

# *Needs Inventory for Capacity Building at Ghana Water Company Limited*



Author: Roderick Jager  
Student Number: 50406

Supervisors: Dr. Jos Walenkamp  
Mrs. Anne Barendregt  
Mr. Evans Balaara  
Mr. Martin Nijse

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# *Needs Inventory for Capacity Building at Ghana Water Company Limited*

*A listing of the needs for Capacity Building at 10 water treatment plants in Ghana*

*This research is conducted in Ghana for Aqua Vitens Rand Limited, acting as operator of the water systems of the Ghana Water Company Ltd. This research was part of the minor Development Cooperation from the The Hague University of Applied Sciences. The research consisted of a field trip of 7 weeks to identify the current situation regarding needs by employees of Ghana Water in the field of Capacity Building. The main needs which were found were linked to the mentality of the workers, communication and maintenance culture. Solutions can be found in the creation of a Ghana water quality hub, review of the existing training programs and changes in organizational processes regarding feedback. An important role is set aside for the planning of these actions and the cooperation with the Ghana Water Company Limited, to ensure sustainability of these actions.*

**Company**

Ghana Water Company Limited, Aqua Vitens Rand Limited

**Supervisors Aqua Vitens Rand Limited**

Mr. Evans Balaara, Mrs. Anne Barendregt and Mr. Martin Nijssse

**Author**

Roderick Jager

**Supervisor The Hague University of Applied Science**

Dr. Jos Walenkamp

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## Summary

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This research is the result of a 12 week internship in Ghana, which was part of the minor Development Cooperation from the The Hague University of Applied Sciences. The research field is water quality and quantity at production level, and how capacity building can further improve this. The company of Aqua Vitens Rand Limited is the operator acting on behalf of the Ghana Water Company Limited, the nation's water provider in urban areas. This company is also the initiator and facilitator of the research.

In 2004 the World Bank started a tender for the implementation of an 'Urban Water Project' in Ghana, as part of the Water Sector Restructuring Program. The companies of Vitens Evides International and Rand Water Limited joined together and formed AVRL, which won the management contract. AVRL operates in all ten regions in Ghana, employees of both VEI and Rand Water Services are detached in AVRL and hold strategic positions to manage the operations.

Cause for this research was the need by management of AVRL to follow up previous research. Earlier research was done in 2009 to gain better insight in the risks present at the largest headworks. This research gave an overview of the risks and the steps to mitigate them. Furthermore, in 2010 a proposal for subsidy from the EU was written by VEI on "Capacity building in Water Quality Monitoring and Surveillance for Ghana".

To give a profound base for the roll out of this proposal the current research needed to be done on regional level to identify the gaps which are present and what solutions are possible with the use of capacity building and a national water quality hub. Therefore the main question of this research is:

*What needs and suggestions are made by employees of the Ghana Water Company Limited regarding Capacity Building?*

The most important of the identified Gaps and proposed solutions are given in the table below.

**Table 0-1: Summary Gaps & Proposed Solutions**

<b>Identified Gaps</b>	<b>Proposed Solutions by regional employees</b>
<b>Gap in level and amount of skilled people</b>	Possible role for a Ghana Water Quality Hub (GWQH)
<b>Gap in allocation and execution of Maintenance</b>	Give plant Operators Maintenance Training Allocation of Maintenance to a specified department
<b>Willingness to transfer knowledge</b>	Change in mentality of employees Ghana Water Company Limited
<b>Gap Documentation procedures</b>	Organizational change / Change in mentality
<b>Gap Organizational Set up</b>	Strategic planning and Mentality Change
<b>Gap in allocation of Funding</b>	Create systems to track funding
<b>Gap in feedback during Procurement process</b>	Create feedback moments, both up and down in the organisation

The main conclusion of this research states that capacity building can be used in decreasing the lack of skilled people and maintenance culture by creating a Ghana water quality hub which develops training programs and sends out trainings teams to educate employees on regional level.

The gap in documentation, knowledge transfer and organizational set up can be changed by a change in mentality. The systems are in place, a different mentality can improve the use of them. Team building is an important aspect for the future.

The gaps in funding and procurement can be decreased with capacity building developing backtracking systems to track procurements. Budget tagging can be used to allocate budget more precisely.

The gaps found result in a final table which gives the combination of proposed solutions by the employees as well as solutions from the researcher. An overview is given below.

**Table 0-2: Identified Needs and Identified Solutions**

Field	Identified Needs	Identified Solutions
<b>People</b>	Gap in level and amount of Skilled People	<i>(possible role for Ghana Water Quality Hub)</i>
	Gap in Part time Study possibilities	Part time training in the field of engineering and chemistry <i>(possibly GWQH)</i>
	Gap in accredited Certificates	Create Accredited Certificates with relevant educational institutes <i>(possibly GWQH)</i>
<b>Practices</b>	Gap in Maintenance Culture	Give Operators Maintenance Training Allocation of Maintenance to specified department
	Gap in willingness of Knowledge Transfer	Change in mentality
	Gap in Documentation procedures	Organizational change / Change in mentality
	Gap efficiency Management Trainee program	Centralised Management Trainee Programme
	Costs and time for Testing by Ghana Standard Board	Create a possibility for in-house testing <i>(possibly GWQH)</i>
<b>Institutions</b>	Gap of Organizational Set up	Allocation of Maintenance to a department, Strategic Planning and Mentality Change
	Gap in allocation of Funding	Create funding track system
	Gap in feedback during Procurement Process	Introduce set feedback moments in Procurement process
	Gap in employees Position vs. number of Trainings	Develop training scheme with contractor at regional level
	Gap in partnership AVRL and GWCL	-
	Gap Accountability GWCL	-

The recommendations made include the creation of a capacity building task force, with members from all relevant stakeholders, thus providing a profound basis for sustainable programs.

In addition the development of a Ghana water quality hub should be undertaken to function as a national hub where training and educational programs can be given, as well creating a more independent base for the testing of water samples. Furthermore, the task of maintenance should be clearly allocated to a department, either existing or created in the future.

The reading order for readers with sole interest in the outcome of this research is to read the summary, the project proposal, the main conclusion and the recommendations.

Readers who would like to have a more profound insight in this research will find the general introduction in chapter one and a research proposal in chapter two. Chapter three gives the main question, the sub questions and the research form and risks. Chapter four describes the methodology, and is followed by chapter five, where the theoretical research is performed. This chapter gives insight in the elements of capacity building, needs assessment and the cultural elements according to Hofstede.

Chapter six, seven and eight answer the sub questions. This research report ends with the conclusion on the main question and the recommendations.

## List of Abbreviations

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AVRL	Aqua Vitens Rand Limited
DC	Development Cooperation
GSB	Ghana Standards Board
GWQH	Ghana water quality hub
GWCL	Ghana Water Company Limited
RA	Risk Assessment
UNDP	United Nations Development Program
VEI	Vitens Evides International
WB	World Bank
WTP	Water Treatment Plant
WQA	Water Quality Assurance

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# 1 Introduction

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This chapter is the start of the research, all the different parties are introduced which relate to the assignment and enablers of the research. The university is introduced, together with the minor which created the possibility for this internship.

A brief introduction of the researcher follows, which a background on his study and related projects,

The Dutch water company Vitens-Evides International is introduced, with a brief explanation of its activities. Finally, the company of Aqua Vitens Rand Limited is introduced.

## 1.1 General Introduction

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This study is done as part of a 12 week internship in Ghana, for the minor Development Cooperation. The research field is water quality and quantity, and how capacity building can further improve this. The company of Aqua Vitens Rand Limited is the operator acting on behalf of the Ghana Water Company Limited, the nation's water provider.

## 1.2 University introduction

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The University of Applied Science in The Hague is a Dutch educational organisation providing an estimated 20,000 students with a Bachelor degree in various studies. Due to the amount of international students attending the university, the international connections and networks are vast.

The Lectorate of International Cooperation provides 3<sup>rd</sup> and 4<sup>th</sup> year students with the possibility to attain the minor Development Cooperation. In this minor students have an intensive program of five weeks in which they learn about development, the effects of development and the position of Sub Sahara Africa in terms of aid, development and progress towards Millennium Development Goals. This forms a base on which the student attains a 12 week internship in Ghana on a study related project, with implementation of the theoretical knowledge gained in the first period.

This will be completed with a research report and a portfolio, which is presented to the Lectorate as well to the company the student was attached to.

### 1.2.1 Researcher introduction

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The researcher or author of this research is a fourth year student Technical Management at the University of Applied Sciences in The Hague. During this study several projects need to be attended as well an internship of six months and a minor of six months. This research is part of the minor and forms a separate internship, performed in Ghana. Prior to this research the student had no international experience on the field of development or water treatment. Therefore this internship is challenging in both educational and personal view, the latter being the main driver for the student to attain this minor.

The internship in Ghana will be performed between October 4<sup>th</sup> 2010 and December 24 2010.

### 1.2.2 Vitens-Evides introduction

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Vitens –Evides International (VEI) is a subsidiary of the two largest drinking-water companies in the Netherlands, Vitens and Evides. The alliance gives the company ample strength and enhanced opportunities to grow internationally. Through this international subsidiary, they make their knowledge and expertise available to water companies in developing countries. This is badly needed as, around the World, a large number of people still have no access to safe drinking-water and basic sanitation.

VEI's mission is to contribute to increasing the number of people in developing countries with sustainable access to safe and reliable drinking water service. In this way it is contributing towards achieving one of the United Nations' Millennium Development Goals: halving the number of people around the world without access to clean drinking-water and sanitary facilities by 2015\*.

Vitens-Evides International supports local water companies in developing and transition countries to improve their operations, become financially healthy and extend their services

to the urban poor. Vitens-Evides is not alone in this stand, several other institutes, such as the World Bank, have similar goals.

### 1.3 Aqua Vitens Rand Limited introduction

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In December 2004, the Government of Ghana, through the Ministry of Works and Housing, invited interested firms to submit their bids on a five year management contract which included operation and maintenance of 80 urban water systems located throughout the country.

In 2005 the bidding process was completed and on behalf of the Republic of Ghana, GWCL signed a Management Contract, on 22 November 2005, with Vitens Rand Water Services BV of Netherlands, a consortium of Vitens International BV of the Royal Netherlands and Rand Water Services Pty of South Africa.

The commencement date of the management contract which will last for 5 years was 6th June 2006. Under the Management Contract, Vitens Rand Water Services BV, through its subsidiary, Aqua Vitens Rand Limited, is managing and operating the urban water systems to targets set in the Management Contract and is being paid a fixed fee for meeting the targets.

The overall objective of the Management Contract is to restore GWCL to a sound financial footing and make a significant improvement in the commercial operations of the company<sup>†</sup>.

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<sup>\*</sup> <http://www.vitensevidesinternational.com/mission-and-approach.html> , [Digital], accessed on 13-1-2010

<sup>†</sup> <http://www.gwcl.com.gh/ourbusiness.php> , [digital], accessed on 7-12-2010



## 2 Research Setup

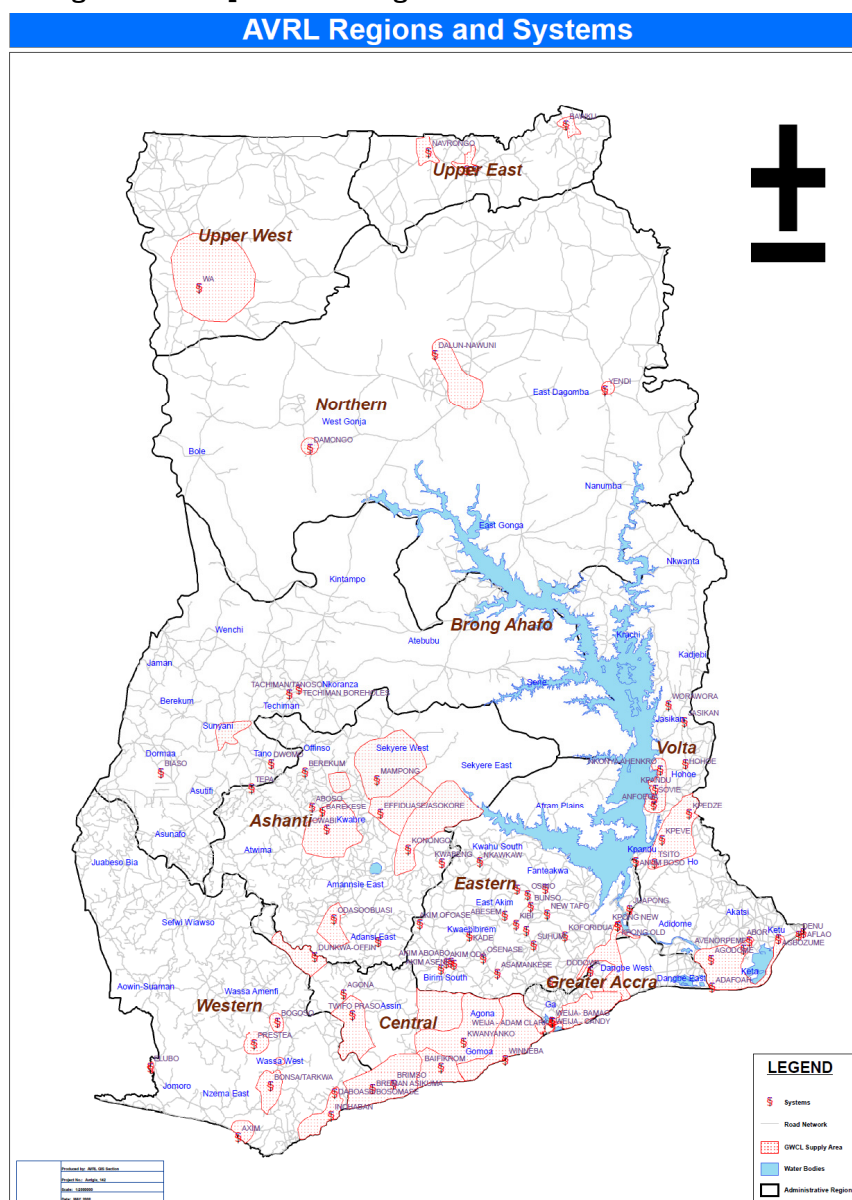
### 2.1 Context of the research

In 2004 the World Bank started a tender for the implementation of an 'Urban Water Project' in Ghana, as part of the Water Sector Restructuring Program.

Aim of this project was to improve accessibility of the water system, develop public private participation (PSP) and Capacity building via training and technical assistance\*.

In order to participate in this tender in Ghana, Ghana VEI and Rand Water Services established the joint venture company, namely Aqua Vitens Water Services, under which Aqua Vitens Rand Limited (AVRL) was created. AVRL is a special purpose limited liability company, established under the laws of the Republic of Ghana to act for and on behalf of GWCL as 'the operator'.

**Figure 2-1: Map of AVRL Regions and Water Treatment Plants**



AVRL operates in all ten regions in Ghana, serving various districts as shown on the map on the previous page. AVRL has jurisdiction in the 'Urban Water Project'. Employees of both VEI and Rand Water Services are detached in AVRL and hold strategic positions to manage the operation. They hold positions such as managing director and financial director. Detached staff of AVRL gets support by so-called 'short-term experts' from the mother companies in the Netherlands and South Africa. The bulk of the employees which operate and manage the water supply at regional level are employees coming from Ghana Water, which are detached to AVRL for the duration of the management contract.

In November 2005 the management contract was signed and the five-year program started. The program objective is to improve the water supply services in selected urban areas and individual regions of Ghana. The objective has to be achieved by optimal investment and improved management and delivery of water services. In total 6 to 8 million people are living in the service area of the water company. Currently, the water quality is not complying with the national standards, which can be found in Annex A: Water Quality Compliance 2009 & 2010.

In 2009 the water quality delivered by AVRL complied with only one of the parameters given by the Ghana Standard Board. For 2010 this has improved to a compliance of two, namely colour and PH. Still there are three parameters on which the water doesn't comply.

During these past years there has been a growing interest from AVRL to know whether their presence has the desired effect. Several previously performed researches gave an indication of this need.

In June 2010 Peter van den Horn completed a research on the topic of "Knowledge transfer as driver for capacity building in urban water supply services in Accra, Ghana", which gives a profound insight in this aspect on managerial level at the head office in Accra.

To gain better insight in the functioning of the regional laboratories and the possible risks holding water quality monitoring back, in 2009 a risk assessment has been performed by Mr. Evans Balaara and Mrs. Margaret Macaulay. In this risk assessment 9 treatment plants throughout the country have been visited and evaluated, creating a risk matrix, followed by a checklist to mitigate these risks. Regions could apply for funding at the main office regarding these lists. Until October 2010 only a small number of projects have been recorded to apply for funding. Further investigation as to why this number is smaller than expected has not yet been performed.

In September 2010, a project proposal has been written by VEI on "Capacity building in Water Quality Monitoring and Surveillance for Ghana", to apply for funding from the European Union. In this proposal capacity building is the main instrument to improve water quality monitoring and will be implemented by a central laboratory facility which foresees in the training of staff, testing and monitoring water quality and create community involvement via the 'Know your Drinking Water' program.

The goals from the World Bank towards capacity building, the performed research by Peter van den Horn, the 2009 risks assessment and the recently written project proposal give the basis to further investigate the possibilities for capacity building on a regional level regarding the ten (10) WTP assessed in the 2009 risk assessment.

## 2.2 Research Field

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Ghana Water has in total a number of 91 water facilities, divided into boreholes and commercial water treatment plants. Within the 91 water facilities, 46 of them are surface water treatment plants, producing up to almost 6 million m<sup>3</sup> per month. The borehole systems make up the remaining 45 water facilities.

In 2009 a Risk Assessment has been done by Mrs. Margaret Macaulay. The assessment was done on a national level, involving 10 of the biggest water treatment plants in the nation. The plants which were involved in 2009 will be used in this research, due to their earlier experience with capacity building and risk assessments.

This research was performed in addition to the follow-up of the 2009 RA, which was performed by Mrs. Sabrina Utech in the same timeframe. The plants which took part in this research are:

- |                               |                              |
|-------------------------------|------------------------------|
| - Abesim (Brong-Ahafo region) | - Koforidua (Eastern region) |
| - Barakese (Ashanti region)   | - Kpeve (Volta region)       |

- Dalun (Northern region)
- Daboase (Western region)
- Inchaban (Western region)
- Kpong (Volta region)
- Vea (Upper East region)
- Winneba (Central region)

## 2.3 Definition Capacity Building

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To be able to research the improvement of capacity building within AVRIL regarding water quality and quantity at a regional level it was necessary to further investigate the term “capacity building”.

The concept ‘capacity building’ is mostly used by donor countries or organisations in the context of projects in developing countries. The researcher compared the definitions given by the World Bank<sup>†</sup> and the United Nations Development Programme<sup>‡</sup>. These definitions have a lot in common. The definition of the World Bank was used as a starting point for this research, since they are co-financing the project. The definition for capacity building given by the World Bank, in relation to social analysis, states:

*‘Capacity building: a coordinated process of deliberate interventions by insiders and/or outsiders of a given society leading to (i) skill upgrading, both general and specific, (ii) procedural improvements, and (iii) organizational strengthening. Capacity building refers to investment in people, institutions, and practices that will, together, enable countries in the region to achieve their development objective. Capacity is effectively built when these activities are sustained and enhanced with decreasing levels of donor-aid dependence accompanied by increasing levels of societal goal achievement.’*

In the research a combination between focus on local, specific needs and long-term strategic goals was the aim, in order to give a complete picture of the situation at the moment of the research. The aspect of Capacity building is elaborated further in the literature study, found in chapter 5.

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<sup>\*</sup> Website World Bank, Project ID: P056256, [Online]. Available at: [www.worldbank.org](http://www.worldbank.org), , visited 14-10-2010

<sup>†</sup> World Bank, n.d. *Glossary of key terms*. [Online]. Available at: <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEV/0,,contentMDK:21154393~menuPK:3291389~pagePK:64168445~piPK:64168309~theSitePK:3177395,00.html>, visited 14-10-2010

<sup>‡</sup> UNDP, 2008. *Practice Note: Capacity Development* [Online]. New York: United Nations Development Programme. Available at: <http://www.undp.org/oslocentre/docs08/sofia/CD%20PN%20May%202008.pdf>, visited 14-10-201

### 3 Project Proposal

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Resulting from the above definition in combination with the previously performed research and results, the main aspect for this research is to look at several specific aspects in the field of capacity building. The research is performed during a round trip through Ghana, visiting the ten WTP of the 2009 RA. Regional personnel are questioned on the field of capacity building to gain insight in local, specific needs on the field of Capacity building. The Concept Note of VEI functions as starting point for possibilities on a long-term and a strategic playing field.

With the given set of parameters, the main question of this research will be:

*What needs and suggestions are made by employees of the Ghana Water Company Limited regarding Capacity Building?*

Following from this main question three sub questions are formulated:

- a) What needs are expressed by employees of Ghana Water regarding capacity Building?
- b) What solutions are proposed by employees of Ghana Water regarding the identified needs for Capacity building?
- c) What could be the role of a water quality hub as stated in the 2010 concept note from VEI / GWCL?

#### 3.1 Global approach

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Based on the formulated research questions and the given time frame in which the travelling is done, 7 weeks, a strategy was developed for data collection. The following methods are used, namely:

- Review of reports and performed research on AVRL / GWCL
- Literature study
- Semi-structured interviews during a field visit

Review of reports and previously performed research by AVRL was used as a basis to start the research on. This can give the researcher insight in the current level of capacities and the directions in which further development is possible.

The literature study was used to gain a better insight in the field of Capacity building and its many varieties and perceptions. This study was performed before and during the research to keep track of the findings and check whether they could be used in the field of Capacity building.

Semi-structured interviews were used to collect data related to the perception of staff of the ten WTP. These perspectives can give insight in the directions or field where future intervention of AVRL is needed to build capacity.

The method of a semi-structured interview was also used to compile and compare data. The questions refer to the given fields in the definition of capacity building from the World Bank and give the interviewer a path to follow during the interviews, without pinning him down to a precise procedure.

In the chapter Methodology, this is further explained.

A set up of the interview questions can be found in Annex B: Semi-Structured Interview Set Up. In order to visit the plants in the selected time frame, a travelling scheme was developed, which can be found in Annex C: Travel Scheme.

### 3.2 Role

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This research was done by the researcher on an independent basis, with the researcher as sole performer and provider of input. In accordance with the supervisors, Mr. Balaara and Mrs. Barendregt, the choice was made to provide the researcher with the possibility to visit different regions in the country of Ghana to collect data via interviews with regional managers and various employees at the headworks throughout Ghana.

The researcher acted in the role of intern attached to Mr. Balaara's department of Water Quality Management at the head office of AVRL in Accra. Mr. Balaara provides, in the role of direct supervisor, the researcher with a letter of introduction.

This gives the researcher the freedom to create his independent view on the research subject with the support from head office and the input of information by the regional managers and employees.

### 3.3 Expected Outcome

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This research was done in the field of capacity building and contributes to the overall insight of the company of AVRL into the gaps experienced by the people at regional level on this very field. With this information it is possible for AVRL to identify and assess these different problems and eventually develop programs to improve these situations. Therefore this research contributes to the improvement of the organisation of AVRL / Ghana Water and enables the companies to deliver a higher quantity and quality of drinking water for the inhabitants of Ghana.

The result of this research was a list of gaps on the field of capacity building. This list was a result of the various interviews performed throughout the country of Ghana, therefore giving a nationwide view on experienced gaps.

A similar list was created covering the possible solutions stated by the employees of Ghana water at regional level.

Both of these lists give input on the assessment of capacity building and developing future programs regarding this aspect.

Thirdly, information was collected regarding the proposition for a "Ghana Water Quality Hub", as written in the concept note by Vitens-Evides. This information gives a review on the need, as experienced by the regional employees of Ghana Water, and possible roles of this hub, giving input into the feasibility for such a centre.

With these three parts of information, an answer was formed on the main question, and creates a conclusion and recommendations regarding the use of capacity building at a regional level to further improve water quality and water quantity.

### 3.4 Challenges

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The following challenges were thought possible to influence the outcome of the research. The means to mitigate them are listed below:

- Size of the research field: With the time period being limited to only 12 weeks, it proved difficult to create a research field which was both feasible and useful. The researcher experienced difficulties demarcating the exact research field.  
Mitigation: A clear view on the used theoretical information and a clear agreement with the supervisor about the needed results was established at the start of the research.
- Accessibility of documents: due to the organizational build-up of AVRL and the relationship with GWCL, the availability of documents could have been insufficient. This harms the progress and planning of the research.  
Mitigation: Enough time for the literature/ desk research to gather all needed documents was planned.
- Time frame: available time span could have been too short to create a good level of understanding with the employees who took part in the research.  
Mitigation: The creation of extra time gaps between visiting the WTP to be able to extend the visit, if necessary.

- Access to a diversified research field: For the research it was important that the researcher had access to a diversified research field, so results drawn from the interviews gave an overview of all levels within the regions. Information should be coming from low as well as high positions in the regions.  
Mitigation: The organizational positions of the interviewees during the visits to the regions were registered and equally used in answering the research questions.
- Cooperation from employees AVRL and GWCL: when the employees of AVRL are unwilling to take part in this research, a profound base is difficult to develop.  
Mitigation: clear introduction letter by Mr. Evans on the goal of this research, clear explanation by the researcher of the means.



## 4 Methodology

This chapter is created to give insight in the chosen forms of research, as described in chapter 3, and the choices made during the research process.

### 4.1 Research Form

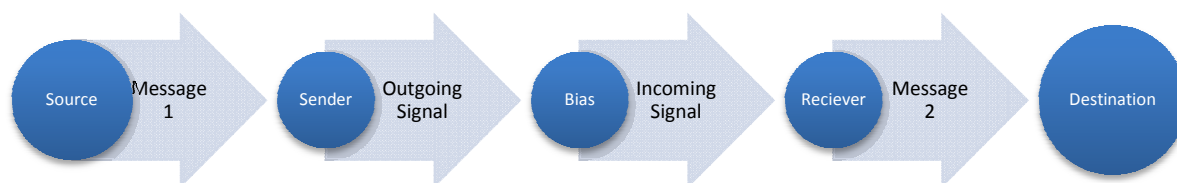
The chosen research form involved a literature study including a review of earlier performed research on the field of capacity building within AVRL and GWCL and field research.

The need for a literature study was the result of the different factors involving the performing of, and the outcome of the earlier conducted research. The fields reviewed in the literature study created a profound theoretical background from which the researcher started the field research.

The field research involved a travelling period of 7 weeks and was performed by visiting different regions and water treatment plants. The choice to do a field research was made to further investigate the specific needs and gaps experienced at a regional level. When the research would have been done completely from the head office in Accra, the chances that the result would have contained a bias would have been much higher. If the researcher visits the regions himself, the different steps between transmitting the needed information will be much lower in number, generally one or two.

According to the classical communication theory of Shannon and Weaver (1949)\*, communication is as the figure below shows;

**Figure 4-1: Shannon & Weaver Communication Theory**



As can be seen, there is an infiltration of Bias in all communication, which takes place between the sender and the receiver. As the amount of senders and receivers increases, the amount of bias moments correspondingly also increases.

Therefore, as the researcher preferred the smallest amount of bias moments in communication, field research was necessary, to minimize the impact of biases.

The research method used in the field research was by semi-structured interviews, a form of qualitative research. Performing research can be done in many different ways, which roughly can be separated into three different main types of research<sup>†</sup>. These fields are; descriptive / prescriptive, relational and experimental.

As this research will not include the relations between different elements or the set up of an experiment, the field of prescriptive / descriptive remains.

The main difference between prescriptive and descriptive is the form in which the research is written. Descriptive mainly *describes* what the present situation is, as where prescriptive actually *prescribes* how the research field should be. Descriptive is done on a level of data collection, but prescriptive is a step further, where opinions and statements are created. A descriptive research strives towards a high level of objectivity<sup>‡</sup>.

This research was done on the field of both descriptive and prescriptive research, as there was no specific hypothesis. Therefore this research strived towards the highest possible level of objectivity in collecting the data. To do so, a specific method of data collection was needed.

During the field research the chosen method was that of a semi-structured interview. This research form fell into the category of interviewing, which is the contrary of the other possible research form; observation.

Interviewing is preferred when the research field is on knowledge, attitude and/or opinions<sup>§</sup>. Within interviewing, there are three main forms of interviewing, regarding interviews between two persons; a non-structured interview, a semi-structured interview and a fully-structured interview.

These different forms find their main differences in the level of direction given by the researcher<sup>\*\*</sup>. In the scheme hereunder an overview of benefits and disadvantages was created.

**Table 4-1: Interview types**

	<b>Unstructured</b>	<b>Semi-structured</b>	<b>Fully-structured</b>
<b>Advantage</b>	No boundaries on subjects from interviewee	Little boundaries on subjects from interviewee	Full control over subjects by interviewer Time effective
<b>Disadvantage</b>	Time consuming Little control over subjects by interviewer	Possibly time consuming Reasonable control over subjects by interviewer	Large boundaries on subjects from interviewee

This research was descriptive as well as prescriptive and created an overview on the research topics. There was a need to investigate topics on the field of knowledge, attitude and opinions, and therefore the research form of interviewing was preferred.

The level of direction was in the middle; there was a set time schedule for the research to be performed, but extra input from the interviewees was also important.

Therefore the methods of Unstructured and Fully-structured were not used, and the method of Semi-structured was preferred and selected as the interview form.

## 4.2 Data Quality

This chapter further explains the research method aspects regarding validity and reliability of the gathered information during the data collection.

## 4.3 Validity

The term validity refers to the possibility of errors in the way the research was conducted, especially within the processes and systems used to gather the information and the research field itself. The questions asked regarding this subject are; "Is the research measuring the correct parameters?"

To ensure this and create a high level of validity, a set-up for the field research was created in the form of a pre set up for the semi structured interviews. With this set up, the research had a universal base, and the results of the interviews would be comparable, thus improving the validity. The set up has the form of interview questions regarding the subjects handled in the literature study. The set up can be found in Annex B: Semi-Structured Interview Set Up.

## 4.4 Reliability

Reliability of the research gives the reviewer insight in the possibility of random errors. To guarantee a high level of reliability, the researcher will take into account the known sources for systematic errors and errors by chance. According to Miles and Huberman<sup>††</sup> (1994), there are three main possibilities for errors;

- The researcher speaks only to people available, and therefore has not an independent (random) sample of the employees.
- The researcher is not able to be present at all times, and therefore the conclusions will not be representative for the research field.
- Representativeness of the sample group.

To minimize the impact of the first aspects given by Miles and Hubermann, the researcher has made appointments with people from different organisational levels within the regions to be consulted during the field research. This gave the researcher the assurance that the people interviewed are representative for the various types of employees and leaders, and that they are available. A second measure was taken, which is the possibility to extend

the visits/ time of interviews. By planning an extra day at every location, the chances of not being able to speak to the interviewee is further decreased.

The fact that the researcher is not able to be present at all time in the research field was an aspects which was mitigated by collecting the most objective information during the interviews and visits to the headworks. With the interviewees giving substantial and useful answers, based on their experience and background within the company of AVRL –GWCL, the answers given represented the best possible and most independent view on the research questions.

The third pitfall was avoided by selecting the respondents based on the problem and not on the basis of a random sample draws.

The interviewees which were selected consisted of people with different functions within the company of GWCL / AVRL, giving a nationwide overview of opinions on different levels in the organisation<sup>††</sup>.

The research has been conducted with a selected group of interviewees, representing all but one of the regions in Ghana. This overview can be found in Annex D: List of Interviewees.

These people either work at one of the visited WTP or hold managerial positions at a regional or national level. The visited WTP are the biggest in volume of treated water in the different regions and in total represent an amount between 82 and 86 percent of the total amount of treated water produced every year in 2009 and 2010.

For further elaboration on these percentages see Annex E: Representativeness of Treatment Plants.

The representational level rises as a result of the chosen research field and interviewees, therefore the conclusions and recommendations given are a representational, nationwide, view on the research questions.

#### 4.5 Data Processing and Analysis

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The answers given to the interview questions are compared with each other in order to find common denominators, representing gaps and solutions on a nationwide basis. As a result of the research type and set up, most of the interview questions are qualitative, and therefore not usable to quantified statements.

However, since there is need to identify the amount of similar problems and solutions, the number of times a problem / solution is named will be evaluated, in order to get insight into the severance of certain situations. This will be done using a simple bar or graph diagram.

The analysis of the raw interview data was done according to the method used by Verhoeven. The method from Verhoeven is constructed as follows<sup>§§</sup>:

The first step consists of an evaluation of the collected data. By allocation the given answers to the different sub questions a more profound view on the collected data is possible.

After this evaluation the data collected for answering the sub questions was linked to the definitions given in the theoretical research, and finally this information was combined with the researchers view on the research topic.

When the previous steps were performed, it was possible for the researcher to give an answer to the different sub questions and combine these answers to form a conclusion and give recommendations regarding the main research question.

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<sup>§</sup> [http://en.wikipedia.org/wiki/Shannon-Weaver\\_model](http://en.wikipedia.org/wiki/Shannon-Weaver_model), [digital], accessed on 24-11-2010

<sup>†</sup> <http://www.leidenuniv.nl/fsw/psychologielexicon/index.php3-c=93.htm>, [digital], accessed 26-11-2010

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‡

<http://team.bk.tudelft.nl/Publications/2000/Ways%20to%20study%20prelininary%20Dutch%20versions/05Beschrijvend%20onderzoek.htm>, [digital], accessed on 26-11-2010

<sup>§</sup> Samenvatting Methoden en technieken, Baarda en de Goede, 2<sup>e</sup> druk, 3<sup>e</sup> oplage, 1997, available on;  
[http://www.students.cs.uu.nl/~ogik/samentent/WO12001\\_Samenvatting%20Methoden%20en%20Technieken\\_boek.pdf](http://www.students.cs.uu.nl/~ogik/samentent/WO12001_Samenvatting%20Methoden%20en%20Technieken_boek.pdf), [digital],  
accessed on 26-11-2010

<sup>\*\*</sup> Leren interviewen, Marian Hulshof, Wolters-Noordhoff, 2007

<sup>††</sup> Qualitative data analysis: an expanded sourcebook Door Matthew B. Miles, A. M. Huberman, 1994

<sup>‡‡</sup> [www.iaa.nl/Sitefiles/PDF/betrouwbaarheden%20Validiteit.pdf](http://www.iaa.nl/Sitefiles/PDF/betrouwbaarheden%20Validiteit.pdf), [digital], accessed on 29-11-2010

<sup>§§</sup> Mertens, J.: *Praktijkonderzoek voor bachelors* (uitgever: Coutinho, 2006)

## 5 Theoretical Basis for the Research

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To establish the theoretical foundation for this research a literature review was conducted. The described concept of capacity building in chapter 2 functioned as a starting point for this review. This concept is further explored and presented in the following section. Furthermore other relevant concepts were found and are reviewed. These concepts are important for the preparation and execution of the conducted field research.

### 5.1 Capacity Building and Capacity Development

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The terms Capacity Building and Capacity Development have been in place for many years, resulting in many different descriptions, each with its own emphasis. Previously, in chapter 2, the definition of the World Bank was introduced. During this research this definition used to have a create point of reference. The definition is as follows;

*‘Capacity building: a coordinated process of deliberate interventions by insiders and/or outsiders of a given society leading to (i) skill upgrading, both general and specific, (ii) procedural improvements, and (iii) organizational strengthening. Capacity building refers to investment in people, institutions, and practices that will, together, enable countries in the region to achieve their development objective. Capacity is effectively built when these activities are sustained and enhanced with decreasing levels of donor-aid dependence accompanied by increasing levels of societal goal achievement.’*

In the past years there has been discussion about the definition of Capacity building in regard to the term Capacity Development. The latter one often refers to a society where institutions and people are already present though further build up was needed. In the studies from UNDP<sup>\*</sup>, capacity buildings is seen as a starting point when there are no institutions in place, and have to be built from the ground up. Capacity Development on the other hand is the situation where several institutions are already in place, but are in need of further strengthening.

When looking for clear statements about what results were needed to comply with the World Bank statements, there was no clear indication on what should be done on the field of Capacity building. The original statement<sup>†</sup>, used when granting the loan to GWCL, gives the following outline;

*‘Component 3) the largest allocations in this component go for Training (US\$2 million) and Technical Assistance (US\$2.5 million). The Training component is left un-specified because the Management Contract Operator will propose a training plan once it is in place and can assess training needs.’*

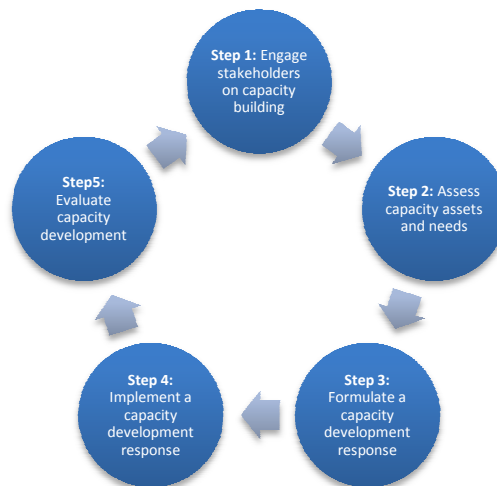
This statement gives no clear indication what is needed, nor what is expected of the Operator.

In the management contract from AVRL<sup>‡</sup>, there are four components presented which need to be fulfilled by the operator, this being AVRL. Again, one of these parts is on Capacity building and Project Management, which states;

*‘This component shall mainly include training of Seconded Staff and technical assistance. Also included are allocations for training in the Grantor Headquarters, vehicles, office equipment, support for the PMU and environmental safeguards as well as support to the PURC.’*

During the research it was not known to the researcher what specific programs had been developed by AVRL and GWCL to fill in these requirements in the contracts. To be able to continue the research the researcher had to use an accepted method or framework. The United Nations Development Program (UNDP) has created a clear set up for working with capacity building. Hereunder an overview is given.

**Figure 5-1: Capacity Building Cycle<sup>s</sup>**



The cycle given above is used to develop and determine which steps need to be taken by the researcher in this research at AVRL and GWCL.

The contract with AVRL started in 2004, and it is unknown to the researcher in this stage of the research if AVRL worked with a similar schedule when introducing the theory of capacity building. With the contract ending in mid 2011, it is important to see what the results have been on the past years of intervention by AVRL as the Operator. There is the need to find out if the above circle is completely followed for at least one time. In the start of the research there was no clear indication given to where in the circle AVRL and GWCL have progressed.

## 5.2 Consequences Capacity Building

Concluding, reviewing the above information, it gives the indication that on the field of Capacity building there is no clear program, nor a clear expected outcome from the World Bank / Ghana Water. The Operator is completely free in developing a program regarding this component. This can result in unclear expectations, both from the World Bank, as from Ghana Water.

To create a better insight in the current situation, a situation analysis is needed, to see which problems are present and which solutions are possible, with the use of capacity building.

## 5.3 Dimensions of Hofstede

As this research takes place in West Africa, conducted by a person resident in a Northern European country, involving implementation of plans by a Western organisation in a West African company, it is needed to take a closer look at the different cultural values the researcher and the research field have. When taking the differences into account, the researcher might be able to obtain more objective results and be able to create conclusions and recommendations with a high feasibility level. The research of Hofstede<sup>\*\*</sup> is used to describe these differences.

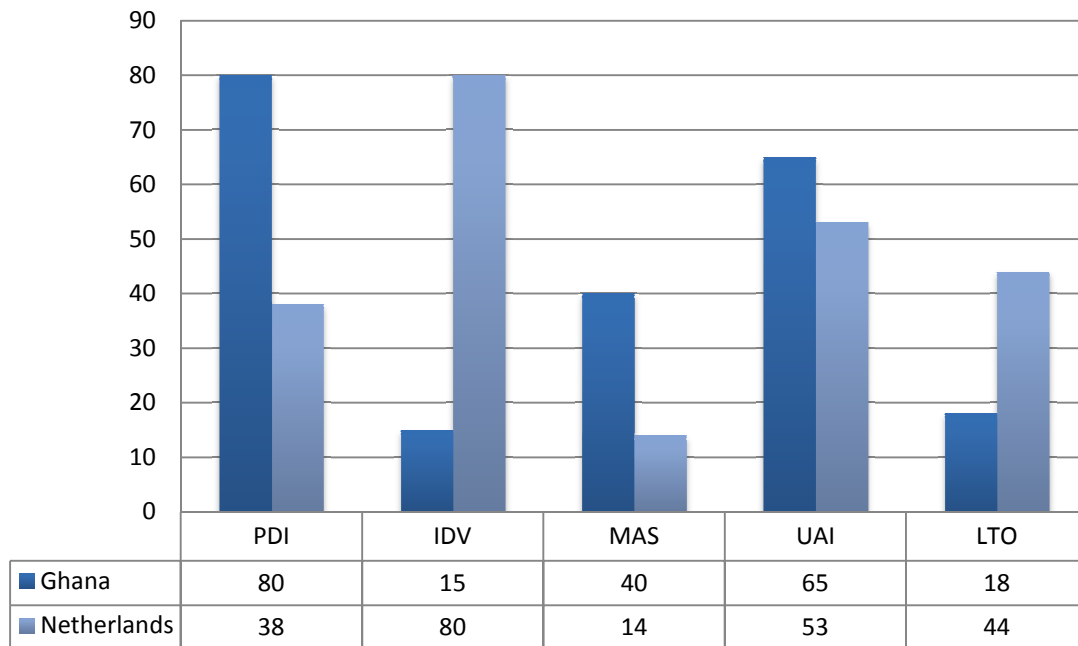
In Annex F: Cultural Dimensions of Hofstede, the different values are explained. Hereunder a figure is shown which gives the different scores of the Netherlands and Ghana, where after a conclusion follows on how to best make use of these differences.

## 5.4 Consequences Cultural Differences

Below, in Figure 5:1 Dimensions of Hofstede: Ghana / the Netherlands the values and the scores for the two countries are shown.



**Figure 5:I Dimensions of Hofstede: Ghana / the Netherlands<sup>††</sup>**



As can be indicated from the above figure, there are substantial differences in the dimensions of Power Distance, Individuality, Masculinity, and Long Term Orientation. Each has its own consequences when conducting research or executing Capacity building.

The difference in Power Distance (PDI), with a higher score for Ghana, makes it clear that there is a great need to address people contributing to this research in a formal way. People in Ghana are working on a more hierarchal base in organizations. The people in the higher levels of the organization may have a different opinion of those on a lower level, but the people lower in the organization might depend on the boss, therefore they will not share their true opinion.

When creating capacity building programs, this aspect has to be looked at closely. Due to the large difference between the Netherlands and Ghana, developed plans might not work due to a lack of outline regarding responsibilities and communication lines.

The large difference on the field of Individuality (IDV), may give difficulties when trying to pinpoint people's exact responsibilities. In societies with low levels of IDV, people expect their friends or colleague to look after them. The relationship with a person is more important than his or her qualities, and therefore they covers when this person fails.

In relation to the difference in the score for PDI, the difference in IDV gives difficulties when trying to investigate people own opinions about a certain situation.

Employees will give their professional opinion, not their private. Finding out the exact needs to solve certain issues can be obstructed by this difference.

In the day to day communication it can be important to ask no direct questions, referring to people positions or opinions, but rather ask indirect questions with a common context, from where a final answer can be distilled.

When introducing capacity building programs, there is a great need to clearly outline what task all employees involved have and how the accountability over money and responsibilities is created, making it easier for the supervisor to pinpoint challenges during the execution.

Regarding the difference on the scores for Masculinity (MAS), this can give problems when assessing the actual needs for capacity building. In Ghana, and therefore within the organization of AVRIL, there is a higher admiration for big and shiny things, which can result in a need for new laptops, which are shiny, instead of new training facilities, which are not. People will look up to persons who are successful, and will have the tendency to polarize on certain aspects. This can give trouble when discussing needs for the future.

Finally, the differentiation regarding Long Term Orientation (LTO). Whereas the Netherlands score 44, Ghana scores a mere 18. This results in a different approach to solutions, and a different way of thinking in total. Employees of AVRIL might settle for a “quick fix” regarding Cap. Building, and therefore have difficulties agreeing to long term education programs.

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\* UNDP Practice Note Capacity Development, Kanni Wignaraja and Lara Yocarini, October 2008

† World bank website,

<http://web.worldbank.org/external/projects/main?pagePK=64312881&piPK=64302848&theSitePK=40941&Projectid=P056256>, accessed 18-11-2010

‡ Management Contract, hard-copy, draft version, accessed 22 October 2010

§ Adapted from UNDP Practice Note on Capacity Development, page 8, accessed 18-11-2010

\*\* Geert Hofstede Website; [www.hofstede.com](http://www.hofstede.com), accessed on 8-11-2010

†† Scores as indicated on the CultureGPS Lite Application, data resourced from ITIM International, accessed on 8-11-2010

## 6 Results Sub question 1

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This chapter informs the reader on the results created on the topic of sub question 1;

*What needs are expressed by employees of Ghana Water regarding Capacity Building?*

During the field research a series of needs appeared nationwide, which are explained below. To create a clear overview the definition of Capacity Building from the World Bank was used, which divides actions on this field in three aspects.

- (i) *skill upgrading, both general and specific,*
- (ii) *procedural improvements, and*
- (iii) *organizational strengthening.*

Reading further into the definition of the World Bank, the definition states; “Capacity building refers to investment in people, practices and institutions.”

These three different fields were used to evaluate the above given aspects and therefore were described separately. Finally a conclusion was drawn with the use of the findings and the theoretical research.

### 6.1 Findings field research People

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*Gap in amount of skilled people*

In different regions the production and WQA department displayed trouble finding sufficient numbers of skilled people to fulfil all the different vacancies. The regions itself are not allowed to hire people beyond the level of general worker. Other employees are hired by the head office of AVRIL and the office of GWCL. In several regions there were not enough people to allow the WTP to run at their optimum.

*Gap for employees to continue study in their field of expertise*

As a result of the training structure within the company of Ghana Water and the qualifications of certain type of employees, such as operators and lab assistants, it is not possible for them to further train themselves in their field of expertise. The people who do want to apply for training on the field of engineering or chemistry, which have not gone to university yet, are seriously challenged by proving their level of skill.

They often switch to the field of marketing, customer care or finance, where part-time trainings are available.

*Gap in certificates for Weija training school / Company Experience*

This aspect relates to the previous aspect. Currently there are no certificates provided by the Wija training school which are accepted nationwide by educational institutions. People are required a certificate which proves their level of skill or experience in order to extend their schooling at polytechnics and /or universities.

### 6.2 Findings field research Practices

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*Time consuming set up for Man. Trainees*

The management trainees are currently hired by the Head Office of AVRIL, with approval of the grantor GWCL. The researcher experienced that the trainees currently travel on themselves between the different departments to get an overview of tasks and responsibilities of each department. After this they are sent off to the regions, working with people in their own field of expertise. Managers of departments in the regions and at the head office of AVRIL need to train the management trainees individually, as they come and go on their own account.

#### *Limited amount of knowledge transfer*

The age pattern within AVRL / GWCL indicates that there are a large number of employees over the age of 50. A large amount of these people are in managerial positions and are responsible for the safe and continuous flow of potable water to the customers.

In several regions managers experience problems regarding the knowledge transfer needed to be able to upkeep and improve the efficiency of the organisation of AVRL at regional level. When arriving in a new region, managers have no clear overview of the essential information from that region, regarding equipment, personnel and distribution. Managers hold on to this information which they see as a strategic asset.

#### *Gap regarding documentation on specific knowledge*

Throughout different regions, in correlation with the previous gap, employees experience a substantial shortcoming regarding the documentation of knowledge. With the re-installation of the General Managers in the regions a number of them had trouble receiving or finding the knowledge needed to work effectively and efficiently.

This knowledge concerns information about equipment, distribution, procurement of materials and many other subjects. It is unknown to the researcher if there is a specific set of documents used when transferring knowledge to a colleague or superior.

#### *Gap in Maintenance culture*

After procuring equipment there is often trouble maintaining it. Workers at the headworks don't receive training on the aspect of maintenance; they are solely educated about operating the machines and systems. The greater part of the headworks has no maintenance officer present, and therefore there is often a lack of maintenance. Multiple regions made a start with educating the headwork employees on this aspect, but maintenance is not clearly allocated to a certain department for the day to day execution of it.

#### *Testing by GSB*

At regional level a small amount of parameters is tested on daily / monthly bases. The amount of equipment present in the regions differs greatly, with no clear standard. For analysis of samples on pesticides and heavy metals, AVRL has to rely on the Ghana Standard Board, which has the equipment to perform these tests. The costs involved and time it consumes is very high.

### 6.3 Findings field research Institutions

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#### *Efficiency in Procurement time and process*

In all regions the procurement time is experienced as too long. This results in temporary fixes, which are not up to the standard of the original equipment. The procurement procedure gives no possibilities to adapt the request for certain material, once entered the procurement process. When new needs arise it is not possible to add them to request already filed. Regions experience a gap in communication between the head office and the regions / headworks regarding their precise needs and additional needs for equipment.

#### *Allocation of Funding*

In all regions employees experience difficulties regarding funding. The funding procedure asks for all departments to give a year's estimated need for funds and allocates them according to the monthly amount of the yearly budget. The main problem lays in the allocation of the budget on a regional level. According to different regions, the amount budgeted is not sufficient, therefore budget of other departments is used to achieve results.

#### *Gap regarding Position vs. Training*

In different regions problems are experienced regarding the training received to upkeep the level of skill. At different levels there is a different need for training, although the main focus is on the operators to be able to work with the equipment provided by the contractors. In most cases, an operator comes in and provides new equipment without proper training of the people working with this equipment. Mostly employees in managerial positions receive these trainings, although they don't need this for their day to day responsibilities.

### *Gap in Accountability / Transparency GWCL*

The possibility to see what processes are done by GWCL and what the completion of it is, is unclear to many regions, including AVRIL head office in Accra. Employees in the regions have little insight in the progress of requests for equipment or funding and do not know on which basis decisions have been made. The researcher had no access to the head of office of GWCL in Accra.

### *Gap regarding the position of AVRIL vs. GWCL*

Due to the creation of the management contract, an extra organisation has been installed in the water sector of Ghana, being AVRIL. In many regions there is uncertainty regarding the positive attitude of GWCL towards AVRIL. Political factors influence the performance of AVRIL as a whole, which has negative effects on the regional performance as well.

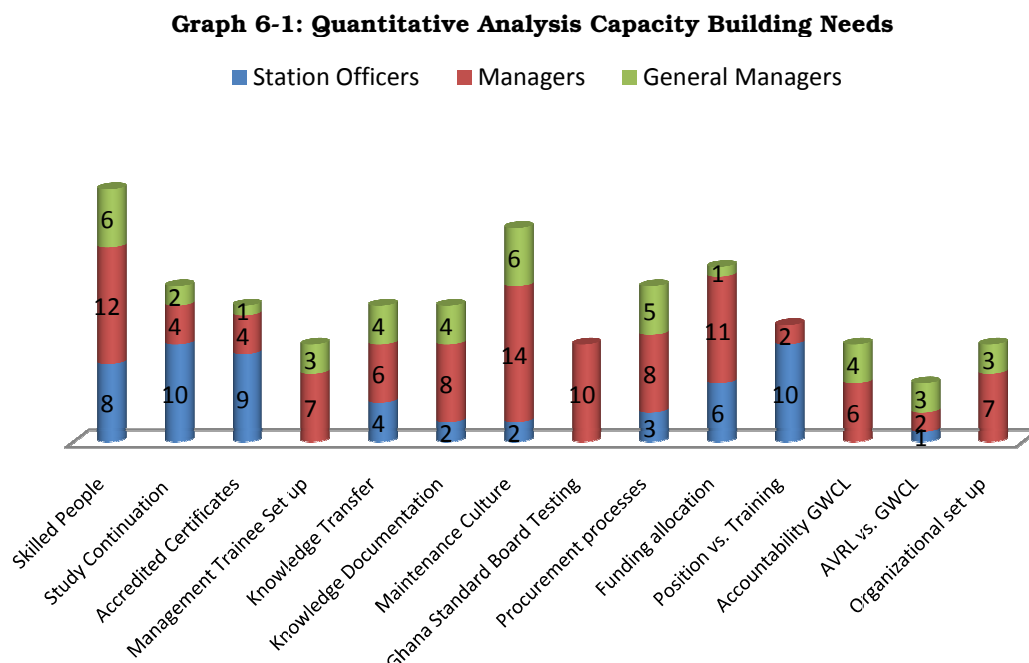
### *Gap in organizational set up*

In a number of regions there is a gap identified regarding the organisational structure of AVRIL / GWCL. Regions experience a greater amount of interest in the field of customer care and revenue collection than interest for the departments of production and water quality assurance.

A second gap is identified concerning the attention of the head office towards the regions / headworks. In several regions employees at the headworks have the feeling they are neglected and at a dead end. On regional level employees identify a gap in the attention for their problems and the attention troubles at the head office

## 6.4 Conclusions Sub Question 1

Below a quantitative overview of the identified needs is given, according to the number of times a specific term is named by the regional employees interviewed during the field research. From this a prioritization was made which is given below.



On the aspect of people, from the three needs identified by employees of Ghana Water, the need for skilled people to fulfil the vacancies at regional and district level needs to be decreased first, and has the highest priority. For a company to be able to be sustainable, the aspect of cost effectiveness is highly important. When a company is unable to fulfil all vacancies, it is likely that its efficiency and effectiveness go down. To be able to deliver the

population of Ghana with the highest amount of potable water it is needed to operate the headworks at its full capacity. Currently Ghana Water was unable to do so.

On the level of practices were the most important needs; maintenance culture, knowledge transfer and documentation. These needs all have direct effect on the working of the organization of AVRL.

Regarding the aspect of institutions, the gap in procurement time and process combined with the need in funding are both highly important. They both link to the gap in organizational set up. The organization of AVRL / Ghana Water contains two different but equally important entities, people and procedures and together they make up a large portion of the organizational set up.

In the chapter Discussion the researcher will further elaborate on possible causes for these needs.



## 7 Results Sub question 2

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This chapter will give an overview of the results regarding sub question 2;

*What solutions are proposed by employees of Ghana Water regarding the identified needs for Capacity building?*

In accordance with the previous chapter and the set up of the World Bank definition and attention fields, this chapter was structured similarly on the aspects people, practices and institutions. The results given in the previous chapter point out several needs, caused by various factors. In this chapter a number of them were presented with a solution, although some of these needs were not met with a clear and single solution formed by the regional employees and their knowledge of capacity building.

Where a suitable solution is lacking, the researcher uses literature to propose a solution. A number of needs were also met with a solution in the following chapter, with use of the Ghana water quality hub.

### 7.1 Findings field research People

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*Provide part time training in the field of engineering, maintenance, chemistry and managerial aspects*

To be able to find and keep skilled personnel in the fields of engineering, chemistry and maintenance, the providence of part-time courses in these fields can help Ghana Water decrease the need for skilled people. Employees of Ghana Water suggest courses organised by the training centre in Weija or by universities in a partnership form. Creation of a Ghana Water Quality Hub can support these courses by providing a location for the training teams.

*Provide operators with a better understanding and skills on the aspect of maintenance*

The current level of knowledge of plant operators was not sufficient to fully understand the high need for continuous maintenance of equipment used to produce potable water. With a nationwide program, performed by a skilled team of experts, this understanding can grow, which results in better performance of the headworks. The team should be able to visit the main treatment plants and instruct the operators on the use of maintenance techniques.

### 7.2 Findings field research Practices

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*Centralise start up training for new Management Trainees.*

When new management trainees for different departments are hired, it can be more effective when they have a start up program which is done in the form of class education. This is more effective for the managers involved and results in Management Trainees who can be send to the regions with sufficient knowledge to work independently. When the trainees receive a program with different classes on the departments of Ghana Water, it will costs the involved manager less time and gives the trainees a more dedicated teacher.

*Send trainers for follow up training to the regions.*

When trainers for follow up training in the field of water quality and production are send to the regions, the effectiveness of the training is improved. The employees who receive training do not have to travel towards the Head Office and can continue to perform their daily operations. The trainers get a clear view from the work situation at hand and can adapt their training program to fit best tot the local circumstances. Money is saved for travelling costs and allowances for a stay in Accra.

### 7.3 Findings field research Institutions

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*Clearly appoint the task of maintenance of equipment*

During the research, the task of maintenance was not clearly appointed to either an existing department, or a department which will be created in the near future. The result from this was poor maintenance, due to the inability to assign the needed employees to perform it. The creation of a clear job description regarding maintenance on regional level,

and the accountability of these responsibilities to a certain department can further improve the efficiency and effectiveness of the water production. With a maintenance department, consisting of people with sufficient experience / skills will further decrease the problem regarding maintenance.

*Improve communication in procurement process.*

When procurement of equipment or chemicals is needed, simple communication procedures and control loops can improve the level of accurate procurement. When the procurement department checks with the region before actual ordering takes place, it is possible for the region(s) to verify whether the correct materials are ordered. From head office it is possible to check whether there are additional needs from the regions.

*Develop training programs on regional level, in accordance with the contractor.*

If new plants are built or old plants refurbished, there is a need for the training of the plant employees. Currently, the selection of training is done by Head Office, which results in ineffective training efforts. People trained are often not working at the plant. When trainings are supplied by the operator, the region should be able to select the people which receive this training and, with consultation from the contractor, be able to create the most effective and efficient training program to operate the plant.

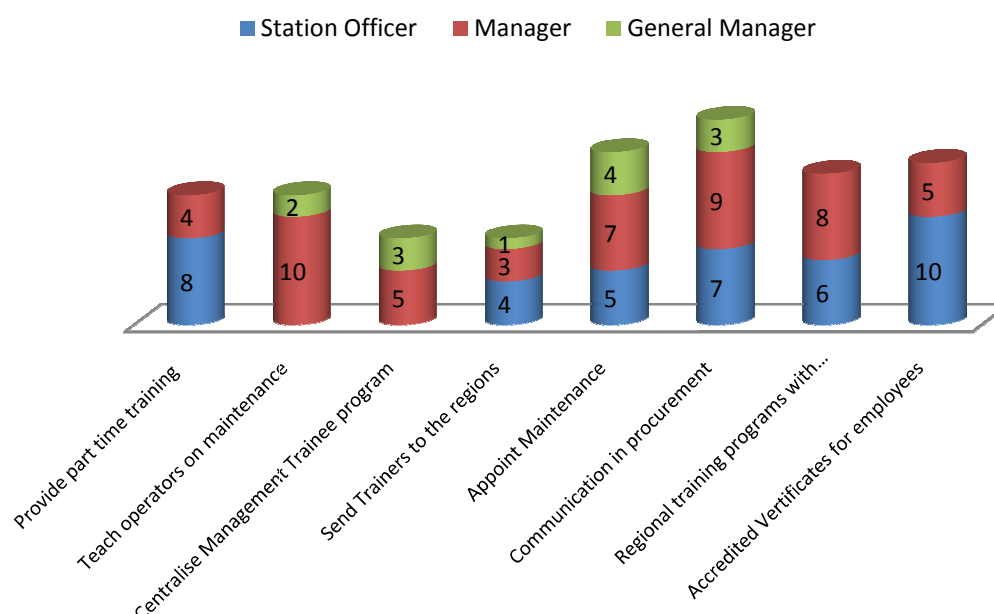
*Provide employees with accredited certificates, giving proof of experience.*

When employees at regional and downwards to operator level are given an accredited certificate, it is possible for them to further educate themselves in their field of expertise. Currently, many employees have no possibilities to study, due to absence of certificates which proof their level of experience.

## 7.4 Conclusion Sub Question 2

Below, an overview of the possible solutions according to regional employees is given. Due to the difficulty of the term Capacity Building and the subjects it handles, regional employees experience difficulties proposing solutions which fit within their perception of this term. Therefore not all identified needs are met with a solution.

**Graph 7-1: Quantitative analysis of proposed solutions for indicated needs regarding Capacity Building**



After the overview above, the given solutions are compared with the identified gaps in the previous chapter, linking the two together. In this table a comparison is made with the solutions given by the regional employees, in regard to the identified gaps.

**Table 7-1: Identified Needs versus proposed solutions from Ghana Water employees**

Field	Identified Needs	Identified Solutions
<b>People</b>	Need for higher level and amount of Skilled People	<i>Not met with solution from Ghana Water employees (possibly Ghana Water Quality Hub)</i>
	Need for Part time Study possibilities	Supply part time training in the field of engineering and chemistry (possibly GWQH)
	Need for accredited Certificates	Create Accredited Certificates with relevant educational institutes (possibly GWQH)
<b>Practices</b>	Maintenance Culture	Give Operators Maintenance Training Allocation of Maintenance to specified department
	Gap in willingness of Knowledge Transfer	<i>Not met with solution from Ghana Water employees</i>
	Gap in Documentation procedures	<i>Not met with solution from Ghana Water employees</i>
	Gap efficiency Management Trainee program	Centralised Management Trainee Programme
	Costs and time for Testing by Ghana Standard Board	<i>Not met with solution from Ghana Water employees (possibly GWQH)</i>
<b>Institutions</b>	Gap of Organizational Set up	Allocation of Maintenance
	Gap in allocation of Funding	<i>Not met with solution from Ghana Water employees</i>
	Need for feedback during Procurement Process	Introduce set feedback moments in Procurement process
	Gap in employees Position vs. number of Trainings	Develop training scheme with contractor at regional level
	Gap in partnership AVRL and GWCL	<i>Not met with solution from Ghana Water employees</i>
	Gap Accountability GWCL	<i>Not met with solution from Ghana Water employees</i>

Concluding from the above presented data, on the field of Persons, the need for more of skilled people was not adequately met with a solution, according to the ideas of Ghana Water employees. The use of a nationwide water quality hub might be of use, which will be discussed in the following chapter. The aspects regarding Study and Certificates will also be viewed at in the next chapter.

The most important need regarding Practices, the maintenance culture, can be decreased with the use of training and changes in organizational set up, which fits the WB description of capacity building. When a training program is developed, which focuses on repetition and periodical checks, a profound base for future maintenance procedures can be formed.

The needs for documentation and knowledge transfer were not met with adequate solutions on the field of training.

The gap regarding management trainees is met with the centralization of the first part of the management trainee program.

The gap of testing by the Ghana Standard Board can be met with a solution regarding the Ghana water quality hub, which will be discussed in the following chapter.

On the aspect of Institutions, the gaps in institutional set up, funding and procurement are partly met with the solutions of allocation of maintenance for the first and improved communication for the latter one. Again the solution has to be found in a change of mentality of the employees of AVRL. The current organizational set up results in a lack of communication regarding funding, as well as a lack in control measurements regarding the spending of budget, down to grassroots level. Due to the position of AVRL, the company can only influence part of the funding and procurement process. This cannot be changed with the use of capacity building.

The gap position vs. Training is met with a solution to decentralise training allocation to the regions, and make programs in cooperation with contractors.

The gaps regarding the accountability of GWCL and the relation between AVRL and GWCL are not met with solutions regarding capacity building. AVRL has little influence in the functioning and processes of this organisation.

Deducting from the above text it can be concluded that several needs are met with feasible solutions to mitigate them, yet other, larger ones are not presented with a clear cut solution. This creates a need for further research and/or the use of a Ghana water quality hub.

## 8 Results Sub question 3

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This chapter will give insight in the feasibility of the Ghana water quality hub, seen from the regional employees of AVRL. This chapter gives an answer to the third sub question, namely;

*What could be the role of a Ghana water quality hub as stated in the 2010 concept note from VEI / GWCL?*

In the table below an overview is given of the gaps identified in the field research and which gaps can be decreased with the use of a water quality hub. The gaps which can be decreased are indicated with an **x**.

**Table 8-1: Gaps decreased by a Ghana water quality hub**

GWQH?	People
<b>x</b>	Gap Skilled People
<b>x</b>	Gap Study
<b>x</b>	Gap Certificates
Practices	
<b>x</b>	Gap Maintenance Culture
	Gap Knowledge Transfer
	Gap Documentation
<b>x</b>	Gap Management Trainee program
<b>x</b>	Gap Testing by GSB
Institutions	
	Gap Organizational Set up
	Gap Funding
	Gap Procurement
	Gap Position vs. Training
	Gap AVRL vs. GWCL
	Gap Accountability GWCL

The above table gives a number of gaps which can be decreased with the use of a Ghana water quality hub. These gaps and the needed actions from the GWQH were discussed below.

### 8.1 Conclusion Sub Question 3

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The gaps on the amount of skilled people, the management trainee program and the maintenance culture can be decreased by the creation of a GWQH where new management trainees are trained in a centralized form before send to the regions. This hub can also be the base of maintenance education teams which can travel to the different regions to educate the employees. With a centre on water quality, partnerships with relevant trainings institutions and universities can be developed, giving trainings and courses to decrease the gap regarding study in the field of chemistry and engineering.

With a central location and equipment to test all parameters regarding water quality, a more independent position can be created for the company of AVRL / GWCL. With a water quality hub it is no longer necessary to perform tests with the use of the Ghana Standards Board. This can lead to a significant reduction in costs. Important aspects of the Ghana water quality hub need to be a business plan which results in a sufficient revenue stream within 5 years, a small scale set up, trainers with a high level of experience and experts on their field of study.

## Conclusion

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After performing the field research, speaking with different employees, visiting different water treatment plants and combining this information into an answer on the three sub questions, an answer can be formulated on the main question, being:

*What needs and suggestions are made by employees of the Ghana Water Company Limited regarding Capacity Building?*

With the definition of the World Bank dividing actions of capacity building in the fields of People, Practices and Institutions, an answer on the main question will be given combining these three elements.

In the field of People and Practices, employees of Ghana Water indicate a clear need for capacity building in the field of maintenance and the number and level of skilled people. These two problems are currently the largest and need to be solved. A possibility for solving these needs could be the development of a Ghana Water Quality Hub. Side projects can be developed to start partnerships with selected universities, to be able to further improve the knowledge level of regional employees. A Ghana water quality hub, as supposed by the concept note of VEI, could supply these facilities. Important aspects, which can be deducted from the different needs, relate to maintenance training, team building and education.

The need for capacity building regarding the aspect of practices was found in the need to further improve knowledge transfer and documentation. Currently the systems to perform these actions are in place, the employees need to be further educated in the need to use them in their most effective way. When employees understand the need to effectively exchange knowledge and information, the circulation of employees is easier, thus improving the level of knowledge throughout the regions. This again regards towards a mentality change. Knowledge management is an aspect which needs to be improved in the companies of Ghana Water and AVRIL.

On a level of institutions, capacity building can be used to improve the traceability in the procurement process. When a request from a regional office is send to head office there should be a possibility for the applicant to get feedback on the progress of his/her request. This was not present at the moment of the research. Organizational changes are needed to be able to track procurement requests, giving regional offices insight in the progress of the procurement. Furthermore, capacity building activities should be used to implement procedures to link funding to specific activities so this can only be used for the execution of these activities. This prevents misuse of funds by unauthorized persons. A procedure should be created were a check is performed regarding the correct use of funds. This creates a higher standard of accountability and improves funding allocation.

Concluding from the above aspects, it can be said that capacity building can be of use to improve certain aspects on regional level. An important role however is needed for the development and planning of these activities, to ensure maximum effectiveness. AVRIL needs to cooperate closely with GWCL to ensure sustainability of these programs. When the above given steps are performed, needs from employees of Ghana Water can be met and help improve the functioning of the Ghana Water Company Ltd. Better functioning of the organisation of Ghana Water results in more potable water and helps the inhabitants of Ghana improving their life.



## Discussion

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During the research certain aspects have come to notice of the researcher, which have had an impact on the research and the effectiveness of the organisation of Ghana Water as a whole. Hereunder these aspects are discussed.

First of all an important aspect is the difference in the way company information is used. In companies in the Netherlands there is an important role for the knowledge that employees of a company have. This knowledge is seen as an important factor to let the company work efficiently and effectively. In Ghana differences can be seen in the way knowledge is treated. In most Dutch companies all important knowledge is shared with other employees in order to create a higher level of effectiveness. Important information is collected and archived in a database, so future projects can be done with knowledge gained in earlier projects. In most cases this knowledge is freely shared with all employees who need such information for their work.

In Ghana a different approach is followed. Contrary to the fact that Ghana has a much lower score on the aspect of individuality, knowledge is hardly shared. Employees of Ghana Water see the knowledge they gain during their work as an important and highly personal asset. They are not keen on sharing this and this has an effect on the organisation. For instance; the distribution manager of the Sunyani office retired, without leaving information on the exact location of important valves in the system. Therefore his successor was unable to close a valve so a major leakage could be stopped. Employees of Ghana Water had to search for the retired manager in order to find the right valve.

A reason for the lack of information sharing is the way promotions are carried out within the organisation of Ghana Water; on personal basis, without a clear system. Within the company there is an important role for connections and knowledge. With the right connections and the right knowledge, people can be promoted and receive a higher salary. Employees of Ghana Water are afraid that information they share may result in less status or importance for them as personalities and the possibility of making mistakes and getting into a conflict, which links with the high scores on masculinity and uncertainty avoidance. When knowledge is shared employees are afraid that they lose their advantage over colleagues and will not receive a promotion.

The result of this fear is that projects often come to a halt due to a lack of knowledge or the unwillingness of sharing information by employees involved. Improving the organisation of Ghana Water becomes more difficult with problems like this. Team work sometimes becomes difficult and can bring work to a preliminary stop, resulting in less water produced and sold, resulting in less money flowing in and an working culture where people see it as even more important to hold on to their knowledge, as promotion become more scarce.

Another important aspect is the importance of Long Term Orientation. During the internship the researcher made a trip past several water treatment plants of Ghana Water and here he experienced a high number of equipment with defects due to lack of maintenance. When asked employees explained that it is not precisely clear who is responsible for this aspect. When equipment breaks down and production can continue, sometimes at a lower rate, low priority is given to the repair. This often results in no repair at all.

The researcher could not find any proof of long term maintenance planning or a clear description of the responsible employees regarding maintenance at the regional offices visited. During the end of the research initiative was taken by AVRIL with the creation of a maintenance team, responsible for training of operators and creating greater awareness for the importance of maintenance.

Overall the researcher concluded that mentality of the workers is an important factor which needs improvement and relates to many needs expressed by employees; team work and a feeling of responsibility. Within the company of Ghana Water and also within AVRIL there are many systems in place to provide a more efficient and effective way of operating, but use of them should be extended. The employees need training on a basic aspect of working in a company; team work. When performing the research it became clear that many

employees don't see the need to cooperate with each other in order to work better. They prefer to work on individual basis, this effects the company in its most important aspect; provide the inhabitants of Ghana with potable water. People take pride in what they achieve but only when they did it on their own. They see it as a less worthy achievement when they reach it with help of others, even when the total result becomes better. This might be related to the high score on Masculinity and Power Distance.

Also the researcher experienced a lack of responsibility for certain aspect of work such as maintenance. Employees of Ghana Water often don't see the effects of their work and therefore don't take their tasks as serious as they should.

With an improvement on team work and responsibility the employees of Ghana Water can work better and more effective, helping the company in the best way they can. When these two aspects are more present the needs and solutions indicated have a higher level of success.

## Recommendations

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To ensure maximum effect of the needed actions in the field of capacity building certain actions need to be taken. This chapter will give recommendations for future actions.

Create a capacity building task force; To ensure the greatest amount of success and sustainability for capacity building programs, it is needed to develop programs which have a profound basis and support from all stakeholders. Therefore it is needed to create a task force which consists of skilled people of all relevant parties, including GWCL, the Ministry of water resources, works and housing, AVRL and others. When programs are based on a wide basis of support, sustainability can be improved enlarging the effect of the developed programs.

Allocate the task of maintenance; Currently, the task of maintenance is not clearly allocated, resulting in poor maintenance and high down time of equipment. When the task of maintenance is clearly allocated, accountability is improved and employees can be trained to perform their tasks. With support of the GWQH, training programs can be developed to improve the level of skills and knowledge on the aspect of maintenance.

Send training teams to the regions; With the creation of capacity building programs it is important to educate the involved employees in their own working environment, thus being able to implement the programs directly into the daily routine. This method is preferred over a centralized training program, improving the effectiveness of these programs.

Development of a Ghana water quality hub; This research identified several needs which can be decreased with the creation and operation of a water quality hub. The Water Quality Hub can function as a centre where trainings and courses are facilitated, together with the testing of samples for AVRL / GWCL, as well as private parties.

Important to mention is that the Ghana water quality hub functions as a tool, not as a sole solution to the earlier identified needs. The Water Quality Hub can only work effective and efficient in combination with the above recommendations. Therefore further research should be performed to develop a sustainable business case.

At this stage the hub could have the form of a small scale department with employees in different fields, such as water quality, production and finance. This centre should be able to test all parameters required by the Ghana Standard Board. In addition it should provide a location for a centralised management trainee program, as well as a place where training teams can develop programs which are then rolled out on a regional basis.

In accordance to the research of Miss Sabrina Utech, this centre can also house a department which is responsible for the roll out of the Water Safety Plans to all WTP of Ghana Water. Such a department should not only perform checks but also provide trainings on regional level to educate employees on the benefits of Water Safety Plans.

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## Speech

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- Conversations with *Mr. Nijse*, General Manager Aqua Vitens Rand Limited, October 2010 / December 2010
- Conversations with *Mrs. Utech*, Student Food Process and Technology, October 2010 – December 2010
- Interviews performed during field research, see Annex D: List of Interviewees

## Annexes to Research Report

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## Annex A: Water Quality Compliance 2009 & 2010

NATIONAL SUMMARY 2009			
Ghana Standard Parameters	95% of samples		Compliance index (0.95)
	Analysed	Complying	
<i>pH</i> [6.5-8.5]	96%	97%	<b>0,94</b>
<i>Colour</i> [15Hu]	97%	100%	<b>0,97</b>
<i>Turbidity</i> [5]	93%	99%	<b>0,92</b>
<i>R-Chlorine</i> [0.5mg/L]	97%	88%	<b>0,85</b>
<i>E-Coli</i> [0cfu/100ml]	95%	97%	<b>0,92</b>

NATIONAL SUMMARY 2010						
Ghana Standard Parameters	No of Samples			95% of samples		Compliance index (0.95)
	Target number	Actually analysed	Complying	Analyse d	Complying	
<i>pH</i> [6.5-8.5]	13247	12965	12815	98%	99%	<b>0,97</b>
<i>Colour</i> [15Hu]	11967	11692	11477	98%	98%	<b>0,96</b>
<i>Turbidity</i> [5]	9487	8870	8560	93%	97%	<b>0,90</b>
<i>R-Chlorine</i> [0.5mg/L]	12944	12177	10956	94%	90%	<b>0,85</b>
<i>E-Coli</i> [0cfu/100ml]	2461	2110	2107	86%	100%	<b>0,86</b>

## Annex B: Semi-Structured Interview Set Up

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### *Part A: Introduction*

The introduction part was used by the interviewer to comfort the interviewee, explain what the purpose of the interview was and where the results would be used for. The interviewer gave an introduction about the set up of the research, his personal background and the reason for selecting the interviewee to be part of this research. Also the position and tasks from the interviewee were discussed, to give the interviewer a clear view on the interviewee.

Depending on the situation and the personality of the interviewee, this part will take between 3 and 10 minutes and was done in a formal or informal way, according to the position of the interviewee.

### *Part B: Interview questions regarding the research*

This was the main part of the interview, where the questions will be asked which were needed to answer the research questions. The information collected during this part would not only consist of the answers given to the questions but also of the way which answers are given and the body language used by the interviewee during the answering of these questions.

The following list of questions was used during the interviews, although not all questions were used in each interview. The questions asked depended on the position of the interviewee. These questions do not directly relate to the created sub questions, this has been done on purpose, to be able to crosscheck the answers and identify the needs, proposed solutions regarding Capacity Building and role of a Water Quality Hub.

In your work, what problems do you run into?  
Can you identify the main causes of these problems?  
At what organizational level do these problems arise?

Do you know what is meant with the term Capacity Building?  
Can you link the given problems / needs to this term, if so, how?  
What solutions can you think of regarding these needs?

Do you receive training in any way?  
How often do you get training, and in what form?  
What training would be needed by you / your employees?  
What skills can you identify which are needed by you / your employees?

What, in your opinion is maintenance?  
How is maintenance performed at this moment?  
How can maintenance be improved?

Do you see need for a central water quality and training centre?  
What functions could this centre fulfil?  
In what way can you link these functions to the earlier described needs and solutions?

Which problems do you foresee in the near future (next 2-5 years), and how can they be solved to your opinion?

### *Part C: Ending*

When the questions regarding the position of the interviewee were answered, the interview was ended. The interviewer would thank the interviewee for his / her cooperation and explain what will be done with the gathered information. If necessary an appointment for a follow up meeting was made.

## Annex C: Travel Scheme

Travel to Winneba	Wed 20 October	Hotel Winneba from 20-23 October
Follow up Winneba	Thu 21 & Fri 22 October	
Travel to Inchaban (Takoradi)	Mon 25 October	Hotel Takoradi from 25 – 30 October
Follow up Inchaban	Tue 26 & Wed 27 October	
Follow up Daboase	Thu 28 & Fri 29 October	
Travel to Barekese (Kumasi)	Monday 1 November	Hotel Kumasi from 1 – 4 November
Follow up Barekese	Tue 2 & Wed 3 November	
Travel to Sunyani	Sat 6 November	Hotel Sunyani 6 – 10 November
Follow up Sunyani	Mon 8 & Tue 9 November	
Travel to Dalun (Tamale)	Thu 11 November	Hotel Tamale 11 - 16 November
Follow up Dalun	Fri 12 & Mon 15 November	
Travel to Bolgatanga	Wed 17 November	Hotel Bolgatanga 17-20 November
Follow up Bolgatanga	Thu 18 & Fri 19 November	
Travel to Accra	Mon 22 & Tue 23 November	
Travel to Kpeve	Mon 29 November	Hotel Ho 29 Nov – 2 Dec
Follow up Kpeve	Tue 30 Nov & Wed 1 Dec	
Travel to Kpong	Wed 1 December	
Follow up Kpong	Thu 2 December	Hotel Kpong / Koforidua 6 – 12 December
Travel to Koforidua	Wed 8 December	
Follow up Koforidua	Tue 9 & Fri 10 December	
Travel to Accra	Sun 12 December	
Report Writing	Mon 13 – Thu 23 December	
Report Presentation	Thu 16 December	

## Annex D: List of Interviewees

Some names were not known to the researcher and could not be retrieved afterwards. Instead a question mark is placed.

Region	Position	Name
<b>Ashanti</b>	WQA Manager	Charles Tulashie
	HR Manager	Francis Mensah
	Prod Manager	Francis
	Station Officer Barakese Plant	?
	Station Chemist Barakese Plant	?
<b>Brong – Ahafo</b>	GM	Maxwell Boateng
	HR Manager	Clement Kuukaayeng
	WQA Man	Hanson Mensah-Akuteh
	Production Manager	James Fofyi
	Station Officer Abesim Plant	?
<b>Central</b>	HR Manager	Cletus Amoah
	WQA Manager	Stephen Amihere-Mensah
	Production Manager	Ebemisa Aryee
	Winneba district Distribution Officer	S Asyeman-Mensali
	Station Officer Winneba Plant	Sam Lanyea
	Station Chemist Winneba Plant	Komoso Adams
<b>Eastern</b>	Station Officer Kpong Plant	Samuel Eboa
	Water Quality Kpong Plant	Ismael Said
	Electrical Maintenance Kpong Plant	John Patrick Sallo
	Mechanical Maintenance Kpong Plant	Yaw Edjey
<b>Greater Accra</b>	Managing Director AVRL	Martin Nijse
	General Manager WQA	Evans Balaara
	General Manager HR	Emanuel Opoku
	Weija Station Chemist	Hadisu Alhassan
	Weija Production Officer	Paul Gandaa
<b>Northern</b>	Production Manager	Joseph Azumah
	Station Officer Dalun Plant	?
<b>Upper East</b>	GM	Ken Alberto
	Production Manager	Francis Kweshy
	WQA 2 <sup>nd</sup> in charge	Prince
	Station Officer Vea	Mark Morrison
<b>Volta</b>	GM	Emmanuel Appiah
	WQA Manager Replacement / Production Manager	Philip Dwamane – Boateng
	Station Officer Kpeve Plant	Daniel Gezele
<b>Western</b>	HR Manager	Rafael Gafifie
	WQA Manager	Evans
	Production Manager	Mark Codjoe
	Station Officer Daboase Plant	?
	Station Officer Inchaban Plant	?

## Annex E: Representativeness of Treatment Plants

MONTHLY SUMMARY SHEET		2009											
PRODUCTION TREATED WATER (M3)		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
R01A-S01	Kpong New	5.149.130	4.449.100	5.098.600	4.580.340	4.823.700	4.179.000	4.741.000	4.664.080	4.883.054	4.829.790	4.806.929	4.936.036
R01A-S02	Kpong Old	1.019.607	974.685	1.049.585	993.850	993.927	712.268	966.801	1.005.222	986.328	956.450	895.850	1.045.120
R01A-S03	Weija -Adam Clark	5.499.900	5.080.050	5.523.300	5.271.300	5.280.750	5.080.950	5.394.600	5.501.250	5.106.150	5.611.950	4.700.700	5.749.650
R01A-S04	Weija Candy	646.200	587.700	651.150	1.194.300	323.100	721.800	818.550	836.100	753.750	824.850	773.550	833.850
R01A-S05	Weija -Bamag	559.350	507.150	567.900	465.300	120.150	616.950	532.800	492.300	529.200	635.400	660.600	675.450
R02-S01	Barekese	1.502.000	1.360.000	1.530.000	1.390.000	1.475.000	1.393.184	1.343.112	1.349.528	1.498.808	1.602.864	1.798.000	1.937.000
R03-S01	Daboase	461.294	431.929	414.696	359.446	537.582	654.336	674.975	645.901	646.538	645.858	658.491	692.596
R03-S02	Inchaban	271.471	211.009	229.540	143.484	207.174	238.062	266.319	293.152	308.921	300.241	274.251	248.747
R04-S04	Winneba	199.835	198.170	232.427	215.135	210.990	180.274	191.606	175.539	191.042	217.987	219.752	202.266
R05-S09	Koforidua Municipal	148.748	122.858	159.913	132.219	153.333	168.873	159.160	162.997	183.292	163.540	148.039	109.194
R06-S01	Dalun / Nawuni (Tamale)	1.101.883	678.991	977.720	1.001.581	1.033.356	890.659	1.004.730	817.616	832.539	855.907	929.819	1.032.356
R07-S01	Kpeve	270.391	272.230	289.446	264.412	293.782	252.968	280.959	290.060	259.943	245.121	262.487	273.961
R08-S01	Abesim	215.318	183.281	209.591	199.737	210.806	204.379	205.569	214.081	197.135	212.694	205.008	218.327
R09-S01	Bolgatanga	129.600	126.355	143.612	139.168	139.080	125.851	121.121	124.101	117.272	134.008	134.323	143.485
<b>Treated Water (m3)</b>		17.174.727	15.183.508	17.077.481	16.350.272	15.802.730	15.419.554	16.701.302	16.571.927	16.493.972	17.236.660	16.467.799	18.098.038
<b>Nationwide Treated Water ( m3)</b>		20.268.843	17.770.067	19.898.208	19.023.262	18.362.893	18.141.528	19.595.247	19.474.011	19.438.303	20.085.614	19.419.823	21.159.509
<b>Representativeness</b>		<b>84,73%</b>	<b>85,44%</b>	<b>85,82%</b>	<b>85,95%</b>	<b>86,06%</b>	<b>85,00%</b>	<b>85,23%</b>	<b>85,10%</b>	<b>84,85%</b>	<b>85,82%</b>	<b>84,80%</b>	<b>85,53%</b>

MONTHLY SUMMARY SHEET		2010											
PRODUCTION TREATED WATER (M3)		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
R01A-S01	Kpong New	4.932.043	4.393.236	4.820.409	4.757.765	4.906.946	5.016.973	5.180.246	4.917.784	4.702.978	4.461.476	0	0
R01A-S02	Kpong Old	1.066.174	881.264	982.840	948.932	974.502	1.007.116	1.017.750	911.604	913.166	921.381	0	0
R01A-S03	Weija -Adam Clark	5.830.200	4.035.600	4.464.000	5.252.850	5.185.800	4.594.091	4.907.728	5.424.546	5.400.001	5.111.364	0	0
R01A-S04	Weija Candy	850.950	725.850	786.600	1.574.100	822.150	703.636	745.455	839.546	808.636	757.273	0	0
R01A-S05	Weija -Bamag	722.250	590.400	638.550	673.200	704.250	487.455	560.000	591.364	640.000	605.909	0	0
R02-S01	Barekese	1.946.000	1.503.000	2.306.000	2.194.000	2.275.000	2.267.000	2.235.000	2.581.000	2.476.000	2.653.000	0	0
R03-S01	Daboase	662.522	643.712	754.736	664.382	647.246	679.943	674.701	724.779	592.580	608.456	0	0
R03-S02	Inchaban	189.255	110.863	129.174	127.412	99.175	167.025	297.858	263.706	202.154	224.790	0	0
R04-S04	Winneba	215.349	208.555	224.032	215.013	204.005	177.314	206.950	212.954	199.010	218.237	0	0
R05-S09	Koforidua Municipal	359.933	10.536	44.143	57.549	70.024	46.664	13.412	37.676	4.163	1.200	0	0
R06-S01	Dalun / Nawuni (Tamale)	1.067.368	833.225	1.155.155	1.074.068	993.836	888.285	938.114	878.727	887.334	948.757	0	0
R07-S01	Kpeve	296.914	254.725	292.106	296.763	299.163	277.274	312.581	301.287	280.400	270.439	0	0
R08-S01	Abesim	215.318	183.281	209.591	211.013	213.252	214.387	212.332	211.240	209.991	219.753	0	0
R09-S01	Bolgatanga	149.357	126.269	138.880	126.690	112.398	122.334	120.113	131.549	131.322	144.047	0	0
<b>Treated Water (m3)</b>		18.503.633	14.500.516	16.946.216	18.173.737	17.507.747	16.649.498	17.422.240	18.027.761	17.447.735	17.146.082	0	0
<b>Nationwide Treated Water (m3)</b>		21.813.784	17.489.366	20.048.108	21.045.181	20.637.521	19.529.705	20.602.416	21.181.543	20.632.469	19.961.306	-	-
<b>Representativeness (%)</b>		<b>84,83%</b>	<b>82,91%</b>	<b>84,53%</b>	<b>86,36%</b>	<b>84,83%</b>	<b>85,25%</b>	<b>84,56%</b>	<b>85,11%</b>	<b>84,56%</b>	<b>85,90%</b>	<b>#DEEL/0!</b>	<b>#DEEL/0!</b>

## Annex F: Cultural Dimensions of Hofstede

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*Power Distance Index (PDI)* that is the extent to which the less powerful members of organizations and institutions (like the organization they work in) accept and expect that power is distributed unequally. This represents inequality (more versus less power), but defined from below, not from above. It suggests that a society's level of inequality is endorsed by the followers as much as by the leaders. Power and inequality, of course, are extremely fundamental facts of any society and anybody with some international experience will be aware that 'all societies are unequal, but some are more unequal than others'.

Often, in societies with a high power distance, the more powerful have privileges which the less powerful lack. This creates a high dependence of the less powerful towards the more powerful. A clear example can be seen within companies, where countries with a high PDI have a organization based on strong hierarchy, in contrary to countries / companies in low PDI areas, where experience counts as much as position.

*Individualism (IDV)* on the one side versus its opposite, collectivism, that is the degree to which individuals are integrated into groups. On the individualist side we find societies in which the ties between individuals are loose: everyone is expected to look after him/herself and his/her immediate family. On the collectivist side, we find societies in which people from birth onwards are integrated into strong, cohesive in-groups, often extended families (with uncles, aunts and grandparents) which continue protecting them in exchange for unquestioning loyalty. The word 'collectivism' in this sense has no political meaning: it refers to the group, not to the state. Again, the issue addressed by this dimension is an extremely fundamental one, regarding all societies in the world.

People living in societies with a high score on Individualism tend to have more private opinions as where low Individualism countries have an opinion as a group, not as an individual. When a person in a low Individualistic country is punished for done deeds, this will be seen as loss of "face" and shame for the entire family. When in highly individual societies something similar occurs, the person involved will experience loss of self-respect, but this will only imply him/her, not the other family members/ group members.

*Masculinity (MAS)* versus its opposite, femininity refers to the distribution of roles between the genders which is another fundamental issue for any society to which a range of solutions are found. The IBM studies revealed that (a) women's values differ less among societies than men's values; (b) men's values from one country to another contain a dimension from very assertive and competitive and maximally different from women's values on the one side, to modest and caring and similar to women's values on the other. The assertive pole has been called 'masculine' and the modest, caring pole 'feminine'. The women in feminine countries have the same modest, caring values as the men; in the masculine countries they are somewhat assertive and competitive, but not as much as the men, so that these countries show a gap between men's values and women's values.

In masculine societies the dominant values differ from those in more feminine societies, where caring for others and quality of life are important. In masculine societies there is a bigger presence of the need to achieve and be successful.

With a feminine society, there is a more consensus-orientated approach towards problems, as where in masculine societies there is a drive for competitiveness, the live in order to work, not work to live.

*Uncertainty Avoidance Index (UAI)* deals with a society's tolerance for uncertainty and ambiguity; it ultimately refers to man's search for Truth. It indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. Unstructured situations are novel, unknown, surprising, and different from usual. Uncertainty avoiding cultures try to minimize the possibility of such situations by strict laws and rules, safety and security measures, and on the philosophical and religious level by a belief in absolute Truth; 'there can only be one Truth and we have it'. People in uncertainty avoiding countries are also more emotional, and motivated by inner nervous energy. The opposite type, uncertainty accepting cultures, are more tolerant of opinions



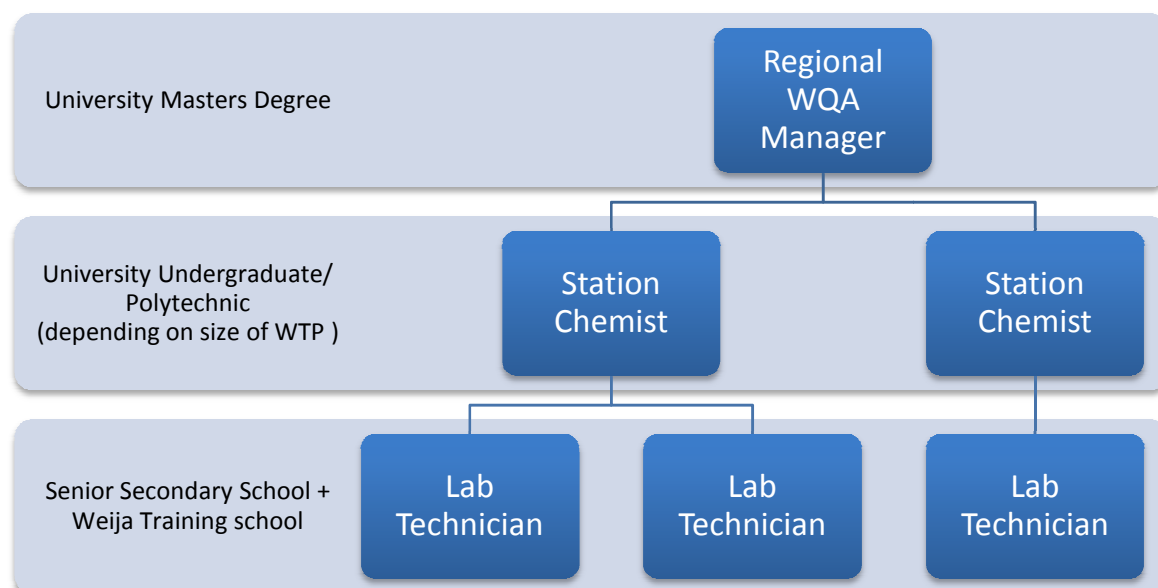
different from what they are used to; they try to have as few rules as possible, and on the philosophical and religious level they are relativist and allow many currents to flow side by side. People within these cultures are more phlegmatic and contemplative, and not expected by their environment to express emotions.

The countries with a low score on the UAI tend to have a more relaxed approach towards situations; there is a lower stress level. This is in contrary with a country or society which scores high on the UAI; there is an inner urge to work hard, which is accompanied with higher stress levels. Showing your emotions is a common thing in these societies, but conflict is a threat, so there is a high need for agreement. In societies with low UAI the showing of emotions is not seen a common, and there is an acceptance of dissent. The flexibility is higher, in opposite to societies with a high level, which has a high need of avoiding failure.

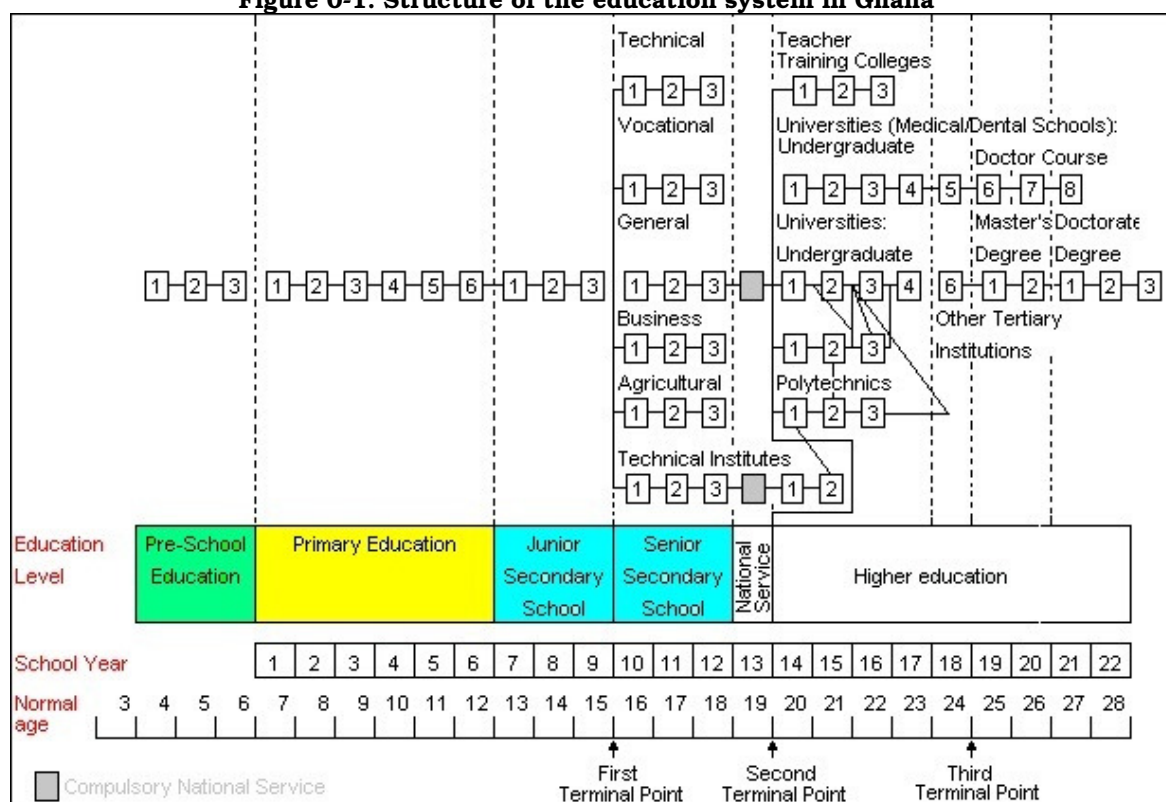
*Long-Term Orientation (LTO)* versus short-term orientation: this fifth dimension was found in a study among students in 23 countries around the world, using a questionnaire designed by Chinese scholars. It can be said to deal with Virtue regardless of Truth. Values associated with Long Term Orientation are thrift and perseverance; values associated with Short Term Orientation are respect for tradition, fulfilling social obligations, and protecting one's 'face'. Both the positively and the negatively rated values of this dimension are found in the teachings of Confucius, the most influential Chinese philosopher who lived around 500 B.C.; however, the dimension also applies to countries without a Confucian heritage.

The countries with a high level of LTO seem to be able to change traditions according to new surroundings. They tend to be able to see solutions changing in accordance to a change in time, context and situation. Societies which do not have this way of thinking, a more Short Term Orientation is presented, seem to be more normative in their thinking, they tend to have a focus on short term results. They have a need to find the "absolute truth", whereas LTO societies believe in many truths, according to the situation or time.

## Annex G: Educational Background at regional Level regarding WQA

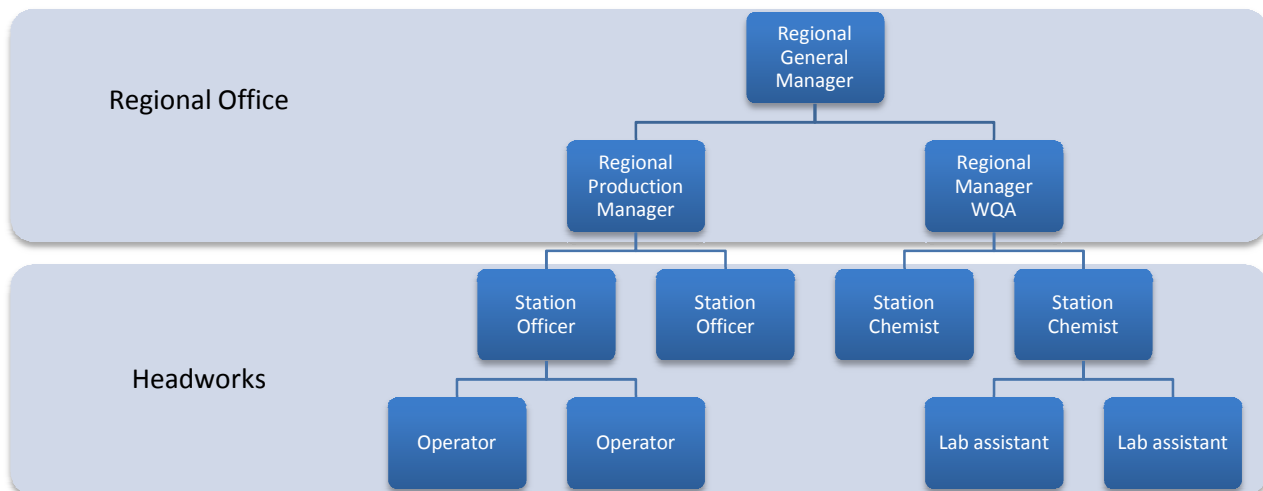


**Figure 0-1: Structure of the education system in Ghana**



Source: <http://www.ibe.unesco.org/en/worldwide/unesco-regions/africa/ghana/profile-of-education.html>

**Figure 0-2: Organizational Set up at regional level**



## Annex H: Summary of Vitens Concept Note

<b>Information on Applicant</b>	
<i>Name of applicant:</i>	<b>Vitens-Evides International</b>
<i>Nationality of applicant</i>	Dutch
<i>EuropAid ID number<sup>1</sup></i>	NL-2010-BTO-1603224830
<i>Registration Number (or equivalent)</i>	KvK 081.34.161
<i>Date of Registration</i>	06/04/2005
<i>Place of Registration</i>	Apeldoorn
<i>Official address of Registration</i>	Van Deventerlaan 10, Utrecht
<i>Country of Registration</i>	The Netherlands
<i>Title of the action</i>	Capacity Building in Water Quality Monitoring and Surveillance for Ghana
<i>Location of the Action</i>	Ghana
<i>Beneficiary Partner 1</i>	Name: Ministry of Water Resources, Works and Housing Nationality: Ghana Type of actor: ACP national government
<i>Beneficiary Partner 2</i>	Name: Ghana Water Company Limited Nationality: Ghana Type of actor: ACP water operator
<i>Implementing Partner 1</i>	Name: International Water Association (IWA) Nationality: International Type of actor: Water Sector Organisation
<i>Supporting Partner 1</i>	Name: CONIWAS Nationality: Ghana Type of actor: ACP Non State Actor
<i>Supporting Partner 2</i>	Name: Water Resource Commission (WRC) Nationality: Ghana Type of actor: ACP National Government
<i>Supporting Partner 3</i>	Name: Public Utility Regulatory Commission (PURC) Nationality: Ghana Type of actor: ACP National Government
<i>Supporting Partner 4</i>	Name: Ghana Standards Board (GSB) Nationality: Ghana Type of actor: ACP National Government
<i>Total eligible cost of the action (A) in €</i>	€ 1,137,000
<i>Amount requested from the European Commission (B) in €</i>	€ 822,000
<i>% of total eligible cost of action (B/A x 100)</i>	72.3%
<i>Total duration of the action in months:</i>	30

<sup>1</sup> This number is allocated to an organization which registers in PADOR. For more information and to register, please visit [http://ec.europa.eu/europeaid/online-services/pador/index\\_en.htm](http://ec.europa.eu/europeaid/online-services/pador/index_en.htm)

The action proposed, establishes a partnership for capacity building for a sustainable national water quality testing, monitoring and surveillance centre in Ghana.

### **Relevance of the Action**

#### *Relevance to the Ghanaian water sector*

In Ghana, the theme of this year's World Water Day celebration 'Clean Water for a Healthy World' emphasized the need to shift more attention towards the issue of water quality as a complement to physical coverage rates. Water quality monitoring is in Ghana a critical issue for review and consideration to the attainment of the Millennium Development Goals (MDGs). Since 2006, the national urban Ghanaian water provider Ghana Water Company Limited (GWCL) has been working in partnership with Aqua Vitens Rand Water Limited (AVRL) to develop a.o. the capacities of the Ghanaian water testing laboratories, coupled to a parallel process involving the establishment of a Water Safety Planning methodology. Both activities aimed at ensuring that consumers are provided with good quality water for drinking. However, these improvements have always been constrained by wider resource gaps. Current laboratory infrastructure (at regional and treatment plant level) is in a poor condition to conduct reliable tests for raw water quality, treatment plant process control, and monitoring water in the distribution system. As a result the capacity of both laboratory facilities and laboratory personnel are limited and need support to meet local standards and best practice thresholds of performance.

This concept note directly aligns to the needs identified by GWCL to improve water quality analysis and surveillance in water services management. The concept note proposal, specifically addresses the need for a well functioning laboratory infrastructure within GWCL; for adequately trained technical staff familiar with best practices, suitable quality testing protocols, parameters and technologies, and the initiation of a process that will lead ultimately to the accreditation of laboratory services in-house. Additionally, upgrading laboratory services at GWCL will serve other sectors in Ghana requiring water quality surveillance, monitoring and testing services (such as bottled water companies, or the mining industry). In this respect, the proposal will not exclusively deal with water quality testing for water supplies alone, it will additionally make a valuable contribution to extending awareness with the public at large regarding drinking water and environmental water resource quality. The spin-off from such actions is to stimulate the economy through greater economic productivity. The impact of industrial (mining) and agricultural activities on the quality of water resources is herewith acknowledged. The ultimate goals and outcomes anticipated from the project include: contributing to a healthy population, especially the vulnerable in society; more cost effective operations of treatment plants; and creation of awareness of water quality throughout the population.

#### *Relevance to Specific Objective and Purpose of this Call for Proposals*

The proposed GWCL water quality hub establishes a partnership between Northern partners (a Dutch utility and an international knowledge association) and Southern partners (the local utility, and the relevant local State and Non-State Actors). The partnership provides the foundation of a process to ensure all regional and plant level laboratories improve the quality of water sampling, analysis and surveillance work. The expected features and sustainable actions from this project will include:

- Well trained and motivated staff: staff will be trained on appropriate techniques in water testing and laboratory management, commensurate with the local standards and practices;
- Suitably equipped laboratory: comprehensive laboratory equipment, suitable to ensure a wide range of testing parameters can be achieved, will be installed to replace obsolete or redundant equipment;
- National focus: a suitably equipped and accredited laboratory will be national in nature, providing services to both public and private sectors;
- Independence: it is expected that the laboratory will, in time, become independent of the parent organisation or subsidiary of GWCL/AVRL, having its own income stream and expenditure;
- Community involvement: to generate interest and create awareness on issues that border on water quality, school, community and youth groups will be

encouraged to visit laboratories for awareness raising purposes. Groups will learn about basic water surveillance and water testing through a 'Know your Drinking Water' programme. A school children's programme will be coupled to this community outreach, and will be championed by the International Water Association (IWA) through its existing 'World Water Monitoring Day' programme.

#### *Contribution of the project to water sanitation strategies and programmes*

Water is a cross-cutting element of the Growth and Poverty Reduction Strategy (GPRS II) of the Ghana and is linked to all eight of the MDGs. The National Water Policy of Ghana captures clearly the need to increase the coverage of drinking water supply nationally with special emphasis on the urban water-poor who pay more for water supply services whilst receiving poor water quality. This project is consistent with the sector activities of the Water and Sanitation Sector Monitoring Platform (WSMP) which coordinates and monitors the activities of all stakeholders in water and sanitation. The proposal will embark on an ambitious re-positioning of the current water laboratory infrastructure of GWCL, moving it closer to a water quality 'hub' providing (advisory) services to GWCL, and other interested partners within Ghana. The inclusion of IWA and NGOs to community awareness raising (school, community and youth groups) education activities, and online monitoring services through the World Water Monitoring Day programme provides added value to this ambition.

#### *Involvement of local Non-State Actors (NSAs)*

The Coalition of NGOs in Water and Sanitation (CONIWAS) of Ghana - the main coordination body for all local NGOs - is assertive of its support to this project. These NGOs (including ProNet, TREND, and SWITCH) are eager to act as supporting partners for the project; assisting in dissemination of information, creating awareness and being involved in wider advocacy efforts. In consultative sessions, developing the concept note, the stakeholder NGOs in the Ghanaian water sector showed their interest and dedication to ensure that consumers (especially the poorest community members and most vulnerable) have access to good quality water, and to support actively the capacity building to ensure water quality testing and monitoring. There is co-financing the project by VEI, water operator from The Netherlands, Ghana Water Company Limited, and IWA.

### **Description of the action and its effectiveness**

#### *How the mandatory results were selected*

The hub will act as a platform in catalyzing and institutionalising innovation and supporting change in water quality monitoring standards, practices and procedures within Ghana. The capacity development programme is formulated jointly by GWCL, VEI and IWA, and is being intensively discussed with CONIWAS (the forum for NGO coordination) in Ghana. The selection of 'mandatory results' takes into account the needs of the beneficiary partners and maximises the synergy with capacity development initiatives of the GWCL/AVRL partnership. The development of a main water quality 'hub' in Ghana - operating within the constraints of the local context - will focus on the following anticipated outcomes:

- Improved and extended potentials for quantitative and qualitative analyses of water to the level as prescribed in the National Water and Sanitation Policy and in relevant national standards documentation;
- Capacitated GWCL staff with knowledge and expertise to translate analytical results into added value for potable water quality assessment, water treatment plant operations, and water resources/environmental protection;
- Transfer and exchange of newly acquired skills and competences with to-be-established regional water quality centres attached to GWCL;
- Groundwork for an accreditation process of central laboratory facilities;
- A business case for a future outsourcing of water quality testing.

The hub will act as a platform in catalyzing and institutionalising innovation and supporting change in water quality monitoring standards, practices and procedures within Ghana. As such the focus on GWCL does not exclude possible extension of services to other customers. The action leads to the following broader goals:

- Improving health of all citizens through reliable, safe water supplies
- Reducing operational costs for GWLC by optimising standards operating procedures and identifying the best possible [least costly] drinking water source/s
- To protect the wider environment [from poorly performing wastewater treatment facilities] and haphazard small-scale mining activities.

The mandatory results from the action are:

1. Improving skills and competency of laboratory technicians involved in water quality testing;
2. Building the capacity of a series of regional water quality monitoring centres attached to GWCL;
3. Extending community awareness on the relevance of water quality monitoring by incorporating the IWA's World Water Monitoring Day initiative for Ghana.

#### *Synergies with other activities*

The hub concept aligns with both existing Water Safety Planning courses and twinning arrangements between water operators through various Water Operator Partnerships (WOPs), two flagship initiatives being implemented by water operators on a not-for-profit basis as being encouraged and facilitated by UN-Habitat, IWA, CapNet, ONEP and others. Training for laboratory staff will be conducted within the context of AVRIL involvement in the water operations of GWLC according to the current (and possibly extended) World Bank management contract. The proposal will fit exactly to the needs identified by GWCL to improve on water quality in water services management. The current focus on coverage only, as emphasised by the MDG targets needs to be widened in order to achieve full benefits of sector investments and seriously contribute to improved health. The off spin of this may well be a huge stimulus to the economy as human (economic) productivity is rising and extended. The proposal will not exclusively deal with water quality testing for water supplies only, it may as well make a valuable contribution to extend awareness within government and the public at large that environmental caretaking also involves water quality issues and threads in many ways. The impact of industrial (mining) and agricultural activities on the quality of water resources is herewith acknowledged. The proposal embarks on an ambitious re-positioning of the current water laboratory infrastructure of GWCL into the centre of a water hub facility providing (advisory) services to GWCL and other interested parties within Ghana. The inclusion of IWA and NGOs to community awareness raising, (school) education activities and online services to the World Water Monitoring Network is of added value to this ambition.

#### *Description of budget, activities and expected achievements*

The project will begin with an inception phase to explain the details of the proposed activities, the coordination of consortium members and their tasks and time scheduling. At the same time, a network will be established involving all concerned partners in Ghana (governmental, private and NGOs), as well as international partners (VEI, IWA, UN-Habitat etc). The following action plans with the anticipated mandatory results have been identified:

Action Plan	Year 1				Year 2				Year 3		
	Q1	2	3	4	Q1	2	3	4	Q1	2	3
Mandatory Result 1											
<b>1a Detailed Training Needs Assessment</b>	x	x	x								
<b>1b Vocational Training</b>				x	x	x	x	x	x	x	x
<b>1c Exposure visit</b>					x				x		
Mandatory result 2											
<b>2a Prepare detailed procurement plan</b>	x	x	x								
<b>2b Procurement</b>				x	x	x	x	x			
Mandatory Result 3											
<b>3a Development of SOP's</b>	x	x	x								
<b>3b Regional dissemination and training</b>				x	x	x	x	x	x	x	x
Mandatory Result 4											
<b>4a Website and study material development</b>	x	x	x								



4b Case study description					X	X	X	X			
4c Integration of feasible business case									X	X	X

**Mandatory result 1:** Improved capacity in laboratory skills

This action aims to develop capacity (knowledge, skills and attitude) within the central water laboratory staff of GWCL as to how to effectively organise a water monitoring system and perform basic water testing according to Ghana's Drinking Water Standards.

**Mandatory result 2:** Central laboratory of GWCL well equipped

This component intends to supplement the main GWCL laboratory with additional services and equipment to run basic water testing protocols (microbiological, chemical). At the end of the project period the central laboratory is able to conduct all water testing needed to fulfil all requirements for GWCL, to assist regional water operators, and to guide valuable environmental/water protection schemes.

**Mandatory result 3:** Establishment of regional water quality monitoring centres attached to GWCL

The Central Water Laboratory ('water hub') will extend and transfer their acquired skills and competences to regional water quality monitoring centres in order to provide onsite basic services on water quality testing according to Ghanaian standards. This will ensure safe and potable water supplies to people and contribute to cost-effective water operations within GWCL.

**Mandatory result 4:** Awareness raising on the importance of water quality within the Ghanaian society

To ensure the sustainability of the action proposed it is critical that the -to be established- water quality hub is a viable business case, being able to operate autonomously and independently. Therefore, we incorporate within the work plan activities to develop this viable business case, including calculation of external and internal tariffs, and the proposition of a business case to the relevant supporting partners of the project.

## **Roles of partners**

**Beneficiary partners** comprise the two key actors in the field of water quality management in Ghana, e.g. the water operator Ghana Water Company Ltd, and the policy maker, the Ministry of Water Resources Works and Housing (MWRWH).

**Implementing partners** comprise two international parties. As an applicant, the Dutch water utility Vitens-Evides International (VEI) has established over the years a long track record in similar capacity building efforts worldwide. The laboratory facilities of VEI in the Netherlands form the largest European Water laboratory with a wealth of expertise and best practices. The other international partner, the International Water Association (IWA), is the global network of 10,000 water professionals spanning the continuum between research and practice and covering all facets of the water cycle.

**Supporting partners** of the action proposed, comprise of the main enablers in the institutional environment for the success of the project, e.g. the Water Resources Commission, the regulator Public Utility Regulatory Commission and the Ghana Standards Board. The local implementing partner is CONIWAS that is the main coordination body for all local Ghanaian NGOs.

## **Sustainability of the action**

*The main preconditions, assumptions and risks of the actions*

Main preconditions, assumptions and risks, before the start-up and during the implementation of the project and how these can be managed are presented in the table below:

Pre-conditions and assumptions	Risks	Risk mitigation measures
Trained staff of GWCL stay on board in spite of their increased potentials on the labour market	Trained staff may leave GWCL	Conduct special laboratory staff appraisals for job satisfaction Job description, evaluation of performance and competitive grading
Accreditation of the Ghana Water Central Laboratory is appreciated and supported by the Ghanaian Government	No commitment and care taking for the established laboratory improvements	Ghanaian legislation has assigned GWCL to provide water services Consumers' complaints create pressure to GWCL to improve performance. Engage MWRWH on the accreditation issue
Financial resources are provided to cover operational cost of the laboratory services	Equipment standing idle in the newly furnished central GWCL laboratory	Thorough commitment of director and management teams in purpose and requirements of capacity development Performance evaluations in place
The continuation of the partnership relation between GWCL and AVRL.	Conflict of interest may arise	Duration of the action proposed condensed to 30 months only Commitment of GWCL demonstrated by financial support to the project.

#### *Sustainability of Mandatory Results*

VEI and its implementing partner Ghana GWCL recognize that capacity development in water quality monitoring and surveillance is of utmost importance to the consumers of water, to the water operators of Ghana Water, and to the Ghanaian environment. This programme aims to address all these by enhancing the capacity of GWCL (laboratory) staff, by embedding water quality advisory services within the operations of Ghana Water, by raising community awareness on water quality, and by establishing a business case for the possible future creation of an autonomous accredited National Water Quality Laboratory. The achievements are maintained as a permanent asset because

The capacity is fully embedded within the Ghanaian government, its legislation and institutions. In this regard the governmental supporting partners (the Water Resources Commission, the Public Utility Regulatory Commission, and the Ghana Standards Boards) play a key role.

There is full commitment of GWCL to the project objectives as demonstrated by their contribution in cash and in kind.

Water Quality is recognized by the Ministry of Water Resources Works and Housing as a valuable asset to strengthen the water sector of Ghana towards the attainment of the MDGs, with particular reference to MDG Goal 7: environmental sustainability.

The project will take place in line and in harmony with the current Management Contract (MC) of Ghana Water Company Limited (Grantor) with AVRL (Operator)