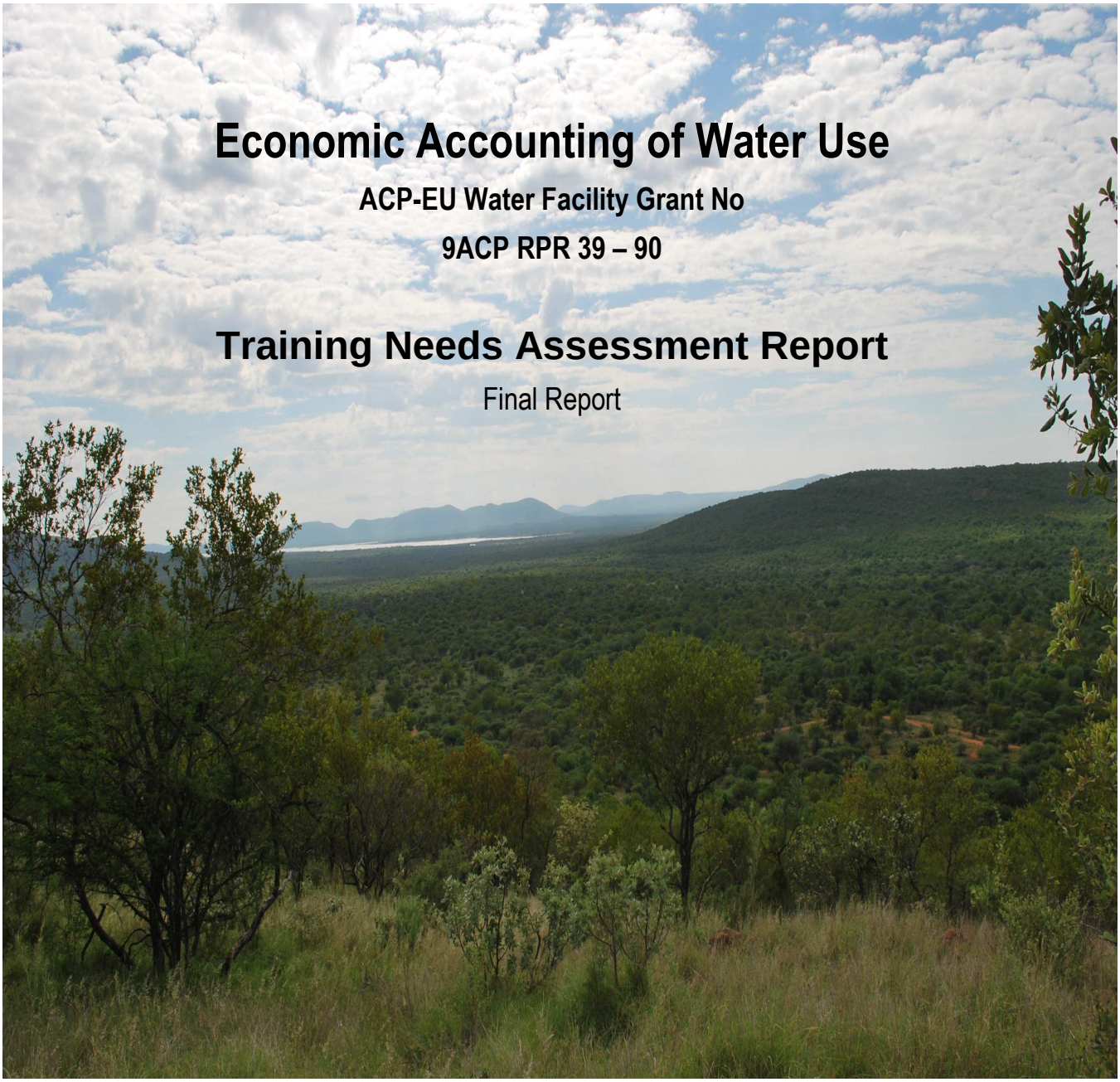
European Development Fund



Economic Accounting of Water Use

ACP-EU Water Facility Grant No

9ACP RPR 39 – 90

Training Needs Assessment Report

Final Report

September 2010

Commissioned by: Federal Ministry for Economic Cooperation and Development

In Delegated Cooperation with: UKaid from the Department for International Development

Global Water Partnership Southern Africa

SADC Economic Accounting of Water Use Project

Training Needs Assessment Report

Produced by the project consultant Egis Bceom International

Funded 75% by the European Union and 25% by the Transboundary Water Management Programme in SADC which is implemented by GTZ and funded by the German and British Governments

SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

EUROPEAN DEVELOPMENT FUND

ECONOMIC ACCOUNTING OF WATER USE PROJECT

ACP-EU Water Facility Grant No
9 ACP RPR 39 – 90

Training Needs Assessment Report

FINAL

Prepared For SADC

by

Dr Mampiti Matete

Egis Bceom International

Acknowledgements

This report was prepared for SADC by Egis Bceom International. The report is one of the products of SADC's regional project on "Economic Accounting of Water Use". The report was compiled by Ms Inviolata Vhevha and Dr Mampiti Matete who are Training Needs Assessment and Capacity Building Experts, respectively, for Egis Bceom International team of consultants. Egis Bceom International greatly appreciates support from the PSC members; professionals from the Departments of Water, Environment, Statistics and Economic Planning; Capacity Building Institutions and Key Informants from the member states who responded to questionnaires during this assessment. The assessment would not have been complete without their valuable inputs.

Egis Bceom International greatly appreciates the guidance of Mr Dumisani Mndzebele, SADC EAWU Project Manager and Miss Caroline Ketshabile (Program Assistant, Egis Bceom International) who provided the much needed logistical support that made the production of this report possible.

Egis Bceom International greatly appreciates the guidance of Mr Dumisane Mndzebele (Project Manager, SADC), Mr Phera Ramoeli (Senior Programme Officer, SADC), Mr Christmas Maheri (RSAP Coordinator, SADC), Mr Peter Qwist-Hoffmann (Capacity Development Advisor, GTZ Transboundary Water Management in SADC), Mr Thomas Farrington (Advisor to the RAO, Programme Implementation, SADC), and Mr Andrew Takawira (Regional Project Manager, GWP-SA).

Miss Caroline Ketshabile (Program Assistant, Egis Bceom International) provided the much needed logistical support that made the production of this report possible.

Lastly, but certainly not least, Egis Bceom International gratefully acknowledges the financial support of the European Commission and the German and British Governments through GTZ in making the capacity building efforts in this project possible.

Contents

Acronyms

EAW	Economic Accounts for Water
EAWU	Economic Accounting for Water Use
EU	European Union
ICM	Integrated Committee of Members
IWRM	Integrated Water Resources Management
IWSD	Institute of Water and Sanitation Development
PSC	Project Steering Committee
RISDP	Regional Indicative Strategic Development Plan
RSAP	Regional Strategic Action Plan
RWP	Regional Water Policy
RWS	Regional Water Strategy
SADC	Southern African Development Community
TNA	Training Needs Assessment
UNSD	United Nations Statistics Division

Executive Summary

The Training Needs Assessment is part of the SADC EAWU project financed by the ACP-EU Water Facility, the European Union (EU) and the German and British Governmenst (through GTZ). The project is part of SADC Regional Strategic Action Plan (RSAP) on Integrated Water Resources Management (IWRM) and Development. It is being implemented under the framework of the Regional Water Policy (RWP) and Regional Water Strategy (RWS), guiding documents which are aimed at facilitating the implementation of the Regional Indicative Strategic Development Plan (RISDP), the blueprint of the SADC's development initiatives. The project is essentially a component of project number RWR 4 (Support for Strategic and Integrated Water Resources Planning), as classified in the revised RSAP which was approved by the Integrated Committee of Ministers (ICM) in 2005. The project strategic objective is to promote the appropriate valuing of the water resource and its use in SADC Member States, build the necessary capacity to undertake the activity and help promote optimal water use and allocation, and strategic investments in the water sector. Whilst SADC has embraced the concept of promoting economic accounting, member states have varying capacity to implement the project.

The primary objective of the assessment was to identify the skills gap towards compiling the Economic Accounts for Water (EAW) in SADC member states. Specifically:

- Determine whether any training is required
- Determine areas in which training is needed
- Determine the extent of the gap to be bridged
- Determine the desired training outcomes
- Provide a basis for monitoring and evaluating skills in EAWU in the SADC region
- Identify possible training institutions

Data was collected from institutions with potential for compiling the accounts, namely, the departments of Water, Environment, Statistics and Economic Planning and professionals working in these institutions, who collect or generate information that is critical for the accounts. Information was also collected from training institutions with potential in building capacity in the necessary skills for the compilation of the accounts. Key information collected included capacity of the institutions and professionals to compile the accounts as well as capacity for training institutions to build capacity in Economic Accounting for Water. Collected information was largely analyzed through descriptive statistical analysis.

The results revealed that the concept of economic accounting for water is relatively new and most professionals in the interviewed departments were not conversant with the concept. While the professionals working in the interviewed departments have high academic qualifications, ranging from first to PhD degrees, they were found not to be skilled in the compilation of the economic accounts for water. Also, capacity in the respective departments in terms of equipment was found to be weak for the accounts compilation. With respect to capacity building, training institutions in member states were found to have potential for building skills in the development of the accounts.

On the basis of these findings, it was recommended that training in all components of the accounts, viz, the Asset, Quality, Physical Supply and Use, Emission and Hybrid Accounts as well as the concept of value and valuation methods, is required and that the training requirements can be met through non- and academic trainings as follows:

- Short-term (1 week)
- Medium term (3 weeks)
- Long-term (academic training)

The proposed training was recommended for decision and policy makers, mainly for sensitization and awareness creation; professionals working in the water sector for appreciation and skills development and for those who want to build careers in economic accounting for water, for long-term sustainability of skills in compiling the accounts.

For this training to be effective it was recommended that a training manual be developed which will help provide guidance on the development of the accounts and that member states should commit fiscal budget towards purchase of the necessary equipment and training. Since some countries have already started compiling the accounts, it was further recommended that training could also be done through exchange programs between counties.

1. Introduction

Economic Accounting of water is a fast growing concept in the water resources management sector because the available water is deteriorating in both quantity and quality. Under these circumstances water use has to be done in consideration of economic principles and hence the need for compilation of water accounts. The compilation of these accounts requires coordination and collaboration between several government departments which include ministries related to water, agriculture, statistics, economics, local government and health. In nations where water accounting has not been introduced these ministries have been doing their traditional roles in manner which is not deliberately aimed at economic accounting of water. Advances in implementation of water accounting in such nations therefore face capacity challenges in the ministries and organizations that provide inputs to these accounts.

SADC is implementing a project on Economic Accounting of Water Use (EAWU) Project which is part of its Regional Strategic Action Plan (RSAP) on Integrated Water Resources Management and Development. It is being implemented under the framework of the Regional Water Policy (RWP) and Regional Water Strategy (RWS), guiding documents which are aimed at facilitating the implementation of the Regional Indicative Strategic Development Plan (RISDP), the blueprint of the SADC's development initiatives. The project is essentially a component of project number RWR 4 (Support for Strategic and Integrated Water Resources Planning), as classified in the revised RSAP which was approved by the Integrated Committee of Ministers (ICM) in 2005. The project strategic objective is to promote the appropriate valuing of the water resource and its use in SADC Member States, build the necessary capacity to undertake the activity and help promote optimal water use and allocation, and strategic investments in the water sector. Whilst SADC has embraced the concept of promoting economic accounting, member states have varying capacity to implement the project.

The project is financed by the ACP-EU Water Facility. The European Commission (EC) undertook to finance a maximum of 75% of the estimated total eligible costs. The German and British Government (through GTZ) agreed to provide a 25% contribution, to specifically fund activities of a capacity building nature, regional stakeholder workshops and Project Steering Committee (PSC) meetings.

The use of the economic accounting of water within the SADC region has been limited. The few countries which have tried to produce water accounts are South Africa, Botswana and Namibia. The concept of EAWU has been largely propelled from the United Nations Statistics Division which now requires all nations to provide data on the water use and the associated economic returns and environmental costs.

In preparation for regional implementation of the Economic Accounting of Water a Training Needs Assessment (TNA) was conducted in the SADC region with a view to identify the gaps and provide a list of institutions which can provide specialized training to cover the gaps. This report presents the findings of the TNA which was done in the SADC region and is organized in four sections. The next section presents the TNA objectives and approach followed in conducting the assessment. Section three discusses the TNA findings and the report concludes, with recommendations, in Section 4.

2. Objectives of the TNA

The training needs assessment is aimed at determining the gap in capabilities of institutions and individuals responsible for developing EAWU and identifying SADC training institutions that can help bridge the identified gap. This in essence involves carrying the needs assessments among the departments of water, environment and central statistics, which are considered as key in the development of EAWU. The basis of the assessment was the types of accounts required for producing water accounts as stipulated by the United Nations Statistics Division handbook on economic accounting for water (UNSD, 2006).

Training need exists when there is a gap between what is required for a person to perform a given task competently and what the person actual knows. A training needs assessment is therefore a method of determining if training need exists and how that need can be satisfied. Carrying out EAWU in the SADC region involves professionals with various backgrounds and at various levels of seniority. Consequently, the expectations of knowledge, skills and ability for these officers vary. Some of the experts required for constructing water accounts are civil engineers, economists, statisticians, water resources managers and environmentalists. The training needs assessment involved an overview of the training institutions available to these professionals.

The purpose of carrying out the needs assessment was to validate the hypothetical judgements with actual training needs to ensure that the proposed training addresses needed subjects. This allows effectiveness since this way resources, time and effort is focussed towards targeted solutions.

The specific objectives of the TNA were to:

- Determine whether any training is required
- Determine areas in which training is needed
- Determine the extent of the gap to be bridged
- Determine the desired training outcomes
- Provide a basis for monitoring and evaluating skills in EAWU in the SADC region
- Identify possible training institutions

The results of the TNA were aimed at highlighting needs to be bridged and thus assist and inform the preparation of training modules and facilitate the development of a training program for Economic Accounting of Water in the SADC region.

3. Approach

3.1 Sample Population and Data Collection Methods

The needs assessment was done with the participation of:

- Implementing organizations collecting data required for constructing water accounts. Both pilot and non pilot countries were involved
- Individuals working in departments that produce data relevant for compilation of water accounts
- Training institutions

The training needs assessment was conducted through two approaches:

1) Desk-top approach

- Project proposal documents and other SADC reports were consulted in coming up with the specific areas for which capacity levels will have to be assessed. Documents available from member states on the internet were reviewed to give insights into needs for the different member states. Progress reports from other components of the project were also reviewed to give guidance.

2) Field Survey approach

- Questionnaires were prepared for the implementing institutions, individuals within these institutions and for the training centers within the countries. The questionnaires were sent to the PSC members (project contact persons) who would then send out to the relevant individuals and organizations within their countries. The request was sent to all the PSC members but responses were obtained from 12 countries. In some cases (Botswana, Zambia and Malawi) questionnaire were completed during stakeholder meetings held in pilot countries. The questionnaires are attached in Annex 2.
- The individual respondents during the survey were drawn from Botswana, DRC, Namibia, Malawi, Lesotho, Swaziland, Tanzania, Seychelles, Zambia, Zimbabwe, South Africa, and Mauritius. A total of 75 people participated in completing the individual questionnaires. The actual people interviewed are listed in Annex 3. Only 2 training institutions (University of Swaziland, Water Management Institute) completed questionnaires whilst the same number (Ministry of Water and Irrigation-Tanzania and Department of Environmental Affairs Botswana) of implementing organisations returned completed questionnaires.

Key Informant interviews were held with the water departments for Botswana, Lesotho, Mozambique and Zimbabwe and with officials from the Universities of Botswana and Zimbabwe. In addition Key Informant Interviews were also held with Waternet and the Institute of Water and Sanitation Development (IWSD) from Zimbabwe. The key informant interviews focussed on views on importance of economic accounting and experiences with EAWU as well as challenges in implementing of EAWU.

3.2 Type of data collected

Information collected through questionnaires administered to individuals included:

- Highest level of training attained by respondent as well as area of specialization
- Level of experience
- Knowledge of the concept of EAWU
- Perceptions on the importance of EAWU
- Experience in doing EAWU
- Challenges faced
- Gaps identified
- Proposed course subjects
- Duration of training courses

The questionnaire on training institutions sought to investigate:

- Duration of courses which were offered
- Entry requirements and catchment area for students
- Experience in dealing with EAWU course
- Institutional capacity in terms of staff and facilities
- Number of students which could be enrolled per course

The questionnaire on implementing institutions identified:

- Overall objective of organization
- Staff compliments and their experience in EAWU
- Categories to which collected data would feed into
- Duration of courses staff members may be allowed to go
- Financing options for the staff members
- Perceptions on the importance of EAWU

3.3 Data Analysis

The qualitative data was analyzed using the thematic approach. In this case the responses to a question were listed down and then categorised to give the appropriate sub themes. The rest of the data was analysed by descriptive statistics whereby given proportions were expressed as a percentage of the total population participating in the study. The descriptions were presented in forms of tables and charts.

4. Findings from the TNA Assessment

4.1 Implementing Individuals

The individuals were assessed for their educational qualifications, areas which they work on, water accounts which they handle and their level of expertise.

4.1.1 Characteristics of the respondents

Educational level and Experience

The qualifications of the people interviewed are shown in Figure 1. Close to 46.4% of the respondents had Master's degrees, whilst a similar proportion (47.9%) held first degrees. Very few had diplomas and even fewer had PhDs. The responsibilities of the various components of water accounting in the region are in the hands of well trained professionals.

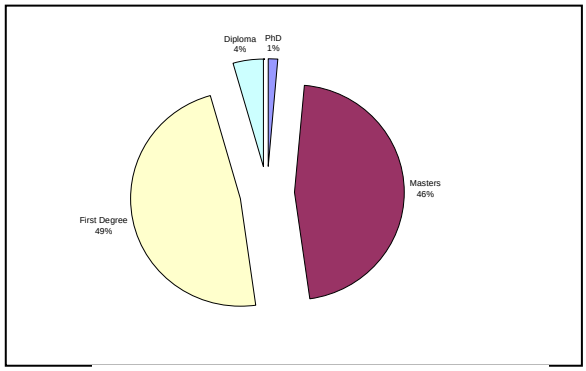


Fig 1: Level of Education among professionals

The respondents consulted were fairly experienced in their jobs and more than 50% had more than five years working experience. This indicates that responses given are from people well informed about dynamics in their areas of work.

Professional Areas

The professionals consulted included engineers, economists, statisticians and water resources managers and the proportional distribution among respondents is shown in table 1.

Table 1: Categories of Professionals Consulted

Profession	% of total
Water resources managers	11.6
Civil Engineers	14.5
Hydrologists/hydrogeologists	14.5
Economists/Accountants	20.3
Statisticians	14.5
Environmentalists/Ecologists	13
Others (Planners, Health)	11.6

The sample population represented the major professions which are required for compiling water accounts. These results show that the basic pre-requisite skills are already resident among the professionals already employed to do work so what will be required is reorientation of the professionals. The distribution of the professionals consulted across countries is shown in Table 2.

Table 2: Professions Consulted and their areas of specialisations

COUNTRY	NO of PEOPLE	AREA OF SPECIALIZATION
Botswana	19	Water Resources Management (1) Hydrological Engineer(2) Water and Waste Engineering(3) Environmental Science and Economics(5) Statistician (7) Intern (1)
DRC	2	IWRM(1) Hydraulics(1)
Lesotho	2	Water Resource Management(1) Development Economics(1)
Malawi	8	Economics (4) Statistician (1) Civil Engineer(2) Environmental Officer (1)
Mauritius	2	Hydrology (2)
Mozambique	5	Economist(2) Hydrologist (2) Hydrogeologist (1)
Namibia	2	Economics and Public Management(1) Environmental Science(1)
South Africa	3	Ground Water and Water Management(1) Project Finance and Economics(2)
Swaziland	18	Agriculture and Applied Economics(2) Water Resources Management and Engineering(4) Agriculture(2) Statistician (3) Health Inspector (1) Environmentalist (2) Ecologist (1) Lecturer(1) Finance and Admin(1) Scholar (1)

COUNTRY	NO of PEOPLE	AREA OF SPECIALIZATION
Tanzania	2	Hydrologist(1) Economics(1)
Zambia	9	Water Resource Management and Engineering(5) Water Quality Management(1) Hydrologist (1 Meteorologist (1)) Inspector (1)
Zimbabwe	3	Hydraulic Engineering(1) WRM(2)
12 Countries	**75 respondents**	**75**

The highest level of response was received from pilot countries where questionnaires were completed during stakeholder meetings.

Experience with components of water accounts

The professionals were providing inputs to the following categories of EAWU inputs:

- Physical water supply
- Emission Accounts (or Wastewater and Effluent Accounts)
- Hybrid and Economic Accounts
- Assert Accounts
- Quality Accounts
- Valuation of Water Resources

Figure 2 indicates the proportionate contribution of information already collected by respondents to the compilation of the accounts.

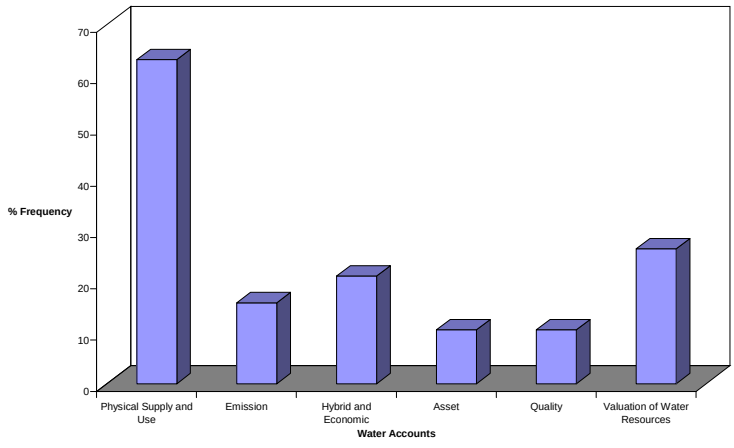


Fig 2: Accounts handled by professionals

From the Figure it is clear that physical supply accounts were the most frequent accounts to which data collected by professions contributed to. Valuation accounts were second whilst asset and quality accounts were the least. The frequency of emission and hybrid and economic account were moderately.

4.1.2 Identified Gaps

The individual participants highlighted the following gaps:

a) The Concept of Economic Accounting of Water

The concept of water accounts in its various forms and uses is not common among the water sector professionals. The proportional distribution of the level of EAWU knowledge among the sector professional is shown in Figure 3.

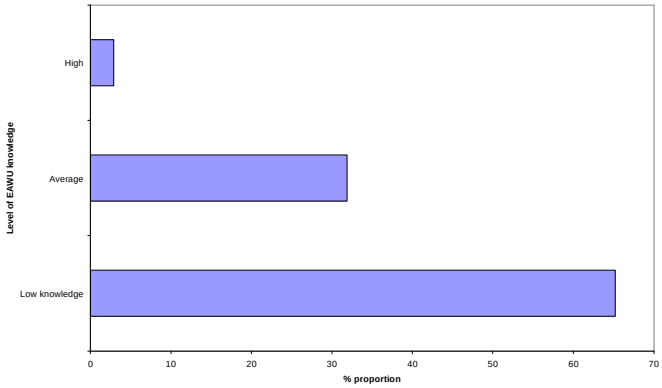


Fig 3: Levels of EAWU knowledge

Most professionals (65%) had low and limited knowledge on the concept of economic accounting of water. The sector professionals who professed ignorance to the concept included water resources managers, statisticians, finance, economists, ecologists, environmentalists, public health, engineers. Those that had some knowledge had gained it through either learning the components in their university days or participating in short courses and projects emphasising economic use of water. About 33% had average knowledge in the subject but they were not confident to share it to be resource persons. Only 5% had excellent knowledge and were confident to be resource persons in at least one of the water accounts categories. These results clearly indicate that knowledge on the EAWU concept in the region is indeed low.

In order to cover the limited and average knowledge among participants there were suggestions of short (1 wk), medium (up to 3wks) and long term (diploma, degree) courses. The proportion of participants preferring each of the course categories is shown in Figure 4

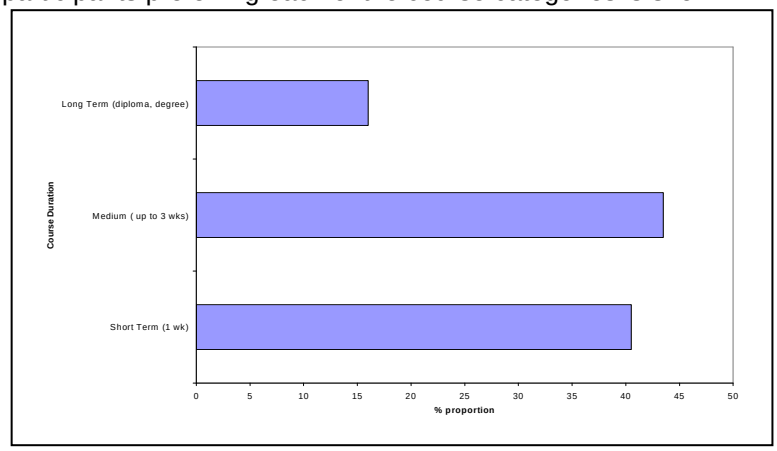


Fig 4: Preferred Course Duration

Respondents preferred short to medium term courses as a way of addressing their gaps in Economic Accounting of water. This is consistent with the fact these are already trained professionals who just need reorientation to compilation of water accounts. The few who suggested long term courses were those with first degrees and had less than 3 years experience. These prefer to be specialists in the areas of water accounting.

Though medium term courses was the most common option key informant, interviews with heads of departments indicated that medium courses will be a challenge for organisations since no permission to employ stand in staff can be granted for such short periods. The preferred options for implementing will be either short- or long-term. In such cases work commitments can be temporarily suspended for one to attend a short course whilst temporary recruitments can be done if one is attending a long term course.

b) Methodologies for economic accounting of water

One of the identified gaps was how to derive the water accounts. Nearly 90% of the respondents did not know how to compile these accounts. They were not aware of components of the accounts (i.e., Physical, Asset, Emission, Hybrid and Economic and Quality accounts as well as the concept of value and Valuation methods. Participants were only able to identify categories to which their work contributed by referring to a description of accounts types which was attached to questionnaires.

c) Practicality of inputting data into tables

Whilst close to 40% had gone through EAWU related training, none had hands on experience with compilation of water accounts. Their experience was largely theoretical and the individuals may not be confident to produce water accounts tables on their own.

d) Application of information from water account

Nearly 60% of respondents did not know how the information collected would be used for planning and decision making. Some collected information for their specific work needs but were not clear on how the data would be used as information to differentiate between beneficial and non-beneficial uses hence provides opportunities for improved allocative efficiency. They had no clear indication of how the economic accounting of water links to daily decisions.

e) Failed to identify a gap to be filled

Some respondents (15%) could not pinpoint specific gaps because they had a vague idea of what was required to compile water accounts.

4.2 Implementing Organizations

The assessment for implementing organisations focussed on organizational objectives, staff compliments and their experience in EAWU, duration of study leave which can be given to staff members, financing options for work related advancement, perceptions on the importance of EAWU to the department and challenges faced in compilation of water accounts.

The response from implementing organisations was low as some like Department of Water Affairs in Namibia indicated that consultations could only be done through face to face interviews. Information presented is mainly based on three countries (Botswana, Tanzania and Zimbabwe) which either responded or were visited.

Overall Objective of organisations and Staff Compliments

The type of organizations consulted were Department of Water (Botswana, Lesotho, Mozambique and Zimbabwe), Departments for Environment and Central Statistical Office (Zimbabwe).

The objectives for the organisations were related to reasons for their establishment. Environmental department were concerned with protection of the environment, water for the management of water affairs whilst Central Statistical Office was concerned with the provision of accurate data for country records. The objective of the organisations had a direct bearing to the individuals which were employed by it. The departments of water had mainly civil engineers and hydrologists, CSO had statisticians whilst Environmental affairs mainly had environmentalists. In almost all of these countries' water departments none of the employed staff members had prior experience with EAWU.

Organization experience with EAWU

Organisational experience in constructing water accounts was low. In Botswana, for instance, the Department of Water Affairs which is tasked with production of the water accounts did not have any experience of doing so. The limited country experience for Botswana had been in the Department of Environmental affairs. In another example of Zimbabwe, the concept was still new and no one had been delegated with the responsibility of producing water accounts. The relevant department such as the CSO, ZINWA, and Water were continuing with their usually business as none of them was quite clear of what water accounts were and what was involved. The country experience had only been limited to identifying the stakeholders who would be required for compiling water accounts. The limited knowledge for ZINWA had been attained through stakeholder meetings and visits by consultants undertaking the project. The Central Statistics Office produced a UNDP sponsored document on overall needs assessment for provision of Environmental statistics but no further progress had been made.

The implementing institutions consulted were handling data which will contribute towards at least one sub account. Water affairs were collecting data towards Physical Supply and Use as well as Asset Accounts; Environmental departments were contributing towards Quality and Emission Accounts. These results indicate that there isn't one department which can employ people with all the skills required to produce complete water accounts. There is therefore a need for good coordination among all the departments so that the ministry mandated with the production of the accounts can get maximum support from all the other relevant departments.

Duration of Courses and Financing Options

The institutions consulted indicated that the staff members can be permitted to take on courses to further their knowledge. The duration for the course can be short and long term depending on the opportunities which would have opened up. However discussions with some institutions indicated that short term courses should not be longer than 7 days in order to minimise the flow of work. If the course contents require more than 7 days then long term courses would be preferred since the staff member can be given study leave and allow another person to be employed. Countries like Botswana assist their staff members with financing during work related advancement whilst others like Zimbabwe and Tanzania rarely do so. The high levels of gaps within the departments indicate the need for detailed training. If the region is to make progress in producing water accounts then some kind of financing is required to ensure that staff members are trained to carry out compilation of water accounts.

Perceptions on the Importance of EAWU

Some departments (Water Affairs in Botswana) consulted indicated that water accounts were of high importance in their work. However others like ZINWA's planning department in Zimbabwe were not clear of that Economic Accounting of Water meant and thus could not objectively judge its importance to their daily work. This indicates a gap in the personnel who are supposed to make decisions to commit resources towards economic accounting of water.

4.3 Challenges Faced in Implementing Economic Accounting of Water

The challenges which were being highlighted by the individuals and implementers are very similar since the individuals consulted work in organisations contributing towards production of water accounts. The challenges have been classified into five major categories which are:

- Data Limitations
- Human skills
- Awareness
- Financial Resources
- Reforms/Changes

Data Limitations

Departments that are involved in economic accounting of water have poor access to data. Largely in many countries there are no data collection devices. Some lack data recording stations like gauging weirs and therefore it becomes difficult for them to provide the required inputs. For some the flow meters to record inputs and outputs into an economic unit are simply not there. In some instances the system for data collection like water quality testing on the incoming and outgoing waters are not operation and thus the impact of the economic development on the water resources cannot be accounted for.

One of the data challenges is related to absence of databases. Some countries do not have databases which has the required information for creating water accounts. In other instances the databases that are available have poor quality assurance systems which then results in unreliable data. In such scenarios the data used will result in water accounts which do not give meaningful value to the decision making systems of the country.

In other instances the reticulations are marred by illegal connections. These tap on the valuable without being recorded. In instances where these connections are made after a bulk meter reading, such connections result in over estimations in water used by economic units and thereby reducing the water use efficiency of the economic unit. In situations where these illegal connections occur before the economic units, the unaccounted-for losses become very high.

In some situations the data collected is neither consistent nor regular. The collections systems are erratic and continuous data is almost unavailable. In water compilation departments have to collaborate. However variations exist in management systems and some departments have poor record keeping systems and high staff turnover. Furthermore other departments have aggregated data which then become difficult to disaggregate into the components required for economic accounting of water. The poor record keeping makes it difficult to disaggregate the data into the units. For example some countries may have data on water consumed without necessary splitting it into the sectors which consumed the water. The challenge of collecting consistent data is higher in cases where data is also required from individuals who often do not keep records.

Human Skills

The economic accounting is driven by the human workforce and all SADC countries face a challenge of the appropriate human skills. Over 50% of those consulted highlighted the issue of human skills. The major challenge is that the available skills in the departments and at times country do not match those required for the production of water accounts. There is a general lack of trained personnel in the region and only 40% of those in departments relevant to compiling water accounts had received EWA specialised related training. In some instances staff members in the responsible departments need to be oriented in the proper direction for them to conduct the water accounts but there are no technical advisors for departments to refer to.

Some departments have staff shortages and the ones in place cannot cope with added tasks of producing water accounts. In other instances there are poor skills resources base to draw from and thus use of non qualified personnel result in production of poor accounts. In some cases for example Botswana, the Department of Water Affairs which is mandated with keeping of water accounts has resorted to employing interns as a means of copying with staff shortages. However such an interim measure is only temporary as the interns will move if offered permanent jobs elsewhere.

Financial Resources

The collection of detailed data needed for production of water accounts requires personnel and equipment. In some countries, the willingness to collect data is there but resources to pay for the personnel for these accounts is often limiting. The level of personnel required is at the minimum at degree level and governments find it difficult to pay for these skilled personnel. In addition whilst countries like Malawi, Swaziland and Zambia appreciate the need for the accounts the financial resources to send people for advanced training are not readily available.

Further the financing of the data collection equipment and field work also requires money which is often not available in government coffers. Some of the infrastructure required like a gauging weir can be very expensive to construct and some countries cannot afford to put them up. Whilst water accounts are important some government find themselves having to prioritise the aspects they can finance and at the moment water accounts do not top the list of priorities.

Public Awareness

This is perhaps the greatest challenge facing the region as far as compilation of water accounts is concerned. As long as water comes out of a tap the public care little about anything else related to how the drop comes to be. The decision makers and planners at the highest levels in countries are not aware of the need for water accounts. This has implications on the planning and resource allocations which will be given to this objective. With no plan and budget for the water accounts their compilation remains a theoretical wish. Knowledge on economic accounting among decision makers is important in directing decisions that involve water. For example ministries may make abstract decisions to increase hectare under cultivation, cattle herd, and urban settlements without necessarily valuating the economic impact of such decisions.

The connectedness of all the departments involved in giving input data to the production of water accounts requires them to be on the same level of awareness and commitment to the process. Thus the decision makers in all the departments relevant for water accounting need to be aware.

There is a generally limited ‘Buy In’ from general public and other relevant stakeholders. The public is also not aware of the importance of the water accounts in their daily lives and thus do not give much attention to them. In some instances EAWU has not been made part of the integral plans of the departments and therefore no staff and time has been committed towards the activity. This presents a challenge for the focal department/ institution which is required to collect data from such institutions.

Reforms

As water sector reforms are done roles and responsibilities change between and among ministries resulting in loss of experience which will have been gained. Often changes/reforms in sectors results in transfer and change of roles. For example in Botswana the water accounts were being initiated under the Department of Environmental Affairs but has since been moved to the Department of Water Affairs. Whilst the two departments will continue to interact in the process of producing water accounts, the resident memory will be lost. Even in instances where personnel remain within the same ministry after reshuffles there are often scattered to other departments resulting in non continuity of activities. In some countries like Zambia some entities been turned into parastatals and collection of data may be low on their priorities.

4.4 Training Organisations

The training institutions were assessed for their experience and willingness to run EAWU related training, staff compliments, facilities for hosting courses, duration of courses and funding issues for one to attend courses.

4.4.1 Consulted Training Institutions

The training institutions who participated in face to face interviews were University of Botswana (Environmental Science and Economics Department), University of Zimbabwe (Agricultural Economics Department) Institute of Water and Sanitation Development and Waternet. Institutions who responded to the questionnaires were Water Development Institute (Tanzania) and University of Swaziland (Agriculture Department)

Experience in Hosting EAWU

Experience of institutions in handling EAWU courses was general limited. Institutions consulted (University of Zimbabwe) had not held courses in Economic Accounting of water because they had never been expressed demand for it. However if there is an increased demand for the course these centres remain ready to offer such courses as short courses or case studies within relevant modules like Natural Resources Economics and Economics of Water. The Department of Environment within the University of Botswana had conducted specialised short courses for the government of Botswana which were related to Environmental Economics and they will be willing to host courses for Economic Accounting of Water. The Institute of Water and Sanitation Development from Zimbabwe had experience in running courses related to the economics of water.

Entry Requirements and Course Duration

Entry into the institutions was open to both holders of Advanced level and those with Diploma or first degrees. This opens up avenues even for diploma holders working in areas relevant to compilation to get further advancements at Universities. Some institutions (University of Botswana, Zimbabwe and Swaziland, IWSD) were open to both full time and part time/block release whilst Water Management Institute in Tanzania was only for full time courses.

Staff compliments

Economic accounting of water is a fairly new concept in the SADC region. However training centres consulted had personnel who had specialised in at least one of the areas required for compilation of water accounts. The areas of specialisation which were resident in the institutions consulted were Economics, Natural Resources Economics, Civil Engineering/Hydrology, Statistics. The level of training in EAWU related training among staff members varied from Masters Level for University of Zimbabwe to PhD at University of Swaziland.

All the institutions consulted highlighted that due to the diversity of the skills required to conduct a full course on economic accounting of water they would not have all the skills to train people under one roof. However these institutions highlighted that they operate in association with other professionals and institutions within their networks and in cases where adequate personnel is missing there will contract short term staff. 100% of the responded sighted this as a strategy of mitigating against the staff shortage gaps. The second option for copying with skills shortage which was highlighted by all the institutions was that their staff members could undergo an intensive train of trainer's course before they can be engaged in the hosting of courses. In this case staff members with the prerequisite educational background would receive orientation training to suite the specific methodologies to be followed in the compiling water accounts.

Facilities

Facilities for conducting courses were not a major consideration as the centres can either use its own premises or hire conference rooms at desired venues. The University of Zimbabwe, University of Botswana, and University of Swaziland indicated that they had lecture rooms and computer laboratories which they could use for the running of the courses. The issue of computers is key to hosting such courses since the courses are largely mathematical and students need hands on practise. The capacity of the lecture rooms varied from 25 to 100 students making it possible for institutions to accommodate participants from more than one country.

Funding Issues

Both long term and short term training centres expect students attending courses to finance their studies through scholarships, government loans, personal funds or companies which they work for. However since the concept is fairly new in the region self paying students are likely to be few and successful implementation will depend on either government or donor funds.

4.4.2 Public Institutions from the Internet Search

Due to the low response of institutions to the request, a web search was carried out on the Universities in the SADC region. Some of the Universities with potential to offer specialised courses in economic accounting of water in the SADC region are shown in Table 3. Only Public institutions were included because these are likely to adapt to the demand to train experts on economic accounting of water if the need was expressed to them by government departments. Courses on EAWU could be hosted in the departments of Environment Sciences, Agricultural Economics and Engineering.

Table 3: Examples of Public Universities with potential to host EAWU courses in the SADC region

Country	Name of University
Angola	University of Agostinho Neto
Botswana	University of Botswana
DRC	University of Goma
	University of Kinshasa
	University of Kisangani
	University of Lubumbashi
Lesotho	National University of Lesotho
Madagascar	University of Antananarivo
	University of Fianarantsoa
	University of North Madagascar
	University of Toamasina
Malawi	University of Malawi
	University of Muzuzu
Mauritius	University of Mauritius
Mozambique	University of Eduardo Mondlane
	University of Pedagogica

Country	Name of University
Namibia	University of Namibia
South Africa	Rhodes University
	University of Pretoria
	University of Western Cape
	University of Cape Town
Swaziland	University of Swaziland
Tanzania	Sokoine University of Agriculture
	University Daresalam
Zambia	Cooperbelt University
	University of Zambia
Zimbabwe	University of Zimbabwe
	National University of Science and Technology

Whilst all of the above institutions have potential to offer training in economic accounting of water, it is likely that those which will show an interest in the concept of economic accounting of water and those members who have offered regional courses like the Waternet funded ones would be most probable hosts of the desired courses.

From the research carried out the only centre with direct experience with economic accounting of water was University of Pretoria, CEEPA whilst National University of Lesotho had experience with economic accounting related courses. In the case of CEEPA students from the 16 associated departments from Southern and Eastern African universities have access to funding during the period in which they reside in Pretoria to do their specialisations.

5. Conclusions and Recommendations

5.1 Conclusions

The conclusions are organized according to the objectives of the TNA.

The Need for Training

The TNA has indicated the need for training in the concept of Economic Accounting of Water in the SADC region. The training needs relate to awareness creation among the decision makers and capacity building in methodologies of compiling the water accounts for the hands on professionals.

Areas in which training is needed

Awareness on the importance and use of water accounts was low especially among decision makers. Personnel responsible for collecting data and constructing water accounts had gaps in definition and methodologies for constructing:

- Physical Use and Supply Accounts
- Emission Accounts
- Hybrid and Economic Accounts
- Asset Accounts
- Quality Accounts
- Valuation Accounts

Extent of Gap to be covered

The training gaps to be covered are not very big since staff members working the various departments already have the prerequisite skills to construct water accounts. The gaps were more to do with application of the theory which some already had. However for the Non-training needs gaps are significant. The Non-training needs relate to availing financial support for some national governments to initiate and or progress with Economic accounting of water.

Desired Training Outcomes

Professionals with short and long term training in EAWU are required and these should follow a well designed training programme. Whilst incorporation of the EAWU was welcomed by long term training institutions, making it a long term course is a process that requires up to 24 months to be approved. Therefore short term courses should be the way to create the skills required for the sector.

Basis for Monitoring and Evaluating EAWU Skills in the SADC region

Currently only South Africa, Botswana, Namibia have some experience in producing some components of water accounts and it is important to see how these countries progress and also how others initiate the process.

Training Institutions

Training institutions are willing to host EAWU courses. However, only a few potential lecturers have the expertise required to run the whole course on compilation of all the water accounts. A few centres have experience in running courses related to economic accounting of water but departments such as Agricultural Economics, Environmental Sciences and Economics have courses relevant to EAWU.

5.2 Recommendations

Based on the above conclusions the following recommendations are made:

5.2.1 Training Needs

The needs observed can be addressed by formulating training courses at three basic levels

(i) Decision makers- These general need awareness courses so that they are capacitated enough to be able to appreciate the value of compiling water accounts and hence commit resources towards the activity. This should be a basic non technical course. The duration of such courses should not be more than 3 days and on average should be a day. The course participates should be people who can influence change in the way water accounting is being done in the countries. Such courses should be offered at regional bodies through regional groupings like GWP who have experience in dealing with decision makers in SADC countries. The courses should then be taken down to national levels through the GWP country partnerships or similar arrangements so that those in charge of making decisions at operational levels can also be informed.

(ii) Professionals already working in the sector –These need specialised training to help them focus on the specific water accounts they need to compile. This category includes sector professionals like hydrologists, hydrogeologists, statisticians, environmentalists, economists and planners. In general they have the desired theoretical background but lack the linkage between their knowledge and its application to economic accounting of water. These need orientation which will make them change the way they collect their data so that information can be found the desired aggregated or disaggregated formats. Whilst they would be given an appreciation of holistic accounts it is important that they focus on their respective accounts so that they are fully equipped to deliver their expected results. Since these people already have responsibilities it important that the courses do not take longer than 7 days. Experience from Waternet programme on professional courses has shown that response to courses longer than 7 days is general low.

(iii) Career Seekers in Economic accounting of water- These courses should be targeted at students who have an interest in being water accounting specialists at the time that they leave University. This can be done by introducing water accounting as subject at both undergraduate and post graduate level. At post graduate level these courses can be introduced to students pursuing Environmental science, Planning, Statistics and various displaces of economics. At Masters Levels these can be introduced into relevant courses such as IWRM offered through Waternet or Applied Agricultural Economics offered at CEEPA or Masters in Natural Resources Valuation offered at University of Dar es Salaam. The development and acceptance of the economic accounting courses as stand-alone courses is a length process which can take up to 3 years since University have their own backlogs on revisions of courses and training materials. Another interim option is to include water accounting as case studies in courses relevant to natural resources management such as valuation of natural resources. A third option is to introduce the five modules on economic accounting of water as modular units hosted by various institutions. Students interested can then be moving to the specific institutions as the times when the module would be offered. Students following the modular course would have to go through all the modules within a specified period of time. This can be applicable even to professionals already working since each module will be scheduled to take no more than 7 days.

5.2.2 Areas to be covered in Training of Professionals and Career Seekers

The training should cover the following aspects:

1. Physical accounts – This refers to the flow from the environment to the economy, between the economy units and back to the environment. The flows are given in physical units within the reference territory for production and consumption activities during an accounting period (general a year). The gaps within personnel mandated with physical supply tables were related to:

- Collection and harmonization of data from line organisations
- Performing surveys on abstraction units
- Performing surveys on flows between the economic units
- Performing survey on the return flows
- Applying coefficient method for physical flow estimation
- Territorial delineations, aggregations and disaggregations
- Deriving indicators

2. *Emission Accounts* – These describe the amount of pollutants added by the water users to the water during their economic activities. Specific gaps identified were:

- Collection and harmonization of data from all involved organizations – there was limited knowledge on which organisations should be involved and how to aggregate their data
- Performing surveys on emissions – There was a limited knowledge on which parameters to use
- Setting up monitoring programmes
- Estimating emissions
- Setting up an emissions register
- Deriving indicators

3. *Hybrid and Economic accounts* – This involves presenting water supply and use in monetary terms; identifying the costs, investments and maintenance and evaluating the economic instruments to manage water. The areas where gaps were identified are:

- Collection and Harmonization of data from line organizations
- Water Economics
- Use and supply of water in the economy
- Inventory and record keeping
- Use and supply of water related products in the economy
- Specific government instruments
- Deriving indicators on impact of water on economy and vice versa
- Policy research and development

4. *Asset Accounts*- These provide information on how the abstractions and return waters influence the stock of available water resources. Professionals handling these accounts had limited knowledge on:

- Hydrological cycle
- Asset qualification and their characteristics
- Estimating stocks in river, lakes and reservoirs, soils, groundwater and air
- Transboundary water resources
- Renewable, depleting and virtual water resources
- Consistency with other accounts
- Deriving indicators

5. *Quality Accounts* – These describe in qualitative terms the stocks of water which are described in the volume terms of the water assets. The specific gaps were:

- Water quality issues
- Concept of water quality accounting
- Water quality assessment methods
- Experiences in water accounting
- Deriving indicators

6. *Valuation Accounts*- These describe the process of valuating the water resources. The specific gaps recorded were:

- The concept of value
- Valuation methods, and
- Application thereof in water
- Categories of economic uses of water

7. *IWRM and Economic Accounting of Water* – This describes how Economic accounting of water fits into the whole framework of IWRM. The specific gaps to be addressed are:

- IWRM and water Accounts
- Water Efficiency
- Non conventional sources of water
- IWRM mainstreaming
- IWRM in SADC region
- Policy Implications.

Training materials: Modules for all the above 6 important accounts in water accounting should be developed so that those involved can have access to a step by step guide. In addition to these, another module intended for creating general awareness among decision makers should also be compiled. Further, there should be a module which integrates economic accounting of water use with IWRM so that the relationship between these can be emphasized.

5.2.3 Training Institutions

From the preliminary assessment it is recommended that closer collaboration for possible hosting of the courses is pursued with the institutions which either showed an interest or have experience in running courses related. These institutions are:

1. University of Pretoria – CEEPA
2. University of Dar e Salaam- Institute of Natural Resources Assessment
3. University of Botswana- Department of Environmental Sciences
4. National University of Lesotho – Agricultural Economics Department
5. University of Zimbabwe- Economics Department
6. University of Swaziland – Agricultural Economics Department
7. Institute of Water and Sanitation Development

However more contacts should be made with other possible institutions so that choice of possible hosts can be widened.

5.2.4 Non Training needs

The Non training needs identified can be addressed through lobbying and advocacy

Financial Resources- Funding partners are required to assist in building capacity among SADC member states because some governments have limited budgets for capacity building and are unlikely to commit financial resources towards training. It is therefore crucial that kick start funding is provided so that the interest in economic accounting is created. This funding should be sourced at regional levels through already collaborating partners like the EU, GTZ, GWP and other potential partners like Waternet and Capnet. Further, some training institutions like CEEPA have funding for students from the associated 16 Departments from Southern and East Africa and these should be lobbied to also reserve some percentage for those specialising in Economic Accounting of water.

Equipment – It is unlikely that funding for capital equipment would be donated. The most likely source of funding is the national governments budget allocations. It is therefore important to have interactive platforms where the need for such equipment can be advocated for.

Exchange programmes- Since countries are at various levels of implementing economic accounts it is possible to exchange personnel that have had experience with those that are still intending to start. This can create partnerships in the region and allow for continuity of sharing of ideas.

5.2.5 Monitoring of EAWU Skills

It is important to put in place a system for regular checks on the progress which countries will be making in creating skills for implementation of economic accounting of water. One possibility will be to circulate questionnaires to PSC members at an agreed interval.

ANNEX 1: Key Informant Interviews Guidelines

TRAINING INSTITUTIONS

1. What kind of training facilities does your organization have? Discuss lecture rooms, hostels, internet conference facilities.

2. Do you have any experience in running EAWU related courses? Discuss the nature of tutorship, duration of course and content.

3. Describe the student recruitment and training execution modalities? Discuss the entry requirements, catchment area for students, staff qualifications/compliments and ways of complementing capacity gaps.

Or

Do you have any plans to embark on EAWU courses? Would you be willing to host one? What procedures would you have to follow to be able to run courses? How long will these take?

4. What topics do you think should be covered in a course on Economic Accounting of Water Use

5. What are the costs of courses at the institution? Discuss funding issues

IMPLEMENTING INSTITUTIONS

KEY INFORMANT INTERVIEWS

1. Give an overview of EAWU in your country. Which departments are involved, their roles and responsibilities, and What progress has been made towards EAWU.

2. How much of your staff are doing work which is related to EAWU? What are their qualifications and contacts?

3. What are the challenges (current or anticipated) in implementing EAWU? Suggests ways of mitigating against these challenges.

4. What are the provisions of your staff development policies? How long can staff members go on study leave? Who determines whether or not someone should go on study leave? Are there any possibilities of funding?

5. Which organizations do you think would best provide training for EAWU? Provide their contact details? What sort of course do you think would be appropriate?

6. What is your opinion on the importance of EAWU in your daily work and in water resources management in general? What is your view on its relevance and sustainability?

ANNEX 2: Questionnaires used in Data Collection

TNA SURVEY- INDIVIDUALS

SADC is implementing a project on Economic Accounting of Water Use (EAWU) in which all Member States are represented in the Project Steering Committee. A survey is being undertaken to establish the level of EAWU expertise and capacity gaps among professionals in the SADC region. You are therefore kindly requested to complete this short questionnaire in order to be registered in a database of SADC EAWU professionals. Email the completed questionnaire back to your PSC member

Surname:	First Name:
Email Address:	Telephone:
Highest Qualification ☐Cert ☐Diploma ☐ 1st Degree ☐ Masters ☐ PhD	Job Title:
Name of Organization	Type of Organization ☐Gvt ☐ PVT ☐NGO
Level within organization ☐Junior ☐Middle ☐Senior	Years of f relevant experience ☐0-3 ☐3.1-5 ☐5.1-10 ☐10.1+
WORK RELATED INFORMATION	
Do you have knowledge of Economic Accounting of Water Use as a concept?	☐Yes ☐No
Rank the level of your EAWU knowledge	☐Low ☐Average ☐High
Which categories of EAWU inputs do your duties contribute to? (Refer to explanations at end of the questionnaires)	☐Physical Water Supply ☐Emission Accounts ☐Hybrid and Economic Accounts ☐Assert Accounts ☐Quality Accounts ☐Valuation of Water Resources
At what level have you shared your knowledge in EAWU?	☐National ☐Regional ☐ International ☐None
Would you be comfortable to be a resource person for at least one of the Water Accounts above?	☐Yes ☐No
What gaps do you feel need to be covered for you to be more effective in your water accounting duties?	

What type of course would you prefer for filling in your felt gaps in EAWU?	☐Short term ☐Medium term ☐ Long term
What is your perception on the importance of EAWU in your daily work?	☐High ☐Medium ☐Low
Mention any challenges you are facing/likely to face in implementing EAWU?	

THANK YOU

a) Physical Supply and Use accounts- hydrological data on water supply and discharge

b) Emission Accounts- Records of pollution discharged to water by an economic unit

c) Hybrid and Economic accounts- physical and monetary data on water supply and use

d) Asset accounts- stock of water resources at the opening and closing of accounting period

e) Quality Accounts- stock of water in terms of its quality

f) Valuation of water resources- application of economic techniques to determine actual economic value of water in its various uses.

TNA SURVEY - IMPLEMENTING INSTITUTIONS

SADC is implementing a project on Economic Accounting of Water Use (EAWU) in which all Member States are represented in the Project Steering Committee. A survey is being undertaken to establish the level of EAWU expertise among organizations in the SADC region. Your organization is therefore kindly requested to complete this short questionnaire in order to assist this project in data collection. Email the completed questionnaire to your PSC member

Name of Implementing Organization	Country
Name of Department if applicable	☐Gvt ☐ PVT
Contact Person, Telephone and Email	Years of experience with EAWU applications
Level of Person Completing Form	
Level of Operation for your organization/department	☐International ☐National ☐ Regional ☐District
Overall Objective of Organization	
Number of technical staff with EWUA knowledge in each of the qualification bands	Diploma - Degree - Masters - PhD -

Which of these EAWU categories does your organization address (Refer to explanation at bottom of questionnaire)	☐Physical Water Supply ☐Emission Accounts ☐Hybrid and Economic Accounts ☐Assert Accounts ☐Quality Accounts ☐Valuation of Water Resources
What challenges do you face in implementing EAWU?	
How long can staff members be allowed to be off duty in order to attend courses?	☐Short term ☐Long term ☐Both short and Long term
Does the organisation assist its staff members in securing funding for courses?	☐Yes ☐ No
What is your perception on the importance of EAWU in your daily work?	☐Low ☐Average ☐High

THANK YOU

a) Physical Supply and Use accounts- hydrological data on water supply and discharge

b) Emission Accounts- Records of pollution discharged to water by an economic unit

c) Hybrid and Economic accounts- physical and monetary data on water supply and use

d) Asset accounts- stock of water resources at the opening and closing of accounting period

e) Quality Accounts- stock of water in terms of its quality

f) Valuation of water resources- application of economic techniques to determine actual economic value of water in its various uses.

TNA SURVEY - TRAINING ORGANIZATIONS

SADC is implementing a project on Economic Accounting of Water Use (EAWU) in which all Member States are represented in the Project Steering Committee (PSC). A survey is being undertaken to establish the level of EAWU expertise and potential to host EAWU among training institutions in the SADC region. Your organization is therefore kindly requested to complete this short questionnaire. Email the completed questionnaire back to your PSC member

Name of Organization	**Country**
Category of Training Institution	☐Gvt ☐ PVT ☐NGO ☐University
Contact Person, Telephone and Email	Years of experience with EAWU related training
Type of current courses offered	☐Short courses ☐Long term course ☐Both Long and Short term
Entry Requirements	☐Advanced level ☐Degree ☐Experience
Mode of tutorship	☐Distance ☐Part time/Block Release ☐Full time
Catchment area for courses offered/ Where do your students come from?	☐National ☐Regional ☐ International ☐None
Do you have any Sponsored EAWU courses at your institution?	☐Yes ☐No
Which of the following EAWU components do your EAWU courses address? (Refer to explanation at bottom of questionnaire)	☐Physical Water Supply ☐Emission Accounts ☐Hybrid and Economic Accounts ☐Assert Accounts ☐Quality Accounts ☐Valuation of Water Resources
What is the probability that your institution may offer EAWU courses if it is given course modules?	☐High ☐Medium ☐Low
Which category of courses would you offer	☐Short courses ☐Long term course ☐Both Long and Short term
How many staff members have EAWU related knowledge in each category?	Degree--- Masters -- PhD--
How do you cope with expertise shortage within your department/institution?	☐Hire part time staff ☐Send students out ☐Drop courses requiring what we do not have

Has your organisation participated in EAWU related projects?	☐Yes ☐No
What is your maximum enrolment per course?	☐0-25 ☐26-50 ☐ 100+
Which of the following facilities do you have?	☐Lecture rooms ☐Computer lab ☐Conference rooms

THANK YOU

a) Physical Supply and Use accounts- hydrological data on water supply and discharge

b) Emission Accounts- Records of pollution discharged to water by an economic unit

c) Hybrid and Economic accounts- physical and monetary data on water supply and use

d) Asset accounts- stock of water resources at the opening and closing of accounting period

e) Quality Accounts- stock of water in terms of its quality

f) Valuation of water resources- application of economic techniques to determine actual economic value of water in its various uses.

ANNEX 3: TNA Survey Respondents

KEY INFORMANTS

COUNTRY	NAME	Department /Organization	CONTACT DETAILS
Botswana	Kalaote Kalaote	Dept of Affairs	Email:kkalote@yahoo.co.uk
	Mr Rathede	University of Botswana Natural Economics	Tel:25935527228 Email: rathedim@mupipiu.bw
	Dr Mupimpila	University of Bostwana Natural Resources	Tel:+2603552724
	Professor B.P Parida	Botswana University	Email: paridab@mopipi.ub.bw
	Ms W Hambira	Botswana university	Tel:2673552524 Email: hambira@mopipi.ub.bw
Zimbabwe	Mrs N. Neseni	Institute of Water and Sanitation	Tel:011309250
	Mr B Mambos	University of Zimbabwe	Tel: 0912321760,011874864 Email: bmlambo@agric.uz.ac.zw
	H Ntuli	University of Zimbabwe	Tel:0913448749,0912704075 Email: hntuli@agric.uz.ac.zw
	Mr M. Viriri	CSO	mviriri@zimstats.co.zw 0912 947 673
	Mr Dzwairo	ZINWA	
	Mr Z. Manyangadze	Department of Water	

INDIVIDUALS PERSONAL DATA

	COUNTRY	NAME	POSITION/AREA OF SPECIALISATION	CONTACT DETAILS
1.	Botswana	Kalaote Kalaote	Water Resources Management	Tel: 2673607325/6 Email: kalaotek@gov.bw
2.		Christmas Maheri	RSAP Coordinator	Tel:2673951863 Email: cmaheri@sadc.int
3.		Itumeleng Masebe	Assistant Water Resources Affair	Email:lmasebe82@yahoo.com
4.		Ontlogetse Dikgomo	Principal Hydrological Engineer	Tel:2673607342 Email: odikgomo@gov.bw
5.		Itumeleng Masebe	Intern	Tel:3607335 Email:imasebe82@yahoo.com
6.		Tugrid Iotukile	Chief Natural Resources Officer	Tel:3902050 Email: iotukile@gov.bw
7.		Dimakatso Isoa	Principal Hydrological Engineer	Tel:3658574 Email: dtihabiwe@gov.bw
8.		Botsalo Thamuku	Water Engineer	Tel:3607159 Email: bthamuku@gov.bw
9.		Peloyame Ntatsi	Conservation Programs Officer	Tel:3974557 Email: pnthatsi@kcs.org.bw
10.		Kalaote Kalaote	Water Resources Engineer	Tel:3607326 Email: kkalaote@gov.bw
11.		Ditshupo Gaobotse	Statician	Tel:3671300 Email: dgaobotse@gov.bw
12.		Motshabi Moreti	Principal Statistical Officer	Tel:3671395 Email: mmoreti@gov.bw
13.		Jobe Manga	Assistant Natural Resource Officer	Tel:3902050 emailjmanga@gov.bw
14.		Kagiso Ledikwe	Water Resources Engineer	Tel:3607335
15.		Kakanyo Fani Dintwa	Senior Statician	Tel:71699261 Email: kfdintwa@gov.bw

	COUNTRY	NAME	POSITION/AREA OF SPECIALISATION	CONTACT DETAILS
16.		Winstern Kabo	Statician	Tel:3671406 Email: wkabo@gov.bw
17.		Phemelo Ntwayapelo	Statician	Tel:3671365 Email: pntwayapelo@gov.bw
18.		Otsile Chelenyane	Assistant Statistician	Tel:(267)71600443 Email:otsilec@yahoo.co.uk
19.		Phetoso Zambezi	Chief Statistician	Tel:3671394
20.	DRC	Jean Claude Nkunga	Chief of Studies Office	Tel:+243815310919/896904636 Email: kmkjc@yahoo.fr
21.		Cyrille Masamba	Senior Expert in Water	Tel:+243818821988/895138092 Email:cyrille@yahoo.fr
22.	Lesotho	Leshobori Nena	Hydrologist	Tel:(266)58444483 Email: ynena@dwa.ov.ls
23.		Diketso Malephane	Chief Economic Planner	Tel:(266)584444783 Email: malephane@commwater.gov.ls
24.	Malawi	Richard Malata	Chief Economist	Tel:+26599904184 Email:malatarichard@yahoo.co.uk
25.		Matheus Kandodo	Economist	Tel:+265(0)99161902 Email:mkandodo@gmail.com
26.		Hastings Chipengu	Senior Economist	+265999618536
27.		Patrick Nyirenda	Environmental Officer	Tel:2651771111 Email:patricknyirenda42@yahoo.com
28.		Mphambo Kadzitaye	Economist	Tel:0999370792 Email:mwadutaye@yahoo.com
29.		Madalitso Njolomole	Assistant Statistician	Tel:265888874318 Email:njolomole77@yahoo.co.uk
30.		John Chingawale	Civil Engineer	Tel:0999401307 Email:jchingawale@yahoo.com
31.		Lewis Banda	Water Quality Manager	Tel:+2651310254
32.	Mauritius	Alicindor Henrie Antone	Senior Hydrologist	

	COUNTRY	NAME	POSITION/AREA OF SPECIALISATION	CONTACT DETAILS
33.		Rajeswhar Pokhun	Senior Hydrologist Officer	Tel:(230)4657988 Email: WRU@intnet.mu
34.	Mozambique	Callistus Mponzi	Economist	Tel:0754-349248 Email:callymponzi@yahoo.com
35.		Hosea Sanga	Senior Hydrologist	Tel:+255713456779 Email:hoseasanga@yahoo.com
36.		Fatuma Mambo	Hydro-geologist	Email:fmambo@rockemail.com
37.		Diana Kimbute	Hydrologist	Tel:255786752925 Email:mwakedi@yahoo.com
38.		Elsie Salima	Principal Economist	Tel:01788888 Email:elsisalima@yahoo.com
39.	Namibia	Esther. T Mikka	Development Planner	Tel:+264612087198 Email: SibandaF@mawf.gov.na
40.		Florence Sibanda	Deputy Director	Tel:+26461207198 Email: SibandaF@mawf.gov.na
41.	South Africa	Thamae Thamae	Executive Secretary	Tel:+27123367794 Email: lenka.thamae@gmail.com,thamaeL@dwa.gov.ls
42.		Sandile Mathe	Chief Director Finance-Water Trading Accounts	Tel:012-3368760 Email:mathez@dwaf.gov.za
43.		Mahomed Vawda	Director-Water Pricing and Finance	Tel:27123368391 Email:QAC@DWA.GOV.ZA
44.	Swaziland	Dlamini Ditsile Daisy	Environmental Economist	Tel: +2686417604 Email: ddlamini@sea.org.sz
45.		Sipho Nkambule	CEO	TEL(27)137810317 Email:sopho.nkambule@kobwa.co.za, maguga.oice@kobwa.co.za
46.		Sandile Gumedze	Senior Ecologist	Tel:7605-3476 Email: ecology@sntc.org.sz
47.		Constance Van Zuydan	Environmentalist	Email: constance.vanzuydane@sec.co.sz

	COUNTRY	NAME	POSITION/AREA OF SPECIALISATION	CONTACT DETAILS
48.		Stephen Khumalo	Senior Health Inspector	Tel:4046035,76077926 Email: khumalost@gov.sz
49.		Ncamiso Ngcampalala	Scholar	Tel:76612396 Email:bandzie@gmail.com
50.		Makhosini Khoza	Design Engineer	Tel:4043858/76224233 Email:mmabhuta@yahoo.com
51.		Anne Kruger	Irrigation Water Management	Tel:(268)3232415/7616299 emaileewud@swazi.net
52.		Leonard Ndlovu	Water Resources Manager	Tel:(268)3134308 Email: lndlovu@rssc.co.sz
53.		Mcebisi Mkwananzi	Lecturer	Tel:(268)5274021 Email: mcebisi@agric.uniswa.sz
54.		Bernard Dube	Swaziland Water Services Corp	Tel:(268)76028696 Email: Bernard.dube@swsc.co.sz
55.		Thandie Dlamini	Assistant Statistician	Tel:4042151/3,76512463 Email:thandiedm@yahooco.uk
56.		Job Mavuso	Dairy Development Manager	Tel:5058262/4
57.		Nsika Dlamini	Statistician	Tel:76135018 Email: dlamininsi@gov.sz
58.		Anita Mukasa	Finance and Admin	Tel:(268)4040768 Email:accounts@business-swaziland.com
59.		Welcome Nxumalo	Economist Assistant	Tel:4082345 Email: welcomen@centralbank.org.sz
60.	Swaziland	Thulasizwe Dlamini	Under Secretary Technical	Tel:(268)76086481 Email:dlaminithul@gov.sz,thulasjol@yahoo.com
61.		Musa Dlamini	Water Resources Engineer	Tel:383-8998/7602-8593 Email: musadlamn@ssa.co.sz
62.	Tanzania	Karim Lichela	Hydrologist	Email:furahakarim2002@yahoo.com
63.		Renatus Machumi	Economist for Water Resources Department	Tel:(255)755661427 Email:renatusmib@yahoo.com

	COUNTRY	NAME	POSITION/AREA OF SPECIALISATION	CONTACT DETAILS
64.	Zambia	Cristopher Chileshe	Assistant Director –Water Resources Management	Tel: +260211243543 Email: cchileshe@mewd.gov.zm
65.		Kenneth Nyundu	Principal Water Quality Officer	Tel:260211243543 Email: cchileshe@mewd.gov.zm
66.		Chisanga Siwale	Acting Senior Hydrologist	Tel:+260977674413 Email:siwalechisanga@yahoo.com
67.		Albert Chomba	Principal Water Engineer	Tel:(260)977825940 Email:chomba08027@alumni.itc.nl
68.		George Wainyayae Sikuleka	Chief Irrigation Engineer	Tel:(260)977777573 Email :gwasikuleka@gmail.com, gsikuleka@maff.gov.zm
69.		Mumbuwa Munumi	Chief Planner	Tel:0977-428109 Email: mmunumi@mewd.gov.zm
70.		Mafayo Ziba	Energy Officer	Tel:(260)211251337 Email: mziba@mewd.gov.zm
71.		Luwita Kanema Changula	Inspector	Tel: +260 977676567,968443595 Email:lkchangula@necz.org.zm,luwitak@yahoo.com
72.		Joseph Katongo Kanyanga	Chief Meteorologist	Tel:+260211252728 Email:jkkanyanga@yahoo.com
73.	Zimbabwe	Zwikomborero Manyaze	Acting Chief Hydrologist	Tel:+263-4-793914 Email:zmanyandze@hotmail.com
74.		Bongile Ndeni	Director Planning and Projects	Tel:(263)011884371 Email: zmanyangadze@hotmal.com, hydro@mweb.co.zw
75.		Rennie Chioreso	Programme Officer	Tel:+2634336725/333248 Email:rchioreso@waterneonline.org

References

UNSD (in cooperation with the Subgroup of the London Group on Water Accounting). 2005. Integrated Environmental and Economic Accounting for Water Resources (August Draft). UN.