to WRM at community level was done with two separate groups comprising of both men and women in two communities; - Santrokofi Bume and Benua The result is documented in Table 11

Table 11: Gender Specific activities

	ACTIVITY	MEN	WOMEN
1	Siting of water points	*	
2	Digging of Trenches	*	
3	Carting of materials to site	*	*
4	Cleaning of water points		*
5	Fetching of water	*	*
6	Weeding of path to catchment	*	
7	Caretakers	*	
8	Collection of water tariff	*	
9	Keeping Money	*	*
10	Hygiene Education	*	*
11	Source Protection	*	*

The results confirm the issue of male dominance. In the communities, all the caretakers as well as the water tariff collectors are men

3.6.3 (e) Gender Sensitisation Programme

The Project is working towards creating equal opportunities for men and women in the water and sanitation sector. The initiatives so far are the following:

- Communities are advised to have equal number of women and men on the Watsan Committees.
- The communities are also advised to select women for some of the important positions on the committees e.g treasurer, chairman, secretary.
- In hygiene education and planning with the communities, women and men's groups are consciously targeted.
- Within the Private sector, the project is encouraging women to take up positions as latrine artisans; area mechanics; suppliers and consultants.
- Conscious efforts are being made to get a balance of men and women in positions at Regional, District and Community level. At the planning level the CWSD acknowledges the need for main streaming gender issues into the sector activities and the National Strategy highlights the following principle:-

  Special focus on women as both users of water as well as planners, operators.
- Gender aspects are an integral part of all training of the project at all levels (community, zonal, district, and regional).
- Gender sensitisation workshops were held for all the senior staff at the regional level. A similar one has been planned for District Assembly members, heads of departments and selected senior staff from District Assembly Administration and District Water and Sanitation Teams.

It has been proposed that in the second phase of the project (September 1997-2003), an officer will be assigned the responsibility as a focal point to collate and link up all the gender activities within the project.

To give balance to the traditionally male dominated private sector, the project is consciously looking for female contractors and consultants.

In the training of artisans, caretakers and pump mechanics, women are encouraged to offer themselves to be trained.

So far 15 women have been trained in 5 districts as latrine artisans, 60% of the suppliers are women, 4% consultants and 7% contractors.

3.6.4. **Success**

The Volta project has been most fruitful in promoting gender mainstreaming beyond the issue of the representation of women. There has been more than one gender training workshop for staff at the Regional office, colleagues from CWSD, TREND and the Royal Danish Embassy. The workshop focussed on improving the institutional ability of the project to analyse and implement gender policies through better gender sensitivity.

Through membership of the WATSAN committees, women are involved not only in caretaking, cleaning and hygiene education, but in technical and managerial tasks.

Through re-orienting men on the importance of women in their communities, women are gradually being involved in decision making. Hygiene education is not limited to women's groups but to all community based organisations.

3.6.5 **Lessons learned**

Positions on WATSAN committees are seen as status positions by men and are not generally given to women. This is mostly a socio- cultural issue. In the 4 communities visited there were no women chairpersons or secretary. Women were given the post of treasurer but in some cases this simply meant holders of money, i.e. the men kept the books. Women were mostly relegated to the role of porter and member without portfolio.

Insults from other women and the superstitious believes about spiritual attacks if you are an active WATSAN member is identified by women as the main stumbling block to become more involved in the community decision making process

Men are now performing some activities such as water fetching which was hitherto regard as traditional role of the woman

3.7. PRINCIPLE 7: Capacity building is the key to sustainability

3.7.1. Background

The New Delhi statement (UNDP, New York 1990) stated that "human resources development is essential at all levels from community members to politicians.... Training of professionals, managers, technicians, and extension workers builds competence and confidence".

Community management of water supply and sanitation facilities is a relatively new concept in Ghana and judging from the experiences in other countries, one can predict that the shift of on-going and future projects to community management will not be easy. The success of the National Community Water Supply and Sanitation Programme will depend on the motivation and capability of the personnel responsible for implementing it. To a large extent, the Community Water Supply and Sanitation Programme could be characterised as a human resource development and training programme. The sector strategy considers institutional capacity building and human resources development to be a crucial component of the on-going efforts to ensure an accelerated and sustained development.

In its broadest sense, human resource development includes recruitment and selection of personnel, pre-service training, on the job coaching and support, long range planning for personnel needs at institutional and sector-wide levels and personnel management policies such as incentives

Against this background, the Volta RWSS Project has as part of its implementation strategy, a training unit co-ordinated by a Training Advisor. The Training Unit is planning and co-ordinating extensive training activities for specific target groups – Project employed staff, District Assemblies, Partner Organisations, Private Contractors, National service Personnel, Technical/Engineering students on attachment, Area mechanics and artisans, etc.-in the water sector in line with the national strategy for community water and sanitation.

3.7.2 Methodology used

In assessing this principle, the following methodology was adopted:

- review of consultants reports on training
- discussions and interview with relevant project staff, SBDU, EHAs/EHOs, DMC,selected artisans and contractors.
- observing training for EHAs and WATSAN

3.7.3 Results

3.7.3 (a) Percentage of budget allocated for training

Out of phase one total budget of 115.700DKK, 6.927 million DKK representing 6% has been used for training and capacity building during the first phase of the project.

3.7.3 (b) Local Training Institutions

The project has currently expanded into all the 12 districts in the Volta Region and this requires an increase in demand for training services for the various target groups. In order to meet the increasing demand for training for the various target groups, the project considers it appropriate to develop the capacity of additional regional institutions that already have the requisite experience in pre-service training of similar target groups. The objective is to gradually hand over the training assignments of these various target groups to these institutions, and ultimately to institutionalise training programmes for the benefit of VRWSSP and the CWSD.

The major inputs for the development of the local training institutions are:-

i. the training of the academic staff of the institution
ii. rehabilitation of physical structures – classrooms, library, conference hall and kitchen blocks
iii. provision of furniture
iv. Pre – financing of teaching materials and equipment - white flip boards, flip charts, training manuals.

A consultancy fee of $80 per man - day is paid to the institution. According to a Memorandum of Understanding between the project and the institutions, $50 out of the fee is used to defray cost of rehabilitation and the remainder used to pay the tutors for their facilitation.

Table 12 shows the institutions whose capacities have been built to carry out training programmes for the various target groups.

Table 12: Training Institutions and their areas of training

Training Institution	Activity
1. TREND (ITN centre)	Main institution concerned with human resource development aspects of the community water and sanitation sectors, including development of curricula and training materials with emphasis on hardware as well as software aspects.
2. School of Hygiene	Training of Environmental Health Staff
3. Ghana Education Service	Training of School Health Co-ordinators
4. Small Business Development Unit (SBDU) Private Business Partner	Training of artisans, contractors and area mechanics.
5. Ho Polytechnic (A tertiary institution)	Training of Technicians/Engineers from the District Assembly and the project employed engineers
6. Institute of Adult Education, Tsito (A department under the University of Ghana, Legon)	Training of Community Development Staff and partner organisations for WATSAN training and members of the District Management Committees.

3.7.3 (c) **Institutional Sustainability.**

In line with the government's decentralisation policy, the VRWSS Project has established institutions and structures at the district and community levels for the planning, implementation and management of water and sanitation facilities.

District Management Committees (DMCs) are formed to operate as sub committees of the various District Assemblies to see to the planning and implementation of project activities in the districts. The project has also establishished District Water and Sanitation Teams (DWSTs), to operate under the district assembly. The WATSAN committee at the community level also sees to the operation and maintenance of the facilities.

The long term objective of these structures is that District Assemblies will initiate, implement and manage the implementation of all water and sanitation programmes in the district to ensure their sustainability, while the regional team of CWSD will assist with finance, technical advise, quality assurance etc..

Presently, the project is engaged in building the capacity of the district assemblies through the provision of office structures, computers, photocopiers and other accessories backed by training to give them the requisite knowledge and skills to take up their new responsibility.

CAPACITY BUILDING OF DISTRICT ASSEMBLIES

Ms. Fay Ephraim, Zonal Planner of the Southern Sector, CWSD, Presenting computers and photocopying machines to the 12 District Assemblies at a ceremony.

Role of district assemblies in Phase II

At a recent seminar on the roles and responsibilities of District Assemblies in Phase II, it was agreed by all parties that the Assemblies will play a more active role in the implementation since all district activities will be planned and budgeted for by the District Assembly and district team. The Assembly will pre-finance some of the construction contracts and therefore be directly responsible for the contract administration and management. The Assemblies will also contribute to running cost of the district offices and therefore be involved in the administration. At a recent seminar on the roles of the District Assemblies in phase II of the project, a memorandum of understanding outlining the roles of the Assembly and that of the Project was reached. A sample form is shown in appendix A.

3.7.3 (d) Output of training Activities

Training on the VRWSS Project involve several target groups, organisations, training institutions, and trainers. Training is required at various phases

Ten extension supervisors were trained by Training Network Centre (now TREND) during the Pre-project period. Based on the needs identified in the field, they were given additional training in project specific issues. After the training for the extension supervisors, they supported the TREND training team in training 20 field assistants drawn from the Ministry of Health and the Department of Community Development. The field assistants were stationed at the zonal level and act as a link between the community and the district project office.

9 Engineers, 14 extension staff, administrative officers and some officers in the Regional office received training in both local and external institutions e.g. Management Development and Productivity Institute (MDPI), Accra, Ghana Institute of Management and Public Administration (GIMPA), Accra, Price Water House, Accra, PAID- Cameroon, NETWAS-Kenya, ISWD- Zimbabwe, Aahus – Denmark and IRC the Netherlands.

Some project staff also undertook study tours to related projects in Uganda and South Africa.

Training programmes are also organised for all extension staff, which includes environmental health officers, and assistants and community development staff.

So far 160 associate staff from the Environmental Health Division, Department of Community Development and the District Assemblies have been trained on the project. This is made up of 135 Environmental Health Assistants, 20 Environmental Health Officers, 13 Community Development Staff, 12 Administrative Officers and 6 Technician Engineers.

At the District level, there is training for District Management Committee. As at the end of 1996, 8 out of the 12 Districts have had their DMCs trained.

At the community level, 272 out of 476 WATSAN committees formed in 11 districts have been taken through the first phase of training (pre-construction). The objectives of the WATSAN training were to equip them adequately with the skills and knowledge to enable them co-ordinate the community'contribution towards project implementation, with specific emphasis on selection of technology options, resource mobilisation, setting up systems for community-based operation and maintenance of facilities, as well as facilitation of behavioural changes especially among vulnerable groups such as women and children.

Artisans in the community are also not left out as they undergo community-based training for the construction of the different types of household latrines. The project has as at June 1997, trained 357 community based artisans training in the construction of five different types of household latrines in 8 out of the 12 districts.

Water point caretakers appointed by the communities are made to undergo on-the-job training in preventive maintenance and cleanliness. The training of caretakers is the responsibility of the contractors constructing the water supply system.

15 area mechanics have been trained so far.

Contractors do the construction of water systems and sanitation facilities. So far, 77 contractors have been trained.

There has also been computer training for all categories of staff at both district and regional offices of the project. The content of the training include various areas and levels of computer literacy such as Word Perfect, Lotus 123, d-Base IV and Microsoft 97.

Staff who cannot speak the local dialect also have tuition in Ewe, the local dialect to enable them communicate effectively with the community members.

Functional literacy classes are also organised for security guards to be more functional in their duties.

In service training for 12 professional drivers on the project was carried out at the National Vocational Training Institute in Accra whilst the driving instructor carries out routine training in motor cycle riding and driving for staff whose work demands easy mobility.

In all the 12 districts the project has engineers who are the managers of the district offices. They have been retrained to design and supervise the construction of community water supply and sanitation systems. As managers, they were also trained in management and supervisory skills.

In collaboration with the Ghana Education Service and the Ministry of health, 169 schoolteachers from first cycle schools including circuit supervisors have been trained as school health co-ordinators on the curriculum on water, health and sanitation.

So far all those who have had training through the programme are using the skills acquired.

3.7.3 (e) **Training Effectiveness**

An evaluation report on Training Effectiveness for EHAs and WATSAN Committee members by the TREND group in 1996 indicated that the training has imparted knowledge, skills and attitude necessary for the successful implementation of the project

A survey of DMCs, their membership and training in four districts by the training advisor, Mr E.D.K Fiagbe revealed that all the DMC members found the training activities very relevant and useful to their functions in various ways. One DMC member in the Hohoe District commented:

"The training has broadened my knowledge and equipped me with the skills require to perform as a project management team member".

Training given to artisans and caretakers was found to have produced good results as between sixty to eighty percent of the latrine artisans were able to construct several household latrines after the training. Similarly, most of the caretakers had undertaken extension work on water systems as well as preventive maintenance on the taps and pipelines.

From field results most of the WATSAN committees operated and functioned well before and during construction in the performance of tasks such as organising fund raising activities, disseminating project information and hygiene education.

3.7.3 (f) Refresher Courses

Refresher courses are organised periodically for field staff, partner organisations, and the District Water and Sanitation Teams. In contrast, no refresher course has been organised for latrine artisans, caretakers and contractors since their initial training. During the field survey all WATSAN committee members, caretakers and artisans the team interacted with were of the view that at least six months after the initial training, a refresher course should be organised for them.

3.7.4 Techniques used in training

The training research and Networking for Development (TREND) Group for the past four years were involved in the training of Extension Supervisors for the Volta RWSS Project.

Training of Trainers is a feature used most often. Presently, all the Extension Supervisors initially trained within the project have assumed full responsibility of the training of others. This has proved successful as most of the staff confidently facilitates during training sessions for both project staff and other stakeholders.

The analysis indicated that participatory methods were used quite extensively during the training and these included open discussions, role plays, songs and group work. Others are the story with-a-gap, F-diagram and the 3 pile -sorting cards.

All training were done in an informal, relaxed atmosphere. At a recent training for DMCs in one of the districts, which the Assessment Team observed, the training was interactive, with trainers working in pairs and asking participants open-ended questions. This gave an opportunity to everyone to share their thoughts, ideas and personal experiences.

At WATSAN committee training by a Partner Organisation observed by the team, community-building activities were interspersed throughout allowing participants to feel at ease and promoting a "we" feeling. These activities involved composing and singing action songs, role-plays and demonstrations.

3.7.5 Success

- The training programme of the project has enhanced staff performance at all levels of the project in terms of knowledge, attitudes and skills. Field staff are exposed to more collaborative communication strategies using participatory methods in hygiene education
- It helped promote effective inter-sectoral networking with relevant agencies and organisations
- Staff confidence level in carrying out activities has increased tremendously.
- At the community level, most of the communities, which were not formerly operating a bank account, are now having an exclusive bank account for water and sanitation and keeping records.
- Communities are now exposed to some practices, which were formerly taken for granted.e.g hand washing at critical times.
- There have been positive developments as women are being encouraged to participate in community activities and take up management positions.
- All the District Assemblies in the region have financed an extension of the district office built by the project.

3.7.6 Weakness

Though participants demonstrate during training a high level of knowledge on water and sanitation related topics, there is a gap of transferring this knowledge into practice.

The WATSAN committees have not been able to train any of the community-based organisations due to the absence of teaching aids.

None of the WATSAN committees, caretakers or artisans have had any refresher training since the initial training.

It has been reported by most of the WATSAN trainers that some WATSAN committee members are not committed to the training.

Although facilitators from the Partner organisations and the locally based training institutions have been taken through participatory training methods, some find it difficult to extricate themselves from their usual didactic method

Some of the WATSAN committee members come to training sessions with the hope of getting some incentive. They loose interest when they find out that there is no incentive

3.7.7 Lessons learned

The use of project staff as well as locally based institutions for training ensures effective targeting of project specific issues.

Transferring training activities to professional training institutions in the locality broadens their scope of activities to be involved in local developmental process. It also offers project staff the opportunity to have time for other activities such as supervision and monitoring.

The financial and other investments made by the project in the development of the locally based training institutions has been worthy since these lead to the study of the project's theme water and sanitation at basic, secondary and other institutional levels apart from the project's main target- rural community members.

3.8 PRINCIPLE 8: Water is treated as having economic and social value

3.8.1. Background

International experience demonstrates clearly the importance of treating water as an economic good. This is necessary from an economic viewpoint, by ensuring that scarce water and scarce money are spent for the highest value uses. It is necessary, from an environmental viewpoint, to ensure that demand management is given adequate attention, and that costs imposed on third parties are taken into account. It is also necessary for reasons of equity, since it is always the poor who are hurt most by the rationing which accompanies inefficient and uneconomic delivery systems. Accordingly, the Dublin Principles place major emphasis on treating water as an economic good in Water Resource Management.

Water supply is a service and just like any service, it involves manpower, repairs, spare parts, energy, etc. These are not free, therefore, in order to provide a safe and sustainable water supply, a cost recovery system has to be introduced.

Since 1986, GWSC collects tariffs on household basis in the rural areas where hand pumps are utilised. But prior to 1986, water supply to the rural areas was free of charge. As a consequence most rural dwellers do not understand the rationale for the collection of tariffs particularly when their handpumps are quite often out of service. Volta Region has at the end of 1991, consequently had an areas deficit of cedis 23,545,000 while only collecting cedis 1,714,000 for the same year, (GWSC Information).

One of the key requirements of the National strategy on community water supply and sanitation for the provision of a water facility is the ability of a community to pay for capital cost and contributed to operation and maintenance (CWSD implementation manual).

In the project area, the task to ensure that the communities satisfy this requirement rests with the WATSAN.

3.8.2. Methodology:

- Informal interview with clan heads, WATSAN and Caretakers
- Visit to all pipestands and some houses where the Assessment Team talked to users and their families.
- Pocket Chart.

3.8.3. Results

Although the District Extension Team have sensitised the communities enough to know the worth of paying for good water to avoid getting ill, some community members still have problems with the payment of the water user fees.

Table 13 showing water tariff collected by communities

Communities	No. of standposts	Amount on Hand (cedis)	Amount in Bank (cedis)	Population
Nyagbo Emil Israel *(1995)	2	-	40,000	460
Santrokofi Bume *(1994)	6	89,000	-	1305
Santrokofi Benua *(1995)	8	28,428	1,000,000 (Treasury Bill)	2065

- * Year water system was completed US $1 = Cedis 2,000

The reasons for defaulting were given as:

- Defaulters are not punished so it demotivates others;
- Lack of regular accounts rendering by WATSAN
- Conflict because of the absence of by-laws
- Conflict with traditional leaders. A number of WATSAN committees especially the chairpersons are not having the desired support from their chiefs. In some cases, the chiefs feel the WATSAN committee chairpersons are usurping their powers.
- Limited income earning opportunities
- Mistrust of WATSA committees and the keeping of funds

Some community members' felt they contributed money, time and effort in the construction of the facility, hence they do not see the need to pay for the water.

3.8.3 (a) Current User Fees

The user fee differs. At Nyagbo Emli Israel it is cedis 200 per household per month. Water is sold to non-community members at cedis 20 per 20 litre containers. Cedi 40,000 was realised for the past 2 years but this was used to pay the caretakers. The problem of unwillingness to pay here stems from the difficulty in defining a household. While some households comprise of 3 persons, others consist of 8 or 10 persons. Some members of this community gave reasons for non-payment of water tariff as:

" Some people are cheating us. Some households are eight in number, yet they pay cedis 200 a month as we those with two children also pay".

" They (WATSAN) have never made accounts of the moneys collected so far".

The first water system completed by the project was at Santrokofi Bume, in September 1994. After almost two and a half years of managing the water system amount realised from the water tariff was only Cedis 89,000. The secretary to the WATSAN explained that a tariff system of cedis 100 per person per month was instituted only seven months ago due to a fault on the distribution line which called for emergency repairs but no money in the WATSAN accounts. They went in for a loan in order to make the maintenance. After this experience, all agreed on a water user fee in order to have money to meet emergencies and replacement of parts. According to the caretakers at Nyagbo Emli Israel, there has not been no major repairs

since the handing over of the water system to them. A tap got spoilt and was replaced at a cost of cedis 40,000.00.Some of the monies collected is also used to pay a token allowance of cedis 5,000.00 a year to the two caretakers.

According to the discussions with some users and household heads, much as they agree to the payment of some tariff to take care of, maintenance cost and the payment of caretakers, children should be exempted or be made to pay an amount (cedis 20.00 was suggested) lower than the parent. This is because payment for children is the responsibility of parents and some parents have more children.

Periodically, accounts of revenue and expenditure are read to community members. So far, cedis 89,000 was collected part of which was used by the caretakers for some repairs.

Why the low amount recorded, Mrs. Ruth Attakora, a WATSAN member said:

> "most of us are peasant farmers. It is very difficult
> getting what to eat let alone get some to sell. Non
> payment is therefore not deliberate, 'the there is not there"'

At Santrokofi Benua, no water tariffs are collected. Instead, funds are raised through levies and annual harvests.. A levy of Cedis 2000 a resident male adult and Cedis 1000 a female is collected annually, usually during the harvesting season. In addition, harvests are organised occasionally where the residents living outside are invited. Amounts realised through these fund raising activities are paid into the WATSAN account for the exclusive use for water and sanitation activities Currently the WATSAN can boast of one million cedis in Treasury bill and cash of Cedis 30,000. Some of the money is used for replacement of spoilt taps and allowance for the caretakers.

In connection with satisfaction with the collection system, the overwhelming response was "yes". According to the respondents, each clan elects a secretary who compiles a clan register. This indicates the names, age and sex of all occupants in each household within a clan. Water tariffs paid are thus entered by the collector in the clan register. The clan collectors intend renders account to the treasurer who acknowledges receipt by issuing an official receipt.

3.8.3 (b) **Satisfaction of water Users on Tariff System**

In the communities where this principle was assessed, water is used for domestic purposes only. The Tariff system however differs in the various communities. To assess if the water users feel the price of water is fair, ten water users each from Israel and Benua communities were asked to vote through the pocket chart on their satisfaction of their tariff system. The results are documented in Table 14

Table 14 Showing Satisfaction of water Users on Tariff System

Tariff System (Cedis)	Score	Rank
200 per household per month	1	3rd
100 per person per month	3	2nd
100 per adult (above 18 years)	16	1st
Paying at water point	0	4th
Total	**20**	

Source: Pocket chart with households at Emli Israel & Santrokofi Bume.

The 2nd and 3rd ranked scores are the tariff systems in place at Santrokofi Bume and Nyagbo Emli Israel respectively. It was explained that it is very difficult defining the number of people that constitute a household. Besides, the "per person" includes all ages, which implies that day old children are to pay.

From results it can be concluded that not all members were consulted before fixing of water user fees. The implication here is that since most community members were not part of decision to pay for water they may revert to their old water sources when the new water supply system breaks down.

3.8.3 (c) Cross Subsidy

The subsidy system does not provide for poorer communities to benefit by paying less. The policy provides that all beneficiary communities contribute 5% of the actual cost of installing the water facility and 10% of the cost of sanitation facilities for institutions. However some District Assemblies, have identified extremely poorer communities and are assisting them with funds in order to pay their 5% and benefit from the scheme.

Within the communities, individuals who have been identified as disabled or very poor are exempted from paying water tariffs.

Table 15 Showing ratio of income from tariff and maintenance cost

Community	Total Tariffs Collected (Cedis)	Total Annual Maintenance Cost (Cedis)
Nyagbo Emli Israel	40,000	85,000.00
Santrokofi Bume	89,000	145,000.00
Santrokofi Benua	1,028,428	160,000.00

US $1 = Cedis 2,000

Whereas communities readily contribute towards the capital cost, there is a resistance towards contributions for operation and maintenance after the handling over of facility to the community. So far non of the communities have encountered any major repairs. But from the ratio above, apart from Santrokofi Benua with one million Cedis in Treasury bill, non of the remaining communities tariff can meet Operation and Maintenance cost.

3.8.4. **Lessons learned**

It was noted during the study that communities with wealthy citizens living elsewhere were able to pay their contributions for capital cost and had sufficient money in their WATSAN account for operations and maintenance due to assistance provided by such wealthy citizens.(Santrokofi Benua is a case in point where the WATSANs have invested one million cedis in Treasury Bills).

Others, with no such assistance find it difficult to meet their financial obligations. Additionally, the difficulty to pay monies towards operations and maintenance of facilities is not only attributable to poverty or lack of interest in paying, but over-taxing of the people In several communities, priority needs being funded at a particular time number as many as four, notably; electricity, clinics, schools and water.

Other reasons attributed to the lack of payment for water are given on principle four. The major highlights are;

- non-transparency in dealing with accounts on the part of some WATSAN committees, thereby discouraging payment
- Personal needs are too many, and since income-earning opportunities are limited in the communities, some members find it difficult to pay.
- In most cases, some few opinion leaders impose tariffs on community members.

SUMMARY AND CONCLUSION

The aim of the study has been to assess the Volta RWSS Project experiences with WRM Principles as agreed in Dublin in 3 selected villages in the Project area.

The assessment has been performed by the active involvement of the community members and key opinion leaders in the study areas. The study revealed the Government of Ghana's concern to improve WRM. As a result, it has established a body to regulate and manage water resources in the country. The Commission will help minimizes water pollution and other environmental abuses in the country. DANIDA is supporting the commission in carrying out an assessment of WRM in the country.

Regarding water source protection all community members identified the need to protect their water sources. A very promising case is found at Nyagbo Emli Israel where positive customary management practice is in place. However this is effectively done in areas where the water catchment or sources is within the community. In areas where the source is a river passing through several communities or a dam, little is done to protect it from pollution. Furthermore, the absence of vegetation cover in the dam area coupled with other human activities has adverse effects on the quality and quantity of the water. It is therefore suggested that communities through which rivers passes and those living within the catchment area of water bodies should have a committee to carry out constant surveillance to protect it from pollution.

Water is used mainly for domestic purposes. Allocation issues arise in the communities in the Central district of the region in the dry season months of December to April. In the southern districts however, most communities depend on a dam source for varied purposes. Serious concern has been expressed by community members of an Israeli investor negotiating with the District Assembly to acquire land including the catchment area for farming and tourist village. The District Assembly has assured the communities that much as it welcomes investment it will do everything possible to ensure adequate safe water supply to all communities concerned. However, the greatest water quality problem that is likely to bring dispute among the water users was inadequate livestock control. It is recommended that animal troughs should be built at vantage points away from the dam to prevent the cattle polluting the water with their droppings.

With regards to efficient water use, the study has shown that extension of excess water from one village to another is fraught with traditional conflicts and regional boundaries. The result is that volumes of potable water goes into waste in a community while in a nearby community precious man hours are spent in search of water most often, from polluted sources. It is suggested that the Regional Co-ordinating council, the District Assemblies and the Donors find a way of addressing these problems

For a sustainable Community Water Supply and Sanitation Programme, the Volta RWSS project have adopted strategy of community ownership and management (COM) defined as the ownership control and management of water and sanitation services by the communities, including community responsibility for long term repair and maintenance.

In all project communities there are WATSAN Committees, which are responsible for the operation and management of water and sanitation facilities in the community. To ensure a sustained community- based operation and maintenance system, a decentralized maintenance

system is established. It comprises of the WATSAN committee, area mechanic and a spare part shop. In the communities with water systems, caretakers are trained and equipped with tools to carry out routine and preventive maintenance. DWSTS have been established in each district. They are the arms of the District Assembly for monitoring and facilitating water and sanitation activities in the districts. In the communities are EHAs and Partner organizations that organize the private sector institutions and support the communities in education, mobilization, and implementation of projects and subsequent maintenance of systems.

Even though the project has put in place structures to ensure effective management at the lowest appropriate level, results indicated that there are some problems that can have serious implications on the sustainability of the management at the lowest level. It is therefore suggested that periodic workshops be organized for WATSAN committees to refresh them on proper keeping of accounts and minutes writing. They should be made to render accounts to the communities on a monthly basis to enhance transparency and trust in the committee and the communities.

On stakeholder involvement, representatives from all institutions and organizations in the water and sanitation sector as well as other identifiable bodies are included in the newly established Water Resource Commission.

At the Regional level, quarterly collaborative meetings are held with the Regional Administration, NGOs in the water and sanitation sector, heads of line ministries, e. g. Ministry of Health, Department of Community Development, Ghana Education Service. Partner organizations and Consultants. This forum offers a good opportunity for information dissemination. However, there is the need to involve other agencies such as Environmental Protection Agency, Forestry Commission, Irrigation Development Authority and Volta Lake Transport Company that are involved in environmental and water source management.

On the issue of gender, the project has put a lot of effort into improving the gender balance at the staff as well as the community level. This is done through encouraging women to take up positions and the incorporation of gender issues in all training materials as well as conducting special gender workshops for regional and district staff. Emphasis is also put on training women's groups, encouraging women to take up positions in WATSAN Committees and training female artisans.

In the communities women are under represented on community leadership committees. Yet they provides most of the services required in the utilization of communal amenities, drawing water, cleaning the public places etc.

In order to establish a gender sensitive development strategy the project is in the process of assigning an officer within the Software Group as the local person responsibility to collate and link up gender programmes.

Human resources development and institutional capacity building has been a crucial component required to ensure accelerated and sustained development of the Volta Rural Water Supply and Sanitation project. Various levels of staff have been trained, in local training institutions and some in institutions abroad. In addition, the project is providing support to the development of the capabilities of locally based training institutions and District Assemblies.
As the District Assembly are going to shoulder more responsibility in phase II of the project focus should be on the District Assembly. The WATSAN are the bed rocks of the success of the project, there is the need for more refresher training and be provided with training materials, principally flipchart booklets and picture stories to be able to train others.

Finally, the project staff and DMC members are involved in creating awareness in the communities that water is an economic good, hence each unit of water should be used wisely and equitably.
WATSAN members and caretakers maintained order at water points and prevent children from misuse. In some communities water is regulated and token fees collected as a way of ensuring social and economic value of water.
The payment of token fees for water or cost recovery is not working in most communities. Some of the contributory factors are socio- cultural. It is assumed that, just like air is a gift of nature and as such must be free. Some community members also feel the water system belongs to the community. They have contributed with their money, time and effort towards its construction; hence they do not see the need of contributing towards post construction cost.
Some communities with resident associations outside are able to invite them annually to support fund raising activities for developmental projects. These communities e.g. Santrokofi Bume do not charge for water but have sufficient money in their WATSAN account and in treasury bills through their fund raising activities.

In contrast other communities with no such resident associations find it difficult to pay for their capital cost, let alone for operation and maintenance. The difficulty be pay money towards operation and maintenance of facilities has been fraught with severity of constraints of local sources of finances coupled with numerous development projects e.g. electrification, schools, water and clinic.

In general, it can be concluded that the Danida sponsored Volta Rural Water Supply and Sanitation Programme is conscious of the urgent need for protection of drinking water sources and water resource management. Sustainable structures have been set up at the community, district and regional levels. Their capacities are being developed to deal with the numerous problems in the water supply and sanitation sector.

At the time of writing, the Ministry of Works and Housing has initiated a comprehensive water resource management study, to identify water resource development. The study would be completed by the end of the year.

The mass media (see appendix F) as well as the Environmental Protection Agency are creating the necessary awareness about the need to protect and conserve our country's water bodies since water is an indispensable resource that ensures the sustenance of life. There is a critical need for all stakeholders, individuals, religious bodies, opinion leaders, Parliamentarians, Ministers, Mass media and all identifiable groups and institutions to get involved in the task of educating the people on the environment and mobilizing them for effective action to arrest the mismanagement of our water and land resources.

LIST OF REFERENCES

Charles Anson-Lawson (1977) - The World's Water, is there enough? Feature Article in the Ghanaian Times of 22/3/97 on the occasions of World Water Day.

IRC (1996) - Framework for the Assessment of WRM approaches in the DWSS Sector. The Hague, The Netherlands, IRC International Water and Sanitation Centre.

Letsa A.Y.D. (1992) - Factors influencing community participation in Health Related Activities.

Charity Ama Mansa Sunu-Doe (1991) - Health Manpower Management, Problems of Nursing Staff in Ghana.

CSIR (1995) - Institutional and legal infrastructure for water quality management in Ghana.

A.E. Amoah (1996) - Commentary and features - Daily Graphic 3/9/96.

(WRRI 1993) - Final Report, inventory and assessment of perennial springs and streams Vol.1

Cowi and Kruger Consult (1991) - Pre-project preparation on: Geographical Delineation of Water Supply Technology options in Volta Region, Ghana.

PEM Consult (1996) - Appraisal report of VRWSS Project Vol.1

Kolly Dorcoo (1995) - Feasibility Study report Mafi Dekpoe/Tedeapenu Group water project.

A. Djegal: et at (1996) - Evaluation Mission report Rural Water Supply and Sanitation Programme Eastern Region.

E.D.K. Fiagbe (1996) - Improving DMC efficiency

DANIDA (1992) - Project Proposal for Rural Drinking Water Supply and Sanitation Programme in Volta Region, Ghana.

GWSC (1994) - Community Water & Sanitation Project Implementation Manual.

DANIDA (1996) - Project Proposal for Volta Region Water and Sanitation Project Phase 2.

Colan Consult (1996) - Volta Region Project. target setting and Development of planning manual Vol.1 –

PEM Consult 1996 (ii) - Sector Programme Support, Water & Sanitation Sector Ghana Vol.2.

APPENDICES

Appendix A

Memorandum of Understanding Between the VRWSS Project and the District Assemblies

APPENDIX A

MEMORANDUM OF UNDERSTANDING

BETWEEN

..... *DISTRICT ASSEMBLY*

AND THE

COMMUNITY WATER AND SANITATION DIVISION (CWSD) VOLTA REGION

A. **Preamble**

The planning and implementation of Community Water Supply, Sanitation and Hygiene Education delivery are being decentralized to the District Assembly, as part of the on-going process of Decentralization in the country.

This Memorandum of Understanding covers the cooperation between the ..... District Assembly and the Community Water and Sanitation Division (CWSD) in the Volta Region concerning the support to communities in the District which are engaged in the process of operating and managing their own water and sanitation facilities.

The Memorandum includes the General Principles, Roles and Responsibilities of the District Assembly and that of the CWSD and their joint responsibilities.

This Memorandum of Understanding is entered into in the context of the Government of Ghana and DANIDA financed Volta Region Community Water and Sanitation Programme (VRCWSP) Phase II.

B. General Principles

It is hereby agreed that the following General Principles shall guide the cooperation between the ..... District Assembly and the CWSD – Volta Region:

1. Community Water, Supply Sanitation, and Hygiene Education shall constitute a distinct component of the District Assembly's five-year Development Plan and the Annual Plans derived from this.
2. Community Ownership and Management of water supply and sanitation facilities shall be facilitated and established as part of community water and sanitation programme delivery.
3. Sanitation and Hygiene Education shall be given equal priority with water supply and the institutions and policies supporting this sub-sector enhanced.
4. Training and Human resources development, especially in relation to capacity development in water, sanitation management and hygiene education shall be enhanced within the District Assembly.
5 Community Water and Sanitation Programmes shall be managed in a financially prudent and transparent manner
6 Gender Equity shall be promoted and in particular, women shall be fully integrated at all levels of decision making and management of water and sanitation activities.

C. Specific Responsibilities of the District Assembly

In order to give substance to the above principles, the District Assembly shall, within the context of Phase II of the Volta Region Community Water and Sanitation programme undertake the following commitments:

1. Designate a District Water and Sanitation Management Sub-Committee (DWSMC) of the District Assembly to oversee the work of the District Water and Sanitation Team (DWST). The Sub-Committee will deal with applications from Communities, approve workplans and recommend the allocation of resources (both capital and recurrent expenditures) for water and sanitation activities in the District.
2. Establish a District Water and Sanitation Team (DWST) to comprise the following staff from the District Assembly's decentralized departments: 1 Environmental Health Officer (EHO), 1 Community Development Officer\Staff (CDS), 1 Administrative Officer (AO) and 1 Technician Engineer (TE). The District Assembly shall also make available Environmental Health Assistants (EHAs) to intermediate with the communities in the promotion of hygiene education and other water and sanitation related activities.
3. The appointment of the Technician Engineer shall constitute a key indicator of District Assembly's readiness to assume its responsibilities. The District Technician shall be appointed NOT LATER THAN AUGUST 31, 1997. He\She shall be specifically designated as the counterpart to the District Engineer.

4. Prepare the District Assembly's own Community Water and Sanitation Programme, outlining the targets for the District and necessary budgets over the Planned Period. In preparing this Plan, Training and Human Resource requirements should be fully integrated into the design of capital budgets for Community Water and Sanitation activities which could be funded through the District Assembly's Common Fund.
5. Utilize portions of the Common Fund to pre-finance hand-dug well, hand-drilled wells and latrine constructions. Under special circumstances the CWSD-Volta Region may finance work in these areas if the Common fund pre-financing arrangement is not functioning in a particular District. With regards to institutional latrines for schools, the Programme is expected to cover 40% of schools in each district.
   The administration of contracts for construction of hand dug well, hand drilled wells and sanitation facilities shall follow the rules specified by CWSD – Head Office for contract administration. Refer to Annex A. The District Tender Boards (DTB) shall award contracts to contractors, who have been pre-qualified by CWSD – Volta Region in collaboration with the District Assembly for the particular type of construction contracts. The contracts shall be based on the unit rates approved by CWSD. CWSD will only reimburse expenses on contracts, which have been approved by the CWSD Regional Coordinator before signing. Refer to annex A.
6 Establish a joint bank account with CWSD – Volta Region to receive and disburse funds for specifically designated Phase II Programme activities.
   The signatories to the joint bank account shall be the District Engineer funded by CWSD together with one designated by the District Assembly.
7. Prepare Financial Statements (with accompanying receipts) regarding disbursements on a Quarterly basis to be presented to the CWSD-Volta Region Office according to a format that satisfies financial and internal controls of the CWSD. These Financial Statements should be subjected to the necessary internal audit procedures of the District Assembly to ensure sound financial management practices.
8. The DWST will prepare quarterly progress reports, satisfying the information needs and format of the CWSD and addressing key issues which affect the attainment of targets and goals set out in the District's Water and Sanitation Plan under the Volta Region Community Water and Sanitation Programme.
9. Support staff incentives with the following incremental financial allocations: 0% in years 1-3; 25% in year 4; 50% in year 5; and 75% in year 6. Refer to Annex B for details.
10. Allocate funds towards the operational cost of the DWST in the following increments: 0% in year 1; 10% in year 2; 20% in year 3; and 30% in years 4, 5 and 6.
    Yearly budgets for the operational costs of the DWST shall be agreed between CWSD and the District Assembly latest on the 1st of October the previous year. The funds shall be deposited on the joint bank account by both CWSD and the District Assembly quarterly in advance.

11. The vehicles assigned by CWSD to the DWST shall be for the exclusive use of the DWST for the performance of their duties, and shall only be driven by drivers authorized by CWSD Regional Coordinator. No private use of the vehicles is permitted. Running cost for the vehicles shall be budgeted and accounted for in the same manner as the other operational expenses of the DWST.

D. Responsibilities of the Community Water and Sanitation Division (Volta Region)

As facilitators of the process of decentralization and community management of water and sanitation, the CWSD (Volta Region) shall, within the context of Phase II of the Volta Region Community Water and Sanitation Programme, undertake the following commitments:

1. On the condition that the District Assembly has recruited its Technician Engineer, the CWSD shall fund one Engineer who will be appointed by the District Assembly and will report directly to the Assembly. The Engineer will coordinate the production of the feasibility reports, designs, and construction supervision and train the Technician Engineer who shall be designated as his\her counterpart.

   The District Engineer (DE) will approve designs, tender documents and sit on the District Tender Boards and have access to relevant tender evaluation materials.

   CWSD funding for the District Engineer will be phased out in the last 2 years of the Programme, as the District Assembly's designated counterpart – the Technician Engineer assumes full responsibility for these functions.

2. Provide the services of a Consultant Extension Supervisor (ES) if required, to strengthen and support software activities at the District level and address issues, which cannot be resolved by the DWST.
3. Provide technical assistance support for the preparation of the District Assembly's own Water and Sanitation Program and Plan, including a Training and Human Resources Development component.
4. Facilitate the establishment and smooth operation of a joint account with the District Assembly for the purpose of transfer of funds to support Phase II Programme activities.
5 Provide regular information and up-dates to the District Assembly on the status of Finances and Resources designated to the Project, vis-à-vis total allocation to the District.
6 Re-imburse the District Assembly all funds that are disbursed to pre-finance works under the Programme.

E. Joint Responsibilities

The two parties hereby agree that the following shall constitute joint responsibilities under this Memorandum of Understanding:

1. Review, amendment or termination of this Memorandum of Understanding can only be effected upon a mutual agreement between the two parties.
2. The two parties shall meet periodically, but not less than once a year, to discuss the progress in the implementation of the above issues.

F. Conditions

The implementation of Phase II of the Volta Region community Water and Sanitation Programme in any District depends on:

1. The appointment, by the District Assembly of a Technician Engineer with a basic qualification of CTC2 or HND.
2. It is only after the appointment of a Technician engineer that the CWSD shall fund the District Engineer position.
3. No investments in construction of water supply and sanitation facilities shall be commenced without the Technician Engineer and District engineer being recruited and mobilized.

This Memorandum of Understanding is signed by the following officials on behalf of their respective institutions:

FOR VOLTA REGION COMMUNITY WATER AND SANITATION PROGRAMME (VRCWSP) PHASE II

NAME .... DESIGNATION.....

SIGNATURE ....

DATE . .....

WITNESSED – VRCWSP

NAME ..... DESIGNATION.....

SIGNATURE.....

DATE.....

FOR THE .....DISTRICT ASSEMBLY

NAME..... ..... DESIGNATION.....

SIGNATURE..... ....

DATE..... .....

WITNESSED – DISTRICT ASSEMBLY

NAME..... DESIGNATION.....

SIGNATURE.....

DATE.....

Annex A

CWSD PROCEDURE FOR TENDERING & AWARD OF CONTRACT

Schemes below ¢100m are handled by the District Assembly (DA).

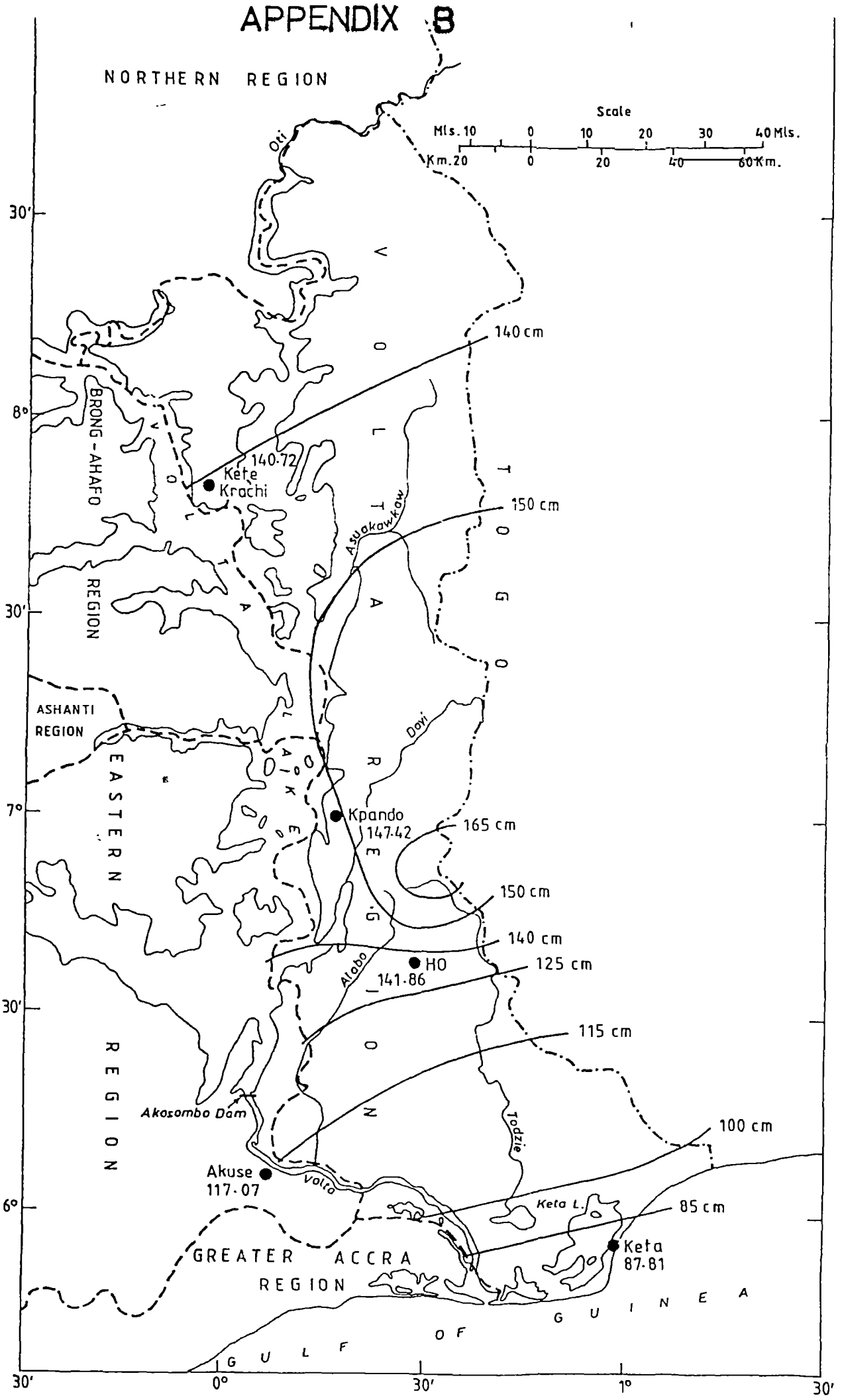
Pre-qualified contractors are selected by the District Assembly with approval from Management of the Volta Community Water and Sanitation programme (VCWSP).
Names of selected contractors are submitted to the District Tender Board (DTB) by the management of Volta Community Water and Sanitation Programme (VCWSP)
The District Tender Board (DTB) opens tenders
Tender evaluation are carried out by the District Engineer or the Consultant
Quality assurance on tender evaluation report are carried out by the Water Supply Engineer (WSE) of the VCWSP
Technical Appraisal Committee (TAC) reviews the tender evaluation report
The management of VCWSP approves the tender evaluation report
The DA awards the contract
The management of VCWSP signs contract

The Regional Tender Board (RTB) handles schemes above 100m.

The District Assembly with VCWSP management's approval selects pre-qualified contractors
Names of selected contractors are submitted to the Regional Tender Board (RTB) by the management of VCWSP
Tenders are opened by the RTB
Tender evaluation is carried out by District Engineer or the Consultant
Quality Assurance (QA) on tender evaluation report is carried out by WSE
Technical Appraisal Committee (TAC) reviews tender evaluation report
Technical appraisal report approved by the management of VCWSP
Technical appraisal report submitted by the management of VCWSP to Head Office CWSD for quality assurance
Quality assured report is returned to the RTB for the award of contract.
Contract is signed by the Deputy Managing Director (DMD) (CWSD) if contract sum is between 100-250m, contract sum above 250m are signed by the Managing Director (MD) (GWSC).

Smaller contracts such as the construction of KVIPs, Hand drilled wells and Hand dug wells are awarded by the DTB based on VCWSP's approved rates.

APPENDIX B



Mean Annual Rainfall

Appendices C & D

Laboratory reports of water samples from Santrokofi Bume and Nyagbo Emli Israel

APPENDIX C

GHANA WATER AND SEWERAGE CORPORATION

WATER EXAMINATION LABORATORY
PO BOX 508, HO (V/R)

LABORATORY REPORT FOR VOLTA RWSS PROJECT

Community: SANTROKOFI BUME

Description of source: RIVER EXISTING CATCHMENT

Location code:

Source ref. no:

Sample taken by: DANIDA STAFF

Date sampled: 14-12-93

Appearance	Acceptable		
Taste	Acceptable		
Colour Hazen (apparent)	10.0	Turbidity (NTU)	5.6
Colour Hazen (true)	<5.0	Total suspended solids (mg/l)	
pH	8.0	Total dissolved solids (mg/l)	87.2
Temperature (°C)	29.6	Conductivity (µS/cm)	174.2

Total alkalinity ($CaCO_3$)	40.0	Carbon Dioxide (dissolved)	
Permanent hardness ($CaCO_3$)	30.0	Oxygen (dissolved)	
Temp. hardness ($CaCO_3$)	40.0	Chloride (Cl)	10.0
Total hardness ($CaCO_3$)	70.0	Fluoride (F)	NIL
Calcium (Ca)	32.0	Nitrite (NO_2)	NIL
Magnesium (Mg)	19.5	Nitrate (NO_3)	NIL
Iron (Fe)	NIL	Ammonia (NH_3)	NIL
Manganese (Mn)	NIL	Sulphate (SO_4)	NIL

Parameters expressed as mg/l (ppm)

Plate count (colonies/ml)		MPN (total coliforms)	
		MPN (faecal coliforms)	

Remarks: Water has good physical and Chemical properties. However, further improvement on colour and turbidity could be achieved through filtration.

21-1-94

Regional Chemist/Bacteriologist

APPENDIX D

GHANA WATER AND SEWERAGE CORPORATION

WATER EXAMINATION LABORATORY
PO BOX 508, HO (V/R)

LABORATORY REPORT FOR VOLTA RWSS PROJECT

Community: NYAGBO EMLI ISRAEL Description of source: SPRING

Location code: Source ref. no:

Sample taken by: REG. CHEMIST/BACT Date sampled: 21-12-93

Appearance	Acceptable		
Taste	Acceptable		
Colour Hazen (apparent)	<5.0	Turbidity (NTU)	1.5
Colour Hazen (true)	<<5.0	Total suspended solids (mg/l)	
pH	6.5	Total dissolved solids (mg/l)	32.4
Temperature (°C)	25.4	Conductivity (µS/cm)	64.7

Total alkalinity ($CaCO_3$)	40.0	Carbon Dioxide (dissolved)	
Permanent hardness ($CaCO_3$)	NIL	Oxygen (dissolved)	
Temp. hardness ($CaCO_3$)	20.0	Chloride (Cl)	20.0
Total hardness ($CaCO_3$)	20.0	Fluoride (F)	NIL
Calcium (Ca)	4.80	Nitrite (NO_2)	NIL
Magnesium (Mg)	4.80	Nitrate (NO_3)	0.44
Iron (Fe)	NIL	Ammonia (NH_3)	NIL
Manganese (Mn)	NIL	Sulphate (SO_4)	NIL

Parameters expressed as mg/l (ppm)

Plate count (colonies/ml)		MPN (total coliforms)	38.0
		MPN (faecal coliforms)	

Remarks: Physical and chemical properties are good. Bacteriological test results suggests that the water is ~~not~~ contaminated. Further bacteriological investigation is therefore necessary.

Date: 21-1-94

Regional Chemist/Bacteriologist

Appendix E

Comments by visitors to Nyagbo Emli Israel

APPENDIX E

COMMENTS BY VISITORS TO MYASOBO ENLI ISRAEL WATER SOURCES

25/4/96

IEP/AFS Ghana on excursion with Danish exchange students.
The work is wonderful. I admire the community's commitment and wish to encourage them to keep this spirit up.

Prog. Coordinator

Same goes for me.

Exchange student

Thank you for showing us your beautiful place.

exchange student

Nice clean water in a nice clean place. Thank you. Denmark

It was a real nice place and it was nice to see that our tax money is been used to developing projects.

Simon S

31/10/96

Very impressive situation estaslish in a nice manner - all neat. Good fortune in the future. Very organised Comms. Keep it up. Pete Vendelbo (Danida).

Ben. Kubabom (CWSD, Accra)

Ms. Fay Ephirim (CWSD, Accra)

Appendix F

From the Ghanaian Papers on water pollution

APPENDIX F

DAILY GRAPHIC. Thursday, June 5, 1997. Page 7

Protect waters, save life

By Adwoa Van-Ess

TODAY is World Environment Day and it is being celebrated under the theme, "For life on earth."

The day was declared by the UN and has been celebrated as such since 1987 to focus attention on issues affecting the environment, and the appropriate actions to halt environmental degradation and improve upon the quality of life on earth

Ghana has however chosen a local theme "protect our waters and save life," to draw public attention to the need to protect and conserve water bodies since water is one of the most important life support systems.

Results of studies carried out on assessment of global fresh water resources indicate that the world is gradually heading towards a water crisis The situation could be the same for Ghana because many of our rivers and lagoons like the Densu, Odaw, Fosu, Korle, and Chemu among others have been so badly degraded, while the catchment areas of most streams and rivers have been laid bare through farming activities making them dry up during the dry season.

Other rivers and streams which do not dry are so contaminated with all sorts of pollutants that they can best be described as dead This is because instead of providing potable water as implied by their names — fresh water bodies — some of them are rather sources of water-borne diseases such as cholera, guinea worm, typhoid, diarrhoea and dysentery, among others

Contamination of water

One only has to drive along the Nsawam-Accra road to see the linkage between the contamination of water bodies and water related-diseases Whereas the Densu River serves both as a source of water for domestic, commercial and industrial purposes for millions of people who live along its course, the river also serves "conveniently" as a source of waste disposal, and which includes both liquid and solid.

However, because the river is not as big as the Volta River, it is not able to purify itself as big and swift-flowing rivers could do Coupled with that are the activities of fishermen at Weija where the river has been dammed to serve as a source of water for domestic, commercial and industrial purposes for Accra West and its environs.

Another problem with the Densu River is the leaching of agro-chemicals like fertilisers, insecticides and herbicides used by the large-scale pineapple farmers along its banks

All water bodies in the country suffer similar fates since they have all been turned into receptacles for waste with the setting up of human settlements and the establishment of agricultural and industrial activities close to them

These industries include agro-industries, textiles, food and beverages, pharmaceutical, chemicals, leather and tanning, cosmetics, detergents, paper and printing, paint, glue and varnishes, petroleum products and refinery All these activities exert adverse impact on the environment due to the discharge of partially treated and untreated effluents into water courses

In Tema for instance, the industries concentrated on the Chemu Lagoon catchment, discharge highly polluting effluents into the integrated drainage system which currently drains into the lagoon Similarly, a greater number of medium to large scale industries in Accra located in the Korle Lagoon/Odaw River catchment area also discharge into the Odaw River which ultimately empties into the lagoon The situation is not different in Kumasi where the Subin River is generally filled with industrial effluents and other waste materials

The Environmental Protection Agency (EPA) and the erstwhile Institute of Aquatic Biology in 1994, carried out rapid pollution assessment studies of the Chemu Lagoon, the Odaw River and Korle Lagoon catchments. The studies confirmed that the untreated effluents discharged into the water courses constitute high pollution loads far in excess of their assimilative capacities

Experts' views

According to experts, these effluents are "characterised by high values of suspended solids, conductivity, salinity, sulphides, BOD, COD, ammonia and heavy metal concentrations compared with background values obtained for marine and riverine environments". The studies also established that the levels far exceed the threshold limits set by the World Bank

The harmful and toxic levels of the pollutants have adversely affected coastal ecosystems, particularly, the fairly fragile nursery grounds of certain species of fish, habitats and biodiversity

At the launching of this year's World Environment Day celebrations, last week, the Minister of Environment, Science and Technology, Mr J E Afful, said at the moment, many man-hours are wasted daily by the rural population in search of water Also, water-borne diseases continue to plague them He expressed the ministry's concern about the discharge of untreated effluents by industries into water bodies and called for a more concerted action to tackle and resolve the problem

Accordingly, the EPA has come out with guidelines on effluent discharge for industries to encourage them to adopt cleaner production technologies, and treat their effluents before discharging into the water bodies

There are plans to treat liquid waste and recycle solid waste But for now that is what they are, plans! There is the problem of financial and logistic support to back those plans and we would be getting somewhere only when that is done

WORLD ENVIRONMENT DAY
(THURSDAY, 5TH JUNE, 1997)

Today is World Environment Day. It is a day set aside by the United Nations since 1987 to focus attention on environmental concerns as they affect socio-economic development worldwide.

To mark the occasion, the Ministry of Environment, Science and Technology (MEST) wishes to send this message to all partners and stakeholders involved in environmental management:

The Global Theme for this year's World Environment Day is "For Life on Earth". The National Theme is "Protect our Waters and Save Life".

The need for developing countries such as ours to protect our environment to ensure life has become all the more urgent given that industrialisation is creeping up on many African countries. More importantly, Africa needs to protect her vital resources which are the sources of life on Earth from being destroyed through neglect and sheer ignorance. There is therefore an urgent need for international determination and cooperation to face the challenges that lie ahead.

The Ministry of Environment, Science and Technology identifies Water as one of the most important sources of life on Earth which should be managed properly.

Freshwater in rivers, lakes, wetlands and groundwater sustains terrestrial ecosystems. With increasing populations and increasing demand, the need for regular supply of water is growing rapidly, as is the need for clearer under standing of its renewability and its complex roles in ecosystems.

The Ministry, in the light of the above concern, decided that the theme for the national celebration of this year's World Environment Day should be "Protect Our Waters and Save Life"

The need to protect our water bodies from pollution emanating from different sources especially domestic and industrial is very critical, for we depend on water for our daily survival and without water the situation on Earth would be deplorable. The Densu river, for example, and many others scattered all over the country, are being polluted by domestic and industrial activities making it difficult to use them for domestic purposes without expensive treatment. There is the need for us to arrest this deplorable situation. This cannot be done by one individual or institution alone, it requires all hands. Everybody and every institution should get involved and should care about the environment.

The celebrations are going to be a year long activity. All Ghanaians and non Ghanaians in Ghana are encouraged to embark on sustainable environmental management programmes.

Traditional Authorities, District Assemblies, Local Communities, Students, Researchers, Religious Bodies, NGOs, Parliamentarians, Ministers, the Mass Media, Regional Coordinating Councils and all identifiable groups and institutions should undertake activities such as environmental education and awareness programmes, tree planting, clean up campaigns, anti-bush fire campaigns as well as anti-pollution campaigns to help improve the quality of our environment to sustain life on Earth.

Let us all develop greater interest and concern about what is happening around us and help in shaping the destiny of the world in a way that is desirable.

United, we shall succeed in preserving the integrity of God's creation and ensuring a better quality of life on Earth.

Thank you.

DAILY GRAPHIC. Thursday, April 10, 1997. Page 24

Pollution of River Densu continues

From Emmanuel Mezikpih, Machigeni

SOME fishermen at Weija-Machigeni and the surrounding villages in the Ga District of the Greater Accra Region continue to use unorthodox methods for fishing in the Densu River despite persistent warnings from the Ministry of Environment, Science and Technology.

When the *Graphic* visited the area, large chunks of tree branches were found dumped in various parts of the river.

A team of scientists put together by the ministry last year to test the quality of the water said the activities of the fishermen had seriously polluted the river and affected its water quality

The Densu River is the only source of potable water for the people of Accra West.

The unconventional fishing method "Atidza", involves dumping large quantities of barks of trees, branches and leaves in the catchment area and then left to rot.

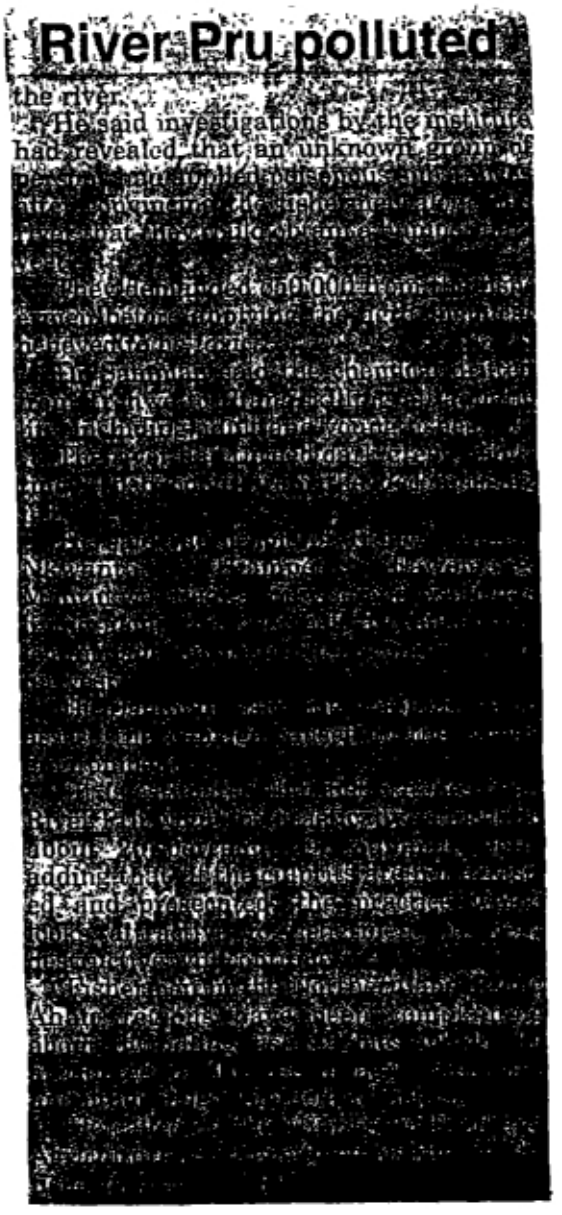
This attracts shoals of fish, including fingerlings which do not only feed on them but also rest under the shades they provide.

The fishermen then cast their nets at the various spots where the branches are for their catch

River Pru polluted

THE Institute of Aquatic Biology (IAB) has revealed that River Pru in the Brong Ahafo Region is polluted with toxic substances.

Dr James Samman, Principal Research Officer in-charge of Tamale field office of the IAB of the Council for Scientific and Industrial Research, who gave the warning has consequently warned the public against the consumption of fish from



GHANAIAN TIMES

The world is drying up, says UNESCO boss

Marakesh, Morocco

UNESCO Director-General Federico Mayor on Saturday called on the international community to implement a "new water ethic to rationalise the use of water and avoid dramatic shortage.

Mayor, speaking at a world water forum of scientists and experts from 50 countries, said the world was at a turning point and action must be taken to avert any disaster

"The warning signs are clear .severe water scarcity in many regions of the world, falling water tables, shrinking rivers and lakes, widespread pollution and creeping desertification", he said.

"To avoid a water crisis in the future, we have to urgently address the problem at source, to promote a new attitude to water to establish a new water ethic".

The Marakesh meeting ended on Saturday.

With one billion people already lacking access to clean water and adequate food, the world population is expected to grow from 5 5 billion to 8 5 billion by the year 2025, which will generate need and increase water consumption, reports show

Mayor said that total demand for water increased seven-fold between 1900 and 1990 while irrigated areas grew six-fold over the same period

Demand for water is gone so high -- as twice the rate of population growth, Mayor said, adding this was due to changes in lifestyle linked to economic development

"This is a bad news in as such as demand will continue to accelerate as living standards worldwide hopefully improve .to provide for foreseeable future needs, water resources development and management agenda as part of a global strategy", Mayor said --REUTERS/ GNA

A WATER-WATCHING WORLD

"WARS of the next century will be over water," warns Ismail Serageldin, environment vice president of the World Bank. According to Serageldin, 80 countries already have water shortages that threaten health and economies.

But the problem is not that sufficient water is unavailable on earth "The total quantity of fresh water on the Earth exceeds all conceivable needs of the human population," says hydrologist Robert Ambroggi. Most crises are due to poor water management. Half the water used in irrigation seeps underground or evaporates. City water-supply systems leak from 30 to 50 per cent of their water, and sometimes even more.

"The time is coming," says The Economist, "when water must be treated as a valuable resource, like oil, not a free one like air."

Our dying rivers and lakes

By Emmanuel Kojo Kwarteng

THE state of the Densu and Birim rivers became prominent at the just-celebrated World Environment Day, themed "Protect our waters and save life".

The day which falls on June 5 every year, according to the United Nations, is set aside to reaffirm member countries' commitment to arresting environmental problems and evolve ways to change the trend of environmental degradation with the view to improve the quality of life of the people.

According to a research conducted by the then Institute of Aquatic Biology (Now Institute of Water Research), the Birim River and its tributaries which span across the Eastern Region, providing water for industrial and domestic purposes has now been rendered unsafe for human consumption because of contamination by high levels of faecal bacteria.

River Densu, which in the 1960s and early 1970s was also popular has also suffered serious pollution because the river and its tributaries just like the Birim, have become waste (solid and liquid) disposal grounds by inhabitants from East Akyem in the Eastern Region where it takes its source and flows through over 50 towns and villages to Accra West.

Commenting on the situation, Ms Patience Adow, Eastern Regional Minister, on the occasion of the World Environment Day at Nsawam, said Densu is dying for this is not the river I knew in the 60s. The two rivers are the few among the hundreds in the country which are dying as a result of human activities.

These activities ranged from pollution from industrial and domestic effluents, chemical waste, mining, sedimentation and siltation from erosion and agricultural waste disposal. Others are unhealthy environmental practices by people along the route of rivers, farming close to river banks. These culminate into situations where rivers cannot store enough water leading to shortage of water during the lean season.

Another issue that crops up about farming close to rivers is the issue of fertiliser applicability. Some of the chemicals are washed into the rivers, thus contaminating them and rendering them unsafe for human consumption.

Small-scale mining and illegal mining activities popularly known as "galamsey" cannot escape mention since. Here mention can be made of the Offin River, Patangye and Ankobra at Dunkwa-on-Offin, Tarkwa and Prestea where these miners wash directly into the rivers, causing severe pollution.

The problem is that water use in Ghana is virtually unregulated, so there is little if any effort to conserve the resource. What is more pathetic is that majority of the people who live in these areas and utilise resources from such rivers do not know the effects of such actions on their health, the country and the future.

It is a fact that millions of the people dwelling along river banks take fresh water for consumption without any treatment. Therefore when the water is contaminated, people who drink such water stand the risk of contracting water-borne diseases such as bilhazia, diarrhoea, guinea worm, typhoid, dysentery, malaria and onchocerciasis.

Also polluted rivers end up becoming unsafe for all other living matters, hence eventually they die. For instance algae and water plants on which fish thrive are also gradually exterminated and this affects fishes in the rivers. Fishermen and others are deprived of their source of livelihood.

In September 1995, the Institute of Aquatic Biology revealed that there was no aquatic life in the Korle Lagoon due to human (anthropogenic) activities.

The net effect is that productivity is adversely affected. The nation spends billions of cedis on the health of people affected by these diseases. Pressure is put on the budget for an increase in health facilities in the rural areas.

The environmental challenges impose immense responsibilities on the government, private sector, NGOs and the entire citizenry of Ghana to reverse the situation. Since the Constitution of Ghana enjoins citizens to protect and safeguard the environment, there is therefore the need for all stakeholders to get involved in the task of not only educating the people on the environment but also mobilising them for effective action to arrest the drying up of our waters and the deterioration of the environment.

It is against this background that necessary steps to deal with the numerous problems must be expedited to save our rivers from extermination. The formulation of industrial effluent guidelines on water source pollution and effective management of environmental and natural resources by the Environmental Protection Agency, (EPA), would help save the situation.

A concerted effort is needed to protect, especially the Birim and Densu rivers and all other endangered rivers to save them from extinction. Parliament should enact a law to ban farming on the catchments of river bed, which should contain stringent punishments for offenders.

The Ministry of Food and Agriculture and the Lands Department should monitor activities of farmers, especially those along river banks routinely to ensure that their activities do not injure the environment.

There is the need for efficient management of land and water in the face of the increasing population and the growing demands in all the various activities based on land and water use. The pledges and re-affirmation of commitment to save the Densu and Birim rivers by policy-makers and implementers on the World Environment Day should be translated into action.

EDITORIAL

Crisis Looming in Kumasi

RESIDENTS of Kumasi appear to have taken for granted the many warnings from environmentalists and officials of the Ghana Water and Sewerage Corporation (GWSC) against the degradation of the catchment areas of the two main water sources fo. the municipality — Owabi and Barekese Dams.

And now, the fall out of the effect of the degradation through interference is ominous, and unless the people show a more serious attitude towards the preservation of these two main water sources, the situation might get out of control in no time.

Officials of the GWSC said in Kumasi on Wednesday that as a result of the continued destruction of large areas of the Owabi Dam catchment areas by land developers, the dam is now threatened by pollution and siltation. And the high level of pollution and siltation has led to a sharp increase in the overhead cost of treating water from the dams.

This development is disturbing because it has a great potential to cause health and economic hardships for the residents.

Obviously, if the Corporation is overstretched financially in the processing of water for Kumasi and its surroundings, it would be forced to increase tariffs to ensure regular and adequate supply. On the other hand, if the Corporation decides to absorb the cost without increasing tariffs, then surely, residents cannot be provided with their required supplies. Have the people braced up for this situation?

Kumasi is a metropolitan city with a large and ever-increasing population. Owabi dam was built about 70 years ago, but as the population grew and it could not satisfy the needs of the people, Barekese dam was built in the hope that Kumasi would be assured of uninterrupted water supply.

Now, these two water sources are under siege from land developers, sand winners and charcoal burners. Can Kumasi withstand any water crisis?

It is unfortunate that residents have been apathetic towards efforts being made to protect the purity of the two dams. More regrettable is the charge that chiefs who should play a frontline role in the communities' efforts to conserve the water sources have lent their support to the destruction of the catchment areas of the Owabi dam: They sell out the lands that are forbidden for development to estate developers to build houses on. Can't anyone do anything about this?

The normal Ghanaian silent attitude towards anything that does not affect him directly has seriously undermined the preservation of the two dams.

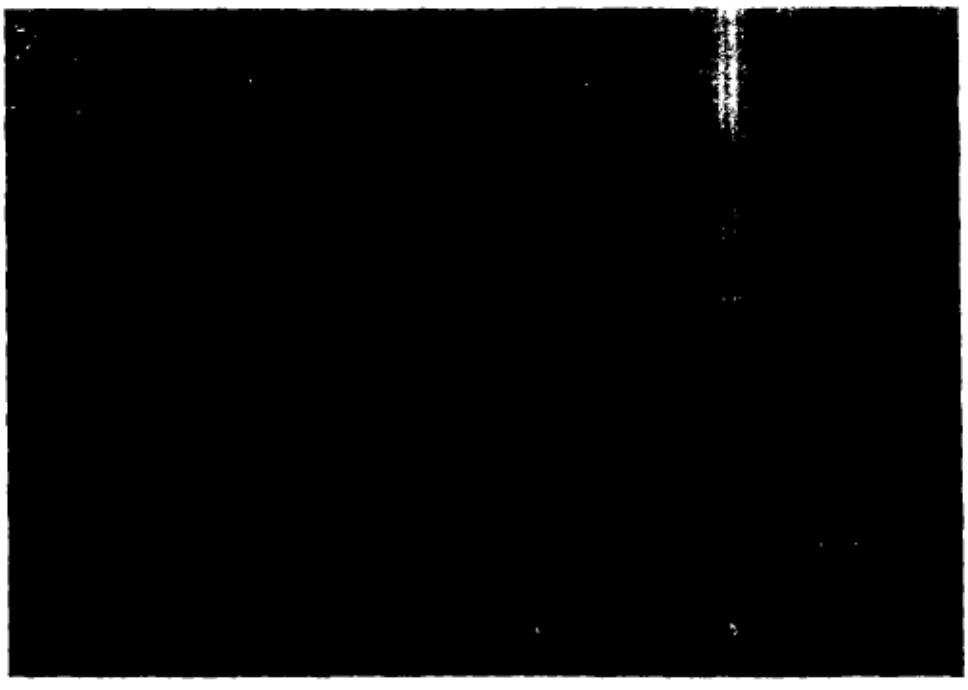
Unless environmental groups, opinion leaders, government agencies and individuals constantly emphasize and actively get involved in protecting the two dams, Kumasi can face a serious water crisis of a dimension unexperienced by the municipality.

Whether the people want this crisis or not, depends on them.

Appendix G

Photographs showing scenes in the study areas

a) Community Members offering communal labour towards the completion of the slow sand filter at Mafi-Dekpoe.



b) Water reservoir in one of the Communities benefiting from the Mafi-Dekpoe/Tedeapenu water project.

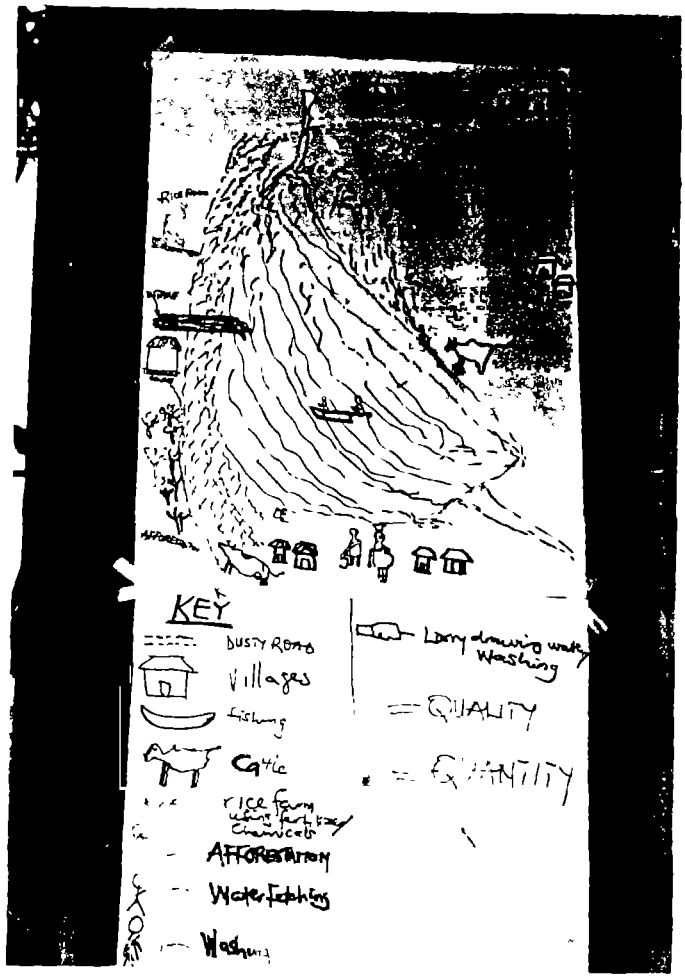
C. Queing for water at a Community water point in the dry season (February)

D. School Children returning from the 5 Km. walk for water.

The WATSAN Secretary, Flanked by the Chief Togbe Dadra IV and other member of the Community during the Mapping exercise at Nyagbo Emli Israel

Meeting of the Dam Management Committee and other stake holders at Mafi-Dekpoe.

A member of the Assessment Team in Hohoe District observing the mapping exercise at Nyagbo Emli Israel.



Out come of mapping exercise at Mafi-Dekpoe

A Community Development Staff training Partner Organisations.

A WATSAN member leading in the assessment on gender specific activities during the study.

A Female member of the Dam Steering Committee expressing her views on the role of stakeholders.