Assessment of Water Governance in Ghana

WARNING

The designation of geographical entities in this book, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of GWP West Africa concerning the legal status of any country, territory, or area, or its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication do not necessarily reflect those of GWP/WA. This publication has been made possible by the funding from the European Commission and Global Water Partnership (GWP).

Published by : GWP/WA, Ouagadougou, Burkina Faso

ISBN : 978-2-918639-00-8 - July 2009

Available from : Communication services of GWP/WA
03 BP 7112 Ouagadougou, 03 - Burkina Faso
Tel. +226 50366212, Fax : +226 50366208
Email : watac@fasonet.bf ; info@gwpao.org
Site Web : www.gwpao.org

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMNS

1.	AFD	French Development Agency
2.	CIDA	Canadian International Development Agency
3.	CWSA	Community Water and Sanitation Agency
4.	DAs	District Assemblies
5.	DWSTs	District Water and Sanitation Teams
6.	EPA	Environmental Protection Agency
7.	EPC	Environmental Protection Council
8.	GIDA	Ghana Irrigation Development Authority
9.	GTZ/KFW	German Agency for Technical Co-operation
10.	GWCL	Ghana Water Company Limited
11.	GWP	Global Water Partnership
12.	GWSC	Ghana Water and Sewerage Corporation
13.	HSD	Hydrological Services Division
14.	LI	Legislative Instrument
15.	MMDAs	Metropolitan, Municipal and District Assemblies
16.	MSA	Meteorological Services Agency
17.	MWRWH	Ministry of Water Resource Works and Housing
18.	PNDCL	Provisional National Defence Council Law
19.	PURC	Public Utilities Regulatory Commission
20.	VRA	Volta River Authority
21.	WATSAN	Water and Sanitation
22.	WRC	Water Resources Commission
23.	WRI	Water Research Institute

ACKNOWLEDGMENT AND THANKS

The study on water governance was carried out by Meta Meta firm. The programme was coordinated at global level by M. Frank Van Steenbergen (Meta Meta) and the regional level by Alan NICOL for East Africa and Cyriaque ADJINACOU for West Africa. In each country a consultant was recruited to make the study. In Benin, the team was composed of Mr. Hubert ONIBON (Afriturible) and Ms Arlette TCHABI and Morènikè FAKOREDE ; in Burkina, we had Mr. Athanase COMPAORE (SAWES) and Mr. Jerome THIOMBIANO, consultant ; in Ghana, Mr. Nii Boi AYEBOTELE (Nii Consulting) and in Niger, Mrs Mariama GAMATIE. They all worked under the coordination of the Executive Secretariat of GWP West Africa. We would like to thank all the consultants for their efforts.

We would like to extend our sincere thanks to all the water sector partners in Benin, Burkina, Ghana and Niger starting from the various national directorates in charge of water for their availability and warm collaboration.

We want to express our gratitude to all those we do not nominate here for their collaboration.

We would like to profit from this opportunity to thank the financial partners, the European Union and Global Water Partnership, whose support has made the work possible.

PREFACE

Water is a very important issue in West African countries and particularly in Sahelian countries. It is true that the problem is not posed in the same way in all countries and the forecast effects of climate change combined with the increasing population growth, the phenomenon of urbanization and the bulimia of industrial development on resources are but aggravating the difficulties. However, everybody agrees that bad governance is the main reasons for drifts on water resources and nature.

Though the world community admits that sustainable management of natural resources including water, can be achieved by a better planning according to the IWRM approach through the setting up of an enabling environment, of appropriate management frameworks and adequate management tools , it should be noticed that in practice things are not moving so smoothly.

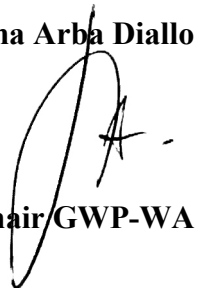
The existence of organizational and legal frameworks, the level of coherence between various actors, the knowledge by stakeholders of the texts in force and their attributions, roles, duty and right, etc. are essential things to assess a good water management. This programme on governance initiated in 2006 by GWP and funded by the European Union in four West African countries (Benin, Burkina, Ghana and Niger) goes in this framework. Very important lessons were drawn and are given to you in this series of documents capitalizing the experience, mostly the regional synthesis document.

The mobilization of stakeholders and their keen interest for this study on water governance were real. The tool used for the synthesis (scorecard) has permitted to synthetically grasp complicated issues. The close collaboration between directorates in charge of water and the organs of the focused Country Water Partnerships has shown that CWP are useful and helpful.

Global Water Partnership West Africa (GWP-WA) is very proud for the coordination of this work.

We hope that the experiences shown in these documents will benefit to all those who have some interest for water governance issues in West Africa.

Hama Arba Diallo



Chair GWP-WA

FOREWORD

This national report is part of a series drafted in the framework of pilot actions for the implementation of the Water Governance Programme initiated by Global Water Partnership (GWP) and funded by the European Union in seven Africa countries : three in East Africa (Kenya, Tanzania and Uganda) and four in West Africa (Benin, Burkina Faso, Ghana and Niger).

The aim of the programme is to contribute to the knowledge on the water governance at the level of these countries and to define some actions susceptible of strengthening it.

The main activities of the programme are based on :

- the production of an assessment report on governance and the identification of activities to be implemented ;
- the holding of a national workshop for the validation of the assessment and actions ;
- the drafting of a final document on assessment and the detail of actions ;
- the contribution to the organisation of a regional validation workshop.

This report makes a status on water governance in the following domains : legal framework, organizational framework, regulatory instruments, intersectoral coordination, local authorities and other management functions. It formulates also priority actions and pilot actions whose implementation will contribute to reinforcing the water governance.

The coordination of the programme is done at global level by Mr. Frank Van Steenbergen (Meta Meta) and at regional level by Mr. Alan Nicol for East Africa and by Mr. Cyriaque G. Adjinacou (MGE Conseils) for West Africa ;

The drafting of national water governance assessment reports was done by a team of consultants recruited in each country. Their work was facilitated by several structures involved in various countries that helped them with relevant documentation. So, for West Africa, in Benin, Burkina Faso, Ghana and Niger, the water administration, in collaboration with the Country Water Partnership, set a multidisciplinary work group in order to technically accompany the consultants in the achievement of their task.

EXECUTIVE SUMMARY

The Country Water Partnership (CWP)-Ghana has a mission to support the countries in the sustainable management of its water resources. Through its network with the world-wide family of Global Water Partnership (GWP), CWP-Ghana fosters integrated water resources management (IWRM) to ensure the coordinated development and management of water, land, and related resources in order to maximise economic and social welfare of the populace ; without compromising the sustainability of vital environmental systems. In this regard, CWP-Ghana commissioned the CSIR Water Research Institute (WRI) to undertake a preliminary study of Water Users' Associations (WUAs) in Ghana by determining their status, "modus operandi", strengths and weaknesses, their roles and responsibilities in the management and use of water among other objectives.

The approach adopted to conduct the study included a review of literature on the freshwater country profile of Ghana, the involvement of water users and a survey to initially identify the major water users in the various sectors of the economy. In all, fifteen (15) entities from different water activities were surveyed. Eight (8) water user groups were formal, one (1) was informal, five (5) were not associated and one (1) is being formed. The study also revealed that clear and specific roles or operations have not been identified for the major water users in agriculture, industry, transportation and recreation within the prevailing legal and institutional framework of the country. From this preliminary survey, conclusions drawn included the fact that existing WUAs' sought to promote, primarily, the welfare and socioeconomic interests of their members rather than promoting the rational use of water by their members.

On the basis of this it is recommended that roles or operations are specified in unambiguous terms for WUAs in Ghana to promote sustainable management of water resources in the country ; operators in industries and recreation are encouraged to form formal WUAs ; the governing structures of existing WUAs' strengthened especially in terms of capacity building. Finally, a comprehensive country-wide field survey of WUAs is recommended.

I. INTRODUCTION

1.1. Background

The Country Water Partnership (CWP)-Ghana is a member of the world-wide family of Global Water Partnership (GWP). The GWP is an international network open to all organizations involved in water resources management. The mission of the GWP is to support countries in the sustainable management of their water resources. Through its network, the GWP fosters integrated water resources management (IWRM). IWRM aims to ensure the coordinated development and management of water, land, and related resources in order to maximise economic and social welfare ; without compromising the sustainability of vital environmental systems. Thus, the GWP provides a platform for multi-stakeholder dialogue at global, regional, national and local levels to promote integrated approaches towards more sustainable water resources development, management and use.

CWP-Ghana works towards attainment of the above-mentioned stated aim through advocacy and support for effective water governance in Ghana. Towards these ends, CWP-Ghana is undertaking the Pilot Water Users' Associations Project. The Pilot Project on Water Users' Associations is a component of governance arrangement for sustainable management and use of water. That is, Water Users' Associations (WUAs) are to be encouraged and properly organised to assist in sustainable management of water resources in whatever sector of the economy they are engaged in, be they in agriculture, industry, transportation, recreation, etc.

This report is the output of a Preliminary Study of Water Users' Associations in Ghana that the CWP-Ghana commissioned the CSIR Water Research Institute (WRI) to undertake.

1.2. Terms of Reference

The Terms of Reference (TOR) for the Preliminary Study of Water Users' Association were :

- to conduct a survey of Water Users Associations in whatever activity (ies) they are engaged in Ghana ;
- to determine their "modus operandi", formal or informal, their strengths and weakness – carry out SWOT analysis. If formal, then document their governance structure ; If informal, determine whether the members are working towards becoming formal.
- to determine their roles and responsibilities in the management and use of water as seen by them; and what it ought to be.

To make recommendations as to :

- strengthen existing ones : (two) 2 Pilot Areas Water Users' Associations with respect to capacity building ;
- to organize new ones in two (2) Pilot Areas if none exists ; and
- any other matter relating to the objective of the study.

1.3. Objectives

The objectives of the Preliminary Study of Water Users' Association (in Ghana) were to :

- Identify two (2) areas of the country where pilot WUAs will be created or strengthened if there already exist WUAs ; and
- Assess the actual legal and institutional framework within which WUAs operate and can fulfil their roles.
- The goal is to improve water governance, and thereby promote sustainable water resources development, management and use, in Ghana.

2. METHODOLOGY

2.1. Introduction

The approach used in the study included a review of existing literature on the freshwater country profile of Ghana, the involvement of water users and a survey to initially identify the major water users in the various sectors of the economy. Due to resource constraints, the survey was limited to the southern section of Ghana. Where it was evident that a particular water user belonged to an association, further probing using a structured questionnaire (Appendix 1), discussions and interviews with key personnel or executive officers of the association were conducted to ascertain their roles and responsibilities in the management and use of water. The responses obtained provided the basis for assessing their mode of operation and their strengths, weaknesses, opportunities and threats.

2.2. Framework of analysis

For the purposes of the study, the internal characteristics and structure of the association that enhances its role in the sustainable management and use of water were considered as strength. On the other hand, a weakness was considered as any internal characteristics of the association that render it potentially vulnerable in terms of sustainable management and use of water. An environmental condition that offers prospects for improving the general situation of the association was recognized as an opportunity whilst a threat refers to developments that undermine the over all interest/situation of the association.

3. FINDINGS

3.1. Freshwater Management in Ghana

Pieces of information on the management of the freshwater resources in Ghana, over the past two decades, indicate that a number of initiatives have been undertaken to address problems that constrained the sustainable development and management of the country's water resources, particularly to streamline the role, functions, and decision-making processes within the water sector. In the rural and urban sectors, a number of reforms were introduced to accelerate the coverage of the population with good drinking water and sanitation facilities.

The Rural Water Department of the then Ghana Water and Sewerage Corporation (GWSC) was separated and set up as an autonomous Community Water and Sanitation Agency (CWSA) by an Act of Parliament in 1994. A new policy was introduced that requires that supply of water to rural communities be demand driven and community managed. The communities are also required to make a contribution of 5% of the capital cost of providing the facility (MWH, 1998a).

In the urban water supply sector, reforms have been undertaken to create conditions (through legal, business and regulatory interventions) to facilitate a favourable environment for increased private sector participation. This has led to the transformation of the then Ghana Water and Sewerage Corporation (GWSC) into a limited liability company, Ghana Water Company Limited (GWCL). This is one of several initiatives for introducing private sector participation in the management and operation of urban water supply systems (MWH, 1998b).

The regulation of urban water and other services have been shifted from government to an independent body, the Public Utilities Regulatory Commission (PURC). The PURC is mandated to regulate and oversee the provision of utility services, including approving tariff levels and drinking water quality for treated water to consumers. The Commission is to ensure protection of consumer interests, while at the same time maintaining the balance between tariff levels and investment, operation and maintenance costs of the utility services that will encourage private sector participation in provision of these services (MWH, 2004).

As regards to agricultural development, the Ghana Irrigation Development Authority (GIDA) is responsible for the formulation of plans to develop water resources for farming, livestock improvement and fish culture. The reform strategy adopted was to increase agricultural production, through development of water resources for irrigation with focus on small scale to medium scale schemes (MWH, 1998c).

Reforms aimed at protection of water and the general environment is rooted in the Environmental Protection Plan for the country (EPC, 1994). Further to this, the Environmental Protection Agency (EPA) Act (EPA, 2001), conferred regulatory and enforcement powers on the EPA. The existing institutional and legal framework includes :

- sector specific guidelines for regulating the quality of effluent discharge into existing drainage and water systems,

- EPA Legislative Instrument 1652 which ensures that impact assessment for all projects/developments likely to affect water resources and the rivers ordinance (CAP 226 of 1903) which also prohibits the pollution of water resources,
- Implementation of education, training and public awareness programmes to increase knowledge, understanding and awareness of all people on the rational utilization and conservation of water resources,

- Strengthening of District Assemblies and EPA to enforce laws/bye laws on surface mining, water pollution etc.

The Volta River Authority (VRA) Act 46 of 1961 which requires the Authority " to prevent so far as practicable, the harmful penetration of saltwater up the River Volta to a greater degree than was normal at minimum river flow proceeding the construction of the dam".

There are no natural water quality standards for raw water (surface and ground water), drinking water, irrigation water etc. ; for drinking water, World Health Organization (WHO) guidelines have been adopted while for the others, guidelines proposed by international organizations or in use in other countries are applied.

The EPA Act and the associated Legislative Instrument concentrated on surface water. Hence, the national environmental policy, which seeks to place environmental conservation and protection on high priority in the national developmental agenda with the enactment of the Water Resources Commission (WRC) Act (Act 552 of 1996), enhanced the institutional framework for managing freshwater resources in its entirety **(**MWH, 2004**).** The mandate of the WRC to regulate and manage the country's water resources and to coordinate government polices in relation to them was in response to the need to achieve integration of water resources planning, development and management. Thus, the current legal and institutional framework for water management is based on a close working collaboration between EPA and WRC. These are to ensure sustained development and management of water resources and the environment to avoid the exploitation of water in a manner that might cause irreparable damage to the country.

In this entire framework, however, no clear and specific roles or operations have been identified for the major water users in agriculture, industry, transportation and recreation, among other sectors of the economy. The non-involvement of such users who collectively exploit enormous quantities and impact on water quality represents an unhealthy development in attempts to manage the water resources in the country on sustainable basis.

3.2. Case studies on Water Users' Associations in Ghana

To ascertain the existence or otherwise of Water User Associations (WUAs) in the country, consultations were made with some institutions/associations/groups/individuals. The WUAs surveyed are listed in Appendix 2.

In all, fifteen (15) entities from different water activities were surveyed. Eight (8) water user groups were formal, two (1) was informal, five (5) were not associated and one (1) is being formed. The formal WUAs have constitutions or sets of rules governing them. The number surveyed in the various water activities were as follows:

Water Activity		Number
Water Supply	-	2
Agriculture (Irrigation)	-	3

Fisheries	-	4
Transport	-	1
Recreation	-	1
Breweries	-	4

The following sections of the chapter present case study findings of specific WUAs surveyed.

3.2.1. Private Water Tanker Owners Association (PWTOA) Accra

3.2.1.1. Mode of operation

Private Water Tanker Operators draw especially treated water into lorry tankers and sell the water to consumers who do not have reliable water supplies from the GWCL system. In 1986 between 30 and 50 persons owning clean water tankers came together to form the group. The formation of the Association was motivated mainly by the need to seek member's interest and welfare and to present a common front in tackling issues. The drivers of the water tankers assemble daily at their Odorkor station (Figure 1) to take orders from proprietors or clients.

The Association is formally registered and is governed by a written constitution. Membership is opened to any body who owns a clean water tanker that can supply potable water to the public. To become a member, one submits an application and pays a registration fee. Currently, membership of the Association is about 400. Members contribute an agreed commission daily on a given quantity of water they draw. The proceeds go into a common fund for the administration of the Association.

Fig. 1: Front view of the PWTOA office at the Odorkor station, Accra.

In terms of achievements, as of December 2006, the Association has counselled and trained a total of 110 members in business management and this has led to improvements in the financial situation of the members. Furthermore, members have observed improvements in their lifestyle and provided employment to a number of people.

The Association holds the view that the operations of its members do not impact negatively on land and water resources although water quality deterioration occurs sometimes.

3.2.1.2. Strengths

The experience and competence of members of the Association is relied upon by public institutions such as the PURC, GWCL and the World Bank. This is evidenced by the frequent consultations with the Association in terms of pricing, production and control of water ;

The Association mobilises its members to assist public bodies such as National Disaster Management Organization (NADMO) and Fire Service in times of national disasters ;

The Association ensures that members deliver good quality water to their clients.

3.2.1.3. Weakness

- The mission, objectives or motivation of the Association emphasises welfare and financial gains rather than instilling proper water management practices among members ;
- The Association does not have nationwide representation. Currently, membership is limited to the Accra Metropolis only.

3.2.1.4. Opportunities

- The unplanned and rapid development in the metropolis makes it technically difficult for the GWCL to supply potable water to several households and industries. This offers an enormous opportunity for servicing such deprived places, which opportunity the Association has geared itself up to take ;
- A new wave of private sector participation in water delivery has created awareness among the Ghanaian community about the services of the Association.

3.2.1.5. Threats

- High maintenance cost of the vehicles ;
- Traffic congestion within the city leading to high fuel consumption cost ;
- Unreliable supply of water from treatment plants ;
- High maintenance cost of hydrants ;
- The emergence of splinter groups at other locations in the metropolis.

3.2.1.6. Roles and responsibilities in the management of water

The Association sees itself as an important link in the delivery of treated water to about 250,000 deprived households and industries, including the breweries and pharmaceutical manufacturers. Members, therefore, hope to be in business for a very long time to come.

3.2.2. "Machingani" Water Suppliers, Weija-Accra

3.2.2.1. Proposed

This is an informal grouping of raw water providers. Members supply water mainly to contractors and private estate developers. The group is contemplating the formation of a formal Association to gain recognition and present a common front to confront incessant demands for royalties by local community leaders. The motivation to form the Association is clearly to address members' welfare and profits objectives.

3.2.2.2. Roles and responsibilities in the management of water

The group has been instrumental in the provision of raw/untreated water for construction purposes.

3.2.3. Weija Irrigation Farming and Marketing Society

3.2.3.1. Mode of operation

The Association was formed in 1983 and is opened to any person who farms within a 5- miles radius of Tubakrom, Weija area of the Accra Metropolis upon accepting to abide by the written constitution of the Association. It is registered with the Registrar of Cooperative Societies (No. GAR/NC/28 on 26/06/98).

The main objective, as outlined in its constitution, is to promote the economic interest of its members. Currently the Association is comprised of 121 men and 24 women. Regular funding is from members' contribution as outlined in the constitution. However, at the initial stages, the Weija Irrigation Company provided several inputs to members. This continued for over a decade and thus, provided sound foundation for the establishment of the Association. As part of its governance structure, the Association has a number of committees including a Water Task Force that ensures that recalcitrant members pay water use fees for onward payment to the relevant Authority.

The Association holds the view that none of the operations of its member's impact negatively on land and water resource. The achievements of the Association include the assistance it offers to the retrieval of accumulated and unpaid water bills, facilitation of produce marketing through advertisement in the mass media and input acquisition by farmers.

3.2.3.2 . Strengths

A well organized group evidenced by enthusiastic attendance of members at meetings ;
Strong governance structure of the Association, thus facilitating its functions.

3.2.3.3. Weakness

The objectives of the Association emphasises input acquisition and marketing. No mention was made anywhere about the management of water - an important input sustaining their operation.
The Association does not have nationwide representation. Currently, membership is limited to the locality only.

3.2.3.4. Opportunities

Rehabilitation of the irrigation infrastructure at the site in recent times have assisted in renewing interest of the farmers to acquire more land for cultivation;

Enhanced export awareness created among irrigation site farmers as a result of Vegetable Producers Association of Ghana (VEPEAG)'s continuous awareness creation programme ;

Technological interventions to be implemented soon to reduce water use cost at the site.

2.2.3.5. Threats

High electricity tariff paid by members ;

Difficulty in marketing of produce especially during times of glut.

3.2.3.6. Roles and responsibilities in the management of water`

Nothing has been reportedly done by the Association to promote good water management by its members.

3.2.4. Dawhenya Cooperative Food Farming Society

3.2.4.1. Mode of operation

The formation of this group was mooted by the government of the day in 1973 to cooperatively assist members, create job opportunities and produce food to feed the nation. Funding of activities of the Association has been from contribution of members. In the initial stages, the then European Economic Community representative in Ghana provided a seed capital of ¢110 million.

The Association is registered formally and enjoys recognition from The Ghana Agricultural Workers Union (GAWU) and at the national, regional and district administrative levels. Although there is a written constitution to govern the Association, it was not possible to obtain a copy as no member could locate one for our perusal. Membership is opened to any farmer who operates within a 5-mile radius of Dawhenya. Members have benefited from training packages by the Japan International Cooperation Agency (JICA).

The functions of the Association are performed through ad-hoc committees. For instance, the Land Allocation Committee allocates lands to prospective farmers, the Water Task Force sees to controlled use of water, etc. Others include Disciplinary and Advisory committees. Currently there are 165 members, dominated by males.

The Association is of the view that excessive use of agrochemicals has resulted in members' plots becoming saline and unproductive in recent years. As regards achievements, members claim that the Association has been of no benefit to them because it has not been able to mobilise funds to embark on it functions.

3.2.4.2. Strength

The Association is endowed with persons experienced and knowledgeable in both agronomic practices and environmental issues.

3.2.4.3. Opportunity

The use of windmill to distribute water on members' plots minimises the payment for energy cost.

3.2.4.4. Weakness

Members' expression of pessimism in the future of irrigated agriculture.

3.2.4.5. Threats

- Lack of funds to undertake farming ;
- Lack of inputs;
- Unavailability of machinery to till the land ;
- Members' produce (rice) cannot compete with imported ones, as consumers in Ghana prefer imported rice.

3.2.4.6. Roles and responsibilities in the management of water

Nothing has been reportedly done by the Association to promote the proper use of water by its members.

3.2.5. Ashaiman Irrigation Farmers Cooperative Society

3.2.5.1. Mode of operation

Formed and formally registered with the Registrar of Cooperative Societies in 1998, membership of the Society is opened to any person granted a plot at the irrigation project site.

The objectives of the Society are aimed mainly at promoting the economic interest of its members. The constitution outlines a governing structure that specifies roles to such committees as Executive, Agricultural, Financial and Maintenance. The roles of the Agricultural committee includes input allocation, planning cropping calendars and arranging for water supply to plots and extension services. Levies on irrigation services provided are the main source of funds for administering the Society.

There are currently 100 members and the Society enjoys recognition from GAWU, the District Assembly and Peasant Farmers Society of Ghana (formed in 2005). The Society has benefited from various advocacy platforms of Oxfam (an international Non-governmental Organization) during which problems bedevilling local rice production have been raised.

The Society recognizes that the activities of its members have impacted negatively on the land as the soils have become saline due to the excessive use of agrochemicals. In addition, water scarcity and quality deterioration is experienced due to serious encroachment in the catchments of the reservoir. These developments raise issues of sustainability.

The achievements of the Society include facilitation of training of members in good agronomic practices, information sharing and general improvement in farmers' welfare resulting from activities of the Society.

3.2.5.2. Strength

The Society has on its members roll persons experienced and knowledgeable in both agronomic practice and environmental issues.

3.2.5.3. Threats

- Difficulties in marketing of produce ;
- Lack of working capital ;
- Encroachment on the reservoir.

3.2.5.4. Roles and responsibilities in the management of water

The activities of the Agricultural committee of the Society seek to promote the rational use of water by its members.

3.2.6. Boat Owners Association, Kpandu-Torkor

3.2.6.1. Mode of operation

The Boat Owners Association is composed basically of resourceful fisher folks who own motored boats and have found transportation of goods and people across the banks of the Volta Lake a lucrative business. The formation of the group in1996 was motivated by the need to assist in times of boat disasters on the lake.

The aims of the group include developing safe transport business on the lake and assisting members to acquire inputs. It is informal, not yet registered but has a written constitution. Membership is opened to any person who owns a motorised boat. Currently, there are 25 members. The group monitors the safety status of members' boat on fortnightly basis and advises accordingly.

The activities of the group started at Kpandu Torkor but have spread to Gemeni, Abotoase, Kwamekrom, Yeji, Dambai, Akate and other fishing communities along the Volta Lake. Funding of its activities is from annual dues and contributions from weekly landing fees of members. Election to Executive committee position is based, among other considerations on how wealthy a member is.

The group is recognized in the District Assembly and collaborates extensively with the Inland Canoe Fishermen Council. The Association does not hold the view that any of its members operates in a manner that impact negatively on land and water quantity or quality.

In terms of achievements, the Association has been of immense assistance in times of distress and accidents on the lake. However, not much has been achieved in the acquisition of inputs to members.

3.2.6.2. Strength

The Association is endowed with persons experienced and knowledgeable in diving, fishing and operation of motorised boat.

3.2.6.3. Weaknesses

The lack of safety devices on boats, technical know-how in navigation and general environmental awareness among members ;

The dynamics of the aquatic system are poorly understood by members.

3.2.6.4. Opportunity

There is a vast area of the lake that is inaccessible but abounds in resources required in other parts of the country.

3.2.6.5. Threats

Increasing scarcity of wood for boat construction.

3.2.6.6. Roles and responsibilities in the management of water

Currently, the Association does not play any role in this regard.

3.2.7. Ashanti Fish Farmers Association, Kumasi

3.2.7.1. Mode of operation

The formation of the Association in 1992 was mooted by a Fishery Extension Officer. It is composed of persons associated with the business of fish: farmers, fish mongers, feed sellers, etc. The main aim of the Association is the promotion of the economic and social well being of its members.

It is formal, registered and has a written constitution. Currently, there are 180 members. Registration fees, dues and levies charged on fish and fish products are the main source of funds for administering the

Association. The state has assisted the Association by providing machinery for the construction of ponds for members and other farmers elsewhere. This is rented out occasionally and also provides some funds for the Association.

The group is not recognized extensively but enjoys strong collaboration with other Fish Farmer Associations located at Tarkwa, Dunkwa and Kadjebi. The Association is of the view that the operations of some of its members have had negative implications on water availability and/or quality and raised issues of sustainability. In this regard, the Association had linked up with Non-Governmental Organizations such as Technoserve to undertake education of members on water management.

In terms of achievements, the Association has been of immense assistance in the facilitation of training for its members. However, not much has been achieved in the acquisition of inputs to members.

3.2.7.2. Strengths

Members are knowledgeable in water management.

3.2.7.3. Weaknesses

The objectives of the Association emphasise measures to enhance socio-economic wellbeing, to the detriment of water resources management issues.

3.2.7.4. Opportunity

There is a huge unexploited potential for expansion nationwide.

3.2.7.5. Threats

- Lack of confidence in leadership ;
- Difficulty in the acquisition of inputs.

3.2.7.6. Roles and responsibilities in the management of water

The Association recognizes its role in this regard but institutional support is required to strengthen it.

3.2.8. National Inland Canoe Fishermen Council, Accra

3.2.8.1. Mode of operation

The idea for the formation of the Association was mooted when a group of fishermen who felt marginalised and expressed dissatisfaction about the distribution of fishing inputs meant for them. This Association was formalised and registered in 1983 with an initial membership of 15,000. Membership is opened to any body involved in inland fishing and by 1994 its census revealed a population of 56,345 persons.

The aims of the Association include securing inputs for members at affordable prices, seeking their welfare, advising on proper fishing methods and building capacity of fisher folks. The constitution stipulates a 5 year term, renewable twice for its executive committee at all levels.

The governance structure begins from the community executives, linked to the zone, district, national and the council of elders at a national congress which is the highest decision making body. Regular funding is from members' contribution as outlined in the constitution. This includes one time payment of registration fees and surcharges on inputs. However, assistance in the form of vehicles and office equipment come from the Ministry of Fisheries.

The Association is recognized at all levels in decision–making regarding fisheries issues in Ghana. It is affiliated to the National Fisheries Association of Ghana and APEX Farmers Association of Ghana. There is a strong collaboration between the Association and The Ministry of Fisheries, EPA and the Water Research Institute (WRI), as regards training and water management.

Members of the Association have many complaints against the activities of cattle ranchers and the Volta Lake Transport Company. Their conflicts bother on the destruction of their gears by these other users of water. On environmental issues, the Association is of the view that the use of "Acadja" fishing method by some of their members is destructive to not only the forest resources on land but also fouls the water environment. The use of explosives and chemicals for fishing results in water quality deterioration. On sustainability, it recognizes that current fishing practices of many members would lead to over fishing and fishery recruitment failures.

On achievements, the Association has assisted members to acquire inputs, facilitated the establishment of premix fuel stations at major fishing communities and created jobs for the population at large.

3.2.8.2. Strengths

- Large membership across the country ;
- Has been an effective tool to disseminate information to ever migrating fisher folks even beyond the borders of Ghana ;

Active in educational and political programmes.

3.2.8.3. Weaknesses

- Difficulty in updating membership record ;
- Lack of offices at the zone and district levels.

3.2.8.4. Opportunity

There is a huge potential for expansion and recruiting members nationwide.

3.2.8.5. Threats

- Lack of capacity to phase out undesirable fishing methods ;
- Difficulty in the acquisition of inputs ;
- Inability to conduct censuses frequently.

3.2.8.5. Roles and responsibilities in the management of water

The Association recognizes its role in ensuring healthy aquatic environment, introduction of culture based fishery and sustenance of the fringing vegetation round water bodies but institutional support is required to enforce these measures.

3.2.9. National Association of Sachet Water Producers, Accra

3.2.9.1. Mode of operation

The formation of the Association was necessitated by the incessant calls on water producers to improve upon the quality of water being offered for sale to the public. It was formed and registered as a formal body in 1999 with membership being offered to any person registered under the Companies Code, 1963 (Act 179) to engage in the commercial packaging of water. The Association is recognized at all levels in the Ghanaian Society and has a strong collaboration with the FDB, GSB and the Metropolitan/Urban/Local Authorities.

The Association aims mainly at the introduction of excellent and ethical business practices in the venture. Its constitution insists that applicants regularized their standing with regulatory bodies like the Food and Drugs Board (FDB), Ghana Standards Board (GSB), Metropolitan/Urban/Local Authorities prior to being offered membership of the Association. Currently, there are about 300 members with females outnumbering males. Funding of the Association is from membership dues and levies decided upon in times of need or problems.

The Association recognizes that the indiscriminate disposal of wastes resulting from the consumption of its products threatens not only surface waters but also the water table and is therefore, of environmental concern. In this regard, it has provided a number of bins in public places to facilitate the disposal of plastic wastes. The Association has assisted in the transfer of technology to members, facilitated training courses in book-keeping and environmental education among others.

3.2.9.2. Strengths

- Large membership across the country ;
- Active in educational programmes.

3.2.9.3. Weaknesses

- Weak structures at the lower levels ;
- Lack of offices at the local and district levels.

3.2.9.4. Opportunity

An effective tool to disseminate information across the country ;

3.2.9.4. Threats

- Lack of capacity to price product ;
- Difficulty in the acquisition of inputs ;
- Inability to conduct censuses frequently ;
- Indiscipline among members.

3.2.9.5. Roles and responsibilities in the management of water

The Association identified roles in ensuring good manufacturing and hygienic practices in the packaging, handling and storage of water. Other concerns centre on assisting authorities in the maintenance of healthy environment, but require institutional support to embark on these measures.

3.2.10. Breweries, Accra

In this category, the Guinness Ghana Breweries Limited, Beverage Investment Ghana Ltd, Coca Cola Bottling Company (Ghana) and Accra Brewery Company Limited were surveyed. These do not belong to any WUAs and seems to have no competition at their operational sites in the use of treated water supplies from GWCL systems. Therefore, they do not intend to form one in the foreseeable future.

3.2.11. Recreational Users

The responses from a recreational water user, the Aloy's Bay Resorts at Akosombo, revealed the non-existence of a WUA within this water use activity. Indications are that there was a move to form such an Association but the efforts of the local proprietors were thwarted by the expatriates among the group.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

1. From the preliminary survey, the following conclusions are drawn :
2. The existing legal and institutional framework does not provide clear role and/or responsibilities for WUAs ;
3. Many WUAs are found in irrigation and fisheries and water tanker operations ;
4. WUAs in industry is practically non-existent ;
5. Generally, WUAs' in Ghana do not seek to promote the rational use of water by their members. Rather, they seek to promote the socio-economic interests of members.

4.2. Recommendations

1. On the basis of the preliminary survey, it is recommended that :
2. Clear and specific roles or operations should be identified for WUAs in Ghana to promote sustainable management of water resources in the country.
3. The "Machingani" Water Tanker operators should be encouraged to formalize their operations in the form of officially registered WUAs ;
4. The governing structures of Inland Canoe Owners Association and WUAs' in irrigation should be strengthened by way of institutional support from the relevant government ministries and agencies and departments and or non-governmental agencies ;
5. Water users in recreations such as water sports should be encouraged to form WUAs ;
6. Generally, WUAs' should be strengthened in terms of capacity building – through pilot schemes, the executives/leaders could be trained in appropriate managerial skills ;
7. Through training and workshops, members of WUAs' should be impressed upon about the usefulness of water resources management for their own good and the good of the country ;
8. The WUAs' should be encouraged to undertake activities that will promote sustainable management of water resources ;
9. Since this report is based on preliminary survey, an intensive country-wide field survey of WUAs and their activities should be carried out to enable concrete and firm findings, conclusions and recommendations to be made.

5. REFERENCES

- Environmental Protection Agency (2001). State of the Environment Report (Mimeo), Freshwater Resources, Accra.

- Ministry of Works and Housing (1998a). Water resources management study – Economics and Financing building block, Final report Vol.1, Accra.

- Ministry of Works and Housing (1998b). Water resources management study, Information building block study, Accra.

- Ministry of Works and Housing (1998c). Ghana's Water resources management, challenges and opportunities. Min. of Works and Housing, Accra.

- Ministry of Works and Housing (2004). Draft Ghana Water Policy Document, Accra.

- Environmental Protection Council (1994). National Environmental Action Plan Vol. 2, 6 Technical Working Papers, Accra.

APPENDICES

1- Detailed scorecards

Legislative framework (A2)

<table>
<tr><th>LEGISLATIVE FRAMEWORK</th><th>Status of effectiveness</th><th>Barriers to effectiveness</th><th colspan="4">Consequences of lack of governance</th></tr>
<tr><td rowspan="4">Allocation of water rights between different types of uses
Act 522, 1996
Water Use Regulation, 2001 – LI 1692</td><td>Effective</td><td>No integration of different interests</td><td>No of persons affected :</td><td colspan="3">Countrywide</td></tr>
<tr><td>Mechanism exists but not fair</td><td>No one enforces Enforcement is a problem</td><td>Effects :</td><td colspan="3">Conflicts with development</td></tr>
<tr><td>Exist but not official</td><td>Not many know it exists</td><td>Duration:</td><td>Immediate</td><td>Long-term</td><td>Irreversible</td></tr>
<tr><td>Does not exist</td><td>No yet ready to go</td><td>Estimate of cost/ damage :</td><td colspan="3"></td></tr>
<tr><td>Short description of law/ regulation</td><td colspan="6">Act 522 sections 2 (c), mandates the Water Resources Commission to gran water rights. Sections 12-23 vest water resources in the President and sets the framework for acquiring a water permit. Section 13 clarifies the activities for which it is mandatory to acquire a water permit, whiles exempting water for the purpose of fighting fires.
The Water Use Regulation 2001 L.I 1692 spells the main categories of water uses in Ghana for which permits are required and exemptions from the law. The law sets out the procedures and conditions for the acquisition of water use permit and refers to the prevailing water policy whiles setting priority of water use and procedures for conflict resolution. The involvement of stakeholders such as the Environmental Protection Agency, Traditional, local authorities and other relevant government institutions and agencies has been provided for. The law makes provision for compliance monitoring and enforcement of the law by the Water Resources Commission.</td></tr>
<tr><td>Explanation of shortcomings, if any

(use separate sheet if required)</td><td colspan="6">The limits of exemptions and commercial water uses are not too clear. While spelling out the level of water use to be exempted, commercial and industrial water uses such as mining that falls within the exempted levels may not be required to pay, unless under indirect inference from certain portions of the law that states the category of uses for which a permit is required. Information on which to base decision to grant permit (water availability /demand) is inadequate and being compiled. Not a problem in basins with adequate water. Inspectorate for monitoring and enforcement not in place.</td></tr>
<tr><td>Suggested actions?</td><td colspan="6">Clarify legislation limits to capture all commercial water users, and specify raw water charges according. Speed up present IWRM planning. Establish Inspectorate Unit in WRC.</td></tr>
<tr><th></th><th>Status of effectiveness</th><th>Barriers to effectiveness</th><th colspan="4">Consequences of lack of governance</th></tr>
<tr><td rowspan="4">Conflict resolution mechanisms (between different water user groups)
Conflict resolution mechanisms has been provided for under Act 522, 1996, Water Use Regulations LI 1692, 2001 Environmental Assessment Regulation LI 1652 1999 Law on arbitration?</td><td>Effective</td><td>No integration of different interests</td><td>No of persons affected :</td><td colspan="3">Approx. 500,000 in Densu Basin</td></tr>
<tr><td>Mechanism exists but not fair</td><td>No one enforces</td><td>Effects :</td><td colspan="3">Water shortage / pollution
Ecological imbalance</td></tr>
<tr><td>Exists, but not official</td><td>Not many know it exists</td><td>Duration :</td><td>Immediate</td><td>Long-term</td><td>Irreversible</td></tr>
<tr><td>Does not exist</td><td>Not yet ready to go</td><td>Estimate of cost/ damage :</td><td colspan="3"></td></tr>
</table>

Short description of law/ regulation	Act 522, 1996 Section 16 (4 -6) states that a person who claims that his interest will be affected by the grant of water right may notify the WRC, after which the WRC will consider his objections made in respect of it and shall after consultation determine whether the water right shall be granted Section 8 (b) of the LI 1692, 2001 states that where conflicting claims of interest are made over the same water resources, the claim shall be referred to a Water Users committee of the WRC for resolution, whose proceedings shall be informal and governed by the rules of natural justice. The law sets out the priority of water use and refers to the prevailing water policy and shall be guided by domestic water use and any other water use, which fulfils the goals of national socio-economic development. The law makes provision for investigations and public hearing and ensures participation especially the people in the area of the proposed water use activity, likely to be affected. The involvement of stakeholders such as the Environmental Protection Agency, Traditional and local authorities and other relevant government institutions and agencies has been provided for LI 1652 section 27 makes provision for aggrieved persons spells out the procedure for complaints and for determination of appropriate course of action.
Explanation of shortcomings, if any (*use separate sheet if required)*	Lack of awareness and hence the inability of upstream users to co-operate in abating pollution downstream, eg Densu Basin between Koforidua and Nsawam. Procedures in LI 1692 and 1652 need to be harmonised to avoid conflicts between the two as far as water is concerned.
Suggested actions	i) Set up committee to harmonise the two regulations. Identify problem areas in the river basin and set up water users committees to deal with existing cases.

LEGISLATIVE FRAMEWORK	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Legislation for water quality: (There is no separate legislation on water quality, but it has been provided for in WRC Act 522, EPA Act 490, LI 1652, 1999	Very effective	No integration of different interests	No of persons affected :	Country wide		
	Mechanism exists	No one enforces	Effects :	Those without safe drinking water use polluted water sources. Increasing cost of treatment.		
	Exist but not official	Not many know it exists	Duration :	Immediate	Long-term	Irreversible
	Does not exist	No yet ready to go	Estimate of cost/ damage :			
Short description of law/ regulation	Act 522 sections 2 (2) (h) in relation to functions of the WRC states that the WRC advise pollution control agencies in Ghana on matters concerning the management and control of pollution of water resources. And section 35 (g) that the WRC may by legislative instrument make regulations 'for the granting of permits to discharge waste into water bodies' and in (h) for prescribing the acceptable levels of pollution. Whiles the EPA Act 490 section (2) f and h s indicate that the EPA may prescribe guidelines relating to pollution of water and issue pollution abatement notices among other things. Section 28 (1) empowers the EPA to make regulations in respect of water quality issues.					
Explanation of shortcomings, if any (*use separate sheet if required)*	The laws are scattered in the different institutional mandates and legislative instruments, with different approaches. There are gaps, which include the regulation of services to the rural sector which would also include some form of water quality monitoring etc, to ensure that good drinking water for rural water supply.					
Suggested actions?	Consolidate laws on water quality protection and management and set up mechanism for proper coordination and participation of all under the WRC.					

	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**

<table>
<tr><td rowspan="4">Other important laws on water (describe)
a. Volta River Development Act 46 1961,
b. Irrigation Development Authority Decree 1977 SMCD 85
c. Minerals and Mining Law (PNDCL 153)
d. Forestry Ordinance Cap 157 (1949)
e. Fisheries law PNDCL 256 1991
f. Fisheries Bill 1996</td><td>Very effective</td><td>No integration of different interests</td><td>No of persons affected :</td><td colspan="3">Country wide</td></tr>
<tr><td>Mechanism exists</td><td>No one enforces</td><td>Effects:</td><td colspan="3"></td></tr>
<tr><td>Exists, but not official</td><td>Not many know it exists</td><td>Duration :</td><td>Immediate</td><td>Long-term</td><td>Irreversible</td></tr>
<tr><td>Does not exist</td><td>Not yet ready to go</td><td>Estimate of cost/ damage :</td><td colspan="3"></td></tr>
<tr><td>Short description of law/ regulation</td><td colspan="6">The laws mentioned managed, used, and developed water based on their functions and as such was sectorial in nature.
a. Volta River Development Act 46 1961 : Section 33 (1) b the authority has power to regulate the abstraction of water from the Volta River.
b. Irrigation Development Authority Decree 1977 SMCD 85 : Section 20 (1) gives powers to the IDA to regulate the use of any reservoir created for any irrigation project.
c. Minerals and Mining Law (PNDCL 153 1986) : Section 21 stipulates that no person shall obtain direct impound or convey water from any river, stream or water course for mining or other industrial purposes without license granted by the Secretary for the purpose.
d. Forestry Ordinance Cap 157 (1949) : Section 22 (6) b stipulates that ‘no person shall construct any dam or weir across any river or otherwise obstruct the channel of any river in or from any Forest Reserve except with the authority of the competent forest authority.’
e. Fisheries law PNDCL 256 1991 : Section 35 state that the use of explosives, noxious or poisonous matter used in fishing or within a distance of two kilometres from the shores of a river is an offence.
f. Fisheries Bill 1996 : Section 35 (1) states that a licensed aquaculture operator shall carry out his operations in conformity with prescribed standards relating to aquatic environmental protection, quality of produce and hygienic methods. And section 57 makes it an offence to dredge or disturb the natural habitat without prior permission from the Minister.</td></tr>
<tr><td>Explanation of shortcomings, if any

(use separate sheet if required)</td><td colspan="6">Some conflicts in water use arose because there was not a regulatory body for water till 1996, when the WRC was established by an act of parliament. However some still hold on to their mandate without recourse to the WRC, although most of the established institutions are represented on the WRC board. Act 522, 1996 which established the WRC, only repealed part III of the Rivers Ordinance (Cap 226) – Others were not touched.</td></tr>
<tr><td>Suggested actions</td><td colspan="6">Review all laws of other institutions as far as overall responsibility for water resources management is concerned and bring them in line with those of the WRC.</td></tr>
</table>

Regulatory instruments (C6)

<table>
<tr><th>REGULATORY INSTRUMENTS</th><th>Status of effectiveness</th><th>Barriers to effectiveness</th><th colspan="4">Consequences of lack of governance</th></tr>
<tr><td rowspan="4">Regulation on groundwater :
Geological Survey Bill

Drilling Licence and Groundwater Development and Regulations (In preparation by WRC)

EPA LI 1652 (provided for by sensitive area)</td><td>Many cases – handled well</td><td>No integration of different interests</td><td>No of persons affected :</td><td colspan="3">Countrywide</td></tr>
<tr><td>Many cases – but not considered fair</td><td>No one enforces</td><td>Effects :</td><td colspan="3">Unsustainable development</td></tr>
<tr><td>Few cases – not the ‘big’ ones</td><td>Not many know it exists</td><td>Duration :</td><td>Immediate</td><td>Long-term</td><td>Irreversible</td></tr>
<tr><td>No cases in the last year</td><td>Not yet ready to go</td><td>Estimate of cost/ damage:</td><td colspan="3"></td></tr>
<tr><td>Short description of law/ regulation</td><td colspan="5">*EPA LI 1652 (Regulation 30 (2)) refers to* Recharge areas of aquifers, as sensitive areas where a full Environmental Impact Assessment is required.

The WRC is preparing an LI ‘Drilling license and ground water development regulations, which will regulate drillers while ensuring sound practices in the field as well as collecting and collating data on groundwater resources.</td></tr>
<tr><td>Explanation of shortcomings, if any (*use separate sheet if required)*</td><td colspan="5">Not applicable</td></tr>
<tr><td>Suggested actions ?</td><td colspan="5">Not applicable</td></tr>
</table>

<table>
<tr><th></th><th>Status of effectiveness</th><th>Barriers to effectiveness</th><th colspan="4">Consequences of lack of governance</th></tr>
<tr><td rowspan="4">Regulation for water services
i) PURC, LI 1651 1999 ;
ii) Water and Sewerage Regulations LI 1233 1979 (with regulation 16 revoked) ;
iii) Water Charges Regulations LI 1995 (with regulation 2 revoked) ;
iv) IDA LI 1350 1987 ;
v) CWSA Policy guidelines 2005 covering water facilities, management, service, provision, O&M, tariff, quality.</td><td>Many cases – handled well</td><td>No integration of different interests</td><td>No of persons affected :</td><td colspan="3">Domestic and industrial water consumers in urban areas and irrigation water users.</td></tr>
<tr><td>Many cases – but not considered fair</td><td>No one enforces</td><td>Effects :</td><td colspan="3"></td></tr>
<tr><td>Few cases – not the ‘big’ ones</td><td>Not many know it exists</td><td>Duration :</td><td>Immediate</td><td>Long-term</td><td>Irreversible</td></tr>
<tr><td>No cases in the last year</td><td>Not yet ready to go</td><td>Estimate of cost/ damage:</td><td colspan="3"></td></tr>
<tr><td>Short description of law/ regulation</td><td colspan="5">LI 1233 provides for the regulation of supply of water to consumers.
The CWSA Policy Guidelines provides for manuals for Community and Small Towns operational manuals, maintenance manuals, various specifications and standards for hand dug wells, boreholes, household and institutional latrines, tariff setting, etc.
The IDA LI 1350 provides for the management of irrigation projects.
The PURC Act is to regulate and oversee the provision of utility services to consumers and to provide for related matters. Some of the functions of the Commission are to protect the interest of consumers and providers of utility services; monitor standards of performance for provision of services ; to initiate and conduct investigations into standards of quality of service given to consumers; and to collect and compile such data on public utilities as it considers necessary for the performance of its functions.</td></tr>
<tr><td>Explanation of shortcomings, if any (use separate sheet if required)</td><td colspan="5">Section 47 of Act 538 excludes Community Water Supply from the law, The PURC does not have any regulatory charges although this institution is independent. Only urban utilities are regulated (ie urban water supply in this case); a few private water supply systems have emerged and these are not regulated. The LI 1350 co-operative system is discriminatory.</td></tr>
<tr><td>Suggested actions?</td><td colspan="5">Amend law to allow PURC to regulate all water services, public and private.
Amend the LI 1350 to water for both individual and groups.</td></tr>
</table>

Organisational framework (B1)

IWRM institutions	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Apex bodies in water management (water councils ; water committees) Water Resources Commission Local Water Boards (for water supply and irrigation)	Effective	Inadequate integration	No of persons affected :	Countrywide		
	Manages – but not fair/ not good quality	Inadequate capacity	Effects :	Developments will not be sustained		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage :			
Short description of organisation	Established in 1998 through an Act of Parliament (Act 522/1996) with the mandate to regulate and manage Ghana's water resources and to coordinate government's policies in relation to them, as well as attain some measure of environmental protection and conservation. 14 members with representatives of data management institutions, major water users, regulatory institutions as well as women, Chiefs and NGOs. Supported by a Secretariat. - Hosted by the MWRWH. Activities supported by DANIDA and technically by GLOWA Volta Project. Representation is public agency biased. The local water boards are mainly set up by the district assemblies to manage small towns and community water supply facilities and collect revenue for its operations and maintenance.					
Explanation of shortcomings, if any (*use separate sheet if required)*	The WRC lacks adequate personnel, and there are currently professional staff are one each. Some of the WATSAN Committees/Water Boards do not have adequate capacity.					
Suggested actions?	Review representation of Commission and include more civil society representatives and NGOs. Improve the capacities of the WRC and the WATSAN Committees /Water Boards.					

	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**			
Basin organisations (if more than one) *NOTE: MENTION WHICH ONE* Densu Basin Board White Volta Basin Board	Effective	Inadequate integration	No of persons affected :	Country wide		
	Manages – but not fair/ not good quality	Inadequate capacity	Effects :	No sustainable development		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage:			

Short description of organisation	**Densu Basin** The Densu Basin is a pilot programme initiated by the WRC to,create a suitable basin-based management structure. The institutional framework, which by early 2004 officially became established centres around the following entities: (i) WRC Densu Basin Office, (ii) the Densu Basin Board (which administratively is established as a WRC sub-committee) and (iii) the Planning Offices of the District Assemblies.The Densu Basin is operated by an 18 member board comprising representatives of the major district Assemblies that span the river and some representatives from the NGOs, Public institutions such as Ministry of Agriculture and Food, Forestry Commission, Women's and Children's Ministry, a Traditional Authority among others, and is supported by a 2 man secretariate located within the basin. Its core functions though not very different from its parent organisation the WRC is to liaise and collaborate with institutions with the basin for its proper management using IWRM approach. **White Volta Basin** Considering the vast nature of the basin and population distribution, the pilot is limited to the upper catchment of the basin, starting at the confluence of the Kulpawn River to the border with Burkina Faso to pilot international relations on a small scale. WRC Basin Officer to be stationed in Bolgatanga with effect from August 2004, and a selection of a basin board is in progress which may be quite simillar to that of the densu basin.
Explanation of shortcomings, if any (*use separate sheet if required)*	Each basin has specific management needs and lessons learnt from one basin may not necessarily be applied to another. Representations on the Boards are titled towards public institutions. Inadequate capacity.
Suggested actions?	Review representation on Boards and include more civil society and traditional authority representatives. Improve capacity of the Boards.

IWRM institutions	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Regulatory bodies (major) Water Resources Commission Environmental Protection Agency Public Utilities Regulatory Commission	Effective	Inadequate integration	No of persons affected :	Country wide		
	Manages – but not fair/ not good quality	Inadequate capacity	Effects :	Development will not be sustained		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage :			
Short description of organisation	These are independent government institutions established by parliament for specific purposes. The WRC is regulates raw water resources, whiles the EPA regulates all environmental activities including that of raw water resources, and the PURC regulates public water utilities in the urban centres.					
Explanation of shortcomings, if any (*use separate sheet if required)*	The organisations are not adequately resourced and are dependant on donor support for most of their activities though the WRC and EPA generate some funds. Inadequate capacity at local level.					
Suggested actions?	Make the institutions financially viable by establishing the respective funds. Improve capacity in other areas.					
	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**			

Enforcement agencies (inspectorates) Water Resources Commission Environmental Protection Agency Public Utilities Regulatory Commission WATSAN Committees	Effective	No integration	No of persons affected :			
	Manages – but not fair/ not good quality	No capacity	Effects :	Unsustainable development		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage:			
Short description of organisation	The EPA and PURC have inspectorate divisions whiles the WRC is yet to establish one. WRC has basin boards and the EPA has regional and some district units.					
Explanation of shortcomings, if any (*use separate sheet if required)*	There is inadequate collaboration among these agencies with respect to enforcement. General lack of willingness to comply with regulations. District units lack resources to be effective.					
Suggested actions?	Establish effective collaborative mechanism among the agencies. Create awareness on need to comply with regulations and link with these projects. As previously suggested, establish the Inspectorates and provide them with adequate resources.					

IWRM institutions	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Laws or legal framework on community resource management organizations Local Government Act 1993 (Act 462) Local Government Law 1988 (PNDC Law 207) National Development Planning Commission 1994 (Act 479) EPA Act 490	Many cases – handled well	No integration of different interests	No of persons affected :			
	Many cases – but not considered fair	No one enforces	Effects :			
	Used – but in few cases only	Not many know it exists	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not yet ready to go	Estimate of cost/ damage :			
Short description of law	The local government law defined the actors in the decentralization framework: the Regional Coordinating Councils, the Metropolitan, Municipal and District Assemblies, and their committees. Specifying their rights and duties such as district budgets, planning functions, provision of fire service, licenses, bye-laws, acquisition of immovable property, financial matters, rates, legal proceedings, penalties, audits, privileges an immunities etc. The NDPC law established by the Constitution to prepare long-term and medium-term plans on behalf of the GoG. NDPC is the coordinating body of all development planning agencies (DAs,) EPA has district environmental committees for management of environment.					

Explanation of shortcomings, if any (*use separate sheet if required)*	Agencies at district level even though decentralised owe allegiance to their head offices and not to the district assemblies in which they operate. There is high turnover of staff at the district level due to transfers and resignations. Capacity is inadequate in many districts. The DWST's deal with water and sanitation only.					
Suggested actions?	Strengthen central role of DA at the district level, by transforming DWST into Water Unit to deal with water resources management problems. Improve capacity of DAs.					
	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**			
Awareness raising WRC, EPA, PURC, GIDA, Lands Commission, CWSA, GWCL, VRA, NGOs	Effective	No integrated message	No of persons affected :	Country wide		
	Large outreach – but not good quality	Message has no impact	Effects :	Mixed messages to public		
	Limited outreach	Not many know of it	Duration :	Immediate	Long-term	Irreversible
	Does not take place	Not in effect	Estimate of cost/ damage :			
Short description of activities	Awareness Raising is and done on sectorial basis, in the form of media adverts, workshops etc to MDAs,					
Explanation of shortcomings, if any (*use separate sheet if required)*	These activities are disjointed and need to be harmonised, whiles projects on similar issues are approached differently.					
Suggested actions?	Harmonise the public awareness on IWRM by bringing together the different actors, so as not to confuse the public. More especially they should be linked to implementation of projects. Establish a mechanism for collaboration. Bring religious bodies, Water user Associations, traditional Authorities etc. on board.					

Role of water service providers in IWRM

WATER SERVICE PROVIDERS IN IWRM	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Urban water supply services Ghana Water Company Limited Neighbourhood water suppliers Tanker Owners Association Private companies, industry & mining	Effective	No integration	No of persons affected :	Urban dwellers		
	Manages – but not fair/ not good quality	Inadequate capacity	Effects :	Poor or no service to consumers particularly in poor areas.		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage :			
Short description of organisation and mandate	GWCL is a public institution mandated to produce potable water for urban centers at various head works /treatment plants (3 labs in Accra, two in the Northern Region, the transmission of water to reservoirs and the distribution of water to customers through service pipelines. It has currently employed a Private Operator under a management contract. The Tanker Owner's Association is a private organization comprising entrepreneurs who provide tanker services to individuals and obtain water from GWCL and other sources of water. Neighbourhood suppliers get their supplies from GWCL store them and sell to neighbours.					

Explanation of shortcomings, if any (*use separate sheet if required)*	Poor performance of GWCL has resulted in Non-Revenue Water being over 50 %. This has led to inadequate financial resources to operate and expand services. The poor communities in the urban and peri-urban areas are the worst affected.					
Suggested actions	Different supply technologies should be used for the different communities in the urban areas. Set up mechanism to involve poor communities in the planning and decision making regarding the kind of service they can afford.					
	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**			
Rural water supply services Community Water and Sanitation Agency Watsan Committees Water and sanitation development boards,	Effective	No integration	No of persons affected :	Rural and small town communities.		
	Manages – but not fair/ not good quality	Inadequate capacity	Effects :	Non sustainable servicess		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage :			
Short description of institution and mandate	Autonomous body under the MWRWH is responsible for the overall management, planning, budgeting, resource mobilization and coordination of rural water and sanitation projects. Being the focal point of rural water supply, CWSA collaborates with several donor organisations, including Danida, World Bank, CIDA, GTZ/KfW, EU and AFD.					
Explanation of shortcomings, if any (*use separate sheet if required)*	Heavily dependant on donor support for community/ rural water supply and Small towns. Government investment is inadequate to meet the GPRS goals and MDGs.					
Suggested actions?	Government should increase investment by about four fold in the provision of facilities so as to meet the GPRS goals and MDGs.					
WATER SERVICE PROVIDERS IN IWRM	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Irrigation/ flood control Services GIDA HSD MSA	Effective	No integration	No of persons affected :	Country wide		
	Manages – but not fair/ not good quality	No capacity	Effects :	Food shortages in dry season, loss of property during floods		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage:			
Short description of institution and mandate	Establishing the GIDA as a body corporate to formulate and execute plans and programs for the development of irrigation, livestock improvement and fish culture. Land use planning including the provision of housing and other social amenities in the project areas. HSD a department under MWRWH, responsible for hydrological data collection on surface water. Responsible for operating the national hydrometric data collection network on stream flows and sediment transport. The MSA exists to provide meteorological Information by collecting, processing, archiving and dissemination of meteorological information to end-users.					
Explanation of shortcomings, if any (*use separate sheet if required)*	Lack of irrigation policy, Inadequate funding of irrigation and flood control infrastructure. Inadequate funding for GIDA, HSD and MSA.					

Suggested actions?	Irrigation policy in preparation should be completed and implemented. Increase investment on infrastructure to control flood. Enforce of laws to prevent development in flood prone areas and waterways. Increase financing of GIDA, HSD & MSA.					
	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**			
Water treatment services GWCL CWSA Private Companies VRA	Effective	No integration	No of persons affected :	Country wide		
	Manages – but not fair/ not good quality	Inadequate capacity	Effects :	Unsafe water resulting in water borne diseases		
	Manages only small part of its mandate	Not recognized by others	Duration :	Immediate	Long-term	Irreversible
	Does not exist	Not operational	Estimate of cost/ damage :			
Short description of institution and mandate	GWCL is responsible for urban water supply and is regulated by PURC. The CWSA is mandated to provide water for rural communities and small towns and may in some cases provide water treatment facilities such as iron removal plants where it is required. VRA is an electric power utility, but provides the domestic water supply for its needs at Akosombo township and its environs.					
Explanation of shortcomings, if any (*use separate sheet if required)*	Some treatment plants are old, less efficient and expensive. Inadequate capacity in PURC to cover all plants.					
Suggested actions?	Rehabilitate old systems to improve efficiency and reduce cost. Increase capacity of PURC to monitor.					

<table>
<tr><th>REGULATORY INSTRUMENTS</th><th>Status of effectiveness</th><th>Barriers to effectiveness</th><th colspan="4">Consequences of lack of governance</th></tr>
<tr><td rowspan="4">Land use planning controls
a. WRC Act 522, 1996
b. Lands Commission Act 483, 1994
c. Land planning and soil ordinance 1953
d. EPA Act 490 1994
e. Local Government Act 462, 1993
f. Forestry Ord. 1927 Cap 157
g. National Development Planning Commission Act 479 1994</td><td>Many cases – handled well</td><td>No integration of different interests</td><td>No of persons affected:</td><td colspan="3">Country wide</td></tr>
<tr><td>Many cases – but not considered fair</td><td>No one enforces</td><td>Effects:</td><td colspan="3">Non sustainable development.</td></tr>
<tr><td>Few cases – not the ‘big’ ones</td><td>Not many know it exists</td><td>Duration :</td><td>Immediate</td><td>Long-term</td><td>Irreversible</td></tr>
<tr><td>No cases in the last year</td><td>Not yet ready to go</td><td>Estimate of cost/ damage :</td><td colspan="3"></td></tr>
<tr><td>Short description of law/ regulation</td><td colspan="6">a. WRC Act 522, 1996: Section 32 gives powers to the WRC to establish comprehensive schemes for the development of water resources of the area including the protection of water and land within the protected catchment area.
b. Lands Commission Act 483, 1994: Section 2 states that the LC has been mandated to manage public land and any lands vested in the President and advise government, local and traditional authorities on land development.
c. Land planning and Soil Conservation Ordinance 1953 No. 32 Section 3, 7 & 11 provides that the Minister may declare any area designated to be a planning area for purposes of protection of any stream or river and may make regulations in connection to protection of river banks, maintenance of artificial dams afforestation and reforestation among others.
d. EPA Act 490 1994: section 12 (1) states that an environmental impact assessment is required for any undertaken that is or has any adverse effect on the environment. Section 28 (1) also states that the EPA can make regulations for standards and code of practice relating to the development and rehabilitation of the environment.
e. Local Government Act 462, 1993: Sections 46-48 mandates the district assemblies to plan development for the areas under their jurisdiction and any development must have prior approval of the district.
f. Forestry Ord. 1927 Cap 157 : Section 4 (4) states that the Governor in Council may constitute a forest reserve to safeguard the water supply of the district. Section 22 also states the offences in the forest reserve.
g. National Development Planning Commission Act 479 1994 mandates the NDPC to provide planning guidelines for the preparation of sector plans by sector Ministries/Departments/Agencies (MDAs) and district development plans by Metropolitan/Municipal/ District Assemblies; co-ordination the synthesis of sector and district development plans into a national development plan; and monitor and evaluate Programmes and Projects.</td></tr>
<tr><td>Explanation of shortcomings, if any (use separate sheet if required)</td><td colspan="6">Apart from individuals the major offenders of the law are the some public authorities charged with responsibility to regulate. In case of law suit the attorney general is both plaintiff and defendant.</td></tr>
<tr><td>Suggested actions?</td><td colspan="6">Change the laws to make heads of public institutions accountable when they do not comply with regulations.</td></tr>
</table>

	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**			
Nature protection (water-related) Act 522 1996 Environmental Assessment Regulation LI 1652 1999 Forestry Commission Act 571 (Ramsar site LI) 1999		No integration of different interests	No of persons affected:	Countrywide		
	Many cases – but not considered fair	No one enforces	Effects :	Extinction of flora and fauna in both terrestrial and aquatic ecosystems.		
	Few cases – not the 'big' ones	Not many know it exists	Duration :	Immediate	Long-term	Irreversible
	No cases in the last year	Not yet ready to go	Estimate of cost/ damage :			
Short description of law/ regulation	The laws make provision for water to conserve aquatic and terrestrial flora and fauna in respective ecosystems.					
Explanation of shortcomings, if any (*use separate sheet if required)*	Adverse cases before instrument was passed have not bee reviewed. Lack of capacity for coordination and enforcement. E.g. Ramsar site convention.					
Suggested actions?	• Review previous cases like environmental flows from dams and take corrective action. • Include in environmental action plans resources for monitoring and compliance with regulations. • Survey and identify all reserves requiring protection, drawing up priority plans with cost of resources needed for protection.					

COORDINATION	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Coordination with agriculture	Mechanism works well	No balance of different interests	No of persons affected :	Country wide		
	Mechanisms used but not considered fair	No one follows up	Effects:	Soil erosion, sedimentation and pollution		
	Mechanism exist but hardly used	No one knows it exists	Duration :	Immediate	Long-term	Irreversible
	No mechanism in place	Not yet ready to go	Estimate of cost/ damage :			
Short description of coordination mechanism	No laid down mechanism exist.					
Explanation of shortcomings, if any (*use separate sheet if required)*	Irrigation agriculture not making the expected impact on agricultural production for lack of policy.					
Suggested actions?	Complete the Irrigation Policy under preparation and spell out roll of irrigation in agricultural production. Implement regulations on grant of water permit, and environmental Impact Assessment. Also agric extension officers should teach farming technologies eg. Agroforestry to minimise erosion and sedimentation among others.					
	Status of effectiveness	**Barriers to effectiveness**	**Consequences of lack of governance**			

Coordination with energy sector (Hydro-energy Fuel wood production)	Mechanism works well	No balance of different interests	No of persons affected:	Country wide		
	Mechanisms used but not considered fair	No one follows up	Effects:	Deforestation and climate change.		
	Mechanism exist but hardly used	No one knows it exists	Duration :	Immediate	Long-term	Irreversible
	No mechanism in place	Not yet ready to go	Estimate of cost/ damage :			
Short description of coordination mechanism	The sectors have independent programs and pursue them differently. However with the establishment of the WRC and the fact that they are represented on the board means that coordination would be fairly good. These are done mainly through meetings and workshops, where water related activities are referred to the appropriate water related organisations. Coordination with the energy sector would be through grant of water permit for hydropower.					
Explanation of shortcomings, if any (*use separate sheet if required)*	The coordination is not too good, because plans are made independent of other sectors and information flow is lacking and collaboration is low. Deforestation through harvesting of forest for wood fuel not controlled					
Suggested actions?	Establish and improve collaborative mechanism among Energy Ministry and those of Forestry Water Resources. Plant trees for fuelwood in areas where livelihood of communities depend on fuel wood production.					

LOCAL AUTHORITIES	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Providing local services water supply sewage solid waste District Assemblies	Very effective	No integration of different interests	No of persons affected :	Country wide		
	Manages – but not fair/ good	No capacity	Effects :	Poor sanitation		
	Only small part of the mandate is done	Not recognized	Duration :	Immediate	Long-term	Irreversible
	No activity	No authority	Estimate of cost/ damage :			
Short description of institution and mandate	The local government as the basic unit of government is an administrative, deliberative and legislative body for the development of broad policy objectives and critical assessment of developing progress (Act 462). The LI setting up each DA provide a very specific list of functions. DA has to pay 5% of capital cost contribution for community water and sanitation sub-projects, to select beneficiary Communities and to contract the private sector to provide the goods and services for the implementation of water programs. The National Sanitation Policy gives mandate to local government for the provision of sanitation services.					
Explanation of shortcomings, if any (*use separate sheet if required)*	The lack of adequate financial, infrastructure and management capacity. Cost sharing between government (viz DAs) and beneficiaries for provision of facilities and services consequently not effective.					
Suggested actions?	Build Capacity in terms of infrastructure, human resources, operation and maintain ace and cost recovery. Government subvention must be paid to DAs on regular basis.					
LOCAL AUTHORITIES	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Regulating water services water supply sewage solid waste	Very effective	No integration of different interests	No of persons affected :			
	Manages – but not fair/ good	No capacity	Effects :			
	Only small part of the mandate is done	Not recognized	Duration :	Immediate	Long-term	Irreversible
	No activity	No authority	Estimate of cost/ damage :			

Short description of institution and mandate	Regulation of water supply and sanitation at local level through the WATSAN Communities and Water and Sanitation Development Boards for communities and small towns using the Policy Guidelines and Manuals of the CWSA. In Urban Areas the PURC regulates water supply. Sewage and solid waste disposal are by the Municipal and Metropolitan Assemblies and the EPA.
Explanation of shortcomings, if any (*use separate sheet if required)*	Lack of capacity. The MMDAs are both providers and regulators of service in the area of sewage, liquid and solid waste disposal. The EPAs position is difficult when dealing with public institutions
Suggested actions?	Separate water supply and waste disposal at the local level by privatising provision of services so that the local authorities can regulate the services .

LOCAL AUTHORITIES	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
In water resource planning (incl. zoning) District Assemblies and decentralised departments (Environmental Health, Planning, Works department)	Very effective	No integration of different interests	No of persons affected :	Country wide		
	Manages – but not fair/ good	No capacity	Effects :	Non sustainable development		
	Only small part of the mandate is done	Not recognized	Duration :	Immediate	Long- term	Irreversible
	No activity	No authority	Estimate of cost/ damage :			
Short description of institution and mandate	The Districts Assemblies are made up of departments represented at the national level in most cases, and are in charge of district development plans, in collaboration with the communities within the districts. They prepare district water and sanitation plans.					
Explanation of shortcomings, if any (*use separate sheet if required)*	Water resources management does not exist in most district plans. Water related plans are mainly for water supply or irrigation. There is however no department within the districts for natural resources management. The District Water and Sanitation Teams comprise, 4 personnel from water related departments and are not responsible for the management of the resources, and may in some cases perceive themselves to be part of a project other than the district assembly.					
Suggested actions?	The Basin Board should be responsible for the water resources planning component in which the districts are locate. Capacity is now being built so that planning for water resources management would be done with the basin boards. Create in the District Works Departments a Water Unit in which DWSTs will function.					

LOCAL AUTHORITIES	**Status of effectiveness**	**Barriers to effectiveness**	**Consequences of lack of governance**			
Other functions in IWRM – SPECIFY Waste disposal, Environmental Health inspection	Very effective	No integration of different interests	No of persons affected :			
	Manages – but not fair/ good	No capacity	Effects :			
	Only small part of the mandate is done	Not recognized	Duration :	Immediate	Long- term	Irreversible
	No activity	No authority	Estimate of cost/ damage :			
Short description of institution and mandate	Waste disposal and sanitation is part of the mandate of the District Assemblies, and are supposed to have waste disposal plans. They also have inspectorates to inspect households, public toilets, food vendoring, etc.					
Explanation of shortcomings, if any (*use separate sheet if required)*	Planning, management of waste disposal is ad hoc in most cases and do not take a holistic approach. Capacity is poor, because it takes quite some time before new ideas on planning are utilised, for instance the recent Strategic Environmental Assessment, which has been introduced to the districts to refine their plans. The resources are not available to carry out effective inspection.					
Suggested actions?	i) Establish mechanism for collaboration and planning among the different interest groups. ii) Build capacity to work together including provision of adequate resources.					

Effectiveness				**Summary Water Governance**		**Bottlenecks**			
Very effective	Much but not of working fair	Only small Only part of mandate is done	Nothing is happening	**Governance tool**	**Description**	No authority /not operational	Not recognized or known	No capacity or enforcement	No integration
				Allocation of water rights between different uses					
				Conflict resolution mechanisms					
				Legislation for water quality					
				Regulation on groundwater					
				Regulation for water services					
				Apex water bodies					
				Basin councils					
				Regulatory bodies					
				Enforcement agencies					
				Laws on community resource management organizations					
				Awareness raising					
				Urban water supply services					
				Rural water supply services					
				Irrigation/ flood control services					
				Water treatment services					
				Land use planning					
				Nature protection (water related)					
				Coordination with agriculture					
				Coordination with energy sector					
				Local Authorities					
				- In Providing Water Services					
				- In Regulating Water Services					
				- In Water Resource Planning					

2. List of Institutions/Associations/Groups/Individuals Surveyed

Name of Association	Address	Status (Formal or Informal)	Membership	Composition	Activity	Contact/Tel.
Private Water Tankers, Mallam Junction	Box GP 13384, Accra. Tel.021306766	Formal - Registered	150	Male dominated	Sell treated water in tankers. Permitted by GWCL.	The Chairman - Wing. Com (Retired) C.O. Addo 021-400896, 024-4168383
"Mechingani" Water Tankers	-	Informal (Plans to form an association)	Exact number not known (40?)	Male	Abstract raw water from Weija Lake (Densu river) for sale.	Samuel George Ankomah – Interim Chairman – 027-6753783, Kwabena Adjei – 024 - 4686313
Weija Irrigation Farming/Marketing	c/o Irrigation Development Authority, Accra.	Formal – Registered.	-	Mixed but male dominated	Vegetable irrigation	Ahmed Nkensen-Arkaah Via Extension Officer Weija Irrigation Office
Dawhenya Food Farmers Co-operative	Dawhenya Irrigation Dam, Dawhenya	Formal – Registered	200 (Estimated)	Mixed but male dominated	Rice irrigated farming	Nene Gebi – Chairman; Issac Newton - Vice Secretary 024-3226120
Ashiaman Vegetable Crops' Farmers	c/o Ashiaman Irrigation Project, via IDA, Accra	Formal – Registered	96 (17 female, 79 male)	Mixed but male dominated	Irrigation farming	The Secretary Mr. Bernard Kanati Ashiaman Dam site.
Torkor Boat Owners, Kpando	Box 155, Kpando – Torkor	Affiliated to National Inland Fishermen Council – Accra	-	Male dominated	Fresh water fishing & ferrying of people.	The Treasurer Mr. Daduga Chifozee 020-8953241, 024-4937243
National Inland Canoe Fishermen Council	P.O.Box OS 1699, Osu - Accra	Formal - Registered	50,000 (since 1994 census in 1994)	Male dominated (about 3:1)	Coordinates all inland fishing & fish farming activities	The General Secretary Mr. Samson Mahum
National Inland Canoe Fishermen Council Kpando –Torkor Branch.	Box 151, Kpando – Torkor	Inland Fishermen Council. Box OS 1699, Osu - Accra	-	Male dominated	Fresh water fishing & ferrying of people.	Chief Fisherman Mr. Amuzu.V. Ahiafor Stephen, Kpando – Torkor.
The Regional Directorate	Ministry of Fisheries, Accra	-	-	-	Coordinates, directs & supervises fishing activities.	Mr. Leonard Awity Accra.
Ashanti Region Fish Farmers	Kumasi	Formal - Registered	-	Male dominated	Fish farming	The Secretary Nana Agyman Atwreboana 024-4461358
National	Near Trade	Formal -	300	Female	Packaging of	Ms. Agnes Attey -

Association of Sachet Water Producers	Fair Site, La-Accra	Registered		dominated	sachet drinking water	0277448220
Guinness Ghana Breweries Ltd	Guinness Ghana Breweries Ltd.,Accra	No Association	Employs workers under labour law	Mixed but male dominated	Brewery	The Secretary Ernestina Koditsa
Beverage Investment Ghana Co. Ltd. (Pepsi)	Beverage Investment Ghana Ltd. (Pepsi), Accra	No Association	Employs workers under labour law	Mixed but male dominated	Brewery & filtered bottled water (AquaSplash)	Mr. Newton David Kwabena. 021-228316, 228366
Accra Brewery Co. Ltd.	Accra Brewery Ltd. Accra.	No Association	Employs workers under labour law	Mixed but male dominated	Brewery	Mrs. Ayetey & Ing. Amos 021-688851/2
The Coca-cola Bottling Co. Ltd.	The Coca-Cola Bottling Co. Ltd., Accra	No Association	Employs workers under labour law	Mixed but male dominated	Mineral bottling & production of filtered bottled water	Mr. Amo – Acquah (Technical Services Manager – Maintenance Unit), 020- 2015267
Aloy's Bay	Aloy's Bay, Akosombo	(Proposed to other recreational resorts on the banks of Volta River to associate).	Employs workers under labour law.	Mixed but male dominated	Provide recreation & hospitality	Louise Ayim (Mrs.) 0251-20093, 024-337443

3 : Project Staff

Dr. Y. Opoku-Ankomah :	Ag. Director (Project Co-ordinator)
Dr. K. Kankam-Yeboah :	Senior Research Scientist
Dr. E. O. Bekoe :	Research Scientist
Mr. F. Amevenku :	Research Scientist
Mr. S. B. Nobiya :	Principal Technical Officer