



**Sharing the water resources  
of the Orange-Senqu River Basin**



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Environnement Mondial

## ORASECOM: Capacity Building Programme

Report Number: ORASECOM 001/2009







**Sharing the water resources  
of the Orange-Senqu River Basin**



# **ORASECOM**

## **Capacity Building Programme**

### **Report Number: ORASECOM 001/2009**

**Design and Planning of a  
Capacity Building Programme for  
Technical Staff/ Experts/Commissioners and Stakeholders**

## **Final Report**

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## 1. INTRODUCTION

An understanding of water resource management principles and policies is vital to the continued and sustainable management of any water resource. However, when the water resources are shared between different countries, the issues become even more complicated and require focused attention and management. In order to achieve sustainable water resource management it is vital that the key role-players and stakeholders are well versed with the legislation and respective policies and strategies of not only their own countries but also those of their partner states.

The Orange-Senqu River Commission (ORASECOM) is made up of the four Member States namely, South Africa, Namibia, Lesotho and Botswana. While the general principles of water resource management may have an over-arching component, the need to ensure that all role-players and stakeholders are adequately capacitated is vital to open debate on a level playing field.

Transboundary water management has always been of key importance in the Orange-Senqu basin, with individual agreements existing between Lesotho and South Africa (Lesotho Highlands Water Project) and Namibia and South Africa respectively on the use of the shared water resources.

ORASECOM aims to develop the Orange River for the benefit of all the respective states and is the first formal body established for the management of shared water resources since the Protocol on Shared Watercourse Systems became an instrument of international water law in the Southern African Development Community (SADC). The commission plans to develop a comprehensive perspective of the Orange River Basin, study the present and proposed uses of the river system, and determine future requirements for flow monitoring and flood management. It is expected to strengthen regional solidarity and enhance socio-economic cooperation. The multilateral commission will not replace existing bilateral commissions between any of the watercourse states, but rather will provide a broader forum for overall consultation and coordination between the states for sound integrated water resources management and development in the Orange River Basin.

### 1.1. GEOGRAPHICAL CONTEXT

The Orange - Senqu River originates in the highlands of Lesotho some 3 300 m above mean sea level with its highest peak, Thabana Ntlenyana, at 3 482 m, and it stretches over 2 300 km from the source to its mouth on the Atlantic Ocean. The river system is one of the largest river basins in Southern Africa with a total catchment area of 850,000 km<sup>2</sup> inside Lesotho, Botswana, Namibia and South Africa. The natural mean annual runoff at the mouth is estimated at 11,500 Mm<sup>3</sup>, but this has been reduced drastically due to the extensive water utilisation upstream for domestic, industrial and agricultural purposes.

The Orange Senqu River Basin system is regulated by more than thirty-one major dams. Two of these dams are situated in Lesotho, five in Namibia and twenty-four in South Africa. The largest five reservoirs are those formed by the Gariep, Vanderkloof, Sterkfontein, Vaal and Katse Dams with capacities ranging from 1 950 Mm<sup>3</sup> to 5 675 Mm<sup>3</sup> at full supply level. These major dams plus other smaller dams and farm ponds have reduced the current average annual runoff reaching the river mouth at Alexander Bay to less than half of the natural runoff. The Sterkfontein Dam (2 617 Mm<sup>3</sup>) and the Katse-Mohale dams system (2 910 Mm<sup>3</sup>) augment the Vaal Dam (2 122 Mm<sup>3</sup>) which supplies water to the industrial heartland of South Africa, including the greater Pretoria and Johannesburg areas. These industrial areas, supported by the Vaal River, produce more than 50% of South Africa's wealth as well as the more than 80% of electricity requirements. The Gariep Dam (5 675 Mm<sup>3</sup>) and Vanderkloof Dam (3 237 Mm<sup>3</sup>) are the first and the second largest reservoirs in the Orange Senqu-River system respectively. Both Dams are used to regulate the river flow for irrigation purposes as well as to generate electricity during the peak demand periods.

The tributaries downstream of the Vaal confluence are the Molopo-Nossob sub-basin system which is characterised by permanent sand dunes and in living memory the flow has not reached the main stem of the Orange-Senqu River Basin. The Molopo-Nossob sub-basin is located in Botswana, Namibia and South Africa. The Fish River sub-basin is located in Namibia and accounts for the three of the five dams regulating the flows from Namibia into the Orange-Senqu River.

The most important and highly utilized tributary of the Orange-Senqu system is the Vaal River which supplies water to the industrial heartland of Southern Africa, - the Vaal Triangle including Pretoria. As such, the Orange-Senqu System is by far one of the most developed river basins in the SADC region, with many of its intra – and inter - basin water transfer schemes playing a significant role in satisfying different demand scenarios. Such transfers include Lesotho Highlands Water Project and the Orange-Fish Tunnel Scheme. This factor essentially makes the management of the Orange-Senqu River basin a complex matter.



Figure 1: The Orange River Basin

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## 1.2. INSTITUTIONAL CONTEXT

The Orange-Senqu Commission (ORASECOM) was established on 3 November 2000 in Windhoek, Namibia, and this multilateral commission has been meeting regularly since then. It is a legal entity in its own right, with certain functions to execute. Bilateral commissions (between South Africa and Lesotho and between South Africa and Namibia) remain in place, but the activities are subject to scrutiny by ORASECOM. The ORASECOM

is an advisory body with powers only to advise the parties and is not a development agency.

Transboundary water management has always been of key importance in the Orange-Senqu basin, with individual agreements existing between Lesotho and South Africa (Lesotho Highlands Water Project) and Namibia and South Africa respectively on the use of the shared water resources. With the introduction of a joint water resources management commission, referred to as ORASECOM, in 2000, which also included Botswana as a partner due to its specific hydro-political importance in the basin, public participation has slowly emerged as an issue to be addressed at the international level. This development has been flanked by efforts in the riparian countries to enhance public involvement in water resources management, positive experiences with public participation in other African basins, such as the Okavango and last but not least by the international discourse on IWRM (Kranz and Kampa, 2008).

ORASECOM aims to develop the Orange River for the benefit of all the respective states and is the first formal body established for the management of shared water resources since the Protocol on Shared Watercourse Systems became an instrument of international water law in the Southern African Development Community (SADC). The commission plans to develop a comprehensive perspective of the Orange River Basin, study the present and proposed uses of the river system, and determine future requirements for flow monitoring and flood management. It is expected to strengthen regional solidarity and enhance socio-economic cooperation. The multilateral commission will not replace existing bilateral commissions between any of the watercourse states, but rather will provide a broader forum for overall consultation and coordination between the states for sound integrated water resources management and development in the Orange River Basin.

For the past two years, public participation has moved up on the agenda of ORASECOM, but also among the donor community supporting the formation of institutional structures at the transboundary level. An elaborate Roadmap has been drafted in order to direct stakeholder interaction over the years to come, detailing responsibilities as well as concrete steps for implementation. The question that remains is what it takes to put this Roadmap into practice and how learning among all actors can be maintained and strengthened, also with view to fostering the adaptive capacity of the water management regime.

## **2. BACKGROUND**

### **2.1. CONTEXT OF THE STUDY**

In the Agreement that established the ORASECOM, the Commission is regarded as an international organisation with international and national legal personality. The Commission is empowered to serve as the technical advisor of the Parties on matters relating to the development, utilisation and conservation of the water resources of the Orange-Senqu River Basin. The Commission will also perform other functions pertaining to the development and utilisation of the water resources as the Parties may agree to assign to the Commission.

ORASECOM is viewed as an important forum to discuss water matters of mutual interest at a technical level. It may also execute the necessary feasibility studies to enable the Commission to recommend the most feasible technical solutions based on the understanding and use of available information.

While these are noble and worthwhile strategic objectives, it is imperative that the relevant role-players who will effect these recommendations are well capacitated in the execution of their assessment and advisory functions. The need to ensure capacity building of the technical staff, experts, commissioners and stakeholders on an ongoing and sustainable basis is the primary context within which this study will be undertaken. The fact the ORASECOM is in fact not a mature organisation, having only been established in 2000, further emphasises the need to provide sound capacity building as the foundation upon which the Commission will advance into the efficient execution of its functions and mandates.

Ideally, once capacitated, the Commission should be in a position to stimulate and coordinate development within the Orange-Senqu Basin by advising the member states about the availability of water, the results of feasibility studies and the most viable options for infrastructure development.

### **2.2. OBJECTIVES OF THE STUDY**

The main aim of this project will be to strengthen the capacity of the member states of the Orange-Senqu River Basin to manage their shared water resources, to foster cooperation and a multilateral approach to water resources development and management. It is accepted that a lack of cooperation may not only have detrimental effects on the water resources situation, but will also have negative socioeconomic, political as well as environmental consequences.

Capacity building is an important objective of the overall action plan. There is a need for capacity building aimed at different possible targets members of the commission, the ORASECOM Secretariat, representatives and administration in the riparian States, awareness building of the decision-makers, community etc. One important issue is the

development of a common level of understanding between for the four states, the creation of a “level playing field” for discussions, negotiations and joint management.

Capacity building is required in order to ensure that the relevant individuals and teams supporting ORASECOM can fulfill their specific mandates in achieving the following objectives:

- a. Taking measures and making arrangements to determine the long term safe yield of the water resources of the system, surface water and groundwater;
- b. Ensuring the equitable and reasonable utilisation of the water sources in the river system to support sustainable development in the territory of each party;
- c. Facilitating investigations and studies related to development, operation and maintenance of infrastructure on the river system;
- d. Objectives of the ORASECOM Action Plan;
- e. Prevention of pollution and control of aquatic weeds;
- f. Contingency planning for emergencies including drought, flood and pollution;
- g. Regular exchange of information and consultation;
- h. Dispute Resolution.

The main objective of this exercise is therefore the development of a Capacity Building Programme (CBP) based on a need assessment aimed at achieving the abovementioned objectives. The CBP will be aimed at the personnel who are directly involved in the day to day activities of the ORASECOM

### **2.3. KEY CONSIDERATIONS**

During the development of the TNA as well as the actual work sessions and the CBP development phases, it was clear that the training needs were varied between the different member states as well as between the different stakeholders groups involved. It was therefore essential to ensure that the focus of the work conducted as part of this assignment was based on achieving the objectives and functions of ORASECOM.

It was also clear that as an institution, ORASECOM has very specific needs in terms of capacity building required to fulfill its functions and that the identification of training initiatives which will address these needs was not a simple matter. Currently there are a wide variety of courses from a vast range of institutions and service providers which may address some of the needs. In addition, in light of the need for continued professional



development of all members at the different levels, it is essential that training initiatives be identified for the development and empowerment of individual members.

As mentioned a large number of courses do exist, however not all components of all the courses are valid to address the needs of ORASECOM. While some courses can be used in their existing formats and contents to address specific needs, as a general trend it is apparent that existing courses may need to be customised or amalgamated. The training initiatives which were identified for the key focus areas were therefore based on the following criteria:

- **Develop new custom course:** This would essentially entail the creation of a brand new course based on specific criteria required to meet the ORASECOM objectives. In essence a course of this nature would incur a once off development course most likely through the appointment of a Professional Service Provider (PSP). Once this has been achieved, standard training and disbursement costs would be applicable.
- **Customise existing course:** Many courses currently exist for some of the key focus areas. However, based on the strategic nature of the functions of ORASECOM, the detail and length of the existing courses become too cumbersome and therefore such courses may need to be trimmed in terms of length and content to suit the needs of ORASECOM. In such as case, most of the institutions which present such courses will customise the existing course to meet the requirements specified. Such a course will also incur a smaller development cost, after which standard training and disbursement costs would be applicable.
- **Amalgamate existing courses:** This approach would entail the combination of two or more courses into a customised package for the needs of ORASECOM. This is a slightly longer process than customizing existing courses but not as intensive as developing a brand new course. Once again a development cost will be incurred while standard training and disbursement costs would also be applicable.
- **Utilise existing courses:** In many instances the needs of ORASECOM can be met through the utilisation of “off the shelf” courses which are suitable in terms of format, content and length to meet the specific requirements. These courses would only incur the standard training and disbursement costs.
- **Seminars and Workshops:** In some instances, certain topics are of such a nature that they are organisation, strategy or policy specific and therefore cannot be addressed by means of formalised training. In this case, knowledgeable personnel from the member states and associated organisations would be invited to make presentations on specific topics. Such sessions would ideally be combined with pre-planned PIU or similar strategic meetings in order to maximise on time and reduce costs. Since this initiative would largely be an in-house endeavour, the costs associated with this will largely be related to disbursements. Professional fees may be incurred in the event that an external expert is invited to such sessions.



In general terms, the CBP being developed is for different levels of members with varying roles being played within the institution. It is therefore not possible to develop a generic CBP for the organisation and is vital that the role and needs of the different levels are given due credence. The groups specified for the purposes of this project and the relative responsibility of ORASECOM to each group is discussed below:

- **Commissioners:** Based on the profile of the existing commissioners of ORASECOM, it is clear that this level of individual will generally be a person with tertiary qualifications and at least 15 years of experience in the field of water resource management. The commissioners would also be involved in strategic management within their member states. Commissioners will therefore most likely not require training in the basic concepts of integrated water resource management but will rather benefit greatly from interactive discussions and debates on specific topics addressing strategic management imperatives within their member states.
- **Technical Task Team (TTT) Members:** The TTT members are also essentially members who have significant experience and knowledge in general water resource management and would most likely have been involved in the management of such issues within their member states. While they may have a well rounded understanding of the basic principles and applications of IWRM, they may not be experts in any specific field and therefore may prefer to attend specific courses at their discretion.
- **Experts:** Each of the member states will have certain personnel appointed into specialist posts which deal with specifically with the highly technical aspects of IWRM. These experts may be junior personnel who will require targeted training in their field of expertise or experienced experts who may only need to attend short refresher courses to keep with new developments.
- **Stakeholders:** Within the framework of this project, stakeholders do not represent the general public. The stakeholders in this context are organisations and individuals who are involved in IWRM and have a stake in the operational and management policies associated with such activities. Stakeholders would therefore include consultants, water boards, land boards, irrigation schemes, water user associations etc.

## 2.4. APPROACH AND METHODOLOGY

The terms of reference for the project were clear in the fact that the work to be conducted by the project should focus on the preliminary needs assessment that was conducted by the PIU. The preliminary needs assessment was assessed and the project team then proceeded to focus on the identification of additional key focus areas which would correlate to the specific objectives.

Based on this exercise a detailed list of key focus areas was developed and grouped into sensible topics in order to address each objective. These key focus areas were then compounded into a TNA Questionnaire, which would be used for the specific training needs assessment in each of the member states. The TNA Questionnaire is attached as **Appendix C**.

Once the TNA Questionnaire had been finalised, work sessions were arranged in each of the four member states. Prior to the work session taking place, the TNA Questionnaire was circulated electronically to all the member states to allow a pre-assessment. At the work sessions all attempts were made to include as wide an audience as possible. However, while this was not easily achieved, the responses received from the members present at the work sessions allowed the project team to assess and identify the priority training needs for ORASECOM as an organisation. The work sessions conducted were interactive with each objective and the associated key focus areas being discussed in detail with the participants. During the discussions additional focus areas which had not been included in the questionnaire were also identified.

Once all the responses had been received the results were assessed per member state and then collated to provide an indication of the training needs for ORASECOM. The assessment of the results was used to group the focus areas into sensible areas for training objectives. Each of the eight objectives was then addressed in detail in terms of the content and context of the key focus areas. Each focus area was then described in terms of the Objective, Scope and Outcome of training based on the specific topic. This detail is presented in Section 3 of this report.

The results obtained from the work sessions and completed TNA Questionnaires were also used to identify the priority areas for training. Responses for the TNA were based on the identification of KFA as Critical, Important, Optional or Not Applicable. This ranking allowed the identification of priority areas in contrast to those which would be optional extras. Based on this assessment, the following is a list of the key priority areas which were identified:

- **Critical Objectives**

- Objective 1: Objectives of the ORASECOM Action Plan
- Objective 2: Determination of long term safe yield (surface and groundwater)
- Objective 8: Dispute Resolution

- **Important Objectives**

- Objective 4: Reasonable utilisation of water resources to support sustainable development
- Objective 7: Regular exchange of information and consultation
- Objective 3: Prevention of pollution and control of aquatic weeds
- Objective 5: Facilitating Investigations related to infrastructure
- Objective 6: Contingency planning for emergencies

As a general principle, it is accepted that all the members will not attend all the courses and therefore the following assumptions were made in terms of the percentage attendance of the various levels of personnel:

Personnel Level	% of Personnel Attendance
Commissioners	50%
Technical Task Team (TTT) Members	75%
Experts	30%
Stakeholders	15%

In essence this assumption implies that for any given training initiative included in the CBP, 50% of all commissioners, 75% of all TTT members, 30% of all experts and 15% of all stakeholders will be in attendance. Allowance has been made in the CBP to adjust the percentages mentioned in this assumption and therefore make an assessment of the cost implications.

Since it is obvious that there are a large number of training initiatives, it was imperative to divide the key focus areas into phases of priority in order to ensure that there is a priority based logical sequence. The CBP has therefore been divided into three phases essentially encompassing the following:

Phases		
Phase 1	1-3 years	<ul style="list-style-type: none"> <li>• Most intensive phase</li> <li>• Considerable costs incurred</li> <li>• Significant administrative management required</li> </ul>
Phase 2	3-5 years	<ul style="list-style-type: none"> <li>• Course more spread out</li> <li>• Cost is still significant</li> </ul>
Phase 3	5-10 years	<ul style="list-style-type: none"> <li>• May require longer term training</li> <li>• May require adjustment</li> </ul>

It has also been assumed that while a specific need based CBP has been developed for the ORASECOM members, individuals within organisations in the member states will still be receiving on the job training and therefore acquire state specific knowledge and capacity.

While developing the CBP, all attempts were made to avoid being prescriptive in the identification of the service providers as well as the specific courses. It was also not entirely possible to assign a specific date for the courses mentioned since the organisations and institutions generally only update training cycles on a quarterly or annual basis, depending on the nature of the course. As an alternative, a resource base has been developed which will provide an indication of possible service providers for specific types of courses with relevant contact information which can be accessed by the managers responsible for the implementation of the CBP.

### 3. TRAINING NEEDS ASSESSMENT

The ORASECOM Project Implementation Unit (PIU) has already embarked on a process to identify preliminary capacity building needs. The preliminary assessment of capacity building needs conducted by PIU was used as the point of departure.

Based on the available information a detailed breakdown of the ORASECOM objectives was conducted. This entailed the identification of key focus areas for each of the eight objectives which are listed in the ORASECOM Action Plan. A further assessment included the identification of key competencies which may be required to achieve efficient capacity in the specific focus areas. The essential purpose of this exercise was the development of a Training Needs Assessment (TNA) Questionnaire. A template of this questionnaire is attached as **Appendix C**.

More specifically, the objective / aim of this questionnaire was to identify the areas in which capacity is required to be built based on the functions and responsibilities of ORASECOM (Council, technical task teams, steering committees etc) and the national institutions upon which ORASECOM and its members/representatives depend for technical advice, information, data etc. Once the answers to these questions had been obtained, a gap analysis was carried out in order to obtain a clear list of capacity building needs. This list was then converted into a list of interventions of different types.

The following sections provide an indication of the training needs assessment results with graphical interpretations of the results obtained. The information is firstly presented as the original key focus areas which were discussed with the participants of the member state work sessions. The Needs Analysis section for each objective then provides a graphical overview of the responses which were received and collated. Based on this assessment, it was possible to identify the important and critical areas which would require priority attention.

Consequent to this assessment, the various specialists conducted an assessment of each key focus area and the additional focus areas which were identified. Where possible key focus areas were grouped into sensible components and each key focus area was then described in detail in terms of the key components for each area.

In order to ensure that the assessment complements the actual objectives of the ORASECOM Action Plan, the needs assessment as well as the description of the key focus areas has been addressed under the heading of each of the eight objectives.

### 3.1. OBJECTIVES OF THE ORASECOM ACTION PLAN

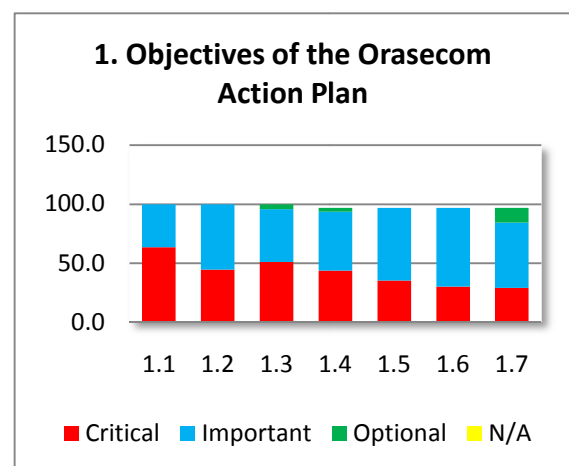
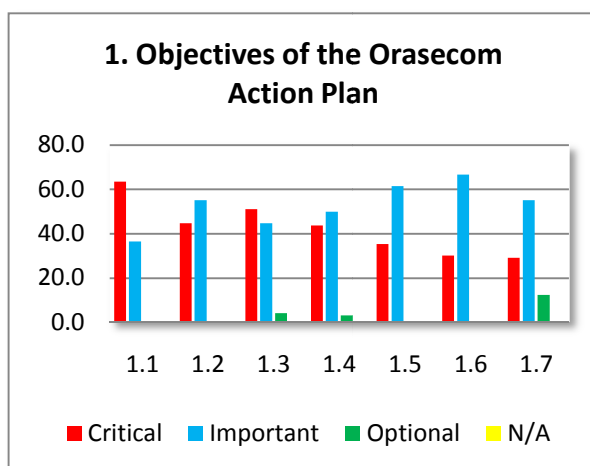
An understanding and knowledge of the background of the organisational structure, institutional arrangements and strategic management philosophies are critical in the efficient function of the organisation.

#### 3.1.1. Needs Analysis

The TNA analysis conducted with members from the individual member states indicated that this objective should receive a high priority in the CBP and should therefore be a focus area which should receive priority attention. The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.

1. Objectives of the ORASECOM Plan	
1.1	Knowledge and understanding of the ORASECOM Agreement
1.2	Clear understanding of the Mission and Vision of ORASECOM
1.3	Knowledge of the primary role of ORASECOM
1.4	Understanding ORASECOM's role in the larger governance area
1.5	Knowledge of the structure and organisation related to functions
1.6	Goals of ORASECOM
1.7	ORASECOM Action Plan

The findings of the analysis for this specific objective are indicated in the graphs below. There was an indication that while there was a basic understanding of the organisation and its functions, the details pertaining to strategic objectives, mission and vision would require some attention.



It can be seen from the graphs that the focus areas related to the ORASECOM agreement as well as factors related to the mission, vision and knowledge of the functions were considered to be of critical importance.

### 3.1.2. Additional Focus Areas

During the needs assessment sessions which were conducted with the members of the individual countries, the following additional focus area was identified and therefore included in the CBP:

- Authority and accountability of ORASECOM

### 3.1.3. Key Focus Areas

**Objective:** The strategic role and function of the ORASECOM in the coordination of transboundary water resource management is a vital component that should be understood clearly by all the relevant role-players. It will therefore be imperative that the technical staff, commissioners, experts and stakeholders are provided with insight into the strategic vision and mission of ORASECOM in order to understand the role of the organisation and therefore efficiently execute the responsibilities associated with the ORASECOM Action Plan.

**Scope:** Since the subject which will be addressed by this specific training initiative will be largely targeted to the aims and objectives of the organisation as well as the specific roles and responsibilities of each member state to the achievement of the strategic objectives, the topics which need to be addressed in this section should cover the following:

- Knowledge and Understanding of the ORASECOM Agreement;
- Clear understanding of the Mission and Vision of ORASECOM;
- Knowledge of the primary role of ORASECOM;
- Understanding ORASECOM's role in the larger governance area;
- Knowledge of the structure and organisation related to functions;
- Goals of ORASECOM;
- ORASECOM Action Plan; and
- Authority and Accountability of ORASECOM.

**Outcome:** It is clear that since this is a very specific organisational driven subject, and therefore a structured course may not exist to address this need. The most efficient means to achieving the required capacity building for this objective would be a strategic workshop session attended by the relevant personnel from all the member states. Presentations from knowledgeable experts and authorities will enable the relevant personnel and stakeholders to obtain a clear understanding of the goals and objectives of ORASECOM.

### 3.2. DETERMINING LONG TERM SAFE YIELD

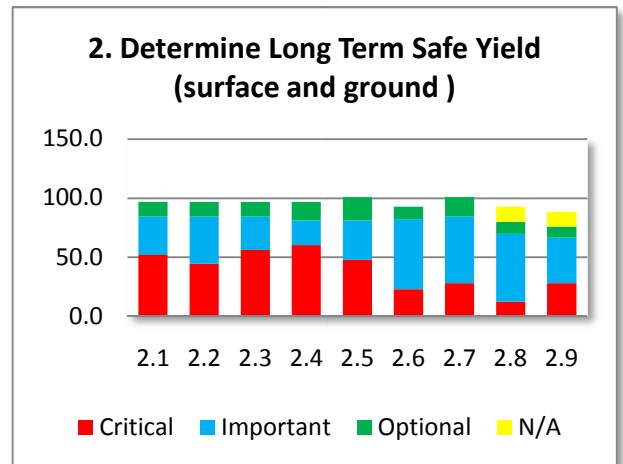
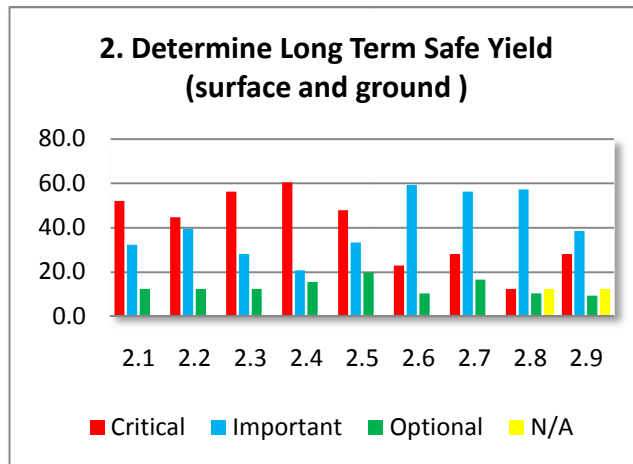
ORASECOM is responsible for the Integrated Water Resource Management of the Orange-Senqu River Basin and as such the relevant personnel instrumental in the execution of this task will be required to be knowledgeable in the area of surface and groundwater management. This aspect will have to be linked to water quality and quantity management in order to understand and management system yield requirements and options.

#### 3.2.1. Needs Analysis

Based on the primary function of ORASECOM it is clear that this component was identified as an area of priority with specific focus on IWRM activities. The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.

2. Taking Measures and Making Arrangements to Determine the Long Term Safe Yield of the Water Resources of the System	
2.1	Water Resource Development Management – Principles and Applications
2.2	Surface Hydrology – Principles and Applications
2.3	Groundwater –Principles and Applications
2.4	Environmental Flow Requirements (Quality and Quantity)
2.5	Integrated Water Resource Management
2.6	Transboundary Diagnostic Analyses
2.7	Catchment Management
2.8	Basic Principles of Modeling
2.9	Data Assessment Techniques

The critical and important elements of the objective as indicated on the graphs below emphasise the fact this is an area of critical importance in the capacity building focus.



The higher weight given to the first five focus areas indicates that there is a clearly identified need for more capacity building initiatives in the practical and resource based aspects of IWRM. While modeling and assessment techniques were also considered to be important these components did not feature as highly critical focus areas.

### 3.2.2. Additional Focus Areas

During the needs assessment sessions which were conducted with the members of the individual countries, the following additional focus areas were identified and therefore included in the CBP:

- Water Quality Management
- Water Demand Management
- Water Conservation Management
- Ecosystems Approach
- Climate Change impacts on water
- Environmental Reporting

### 3.2.3. Key Focus Areas

#### 3.2.3.1. Integrated Water Resource Management (IWRM)

**Objective:** IWRM is a key component for the achievement of effective transboundary water resource management in a cooperative and beneficial manner. Capacity building on this aspect will aim to provide an understanding of IWRM concepts, principles and applications of policies and strategies for the management and implementation of SADC Protocols related to transboundary catchment areas. It must be stressed that the concept of IWRM is largely founded on the inter-relation of a number of aspects and issues which were previously addressed in isolation without the interdependency and impacts being considered. This integration of various aspects is crucial to achieving and implementing effective IWRM.



**Scope:** The training initiatives should be structured to facilitate the capacity building of ORASECOM officials dealing with the technical and political management of the shared basins. This aspect will therefore need to address an array of topics which may be addressed as self-standing components of a larger and more dynamic process. The key strategic topics which need to be addressed in such initiatives should include the following:

### ***Water Resource Development and Management – Principles and Applications***

The objective of this component should be to provide an overview about assessment and decision making techniques in water resources development. Due to the fact that water projects exhibit an extremely long lifetime and also have a broad scope of impacts, it is obligatory to assess the whole set of impacts of water projects. The course should try to develop a methodological framework assisting in the integration of conflicting objectives like economic, social and environmental goals.

A general overview of water resources development strategies should be provided. A formal systems framework based on a state space formulation of water resources planning should be explained. Optimisation techniques including linear, nonlinear and dynamic programming should be explained together with various evaluation techniques. The emphasis should be on classical economic evaluation techniques like cost-benefit analysis and cost-effectiveness approaches.

Aspects of sustainable development and the implications for water resources should also be addressed.

### ***Surface Hydrology – Principles and Applications***

This component should provide an understanding of hydro-meteorological and hydrological processes together with the relationships between rainfall and run-off, hydrological measurements and the dynamics of flow in surface water systems. The course should cover: the hydrological cycle; climate systems; an introduction to rivers, flood plains and wetland environments; hydrometeorologic parameters and measurement; surface water quality, surface water groundwater interactions; data gathering, monitoring programmes and data analysis.

The course content should include the following sub-themes:

- Definition, demarcation and classification of catchments;
- Elements of hydrology of catchments;
- Catchment instrumentation – data collection – recording of data in standard format;
- Data collection techniques: application of remote sensing, geophysical explorations;

- Preparation of hydrology, landuse, geologic, geomorphologic and lineament maps;
- Analysis of hydrologic and meteorological data;
- Groundwater recharge – principles, techniques for recharge improvement;
- Water balance assessment;
- Agronomic aspects of catchment management;
- Scope and applications of GIS in catchment management;
- Philosophy and pedagogy of integrated catchment management;
- Integrated catchment management planning;
- Monitoring and evaluation of catchment management programmes;
- Basic hydraulic principles of static and moving water;
- Measurement of point and estimation of areal rainfall;
- Estimate potential evapotranspiration from weather data and understand the relationship between actual and potential evapotranspiration;
- Differentiate between various runoff processes and identify the conditions under which each are important;
- Choose the appropriate flow measurement technique for different types of watercourses;
- Calculate the discharge of a watercourse by the velocity area method and by use of weirs and flumes; and
- Construct a rating curve for a watercourse.

### ***Water Quality Management***

In order to examine water quality management through IWRM, water quality topics should include regulatory requirements; non-point source runoff; point source discharge; water quality analysis of streams, lakes, and estuaries (including waste heat, conventional pollutants, and toxic chemicals), and in-stream biological resource requirements and assessment.

The aspects covered by such a training initiative should include topics such as:

- Introduction to water quality; defining biological, chemical and physical parameters; and water quality variation in all water bodies;
- Strategies and planning for water quality assessments; objectives and methodology; planning implementation, including staffing, funding and analytical considerations;
- Selection of water quality variables for monitoring and assessments; use of restricted parameters for monitoring programmes; use of expanded ranges of parameters; selecting appropriate ranges for different types of monitoring;
- Key surface and groundwater quality issues and their sampling requirements; principal pollutants and their sources; prevention of contamination; source and resource protection and management; remediation of contaminated water;

- Management of the human use of water resources and the need for water quality monitoring for effective decision-making; using monitoring data to improve management of water use; designing management-oriented monitoring programmes;
- Water quality and human health; key impacts of water on health resulting from contact and ingestion of water; water-related diseases and their impact on morbidity and mortality; preventing disease transmission;
- Environmental water quality requirements; environmental impact of water contamination; establishment of environmental standards; pollution control and prevention;
- Information management in water quality monitoring and assessment; storage and treatment of data; the use of data management systems;
- Policy, IWRM, institutional arrangements and legal frameworks for water quality management;
- Challenges and issues in reservoir water management: features and geographical factors; environmental factors; and multi-purpose use of reservoirs as water sources;
- Public health aspects: water-related disease; public health impacts of water quality; vectors of water-related diseases; parasitic disease associated with poor water quality; public health issues in lake and reservoir management;
- Pollution control: history of pollution control law; principles of pollution control policy; setting standards for water quality in lakes and reservoirs; and waste disposal control;
- Socio-economic aspects: reservoir management from the perspective of local residents and civil society; social and environmental problems of water resource management; analytical framework for water resources management; and the importance of public participation in environmental conservation and management;
- Water quality analysis: sampling of water and sample preservation; analytical techniques for water quality analysis; use of sediment analysis; use of biological monitoring; interpretation and use of data; and planning monitoring programmes;
- Groundwater quality issues: unsustainable, heavy groundwater usage, pollution incidents;
- Groundwater pollution: the conceptual basis for groundwater pollution risk assessment and for aquifer vulnerability. Types of groundwater pollution, assessment of contaminant load from urban and industrial sources, solid waste disposal and agricultural land-use; and
- Groundwater protection strategies: control of groundwater abstraction, land surface zoning for resource and source protection, control of pollution sources.

### ***Water Conservation and Demand Management***

Water conservation and demand management (WCDM) is an approach that aims to conserve water (quality and quantity) and optimize water use through various strategies which include: technologies that increase the efficiency of water use; behaviour change that ensures long-term sustainability of water resources; pricing and setting of tariffs; and an enabling policy within the institutional and legislative environment.

The training initiative should therefore be designed to equip relevant personnel and stakeholders with knowledge and skills on how best to face the water demand challenges, and to:

- Establish a common understanding of definitions, concepts and current approaches in water demand management;
- Share experiences on current practices in water demand management and take stock of best practices;
- Sharpen the participants knowledge and skills on guidelines, standards and tools that support efficient water demand management;
- Develop individual/group strategies and work plans for the implementation of water demand management activities; and
- Focus on different types of water use (and water demand) in urban areas. Factors affecting water demand, micro-component analysis of the domestic water demand, peak and seasonal variation factors, as well as pressure-related water demand are elaborated and different methods of forecasting urban water demand (including population forecasts) should be discussed.

The need for a paradigm shift from traditional supply driven water management to water demand management should be elaborated. Different methods and approaches (structural, economical and socio-political) of urban water demand management should be discussed. Additionally, information on different water saving devices and water conservation measures must be provided.

### ***Sustainable Catchment Management***

Sustainable catchment management is essentially an amalgamation of components of catchment systems and their functions (wetlands, riverine vegetation, estuaries, landscape types, grassland and forests) and the interactions and interdependences of their functions. Effective catchment management is based on an understanding and management of environmental problems caused by human activities and the implementation of corrective measures for identified problems within the catchment systems. Monitoring of water quality and quantity, biomonitoring techniques to assess riparian vegetation, riverine systems and wetlands, basic freshwater ecology, the importance of wetlands in a catchment system are vital components of this aspect.

A training initiative addressing the aspect of catchment management should equip the trainee with the following key skills and capabilities:

- Development of a detailed understanding of the science necessary for the achievement of sustainable catchment management (SCM);
- Development of an awareness of the linkages between hydrology, ecology, legal and planning frameworks relevant to SCM;
- Critical evaluation of the policy positions of different groups concerned with SCM, e.g. representatives of the environmental regulatory authorities, wildlife sectors, environmental user groups, stakeholders, impactors etc.;
- Gain insight into the dependencies between resource monitoring, resource assessment, and water resource management decisions; and
- Gain an understanding of the difficulties of achieving sustainable catchment management objectives in practice and the importance of local details, thereby promoting deeper understanding of the means by which SCM can realistically be achieved

**Outcome:** Having completed such a course the participants should be able to understand and explain IWRM concepts and principles and use their acquired knowledge in their daily functions within their organisations as well as in the broader ORASECOM environment related to negotiations for management of shared water resources.

In today's complex water policy world, an integrated, regional and comprehensive approach to water management is essential. A sustainable approach to water management, linking solutions for water supply, water quality, water use efficiency, water reuse and recycling, conjunctive use of ground and surface water and environmental and aquatic protection and restoration is essential for effective IWRM.

It must be emphasised that IWRM starts with interdisciplinary learning and teaching which is informed by the 'whole water cycle' approach which acknowledges the interconnectedness of water in the landscape and in human and natural systems. Coordination of the management of physical resources and the human systems dependent on these resources through strategic planning, policy making and multi-stakeholder decision making processes will be a vital outcome of capacity building related to IWRM.

### 3.2.3.2. Groundwater – Principles and Applications

**Objective:** While it is accepted that groundwater is a complex medium to deal with and requires a great deal of expertise a basic understanding of groundwater recharge, groundwater storage, and groundwater movement is essential for those involved in the science, engineering or management of the water environment. Capacity building on this aspect should concentrate on the quantification of groundwater hydrological processes. The purpose of such a course should be to provide an introduction to groundwater systems.

It should start with the origins, nature and behaviour of aquifers and subsurface waters and the characteristics that define them and affect groundwater storage and flow.

**Scope:** The techniques of hydro-geological investigation including drilling and pump testing, computer based groundwater modeling and, the evaluation of groundwater resources should be presented. The course should introduce basic concepts in solute transport in groundwater systems as well as basic concepts in groundwater quality analysis. Modeling techniques should be applied to groundwater pollution and pollutant transport problems. Some of the key topics which should be covered in such courses are:

- Groundwater occurrence: porosity, permeability, water holding formations, aquifers, aquicludes, aquifer types, aquifer boundaries, springs and streams in relation to groundwater;
- Aquifer properties: transmissivity, storage coefficient, significance and typical magnitudes of these properties;
- Groundwater movement: flow lines and equi-potentials, natural flow, recharge, flow to wells, drawdown, cone of influence, radius of influence, interference;
- Pumping tests: aquifer and well tests, conduct, measurement of variables, precautions;
- Pumping test analysis: Theis and Jacob approaches, well efficiency. Dupuit-Forchheimer and Theis assumptions, deviations from these, and alternative methods;
- Describe and conceptualise the occurrence and movement of groundwater;
- Apply Darcy's Law to simple groundwater flow problems; and
- Explain the mechanisms of groundwater recharge in different climatic environments.

**Outcome:** The mechanics of groundwater flow, the principles governing flow and their application should be some of the key operational principles which will be explained and therefore understood by the trainees. A basic understanding of groundwater principles, mechanisms and management options will be obtained which will enable relevant personnel and stakeholders to participate meaningfully in discussions and negotiations related to groundwater management.

### 3.2.3.3. Environmental Flow Requirements (quality and quantity)

**Objective:** The assessment of environmental flow requirements is central to Integrated Water Resources Management. It is therefore imperative to provide decision makers with an understanding of the basic concepts, issues, approaches and methods used to determine and manage environmental flows within the framework of Integrated Water Resources Management.

**Scope:** the main components of a course or training initiative related to the understanding of environmental flow requirements should address the following:

- Context to Environmental Flow Requirements: background and introduction to concepts and a discussion on why EWRs are important – regional and international perspectives;
- Ecosystems approach to EFRs: assumptions, objectives and principles of the approach;
- Overview of EFR method development, setting the Reserve (where applicable), legal and regulatory framework, levels of confidence and methodologies such as Building Block, Drift etc;
- Managing Environmental Flows for sustainable livelihoods: the interaction between ecological and socio-economic systems, valuation of ecosystem services and participation of stakeholders;
- Generic 7-step EFR process: the development of water quality methods within ecological reserve assessment, and their link to environment flows;
- Methods for determining EFRs drivers (hydrology, geomorphology and hydraulics
- Data collection and analysis for drivers - hydraulics, geomorphology, hydrology etc.;
- Methods for determining biological response variables in rivers: macro invertebrates: Tools that are used to assess and monitor aquatic ecosystems (Bio-assessment and bio-monitoring), using macro-invertebrate organisms;
- Methods for determining groundwater reserves: an overview of the steps and methods followed in determining groundwater resource direct measures and post groundwater resource direct measure activities;
- 7-step water resource classification procedure based on delineation of units of analysis, linking of value and condition, quantifying EFRs, setting of ecological sustainability base, evaluation of scenarios within IWRM framework and evaluation of scenarios with stakeholders;
- EFR for estuaries: An overview of Ecological Flow Requirements for estuaries. Key features covered would relate to important biota, Micro-algae, Macrophytes and invertebrates, fish, birds and salt water/fresh water interaction rates; and
- Operationalising EFRs.

**Outcome:** The course's overall outcome would be to place environmental water requirements within the context of integrated water resource management, with an emphasis on the use of alternative or non-conventional water resource management measures as a means of meeting the EWR for areas where water resources are limited. This aspect is highly scientific and technical and may be more applicable to specific personnel dealing with the more specialised and technical aspects of IWRM.

#### 3.2.3.4. Environmental Reporting

**Objective:** The environment is increasingly becoming an important business issue and it will be even more so in the future. Environmental reporting nowadays features largely in annual reports and elsewhere. It is however not compulsory and corporate decision makers much therefore make a decision for or against such reporting. The main aspect to be dealt



with in this component is the assessment of the value of the information presented in the reports and the specification of requirements for reporting.

**Scope:** In order to emphasise the importance and value of environmental reporting principles, the following benefits must be accentuated:

- Obtaining an understanding of the current status quo related to the state of the environment within which the specific reporting proponent operates;
- Provision of management information in order to assess the cost of resource utilisation, management and protection in terms of environmental costs, financial and social implications;
- Assessment of good environmental performance versus negative practices;
- Proposed measures for the improvement of environmental performances based on a uniform reporting perspective; and
- Development and assessment of structured strategies which will be implemented to achieve sustainable development and beneficial resource utilisation and protection.

In order to obtain valuable and usable information in terms of environmental reporting it is essential to focus on Key Performance Indicators (KPIs) which will provide the basis for a uniform reporting as well as assessment perspective. Some of these KPIs will include aspects such as:

- Relevant regulations and directives associated with the activity being reported on;
- Environmental obligations in terms of compliance to required legislations;
- Environmental implications such as carbon trading, emissions trading, waste discharge charges, tax rebates etc.;
- Financial consequences of environmental implications;
- Social and development plans of the operation; and
- Sustainable development plans and procedures etc.

**Outcome:** The main result of such an initiative will enable the trainees to understand and assess the values of the numerous environmental reporting documents such as the State of the Environment Report, which is based on national as well as regional KPIs, the Social Development and Sustainable Development Reports of private enterprises etc. Since these reports are generally based on a strategic level they will provide the decision makers with a reasonable well formulated tool to facilitate informed decision making.

### 3.2.3.5. Transboundary Diagnostic Analysis

**Objective:** The GEF's operational strategy recommends the use of a number of tools to facilitate country participation in projects that take an integrated approach to managing land and water resources. One of these tools is the Transboundary Diagnostic Analysis (TDA), a science-based assessment which identifies and quantifies the causes of environmental problems in a geographic region. The TDA takes into account national, regional and global



factors such as the socio-economic, political and institutional contexts, without ignoring national concerns and priorities. The TDA should be an objective assessment, based on the best available scientific and technical information and is compiled through full consultation with all stakeholders. The TDA is a vital document in the preparation of the Strategic Action Programme (SAP).

**Scope:** A Transboundary Diagnostic Analysis (TDA) is a scientific and technical assessment, through which the water-related environmental issues and problems of a region are identified and quantified, their causes analyzed and their impacts, both environmental and economic, assessed. The analysis involves an identification of causes and impacts at national, regional, and global levels and the socio-economic, political and institutional context within which they occur. The identification of the causes would specify sources, locations, and sectors.

The main thrust of a TDA can be summarised as follows:

- Assisting groups of countries to better understand the environmental concerns of their international waters and work collaboratively to address them;
- Building the capacity of existing institutions (or, if appropriate, developing the capacity through new institutional arrangements) to utilize a more comprehensive approach for addressing transboundary water-related environmental concerns; and
- Implementing measures that address the priority transboundary environmental concerns.

It is also suggested in the Operational Strategy that a SAP be formulated when the transboundary concerns, the actions needed to address them or their incremental costs are not clear and that it should precede the development of any technical assistance, capacity building or investment projects to be funded by the GEF.

Therefore a SAP is required to describe a framework for regional action, to demonstrate the linkages between the national and regional actions and to identify the incremental costs (e.g., those that address primarily transboundary environmental concerns) of the proposed activities. The ultimate product, the SAP, is a set of targeted and costed activities (baseline and additional) which, once implemented, will together contribute to solve the major water-related environmental problems of the region and thereby will also provide significant global environmental benefits. The transboundary character of the identified water-related environmental issues and problems and the regional and global significance of benefits to be gained by addressing the specific issues identified during the process of developing a TDA would provide the technical background for the analysis of the incremental costs of the specific actions proposed in the SAP.

**Outcome:** The purpose of conducting a Transboundary Diagnostic Analysis (TDA) is to scale the relative importance of sources and causes, both immediate and root, of

transboundary 'waters' problems, and to identify potential preventive and remedial actions. The TDA provides the technical basis for development of a Strategic Action Programme (SAP) in the area of international waters of the GEF. Although formulation of a SAP relies on the scientific and technical justification provided in a TDA, the specific combination of activities contained in a SAP is also determined by both national and regional policy considerations that may affect project sustainability and cost effectiveness.

#### 3.2.3.6. Basic Principles of Modeling

**Objective:** The science of modeling is a highly specialised and very technical field of expertise which requires very specific training. The main advantage of modeling is that it allows the simulation of various scenarios under varying conditions in order to obtain a series of predictions which are used for decision making related to operational, planning and strategic matters. While it is accepted that not all water resource managers can be experts in modeling it is important for them to understand the basic principles in order to make informed decisions.

**Scope:** The idea of a training initiative in the basic principles of modeling is to provide managers and decision makers with sufficient operational knowledge to understand how a relevant model works, the assumptions and calibration aspects and the interpretation of results based on limitations and strengths. Such an initiative should generally address subject such as:

- Knowledge of hydrology and the hydrological cycle (precipitation, evaporation and stream flow);
- Knowledge of measurement/monitoring and data preparation;
- Knowledge of how catchment land use affects rainfall/runoff relationships;
- Knowledge of different catchment models and their purpose;
- Knowledge of how a model is set up (data sets);
- Calibration techniques;
- Determination of assumptions and the associated limitations;
- Basic statistics (regression and correlation); and
- Knowledge on how to interpret model output.

Specific modeling initiatives for water resource management can also be included in this type of training initiative. This could be addressed as a component of water resources systems analysis with specific reference to the following:

- Integrated water resource management;
- Catchment models;
- Water requirements (quantity and quality)
  - Human needs;
  - Agriculture;
  - Industrial;
  - Aquatic ecology;

- Recreation;
- Reconciling competing requirements; and
- Optimisation techniques

**Outcome:** The essential advantage of a course on understanding the basics of modeling is the provision of sufficient knowledge which will enable decision makers to make enquiries and decisions based on a sound footing. This will also empower the decision makers and role-players to determine aspects which need to be addressed and referred back to specific experts within their own states for better negotiations based on predictions.

### 3.2.3.7. Data Assessment Techniques

**Objective:** In the current age of data and information availability it is important for decision makers to be more responsive to management needs for data that address pollution management concerns, and provide the basis for decisions on programme and infrastructure investment. Data is only valuable and useful if it can be assessed and evaluated in terms of the current need or aspect being discussed and negotiated.

**Scope:** A training initiative on this aspect should therefore focus on the different types of assessment methodologies as well as the value of such a technique to address a specific type of query or scenario. The course should highlight:

- A critique of conventional data monitoring, including types of uncertainty;
- Exploring alternative approaches to monitoring, including diagnostic, screening and survey techniques, which are cost effective and more informative, and which are directly linked to the decision process for water management;
- Techniques for linking data programmes to specific needs for data, including pollution control and pollution infrastructure investment decisions;
- Water quality monitoring as a “service” function: establishing data quality objectives; programme priorities, and “fitness for purpose” concept
- Monitoring for decision making: aligning water quality issues, such as point and non-point source control, basin assessment, and toxics control, with water quality parameters and methods, including multimedia sampling;
- Dealing with uncertainty: types of uncertainty inherent in field and laboratory programmes, and methods for handling uncertainty;
- Monitoring technologies: including diagnostic and screening techniques, and environmental effects monitoring, as alternatives to chemical analysis, and their use in decision making;
- Governments and efficiency: network optimization and rationalization; operational efficiency; roles of government and the private sector in water quality programmes, and cost reduction; and
- Implications of different regulatory requirements on cost of data programmes; and examples of good practices from around the world.

**Outcome:** Decision makers need to be able to interpret data in a manner that allows them to understand the status quo as well as the impact of activities on the status quo in the future. The training initiative for this subject will provide members with the ability to interpret data in a variety of ways in order to obtain an understanding of the situation to facilitate sound decision making.

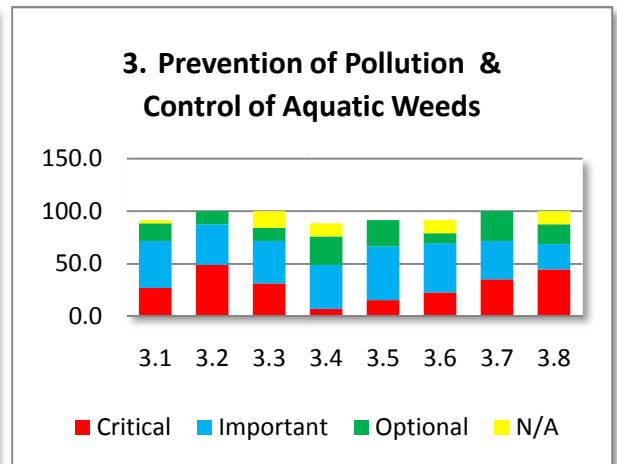
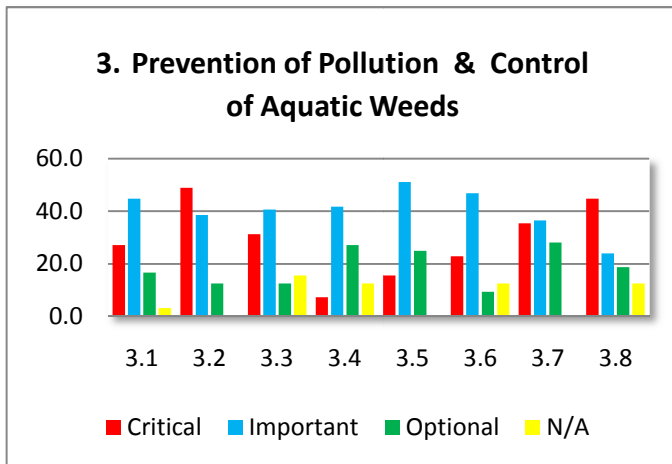
### 3.3. PREVENTION OF POLLUTION AND CONTROL OF AQUATIC WEEDS

Prevention and control of pollution are the basic building blocks for implementation of Integrated Water Resource Management. It is therefore vital to understand the dynamics of the receiving water as well as the aquatic ecosystems water quality requirements, in terms of the IWRM approach where water quality management consists of an integrated source, remediation and resource directed management approach.

#### 3.3.1. Needs Analysis

The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.

3. Prevention of Pollution and Control of Aquatic Weeds	
3.1	Authorisation processes
3.2	Pollution control and prevention
3.3	Penalties and liabilities for pollution
3.4	Resource based approaches
3.5	Source management strategy
3.6	Remediation strategy and tools
3.7	Resource monitoring
3.8	Data management



As a general observation, the majority of the responses received did not place a significant priority level on the key focus areas for this objective with the average indicator being below 50%. This indicates that the main focus of the ORASECOM members will be placed on more strategic management issues rather than practical measures.

### 3.3.2. Additional Focus Areas

During the needs assessment sessions which were conducted with the members of the individual countries, the following additional focus areas were identified and therefore included in the CBP:

- Eradication of exotic, invasive alien species
- Resource Quality Objectives
- Water Quality Standards
- Environmental Impact Assessments

### 3.3.3. Key Focus Areas

#### 3.3.3.1. Prevention of Pollution

**Objective:** As a general rule most countries have regulatory processes associated with the utilisation of the resource in order to ensure the sustainable and beneficial use of resources within a protection framework. The best means to achieve this goal is to use authorisations in the forms of permits, licenses, exemptions etc. which are easily managed in terms of compliance monitoring and enforcement. Since the ORASECOM functions extend over transboundary waters it is essential that the key decision makers involved in operational and management issues are aware of the key authorisations processes in each member state

**Scope:** The training initiative which will deal with this specific aspect will most like be a custom made course which will address the authorisation and pollution control aspects of all member states. In order to gain maximum benefit from such an initiative it may be

advisable to combine this topic with a water and environmental law course. The main aspects which will need to be addressed are:

### ***Authorisation Processes***

- Key legislative imperatives;
- Basic principles for authorisations;
- Types of authorisations;
- Activities which require authorisations;
- The main factors which are considered in the authorisation processes; and
- Roles and responsibilities in terms of process and issuance of authorisations.

### ***Pollution Control***

- Monitoring and assessment;
- Command and control concepts;
- Compliance auditing;
- Compliance enforcement; and
- Corrective actions.

### ***Penalties and Liabilities for Pollution***

- Assessment of liabilities;
- Apportionment of responsibility;
- Imposing of fines and penalties;
- Pollution incident management; and
- Mitigation plans.

### ***Eradication of exotic, invasive alien species***

- What is an invasive alien species;
- What is the effect on water availability (surface water and ground water);
- Eradication techniques (including follow-up);
- Effectiveness of eradication in terms of catchment water yield; and
- Do's and don'ts of eradication (eg, do not leave a wasteland behind)

**Outcome:** The main subjects covered in this aspect will provide decision makers with an overview and basic understanding of the legislation and associated authorisation processes in each of the member states linked to the consequences of non-compliance. This will enable a more informed platform for discussion and negotiations of issues related to development and resource utilisation.

### **3.3.3.2. Resource Based Approaches**

**Objective:** Natural resource-based planning involves inventory and value assessment of natural resources to allow decision makers and stakeholders to determine where development is most appropriate and how to maximize the integration of natural resources into the structure of the environment and a community. By determining the type, location

and function of natural resources, authorities and proponents can avoid the unintended consequences that often occur in the development of urban areas. A community can also use their natural assets to meet water quality goals, reducing property damage from floods and other natural events, protect wildlife and critical habitat, and add to the aesthetic value and the overall quality of life within the community.

**Scope:** The most effective means to address this aspect will be to discuss the various concepts and interpretations of the resource and the value and ranking assigned to resources in different areas based on use and availability. The sub-components which need to be addressed are:

- Policy, strategy and management instruments to facilitate the management of water quality from a resource perspective;
- Making water resource management water quality friendly;
- Understanding the concept of “fitness for use”;
- Integration of WQM policies and methodologies into water resources management;
- Understanding the concept of Resource Classification;
- Balancing aquatic needs with development strategies;
- Guidelines for catchment visioning;
- Guidelines for determining stress, resource water quality objectives and the allocatable resource; and
- Guidelines for converting resource quality objectives into end of pipe discharge standards.

**Outcome:** Providing decision makers and role-players with an understanding of resource based approaches will enable them to assess and evaluate all development initiatives within the bigger picture. This will facilitate decision making at a strategic level rather than on a project or regional basis.

#### 3.3.3.3. Source Management Strategy

**Objective:** A major issue that all member states are dealing with on an ongoing basis is the deterioration of the water quality of their water resources. One of the contributing factors to this water quality deterioration is the increasing level of economic activity and urbanisation, which gives rise to an increasing number and diversity of pollution sources. The management and control of these pollution sources needs attention. Although several source management tools and instruments are available the use of these instruments in support of the national and collaborative programmes requires a coordinated and focused approach.

**Scope:** Elements of a source management strategy could be summarised as follows:

- A strategic objective based on the combination of priority elements;
- Prioritisation of sources at national level;

- Developing Best Practice documents;
- Developing an optimal organisational strategy together with operational elements;
- Prioritisation of sources at a regional level, developing Source Management Plans; and
- Focusing on authorisation of sources.

**Outcome:** A source management strategy is an important tool that allow for the effective management of pollution sources within a strategic regulatory framework. The cooperative nature and imperatives of ORASECOM will benefit from an understanding of each member state's strategy and the possible inter-linkages which can be maximised to achieve the ORASECOM objectives.

#### 3.3.3.4. Remediation Strategy and Tools

**Objective:** Regulatory authorities, based on their government mandates, are generally committed to providing water resources that meet basic human needs on an on-going basis, and enhancing social development by increasing levels of health and general well-being. Contamination from existing and historic activities potentially threatens these goals by rendering areas unavailable or under-utilised for development. Contaminated land is also associated with severe deterioration of the quality of surface water and groundwater which prohibits efficient and beneficial use of water in the public interest. It is therefore imperative that decision makers act to support the health and well-being of their constituencies, particularly disadvantaged communities that bear the burden of contamination risk.

**Scope:** The application of a remediation strategy is subject to existing tools as well development initiatives which will aid in remediation methodologies and processes. The remediation aspect is addressed by two specific processes based on regulatory and technical requirements. A capacity building initiative for this topic will most likely address components such as:

- The application of effective management and legislative tools to ensure that the methodologies, approach and decision making process can be implemented;
- Ensuring adequate and continued inter-departmental (by applying co-operative governance principles) and external stakeholder participation throughout the project; and
- Facilitating inter-governmental cooperation to aid successful implementation of transboundary remediation projects.

**Outcome:** In general, understanding and applying the principles of a cooperative remediation strategy will enable decision makers to achieve their strategic objectives of eliminating immediate harm to human health and safety, ensuring fitness of water resources for current and future use for basic human needs and aquatic ecosystem requirements, and which are also protective of non-aquatic organisms. Key role-players will



be able to implement measures which will enable protection of land and property such that it is fit for use consistent with current and future land-use.

#### 3.3.3.5. Resource Monitoring

**Objective:** Resource monitoring is largely comprised of developing and implementing methodologies and tools to move towards a more adaptive water management regime. An innovative monitoring system should be adaptive and flexible, able to deal with environmental changes and adapt to changes in political context and societal values, able to incorporate new information, technologies and scientific researches, and tailored for specific ecosystems. Managing the human use of water resources, protection from pollution, and maintaining healthy water, require information about both the natural, as well as the anthropogenically-induced changes in water quality. This requires sustainable programmes for water quality monitoring and assessment that are designed to meet management needs, to strengthen decision-making, and to contribute to effective water governance.

**Scope:** A course based on this requirement should provide participants with a thorough understanding of the key concepts and their practical application. In recognition of the varied needs in water quality monitoring, assessment and management worldwide, both foundation and advanced levels of training are required in the following aspects:

- Introduction to monitoring and assessment;
- Network evaluation and optimization;
- Effective water quality monitoring in combination with a comprehensive and coordinated compliance and reporting regime;
- Baseline monitoring linked to delineating source water quality prior development of a source monitoring plan; and
- Detecting and addressing threats to water quality within a river basin.

**Outcome:** Participants will be able to make use of monitoring for decision making: aligning water quality issues, such as point and non-point source control, basin assessment, and toxics control, with water quality parameters and methods, including multimedia sampling.

#### 3.3.3.6. Resource Quality Objectives

**Objective:** The formulation and setting of objectives requires a clear understanding of the functioning of the system as well as the role-players involved and has to be based on adequate information and guidelines. Resource Quality Objectives are vital in the adequate and effective management of a resource to enable beneficial use without compromising the fitness for use by downstream users.

**Scope:** To formulate water quality management objectives the following components must be integrated:

- A clearly demarcated and characterised, manageable system (catchment or sub-catchment);
- All water users within the demarcated system and their water quality requirements; and
- Impacting factors within the system such as natural physical characteristics, anthropogenic activities and development.

Basic concepts related to Resource Quality Objectives:

- The Resource Quality Objectives (RQO's) for a water resource are a numerical or descriptive statement of the conditions which should be met in the receiving water resource, in terms of resource quality, in order to ensure that the resource is protected.
- RQO's for a water resource are set on the basis of acceptable risk, i.e. the less risk we are prepared to accept of damaging the Resource Base and possibly losing the services provided by the water resource, the more stringent would be the objectives. A higher risk to the resource base might be accepted, in return for a greater short term utilisation, and then the RQO's would be set at less stringent levels.
- RQO's are scientifically derived criteria, based on the best available scientific knowledge and understanding. They represent our best assessment of the resource quality which is necessary to provide a desired level of protection to a water resource, with a particular degree of assurance or risk.
- The RQO's are based on a classification system that provides a set of nationally consistent rules to guide decision-making about water resources. A national classification system allows transparency, accountability and long-term goal-setting to be incorporated into water resources management.

A training course on this topic should cover the following aspects:

- Definition of resource quality objectives in terms of aquatic system health and user requirements;
- Translating resource quality objectives into measurable management objectives (flow and quality);
- Translating management objectives into operational rules; and
- Translating operational rules into decision-making re authorization of water use (abstractions as well as return flows).

Practical aspects related to the determination of resource quality objectives include:

- Delineation of the water resource system;
- Water quality requirements of water users;
- Characterisation of the physical system;

- Water quality management guide; and
- Formulation of water quality objectives.

#### Water Quality Standards

- Definition of water quality and the relationship between water quality criteria and standards;
- Water quality constituents;
- Constituent specific criteria/standards;
- Criteria/standards for complex mixtures;
- User specific criteria/standards;
- Deriving criteria/standards for multiple user groups;
- Management objectives and the role of water quality criteria and water quality standards;
- Available water quality criteria, how to use, pitfalls and limitations (different units, underlying assumptions, etc.); and
- Available water quality standards, how to use, pitfalls and limitations (different units, underlying assumptions, etc.).

**Outcome:** The course contents will enable the trainees to understand the process to be followed in the determination resource quality objectives based on the requirements of the users and the availability of the resource for current use versus the needs of future generations. The methodologies use assumptions that are not defined within a holistic scientific basis but rather derived from available technology and understanding that utilises an ecosystem endpoint. The methodology allows for ongoing refinement in the determination to improve confidence.

#### 3.3.3.7. Environmental Impact Assessments – procedures and processes

**Objective:** The concept of Environmental Impact Assessments has gained great prominence in recent years as a decision making tool for regulatory authorities to conditionally allow or totally stop development initiatives based on the expected impact on the environment including local and surrounding communities. The decisions made are based on weighing the benefits against the risks and on identifying measures to minimize negative impacts and maximise benefits. Within the ORASECOM framework, the decision makers may be faced with decisions related to development initiatives which affect more than one member state requiring a collaborative effort to reach an informed and suitable outcome.

**Scope:** This topic will introduce the audience to the principles, concepts, best practice and legal requirements for undertaking Environmental Impact Assessments for either the intention of acquiring authorization or informing decision-making. The course will include:

- EIA Best practice principles (purposeful, rigorous, practical, cost-efficient, efficient, focused, adaptive, participatory, interdisciplinary, credible, integrated, transparent, and systematic);

- An introduction to the generic Impact Assessment process (screening, scoping, alternatives, impact analysis, mitigation and impact management, evaluation of significance, environmental impact statements);
- Public Participation;
- Transboundary EIAs;
- Strategic Environmental Assessment;
- Environmental Management Plans; and
- Review of EIAs and decision-making.

**Outcome:** A course on EIA and the associated sub-processes will equip key role-players with a suitable understanding of the requirements and processes involved in obtaining authorisations. This will also facilitate strategic planning procedures and time frames for project planning and execution.

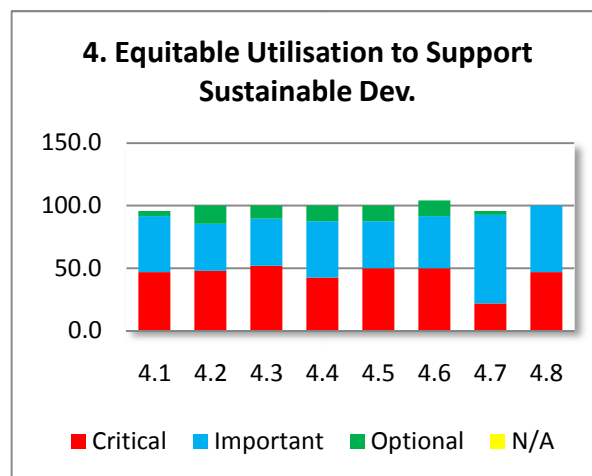
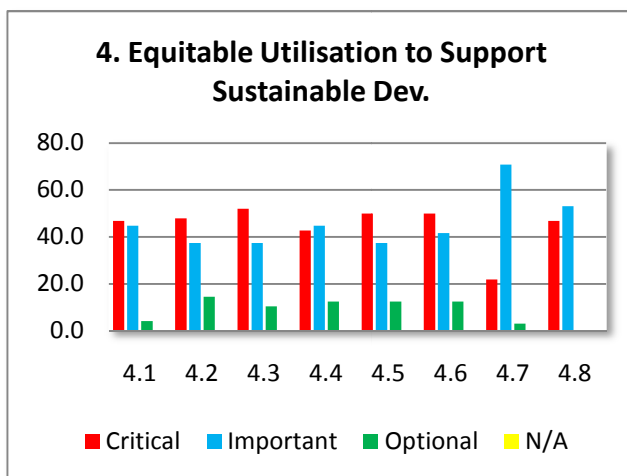
### 3.4. REASONABLE UTILISATION OF WATER RESOURCES TO SUPPORT SUSTAINABLE DEVELOPMENT

Since the ORASECOM deals with the management of transboundary water resources a clear understanding of the relevant legislation of the partner countries as well as international regulatory mechanisms which may impact on the operational management of the organisation is required. In this context it is also vital to understand the international initiative which are being undertaken and implemented in order to ensure sustainable development.

#### 3.4.1. Needs Analysis

The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.

4. Ensuring Equitable & Reasonable Utilisation of Water Resources in the River System to Support Sustainable Development in the Territory of Each Party	
4.1	Principles of sustainable development
4.2	UN Protocols
4.3	International laws
4.4	Environmental principles
4.5	Water legislation
4.6	Environmental legislation
4.7	Bilateral Agreements
4.8	SADC Protocols



The principles of sustainable development are considered to be quite important in the strategic management of water resources as well as in co-operative management of resources. It is therefore clear from the needs assessment that in general equal importance was given to the various key focus areas which comprise this objective. A specific aspect which may require focused attention is based on the fact that bilateral agreements were not considered to be a priority by the majority of the members. This could be attributed to lack of awareness of the importance of such agreements and a training initiative for this aspect should therefore be considered a priority.

### 3.4.2. Additional Focus Areas

During the needs assessment sessions which were conducted with the members of the individual countries, the following additional focus areas were identified and therefore included in the CBP:

- International Water Rights
- Tri-lateral Agreements
- Global Water Partnerships
- World Commission on Dams

### 3.4.3. Key Focus Areas

#### 3.4.3.1. Principles of Sustainable Development

**Objective:** It is clear that without sustainable and equitable management of water, achieving global water and sanitation targets, or indeed any of the Millennium Development Goals, will be virtually impossible. Water is a critical component of sustainable development, essential for socio-economic welfare and poverty reduction as well as human and environmental health. Managing water resources for the human development of present and future generations in an environmentally sustainable way is a daunting challenge. The key to meeting this challenge is to develop capacity for effective and equitable water resource management.

**Scope:** A course on the sustainable development principles and applications will address the following aspects:

- Management philosophy (development vs. environmental protection) in the member countries;
- Environmental assessment in the member countries;
- The three pillars of sustainable development and how they relate to water resource management in terms of key objectives and main criteria; and
- Assessment of sustainability.

### ***Ecosystems Approach***

An ecosystem based approach to planning integrates social, cultural, economic and environmental factors, and emphasizes the need to protect, maintain and enhance whole natural systems as a necessary prerequisite to sustainable living. It is an inherently interdisciplinary process that draws upon a wide range of expertise and perspectives. It is also participatory and inclusive, potentially involving every sector of society.

The ‘ecosystems approach’ seeks the objective management of water quality in lakes and river catchments, the sustainable exploitation of water resources and the maintenance of biodiversity within aquatic catchments. It also seeks an attitude founded upon the sharing of habitat with other ecosystem components and the minimization of human impact.

### ***Climate Change Impacts on Water***

The future effects of climate change on water resources will depend on trends in both climatic and non-climatic factors. Evaluating these impacts is challenging because water availability, quality and streamflow are sensitive to changes in temperature and precipitation. Other important factors include increased demand for water caused by population growth, changes in the economy, development of new technologies, changes in river system characteristics and water management decisions.

In addition to the typical impacts on water management, climate change introduces an additional element of uncertainty about future water resource management. Strategies have been developed and continue to evolve to address these issues. Implementation of adaptation measures, such as water conservation, use of markets to allocate water, and the application of appropriate management practices will have an important role to play in determining the impacts of climate change on water resources.

Key aspects which need to be addressed are:

- **Water Availability:** How changes in temperature, precipitation patterns, and snowmelt may affect water availability locally as well as globally

- Water Quality: How higher water temperatures and changes in the timing, intensity, and duration of precipitation may affect water quality
- Possible Water Resource Impacts
- Impacts of climate change including increasing water scarcity and flood risk, along with decline in water quality.

#### ***World Commission on Dams***

- History;
- Organization and authority;
- Initiatives; and
- Available publications.

#### ***Global Water Partnerships***

- UN initiatives;
- World Bank initiatives;
- EU initiatives; and
- DBA initiatives.

**Outcome:** The global move towards understanding and addressing the causes and effect of climate change will have a bearing in all matters related to environmental management issues. Therefore the concept of “Think global – act local” is becoming more prominent and participants of such training will be able to contextualise global discussions within the local and regional framework.

#### **3.4.3.2. International Laws**

**Objective:** The objective of this training initiative is to obtain knowledge of the principles of the international law applicable to the management of water resources with an international character.

**Scope:** The scope of this training initiative should be structured in such a way to cover the following aspects relevant to water resource management:

- A general overview of the nature and role of international law;
- The sources of international law, including the differences between treaties, conventions, agreements and protocols, and their relationship with the laws of the different basin countries;
- The doctrine of state and individual responsibility;
- The creation of states, succession of states and the acquisition and loss of territory;
- The settlement of disputes between states;
- The purpose, role, powers and duties of international institutions, such as the United Nations, the African Union and the SADC; and
- Enforcement of sanctions and remedies and use of force in terms of the international laws.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the principles of the internal laws in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

#### 3.4.3.3. Environmental Principles

**Objective:** In order to achieve the stated objectives outlined in the ORASECOM Action Plan, it will be necessary to apply key principles that support existing environmental and water laws and provide guidance when formulating legal, financial, procedural, technical and scientific components of strategic planning.

**Scope:** Some of the key guiding principles on which the strategic management policy and implementation should be based are as follows:

- Duty of care to prevent pollution - A successful strategy should be strongly proactive to prevent pollution before actual harm has occurred and be reactive to remediate damage to acceptable levels of risk consistent with intended use of the water resource and associated land uses based on safeguarding the risks to human health and to the environment.
- Use of a generic, risk-averse approach - It is accepted international practice that both source control measures and remediation activities related to control of pollution risk should be based on risk-based approaches that are simple and generic and have a wide range of applications for commonly occurring situations that may give rise to a pollution risk.
- Precautionary Principle - the Precautionary Principle takes reasonable measures to prevent significant harm even this precedes the existence of a proven causal link between pollution and the receptor. The burden of proof shall always be on the potential polluter.
- Best Practicable Environmental Option - Remediation objectives should be the outcome of a systematic consultative and decision-making procedure that emphasises the protection of the environment. The option selected must provide the most benefit or least damage to the environment as a whole at acceptable cost in the long term as well as the short term. This is a holistic approach in that reduction of pollution in one medium does not take place at the expense of another.
- Polluter Pays Principle - The 'polluter pays principle' holds that the individual or organisation causing the pollution is liable for any costs involved in its remediation.



In this situation it is important to identify the responsible parties and to allocate costs in a fair and proportionate manner.

- Public Involvement - Remediation activities will require involvement of key stakeholders and Interested and Affected Parties as a successful remediation outcome must have public acceptability. All management decisions should be fully documented and justified. In this way the transparency of the process will be maintained and public confidence will be enhanced.

**Outcome:** Knowledge of the principles of environmental management will be very beneficial to the decision makers in determining the type of strategic measures which should be applied to a specific case under discussion, assessment or negotiation.

#### 3.4.3.4. Water Legislation

**Objective:** The objective of this training initiative is to obtain a broad overview of the various pieces of legislation dealing with water resource management of the four basin countries within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects for each of the relevant basin countries, if and where applicable:

- The principles and requirements of the constitutional mandate relevant to water;
- The legal requirement to develop and implement water resource management related strategies and plans;
- The legal framework dealing with the protection of the water resources;
- The legal framework dealing with the authorising of the use of water and/or the water resources;
- The legal requirements relevant to the safety of dams;
- The legal provisions dealing with international matters relevant to the management of water resources; and
- The organisational water resource management structure, including the purpose, role, powers and duties of the different institutions.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the various pieces of legislation dealing with water resource management of all four basin countries within the area of jurisdiction of ORASECOM, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

### 3.4.3.5. International Water Rights

**Objective:** The objective of this training initiative is to obtain knowledge regarding the allocation and sharing of water of an international character.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects:

- The different bases of allocating and sharing of water of an international character:
  - Absolute territorial sovereignty;
  - Absolute territorial integrity;
  - Use your property (water resources) in such a way that it does not injure another (country); and
  - Limited (or restricted) territorial sovereignty and community of interest theory;
- The premises, principles and purpose of the Helsinki Rules, and the role they play in sharing and allocating water of an international character; and
- The principles, purpose, and the role of the United Nation's Convention on the Law of the Non-navigational uses of International Watercourses in sharing and allocating water of an international character.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the principles dealing with allocating and sharing of water of an international character, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

### 3.4.3.6. Environmental Legislation

**Objective:** The objective of this training initiative is to obtain a broad overview of the pieces of legislation dealing with environmental governance for the four basin countries within the area of jurisdiction of ORASECOM.

**Scope:** This training initiative should be structured in such a way as to cover the following aspects relevant to water resource management for each of the four basin countries, if and where applicable:

- The principles and requirements of the constitutional mandate for environmental governance;
- The environmental principles incorporated into the law and how;
- The institutions involved in ensuring environmental governance, including their purpose, role, powers and duties;
- The legal framework dealing with the authorising of activities affecting the environment;

- The principles and procedures prescribed for governance, decision-making, conflict resolution and integration; and
- The legal provisions dealing with international matters relevant to the environmental governance.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity under all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the various pieces of legislation dealing with environmental governance of all four basin countries within the area of jurisdiction of ORASECOM, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

#### 3.4.3.7. Bi-lateral and Tri-Lateral Agreements

**Objective:** The objective of this training initiative is to obtain knowledge of the various lateral agreements concluded between some of the governments of the members of the four basin countries within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- The requirements, contents and structure of Bi- and Tri-lateral Agreements and how they are developed;
- The purpose, contents and implications of all the Bi- and Tri-lateral Agreements concluded between some of the governments of the four basin countries within the area of jurisdiction of ORASECOM; and
- The effect of agreements on those basin countries who are not signatories or parties to these agreements.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the agreements between some of the governments within the area of jurisdiction of ORASECOM, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

#### 3.4.3.8. SADC Protocols

**Objective:** The objective of this training initiative is to obtain knowledge regarding the SADC Protocols with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- The purpose and an overview of the SADC Treaty of 27 August 1992
- The organisational structure created in terms of the SADC Treaty
- The purpose and contents of the different SADC Protocols on Shared Watercourse Systems in detail, which include:
  - The types of water uses covered;
  - The rights and obligations of the member states;
  - The effort to maintain a balance between developmental needs and sustainable development as well as the need for conservation;
  - Information-sharing between the different members states;
  - The right of the different member states to develop the resources of shared watercourses within their own territories;
  - The organisational framework necessary for the effective implementation of the Protocol; and
  - The mechanism and framework to settle disputes, including the role of the SADC Tribunal for adjudication.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the SADC Protocols, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

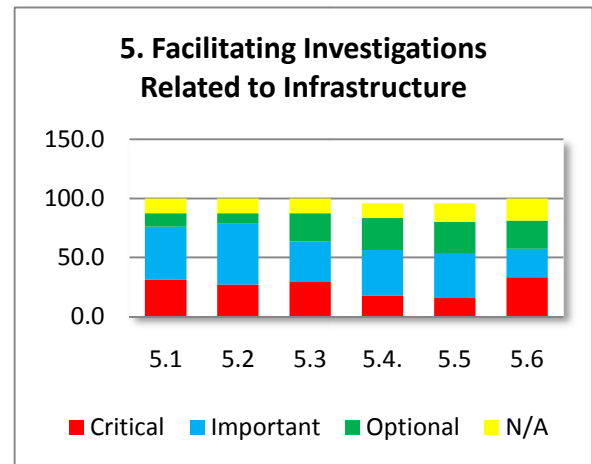
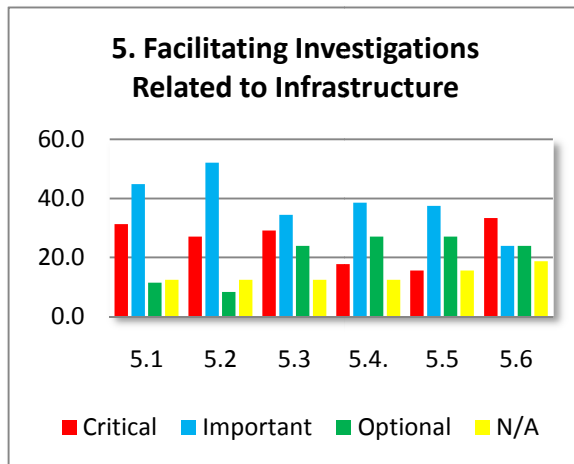
### 3.5. FACILITATING INVESTIGATIONS RELATED TO INFRASTRUCTURE

Infrastructure management is a very specialized field which requires specialized training. Usually this would entail a tertiary education in the engineering field. However, in order to make management decisions and recommendations a basic understanding of the development, operation and maintenance of infrastructure may be required.

#### 3.5.1. Needs Analysis

5. Facilitating Investigations and Studies Related to Development, Operation and Maintenance of Infrastructure on the River System	
5.1	Understanding basic modeling
5.2	Resource economics
5.3	Project management
5.4	Financial management
5.5	Technical understanding related to infrastructure
5.6	Safety of dams

The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.



In general the need to understand infrastructure management was not considered to be a high priority by the members at the work sessions. The technical and specific nature of the subject may be a contributing factor to this assessment and this will most likely be an area that can be attributed to expert training requirements. However, a general need to understand the basics of infrastructure operations was acknowledged as important for effective project management.

### 3.5.2. Additional Focus Areas

During the needs assessment sessions which were conducted with the members of the individual countries, the following additional focus areas were identified and therefore included in the CBP:

- Natural Resource Accounting
- Monitoring and Evaluation Techniques
- Water Resources Systems Analysis
- Safety and Reliability of Tunnels

### 3.5.3. Key Focus Areas

#### 3.5.3.1. Understanding Basic Modeling

**Objective:** As mentioned previously the field of modeling is highly specialised and also quite varied based on the area of applicability. Modeling in the field of infrastructure development, operation and maintenance will also be based on certain engineering principles and will require a different set of rules compared to the modeling mentioned in section 4.2.3.

**Scope:** A training initiative for this specific field of modeling will essentially address the following aspects:

- Hydraulic models, how they differ from hydrological models;
- Available models and their underlying principles of flow routing;
- Model set-up and preparation;
- Model calibration;and
- Interpretation of model outputs.

**Outcome:** The essential advantage of a course on understanding the basics of modeling is the provision of sufficient knowledge which will enable decision makers to make enquiries and decisions based on a sound footing. This will also empower the decision makers and role-players to determine aspects which need to be addressed and referred back to specific experts within their own states for better negotiations based on predictions.

### 3.5.3.2. Resource Economics and Accounting

**Objective:** An assessment of the ways in which economics is used to define, analyze and resolve problems or challenges of environmental management is a critical component in effective strategic resource management. It is essential to understand the social costs and benefits of rival environmental policies and the value of social benefits provided by the environment. Effective resource management is also constituted by the determination of the optimal level of pollution and the determination of policies that efficiently achieve it. An important aspect of resource economics is linked to the management of renewable resources (forests, fisheries & water) and non-renewable resources (oil & minerals).

**Scope:** This topic will cover the following aspects:

- Principles of economics in environmental management;
- Social cost-benefit analysis;
- Market failures and externalities;
- Market based incentives for sound environmental management practices;
- Pollution and regulating polluters;
- Non-renewable and renewable resources; and
- Environmental and resource economics and policy.

**Outcome:** A course on this topic will provide the decision makers with an overview of the analytical questions addressed by environmental economists that bear on public policies.

### 3.5.3.3. Project Management

**Objective:** Project management is the discipline of planning, organizing and managing resources to bring about the successful completion of specific project goals and objectives. The primary challenge of project management is to achieve all of the project goals and objectives while honoring the project constraints. Typical constraints are scope, time and

budget. The secondary—and more ambitious—challenge is to optimise the allocation and integration of inputs necessary to meet pre-defined objectives.

**Scope:** There are many courses available for project management and such courses in general cover the following aspects with the intention of enabling decision makers to manage and execute projects efficiently and successfully:

- Project management principles and project planning;
- Monitoring and Control;
- Contracts in various forms;
- Bid procedures;
- Adjudication of bids;
- Management functions;
- Organization;
- Financial management and control;
- Project administration;
- Foreign currency, taxes, etc.;
- Project management software; and
- Project control systems.

**Outcome:** Attendees of a course on project management will be able to take on the accountability for accomplishing stated project objectives. Key project management responsibilities which include creating clear and attainable project objectives, building the project requirements, and managing the triple constraint for projects, which is cost, time, and scope will be acquired.

#### 3.5.3.4. Monitoring and Evaluation Techniques

**Objective:** In order to gain an adequate understanding of the dynamics of a river system, it is important to understand the principles and practical aspects of environmental sampling and monitoring. Planning, sampling, analysis, quality assurance and data reporting for air, water, solids and liquids and micro biological samples is a critical part of the process. Special requirements for sampling devices, containers and preservatives as well as accepted sampling and monitoring procedures need to be clearly understood.

**Scope:** In order to understand monitoring techniques as well as the associated evaluation and assessment component, a training initiative covering this topic will deal with the following aspects:

- Potential Elements of the Performance;
- Conducting a sampling activity including preparation, collection and submission of the samples;
- Relating sampling methods to sampling activities;
- Utilisation of flow monitoring devices;

- Monitoring considerations, methods and frequency;
- Analytical techniques; and
- Reporting methodologies.

**Outcome:** In order to make informed decisions, the ability to understand and interpret analytical data is critical. An understanding and comprehension of sampling methods and techniques also allows an overall assessment picture to be utilized for sound decision making.

### 3.5.3.5. Financial Management (budget, invoicing, basic financial policy)

**Objective:** Providing an overview of the role of managers in controlling financial resources is critical to the success of any project. Financial management is about planning income and expenditure, and making decisions that will enable managers to effectively manage their projects within the specified budgetary constraints. In non-profit organisations, the money that is allocated to projects is held in trust – on behalf of the community that is being served. The money is not the personal possession of the individual staff members. They have to account for how they used the money, to show that it was used to achieve the goals and objectives of the organisation that they serve.

**Scope:** Managers or managers to be who control budgets or manage large projects of the organisation need to be well versed in financial management principles. The emphasis should be on fostering good communication and understanding between managers and their financial departments. The course content of such a course should cover the following topics:

- Strategy and financial management;
- Overview of financial management;
- Overview of financial statements;
- Detailed look at financial statements;
- Analysis of financial statements;
- The financial planning process;
- Financial accountability in the public sector;
- Budgeting and budget cycles;
- Short term decision making; and
- Long term decision making.

**Outcome:** Trainees who have completed a course on financial management will be able to identify the main elements of financial management and assess whether the financial management within their areas of responsibility is adequate. They will also be equipped with the ability to develop budgets, compile and assess cash flow projections and develop and interpret financial reports.



### 3.5.3.6. Technical Understanding related to Infrastructure

**Objective:** Infrastructure management is a very specialized field which requires specialized training. Usually this would entail a tertiary education in the engineering field. However, in order to make management decisions and recommendations a basic understanding of the development, operation and maintenance of infrastructure may be required. Some basic knowledge of infrastructure development, operation and maintenance will prove to be valuable.

**Scope:** A training course which may need to specially developed for this need should cover the following aspects:

- Basic design principles
  - Dams;
  - Weirs;
  - Canals;
  - Pumping stations; and
  - Pipelines.
- Operating Principles
  - Dams;
  - Weirs;
  - Canals;
  - Pumping stations; and
  - Pipelines.
- Maintenance cycles and costs;
- Flood routing through dams; and
- Releases for environmental flow requirements.

**Outcome:** While attending a course of nature will not be aimed at providing detailed and highly technical information, it will be of such a nature that the participants will acquire a working knowledge of the relevant aspects of infrastructure management to facilitate good decision making.

### 3.5.3.7. Safety of Dams and Tunnels

**Objective:** The member states of ORASECOM have a number of large dams for fresh water resources as well as a significant amount of dams which are used for industrial and mining purposes. The water in the dams may or may not be of good quality and may pose a risk in terms of health and safety. Infrastructure related to water resources is also associated with tunnels in some areas which may also have a safety aspect which needs to be addressed. Therefore the management of the dams and tunnels from a safety perspective is vital for effective management.

**Scope:** A training initiative to cover this topic should address the following:  
Safety of Dams:

- Basic principles of dam design (different types of dams)
- Operation and maintenance of dams
- Risk assessment (what can go wrong, why and the consequences)
- Dam safety inspections
- Environmental considerations
- Dam safety legislation in the member countries

#### Safety and reliability of Tunnels

- Basic principles of tunnel design
- Basic geology
- Operation and maintenance of tunnels
- Risk assessment (what can go wrong, why and the consequences)
- Environmental considerations

**Outcome:** This type of training will provide key role-players and decision makers with the required knowledge for legislative imperatives in terms of safety issues related to dams and tunnels in each member state.

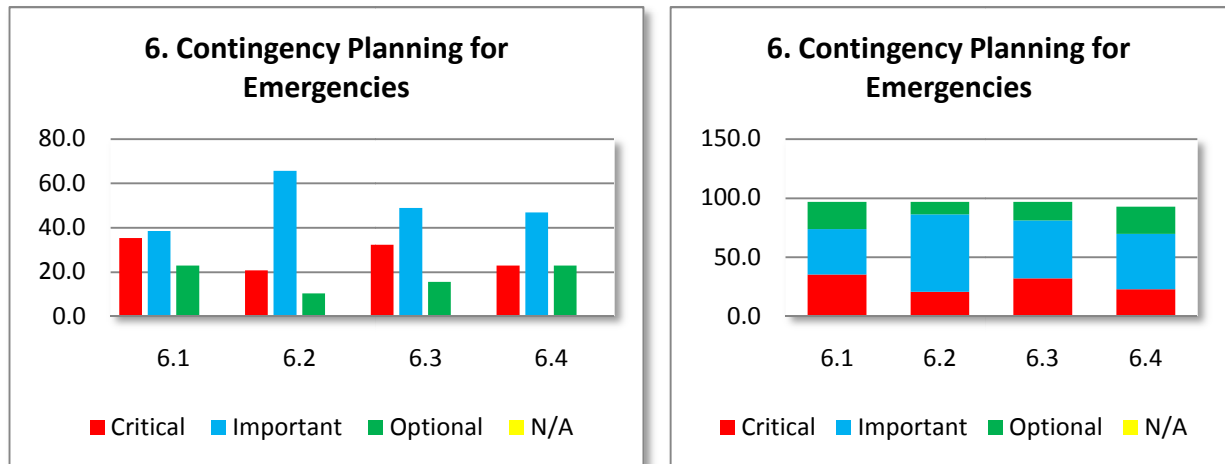
### 3.6. CONTINGENCY PLANNING FOR EMERGENCIES

In the ever-evolving global environmental change sphere, disasters and emergencies are becoming more and more prevalent. It is the responsibility of all organisations which are involved in some aspect of safety and management to ensure that emergency preparedness plans as well as contingency plans are developed, updated and communicated to stakeholders.

#### 3.6.1. Needs Analysis

The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.

6. Contingency Planning for Emergencies Including Drought, Flood and Pollution	
6.1	Emergency preparedness
6.2	Contingency planning
6.3	Risk assessment
6.4	Disaster management



The responses received from the participants of the work sessions clearly indicate that contingency planning is not considered to be a priority objective. This is most likely based on the fact that each member state has its own strategies and policies in terms of dealing with emergencies. Based on this response the training initiatives for contingency planning have been placed in phase 3. However, there is a need to stress the fact that international co-operation in the management of trans-boundary emergencies is vital in any contingency planning.

### 3.6.2. Additional Focus Areas

During the needs assessment sessions which were conducted with the members of the individual countries, the following additional focus area was identified and therefore included in the CBP:

- Flood Forecasting – Modeling

### 3.6.3. Key Focus Areas

#### 3.6.3.1. Emergency Preparedness and Contingency Planning

**Objective:** Emergency management (or disaster management) is the discipline of dealing with and avoiding risks. It is a discipline that involves preparing for disaster before it occurs, disaster response, as well as supporting, and rebuilding society after natural or human-made disasters have occurred. In general, any Emergency management is the continuous process by which all individuals, groups, and communities manage hazards in an effort to avoid or ameliorate the impact of disasters resulting from the hazards. Actions taken depend in part on perceptions of risk of those exposed.

**Scope:** The nature of emergency management depends on local economic and social conditions. The cycle of emergency management must include long-term work on infrastructure, public awareness, and even human justice issues. A training initiative on this aspect must cover the following topics:

- Phases of emergency management: mitigation, preparedness, response, and recovery;
- Risk Assessment and Modeling;
- Early warning systems;
- Development of emergency preparedness plans;
- Communication of emergency plans and procedures;
- Establishing emergency response teams;
- National and regional response plans; and
- Emergency Management Information Systems.

**Outcome:** Efficient coordination and sharing of information is essential in a multi-disciplinary emergency response. Emergency responders and personnel involved in large scale operations need to understand and access each other's information, including geographical information. Civil protection is an inclusive process that involves public sector authorities, voluntary societies and the private sector. When emergencies, disasters or crises occur, a wide variety of organisations and jurisdictions must work together in harmony, yet under circumstances that may be relatively unfamiliar to the participants. Efficient disaster management requires common procedures, compatible plans and a significant knowledge of how other organisations are expected to perform under emergency conditions. Therefore a collaborative training initiative will facilitate this aspect.

#### 3.6.3.2. Risk Assessment

**Objective:** Risk assessment is comprised of an objective evaluation of risk in which assumptions and uncertainties are clearly considered and presented. Part of the difficulty of risk management is that measurement of both of the quantities in which risk assessment is concerned - potential loss and probability of occurrence - can be very difficult to measure. An overview of scientific processes highlights the fact that a risk based approach potentially supports the much needed balance between development and protection. This balance is vital in the consideration of decision makers when assessing and recommending actions specific to development projects.

**Scope:** The topics covered in this type of course must address the need to identify risks and assess them within the scope of the project and greater objectives and goals of the organisation. The following aspects must therefore be addressed:

- Basic risk statistics;
- Risk trees;
- Evaluation of consequences;
- Cost/risk assessment;
- Risk assessment and evaluation;
- Risk perception; and
- Risk management.

**Outcome:** The decision makers will be able to assess risk parameters, identify the key factors that need to be considered and make a decision based on the most favourable outcome after having considered the risks involved.

### 3.6.3.3. Flood Forecasting (Modeling)

**Objective:** Flood forecasting is the use of real-time precipitation and stream flow data in rainfall-runoff and stream flow routing models to forecast flow rates and water levels for periods ranging from a few hours to days ahead, depending on the size of the watershed or river basin. Flood forecasting can also make use of forecasts of precipitation in an attempt to extend the lead-time available for required mitigatory measures.

**Scope:** This topic will cover the following aspects:

- Rainfall measurements and reporting (real time);
- Catchment models (hydraulic) for flood routing;
- Flow measurements under flood conditions;
- Key flow measurement points;
- Reporting; and
- Roles and responsibilities.

**Outcome:** While a course on the basics of flood modeling will not necessarily create experts in the field, it will provide key decision makers with an appropriate level of knowledge which will facilitate a suitably adequate level of assessment to ensure proper planning and management practices are implemented at a strategic level.

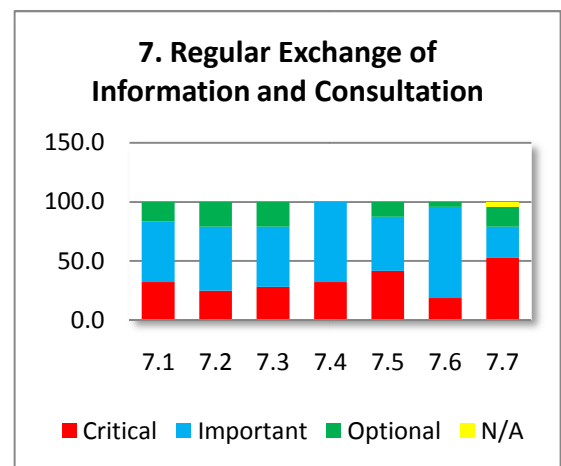
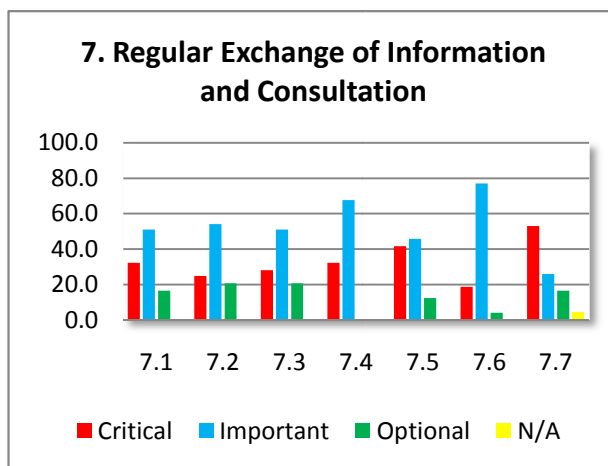
## 3.7. REGULAR EXCHANGE OF INFORMATION AND CONSULTATION

Regular exchange of information between the member states is vital in order to share information as well as transfer skill and enhance capacity building by learning from experts within each country. This would best be facilitated by means of workshops and seminars with participants from all four countries and relevant experts and specialists. Public consultation is also essential in order to ensure that stakeholders are well informed of the functions and responsibilities of ORASECOM.

### 3.7.1. Needs Analysis

The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.

7. Regular Exchange of Information and Consultation	
7.1	Presentation skills
7.2	Public speaking
7.3	Facilitation skills
7.4	Principles and practice of public participation
7.5	Conflict handling in public participation
7.6	Team building
7.7	Written communication and report writing



Written communication and report writing have been indicated as critical in the achievement of the ORASECOM objectives. This together with conflict handling indicates that the arena of international co-operation and negotiation is critical and requires specific attention.

### 3.7.2. Additional Focus Areas

During the needs assessment sessions which were conducted with the members of the individual countries, the following additional focus area was identified and therefore included in the CBP:

- Computer Software Skills

### 3.7.3. Key Focus Areas

#### 3.7.3.1. Presentation skills and Public Speaking

**Objective:** Presentations and reports are ways of communicating ideas and information to a group. But unlike a report, a presentation carries the speaker's personality better and

allows immediate interaction between all the participants. Communication in the public domain is an essential skill that most participants in ORASECOM activities will require.

**Scope:** A well structured training programme to develop good presentation skills should focus on the following elements:

- Practical use of various equipment mediums and software;
- Preparation of visuals;
- Awareness of relaxation techniques, body language, paralanguage;
- Personal image;
- Voice projection;
- Audience rapport and targeting;
- Handling questions;
- Presentation time management; and
- Personal attitude and self-belief.

**Outcome:** The art of public speaking or presenting to an audience with poise and confidence does not come naturally to most people but it is an acquired skill that can be learnt. This type of training should provide members with a multitude of options, from speaker tips, right through to acquiring the valuable presentation skills required of a top class business presenter or a professional speaker.

### 3.7.3.2. Facilitation Skills

**Objective:** Facilitation of meetings will be required by some ORASECOM delegates. Some people are naturally good at facilitating discussion. Other people may initially lack confidence and will benefit from training and the opportunity to first practice using facilitation skills in a learning situation. Relevant personnel will need to be able to deal with groups with necessary dynamic facilitation skills and tools to manage the group process and keep the balance between process and outcomes.

**Scope:** This course should include:

- Meeting etiquette;
- Setting up agendas for meetings;
- Setting the boundaries (meeting rules);
- Facilitation skills and techniques;
- Facilitation vs. chairing;
- How to handle dysfunctional participants;
- How to diffuse tension; and
- How to handle special challenges.

**Outcome:** Members will gain participatory learning skills, understand the qualities and skills of a good facilitator and gain confidence in dealing with groups of people as well as the ability to deal with conflict and difficult behaviours.

### 3.7.3.3. Principles and Practice of Public Participation

**Objective:** The International Association for Public Participation (IAP2) is the internationally recognized body that promotes the Best Practice of Public Participation. It certifies practitioners that fulfill its training and experience requirements. IAP2 provides a certificate program in public participation. Some individuals in or associated with ORASECOM that are responsible for public participation activities would benefit from attending this course (which is presented by several trained individuals internationally, including in South Africa).

**Scope:** Participation programs will benefit from a course that covers the following topics:

- What is public participation?
- Stakeholder identification;
- Foundations of public participation (value-based, decision-based and goal-driven);
- The five steps of public participation (Gain internal acceptance, Learn from the public, Select the level of participation, Defining the process and participation objectives, and designing a public participation plan);
- Communications and Techniques for effective public participation;
- Evaluation of public participation programs; and
- Conflict Handling in Public Participation.

**Outcome:** Participants of such a course will be equipped to conduct public participation in a constructive way that enriches decision-making and engage stakeholders meaningfully. Participants will be able to manage single-issue, vociferous and emotional viewpoints and turn conflict into informed decisions.

### 3.7.3.4. Team Building

**Objective:** The objective of team building is to create and develop a sense of team in a group of people in order to improve their ability to work together.

**Scope:** This course should be tailored to meet the specific size, group of people, time available and specific requirements and may include:

- Self awareness (Identifying what kind of person you are and how you interact with others);
- Other awareness (increasing personal/general/background and working knowledge of other team members);
- Team dynamics;
- Interaction skills; and



- Team building exercises.

**Outcome:** Team building activities provide a mechanism whereby people can learn to work and bond together in a non-threatening, competitive and creative atmosphere. Groups can accomplish complex, creative tasks while learning about their fellow workers. They learn about each other through cooperative working efforts.

#### 3.7.3.5. Written Communication and Report Writing

**Objective:** Written communication guarantees that everyone concerned has the same information. It provides a long-lasting record of communication for future. Written instructions are essential when the action called for is crucial and complex. To be effectual, written communication should be understandable, brief, truthful and comprehensive.

**Scope:** This course component should include:

- Correct formats (for letter, faxes and memos);
- Compiling agendas, minutes of meetings and attendance registers;
- Structure of a report (Introduction, body, conclusion);
- Basic grammar and language;
- Styles of writing (formal, official, technical, emotive); and
- E-Mail etiquette.

**Outcome:** Participants who have acquired good written communication skills will be able to evaluate the effects of content, language and style of written reports. They will be able to write effectively and creatively on a range of topics by choosing language structures to suit communicative purposes as well as edit writing for fluency.

#### 3.7.3.6. Computer Software Skills

**Objective:** In the modern age of information technology, being computer literate is a vital component of being able to communicate and function in the modern world. Having basic computer skills is essential in every business environment.

**Scope:** Training should include the following aspects:

- Basic computer skills (Operating system and settings);
- MS Word;
- MS Excel;
- MS Presentations;
- MS Projects;
- MS Outlook (e-mail); and
- Internet Use.

**Outcome:** The participants of such a course will acquire the essential computer skills for operating at an optimum level in the corporate environment.

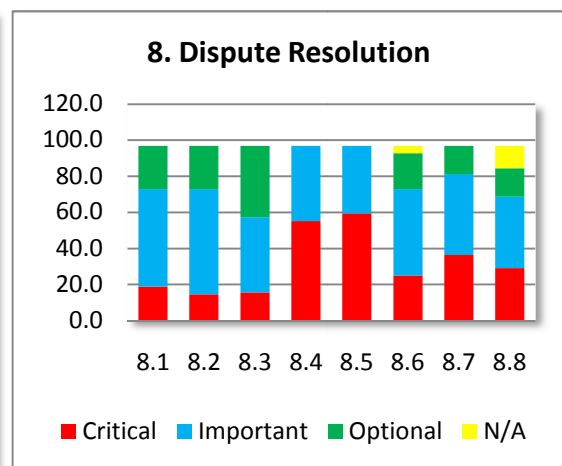
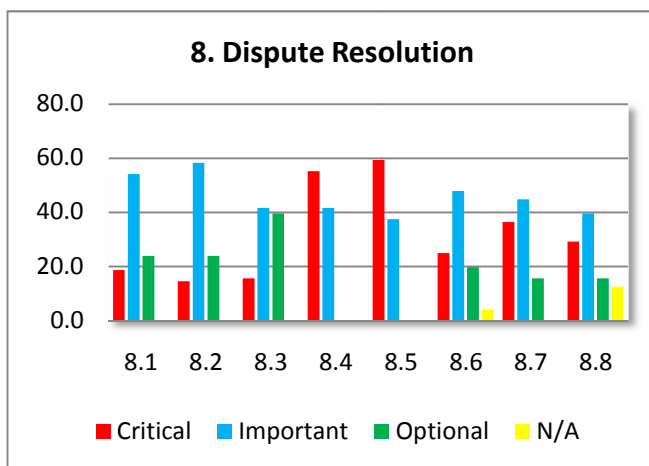
### 3.8. DISPUTE RESOLUTION

In any cooperative and international management system it is inevitable that disputes will arise related to various management, operational and implementation aspects. Negotiations and discussions related to various aspects will also become critical as the organisation grows and implementation factors become more pronounced. Member should be able to manage and deal with conflict situations and possess the skills to undertake fruitful negotiations.

#### 3.8.1. Needs Analysis

The needs assessment was based on the following focus areas in order to obtain an indication of the areas which were considered important and critical by the member states.

8. Dispute Resolution	
8.1	General principles of contract law
8.2	Principles of common law
8.3	Legal processes and instruments
8.4	Conflict management
8.5	Negotiation skills
8.6	Assertiveness training
8.7	Dispute resolution procedures and mechanisms
8.8	Dispute resolution legislation



As indicated in the needs assessment of the previous objective, conflict management and negotiation skills are considered to be critical in the achievement of the ORASECOM objectives and has therefore been assigned high priority and placed in phase 1.

### 3.8.2. Additional Focus Areas

No additional focus areas were identified for this objective.

### 3.8.3. Key Focus Areas

#### 3.8.3.1. General Principles of Law

**Objective:** The objective of this training initiative is to obtain knowledge regarding the general principles of the law with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM. As there might be differences between the principles of the four basin countries, this initiative should be structured in a generic manner, as far as it is possible.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- The procedure how laws are formulated and constituted;
- The purpose of the law and how it could be used to implement policies, strategies and plans;
- The general principles of the law dealing with:
  - The law of contract, including the requirements, contents and structure of a contract and how it is coming into being; the requirements for giving effect to a contract; the implication and remedies if one of the parties does not perform; contract breach, its implications and the remedies available if there is a breach (This is for contracts in general (usually when a private person is a party) and not for treaties, conventions, agreements and protocols (where only countries are parties));
  - The law of delict (when ORASECOM or the governments of the four basin countries might be liable for damage caused by the actions of ORASECOM and these governments or failure to take any action); and
  - The rights of the public and how these rights may be deprived or expropriated
  - The constitutional socio-economic rights of the public and their implications.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity under all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM so that they have an understanding of the general principles of the law, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

### 3.8.3.2. Dispute Resolution: Legal Processes, Instruments and Mechanisms

**Objective:** The objective of this training initiative is to obtain knowledge regarding the legal processes, instruments and mechanisms dealing with dispute resolution, with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- The differences between internal (between basin countries) and external (another person or country than a basin country) disputes;
- The different process and instruments available to resolve internal and external disputes, such as litigation, appeals against decisions, review of decisions, arbitration, mediation, negotiation and alternative dispute resolution, including the purpose and role of each of these as well as the advantages and disadvantages of each; and
- Alternative dispute resolution processes, such as judicial appraisal, expert determination, ombudsman services, neutral fact-finding, early neutral evaluation, executive tribunals, independent interventions, assisted stakeholder dialogue, brokered talks, independent review, and relationship building.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the legal processes, instruments and mechanisms dealing with dispute resolution, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

### 3.8.3.3. Conflict Management

**Objective:** The objective of this training initiative is to obtain knowledge regarding conflict management with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- Why is there conflict and what is conflict management?
- What to know about conflict
  - What is the nature of conflict?
  - Common causes of conflict
  - Conflict between individuals, groups of people and within a group of people
- How to identify and recognise signs, forms and stages of conflict
  - Differences between "disputes of right" and "disputes of interest"

- Stages of conflict and their implications
- Signs of conflict between individuals and between groups of people
- How to manage and resolve conflict situations
  - Building teamwork and co-operation
  - Collective bargaining
  - Conciliation
  - Mediation.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of conflict management, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

#### 3.8.3.4. Negotiation Skills

**Objective:** The objective of this training initiative is to obtain knowledge regarding negotiation skills with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- What is negotiation and the stages of negotiation?
- The types of negotiators, and the advantages and disadvantages of each type;
- The skills necessary for a successful negotiator;
- Positional bargaining, including hard and soft negotiating, the problems with positional bargaining and alternatives to positional bargaining;
- The essentials for negotiations;
- Tactics and preparation of negotiations;
- How to deal with deadlocks and breaking them;
- Inventing “Options for Mutual Gain”;
- Fear, humiliation, including rejection, loss of power and failure;
- Negotiating challenges; and
- Dealing with negative emotions.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity under all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM so that they have an understanding of negotiation skills, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

### 3.8.3.5. Assertiveness Training

**Objective:** The objective of this training initiative is to obtain knowledge regarding assertiveness skills.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- What is assertiveness and what is it not?
- Getting to know and understand people of different personality types;
- How to maintain the balance between being soft on people and hard on results;
- How to handle conflict and aggression;
- How to give criticism and accept criticism;
- How to be confident, have good self-esteem and become more self-confident;
- How to increase your effectiveness and productivity;
- The differences between assertive, aggressive and passive behavior and how to handle these types of people;
- Communication skills, including body language;
- Interpersonal skills; and
- Your basic rights as a person, member of a group and a leader of a group.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have the necessary assertive skills, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

### 3.8.3.6. International Dispute Resolution Legislation

**Objective:** The objective of this training initiative is to obtain knowledge regarding the principles of international dispute resolution legislation with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- The different organisations involved in international dispute resolution, their purpose, role, powers and duties; and
- The different processes and instruments available to resolve and settle international disputes as well as the advantages and disadvantages of each.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat

of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the principles of international dispute resolution legislation, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

### 3.9. GENERAL TRAINING NEEDS

#### 3.9.1. Lobbying and Advocacy

**Objective:** The objective of this training initiative is to obtain knowledge regarding lobbying and advocacy, with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- What is lobbying and advocacy?
- Ways of lobbying and advocacy and the tactics associated with each
- Ethical aspects dealing with lobbying and advocacy
- Blackmail, bribery and corruption matters relevant to lobbying and advocacy.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM, so that they have an understanding of the principles of lobbying and advocacy, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.

#### 3.9.2. Good Governance

**Objective:** The objective of this training initiative is to obtain knowledge regarding good governance, with the emphasis on the management of water resources with an international character within the area of jurisdiction of ORASECOM.

**Scope:** The scope of this training initiative should be structured in such a way as to cover the following aspects relevant to water resource management:

- Linkage between human rights, public administration and effective and responsible provision of management services
- The principles of good governance
- Measures to achieve good governance
- The role of policy and policy implementation
- Ethical governance

- Relationship with role-players (board/commission and stakeholders) and good governance
- Groups and good governance
- Politics and good governance.

**Outcome:** The knowledge obtained under this initiative should be of such a nature as to build capacity among all the officials of the member states of ORASECOM, the Secretariat of ORASECOM and other role-players associated with ORASECOM so that they have an understanding of the principles of good governance, in order to better equip them to manage the water resources with an international character within the area of jurisdiction of ORASECOM.



## 4. OBJECTIVES BASED CAPACITY BUILDING PROGRAMME

The intervention status for each KFA has been provided in the sections below for each of the member groupings who may have a role to play in the ORASECOM activities. In many instances, based on the specific nature of the training required training courses are not readily available and custom course many have to be created.

In instances where an existing course is available to suit the needs of the organisation, this has been indicated in the intervention status table. Potential service providers for these specific courses can be found in **Appendix A**.

### 4.1. OBJECTIVES OF THE ORASECOM ACTION PLAN

#### 4.1.1. Courses Available

Since the training need identified to achieve the stated objective is very specific to the organisational goals and objectives of ORASECOM, there is no course currently available which will satisfy the requirements of the key focus areas. The needs identified will therefore have to be addressed either by means of a custom made course or an in-house seminar or workshop type of initiative.

#### 4.1.2. Recommendation

The most important factor to bear in mind for this objective is that there are no existing courses or training initiatives which will facilitate capacity building on this aspect. It will therefore be necessary to design and implement a custom made training initiative to fulfill this need. As such the following are suggestions for a possible route to be followed:

- Appointment of a suitably qualified service provider who will be able to customise a short course of no longer than 2 days.

Advantages:

- The PSP will be able to provide the required training at a venue and location suitable to the target audience;
- The training can be provided within each member state;
- Travel and accommodation costs would be minimized since only the service provider will be required to travel to the training venues;
- Based on reduced costs a larger number of trainees will be able to attend the training sessions.

#### 4.1.3. Intervention Status

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Days	Introductory
TTT Members	Short Course	2 Days	Introductory
Experts	Short Course	2 Days	Introductory
Stakeholders	Short Course	2 Days	Introductory

## 4.2. DETERMINING LONG TERM SAFE YIELD

### 4.2.1. Integrated Water Resource Management

The purpose of the capacity building programme should be to improve efficiency and effectiveness in the application of integrated water resources management (IWRM) for sustainable management and development of the Orange-Senqu Basin. As mentioned earlier in the report, the concept of IWRM is largely founded on the inter-relation of a number of aspects and issues which were previously addressed in isolation without the interdependency and impacts being considered. The bringing together of these aspects, which include anything from water quality monitoring to good governance, requires a coordinated approach.

#### 4.2.1.1. Courses Available

Numerous courses exist specifically designed to provide training in IWRM:

- UNESCO-IHE offers a wide range of short, intensive and highly specialized courses for mid-career and senior experts. The short courses are held in Delft and vary in length from one to four weeks. These courses vary in focus and content, ranging from specialized technical issues, to management challenges and approaches.

These courses are also offered through high-quality online courses that allow professionals to upgrade their skills from home. The online courses' total study load is 140 hours. A four month course thus takes around 8 hours of work per week. Typical courses presented at this institution include:

- Applied groundwater modeling
- Aquatic ecosystems: Processes and applications
- Cleaner production and the water cycle

- Climate change in integrated water management
  - Environmental engineering
  - Environmental monitoring and modeling
  - Flood risk management
  - Groundwater exploration and monitoring
  - Integrated coastal zone management
  - Managing water organizations
  - Negotiation and mediation for water conflict management
  - River basin modeling
  - Water quality assessment
  - Water resources planning
  - Watershed and river basin management
  - Wetlands for water quality
- Another method of acquiring training in IWRM is through the involvement and use of networks.

WaterNet is a regional network of university departments and research and training institutes specialising in water. The network aims to build regional institutional and human capacity in Integrated Water Resources Management (IWRM) through training, education, research and outreach by harnessing the complementary strengths of member institutions in the region and elsewhere. WaterNet member institutions have expertise in various aspects of water resources management and are based in Southern and East Africa.

The vision of WaterNet is a future in which the Southern African Development Community (SADC) has the institutional and human capacity to educate and train its own water managers, capable to contribute to the equitable sharing and sustainable utilisation of water resources for poverty alleviation, economic development (livelihood security) and environmental security.

Waternet coordinates a Regional Master Degree Programme in Integrated Water Resources Management. Participating Universities include University of Zimbabwe, Malawi, Dar Es Salaam, Namibia, The Western Cape, and Botswana, each focusing on a specialist field. These fields include:

- Water Resources Management
- Water and Environment

- Hydrology
- Water for people
- Water and Society
- Water and land

#### 4.2.1.2. Recommendation

It is recommended that use be made of existing capacity building infrastructure – as far as practically possible, existing capacity building networks and organizations should be used, rather than duplicating efforts.

All training material available through the networks is free. It is therefore also possible to develop a customized IWRM programme presented by a PSP.

#### 4.2.1.3. Intervention Status

An introductory course for Commissioners and TTT Members is suggested, with experts focusing on a specific specialist field within the context of IWRM.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Day	Introductory
TTT Members	Short Course	2 Day	Introductory
Experts	Masters Degree	1 Year	Specialist
Stakeholders	None		

#### 4.2.2. Transboundary Diagnostic Analysis

##### 4.2.2.1. Courses Available

The production of a Transboundary Diagnostic Analysis (TDA) followed by a Strategic Programme of Action (SAP) is a requirement for most projects proposed for financing in OPs 8 and 9 of the GEF International Waters Focal Area.

The advice on TDA and SAP approaches given by the relevant GEF documents is rather limited. The design of new information gathering mechanisms and the experience of a number of GEF projects to date in the design of TDA's provides an opportunity to develop more formal guidelines to assist with the preparation of TDAs and to ensure inter-regional comparability.

In general TDA training is not easily available at established organisations but training material with all the required material, modules and supporting information is readily available from the GEF. The material can therefore be easily utilized to compile a custom course for the ORASECOM area.

#### 4.2.2.2. Recommendation

The University of Plymouth together with the United Nations Train-Sea-Coast programme does present a TDA and SAP course. However, these courses are not held at regular intervals and in the long run may prove to be more expensive. It is therefore recommended that a PSP be appointed to tailor the existing training modules to suit the specific needs of ORASECOM. Another alternative would be the South African Institute of Environmental Assessment (SAIEA), which is an organisation that also provides a wide variety of environmental management courses in South Africa. SAIEA has experience in TDA and is also in a position to create a customised course for this purpose which will be specific to the needs of ORASECOM. Since this is a highly technical course it would not be advisable for all members to attend such training. This type of training should be focused on the Technical Task Team Members and experts.

A one day overview course could be presented to the other members.

#### 4.2.2.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Course	5 Day	Intermediate
Experts	Course	5 Day	Intermediate
Stakeholders	Short Course	1 Day	Introductory

#### 4.2.3. Basic Principles of Modeling

##### 4.2.3.1. Courses Available

Water resource modeling is a highly specialized field practiced by only a few experts, and for that reason there are no ready-made courses available. However, more recently practitioners in the field have started to present one day courses as part of water resource management courses. These courses tend to focus on one model, but on the other hand the principles stay the same. The course can be adapted to serve the ORASECOM training needs at small cost.

The tendency in Southern Africa is to standardize on specific models, such as the water Resources Yield Model and the Water Resources Planning Model, while the catchment

rainfall-runoff model that is most frequently used is the WRSM2000 model. In order to address the identified needs, a specific course will have to be developed. The course that is available focuses on the Water Resource Yield Model.

#### 4.2.3.2. Recommendation

As there are no available courses that address the specific needs of the ORASECOM, it will be necessary to design a course that addresses modeling in its broadest sense, yet specific to what is common practice in Southern Africa. The course should not be longer than one day.

The advantages of developing a course by and for the ORASECOM are:

- ORASECOM owns the course and no other fees than the original development cost will be payable,
- The course addresses the very specific needs within the ORASECOM,
- The course can be taken to where the need is, and not *vice versa*, and
- Courses can be organized as and when they are required.

#### 4.2.3.3. Intervention Status

The objective of the course will be to enable the participants to interpret the results of a water resource model with the necessary understanding to recognize the inherent limitations of such a model. No specialist knowledge is required, and this is not seen as a vital component of the capacity building programme. The need is limited to Commissioners, TTT Members and some stakeholders as part of a project on a need-to-know basis. Specialists will not benefit from the course, their development can only be addressed in the form of on-the-job training

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	No courses available, only on-the-job training		
Stakeholders	Short Course (Only when Required)	1 Day	Introductory

#### 4.2.4. Data Assessment Techniques

##### 4.2.4.1. Courses Available

See section 4.3.5

#### 4.2.4.2. Recommendation

See section 4.3.5

#### 4.2.4.3. Intervention Status

See section 4.3.5

### 4.3. PREVENTION OF POLLUTION AND CONTROL OF AQUATIC WEEDS

#### 4.3.1. Pollution Control and Management

##### 4.3.1.1. Courses Available

###### ***Prevention of pollution***

Pollution prevention is a very site specific and source based management approach which although generic in principle, is also very specific in terms of national and regional management criteria, regulations, policies and strategies

###### ***Penalties and liabilities for pollution***

The application of penalties and liabilities while also founded in general principles of apportionment of liability and responsibility, is also generally nation and region specific.

##### 4.3.1.2. Recommendation

Currently there are no courses which will address the aspects of pollution control and it is therefore recommended that a customised course be developed for this purpose.

##### 4.3.1.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Course	3 Day	Intermediate
Experts	Course	3 Day	Intermediate
Stakeholders	Short Course	1 Day	Introductory

#### 4.3.2. Eradication of exotic, invasive alien species

##### 4.3.2.1. Courses Available

There is a surfeit of material available on exotic, invasive alien species that covers both aquatic species (hyacinths, etc) and terrestrial species. However, there is no readily available course that deals with occurrence, impact and eradication best practice. It would be advisable to combine the theory with at least some form of practical field work, and a two-day course will be required. The course will be area specific, and in all four courses will be required. These would be for:

- Floating aquatic weeds,
- Anchored aquatic weeds,
- Invasive alien trees, and
- Invasive alien bushes.

A fifth one day course for managers, in order to understand the man-power and funding requirements as well as the benefits of an eradication action, will also be required.

#### 4.3.2.2. Recommendation

A suite of two day practical courses needs to be developed, as well as a one day managers course. This could draw on the South African “Working for Water” programme, which could also form a focus for the field work.

#### 4.3.2.3. Intervention Status

The objective of the course will be to create an awareness of the problem, as well as some practical guidance on how to deal with different invasive species. Commissioners and TTT members should only attend the managers course, while the practical courses are aimed at stakeholders. No training for experts is envisaged.

The problem of invasive alien species is wide-spread, and therefore it is recommended that all Commissioners and TTT members attend at least the managers course. For stakeholders the course will be area and project specific.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Managers Course	1 Day	Introductory
TTT Members	Managers Course	1 Day	Introductory
Experts	No intervention required		
Stakeholders	Practical Course	2 Days	Practical

#### 4.3.3. Source and Resource Based Approaches

##### 4.3.3.1. Courses Available

Source and resource management is a continuously evolving concept and has generally been applied at national levels by incorporating the principles into national policies and strategies. Based on this approach the likelihood of a generic course which would address such principles will not be easily available.



#### 4.3.3.2. Recommendation

Since these topics are not highly intensive and would actually cover the strategic policy imperatives associated with the management of water resources it is recommended that this aspect be dealt with in a seminar or workshop format.

Knowledgeable and experienced personnel from the member states should be approached to make presentations on this topic with the main emphasis being place on information exchange, discussions of common principles and debates around the differences.

#### 4.3.3.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Seminar/Workshop	1 Day	Introductory
TTT Members	Seminar/Workshop	1 Day	Introductory
Experts	Seminar/Workshop	1 Day	Introductory
Stakeholders	Seminar/Workshop	1 Day	Introductory

#### 4.3.4. Remediation Strategy and Tools

##### 4.3.4.1. Courses Available

Courses for this topic are widely available but are also very specialised and technical in nature. The courses currently being offered focus on available technology and remediation strategies which are currently being applied nationally as well as internationally. A course of this nature will prove a sound foundation for strategic decision making on technical aspects.

##### 4.3.4.2. Recommendation

Since the nature of this course will be largely technical, practical and operational based, it is recommended that only TTT members and Experts attend such a course. This type of course will allow the participants to manage and guide strategic remediation activities based on a technical foundation.

#### 4.3.4.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Not Applicable		
TTT Members	Course	5 Day	Intermediate
Experts	Course	5 Day	Intermediate
Stakeholders	Not Applicable		

#### 4.3.5. Resource Monitoring

##### 4.3.5.1. Courses Available

Resource monitoring and water quality assessment as well as data assessment techniques are vital tools for water resource managers and there are currently a variety of courses which offer these components.

Courses on this topic are offered locally within Africa as well as internationally through the UNESCO-IHF facility.

##### 4.3.5.2. Recommendation

This type of course will not be necessary for Commissioners, experts or stakeholders but will prove to be beneficial to TTT members who may be required to deal with such aspects on a regular basis. It is therefore recommended that this type of course only be attended by TTT members who have not had exposure to monitoring and evaluation of resource quality data.

##### 4.3.5.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Not Applicable		
TTT Members	Course	5 Day	Intermediate
Experts	Not Applicable		
Stakeholders	Not Applicable		

### 4.3.6. Resource Quality Objectives

#### 4.3.6.1. Courses Available

There are no courses available that deal with the development of resource quality objectives (RQOs). Although the underlying principles (the science) will be the same everywhere, there will be some differences where country specific legislation will play a role. A course can be developed, but this will need to take into account differences in approach between the member countries.

Resource quality objectives form the basis of integrated water resource management. This is a subject that is essential to the functioning of the organization. Member states have to agree on compatible RQOs for shared water resources, otherwise there can be no shared vision. This is therefore seen as essential training for all involved in ORASECOM.

#### 4.3.6.2. Recommendation

RQOs cover two aspects of integrated water resource management, namely water quantity and water quality. They consist in the first instance of narrative objectives, and in the second instance of measurable management objectives. It is how to translate narrative objectives into measurable management objectives that will be the subject of the course.

Two one day courses, one for water quantity and one for water quality will be required. No such courses exist and they will have to be developed. There are only a few specialists who not only have the necessary specialist knowledge and experience, but also a good understanding of the objectives of ORASECOM to develop such a course. This should enjoy a high priority.

#### 4.3.6.3. Intervention Status

The one-day courses should address principles as well as methodology and aim to provide Commissioners and TTT members with a working knowledge on how RQOs are developed and what the practical implications are to implement them. There are no specialist courses available. The only way to gain the necessary knowledge and experience to develop RQOs is to gain exposure and on-the-job training.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 X 1 day	Introductory
TTT Members	Short Course	2 X 1 day	Introductory
Experts	On-the-job training	Project specific	Specialist
Stakeholders	Short Course	2 X 1 day	Introductory

#### 4.3.7. Environmental Impact Assessment

The concepts of Environmental Assessment and Management have gained prominence in recent years as a decision making tool for regulatory authorities to conditionally allow or totally stop development initiatives based on the predicted impacts on the environment including local and surrounding communities. The decisions made are based on weighing the benefits against the risks and on identifying measures to minimize negative impacts and maximise benefits. Within the ORASECOM framework, the decision makers may be faced with decisions related to development initiatives which affect more than one member state requiring a collaborative effort to reach an informed and suitable outcome.

This topic will introduce the audience to the principles, concepts, best practice and legal requirements for undertaking Environmental Impact Assessments for either the intention of acquiring authorization or informing decision-making. The course will include:

- EIA Best practice principles (purposeful, rigorous, practical, cost-efficient, efficient, focused, adaptive, participatory, interdisciplinary, credible, integrated, transparent, and systematic);
- An introduction to the generic Impact Assessment process (screening, scoping, alternatives, impact analysis, mitigation and impact management, evaluation of significance, environmental impact statements);
- Public Participation;
- Transboundary EIAs;
- Strategic Environmental Assessment;
- Environmental Management Plans; and
- Review of EIAs and decision-making.

A course on EIA and the associated sub-processes will equip key role-players with a suitable understanding of the requirements and processes involved in obtaining authorisations. This will also facilitate strategic planning procedures and time frames for project planning and execution.

#### 4.3.7.1. Courses Available

Training covering integrated environmental management is available on many levels from post graduate degrees, through short courses at universities to introductory level. Some courses may be country specific, while others focus on technical and best practice aspects. Some examples of specifically identified courses and service providers include:

- The Southern African Institute for Environmental Assessment Short Courses (e.g. Public Participation, Environmental Assessment, Strategic Environmental Assessment, Environmental impacts of HIV/AIDs on the water sector, Biodiversity and EIA decision-making and Critical appraisal of EIA and external review (for decision-makers).
- Centre for Environmental Management at the North West University, South Africa;
- International Association for Public Participation Certificate Program

#### 4.3.7.2. Recommendation

The development of a custom one day course is recommended for Commissioners and three day course for TTT members. Experts and stakeholders can access a selection of the many specialized courses available from reputable institutions.

#### 4.3.7.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	3 Days	Introductory
Experts	Variety of existing courses	3 weeks	Advanced
Stakeholders	Variety of existing courses	1 week	Intermediate

### 4.4. REASONABLE UTILISATION OF WATER RESOURCES TO SUPPORT SUSTAINABLE DEVELOPMENT

#### 4.4.1. Principles of Sustainable development

A course on the sustainable development principles and applications will address the following aspects:

- Management philosophy (development vs. environmental protection) in the member countries;
- Environmental assessment in the member countries;
- The three pillars of sustainable development and how they relate to water resource management in terms of key objectives and main criteria; and

- Assessment of sustainability.

### ***Ecosystems Approach***

An ecosystem based approach to planning integrates social, cultural, economic and environmental factors, and emphasizes the need to protect, maintain and enhance whole natural systems as a necessary prerequisite to sustainable living. It is an inherently interdisciplinary process that draws upon a wide range of expertise and perspectives. It is also participatory and inclusive, potentially involving every sector of society.

The ‘ecosystems approach’ seeks the objective management of water quality in lakes and river catchments, the sustainable exploitation of water resources and the maintenance of biodiversity within aquatic catchments. It also seeks an attitude founded upon the sharing of habitat with other ecosystem components and the minimization of human impact.

### ***Climate Change Impacts on Water***

The future effects of climate change on water resources will depend on trends in both climatic and non-climatic factors. Evaluating these impacts is challenging because water availability, quality and streamflow are sensitive to changes in temperature and precipitation. Other important factors include increased demand for water caused by population growth, changes in the economy, development of new technologies, changes in river system characteristics and water management decisions.

In addition to the typical impacts on water management, climate change introduces an additional element of uncertainty about future water resource management. Strategies have been developed and continue to evolve to address these issues. Implementation of adaptation measures, such as water conservation, use of markets to allocate water, and the application of appropriate management practices will have an important role to play in determining the impacts of climate change on water resources.

Key aspects which need to be addressed are:

- **Water Availability:** How changes in temperature, precipitation patterns, and snowmelt may affect water availability locally as well as globally
- **Water Quality:** How higher water temperatures and changes in the timing, intensity, and duration of precipitation may affect water quality
- **Possible Water Resource Impacts**
- **Impacts of climate change including increasing water scarcity and flood risk, along with decline in water quality.**

***World Commission on Dams***

- History;
- Organization and authority;
- Initiatives; and
- Available publications.

***Global Water Partnerships***

- UN initiatives;
- World Bank initiatives;
- EU initiatives; and
- DBA initiatives.

The global move towards understanding and addressing the causes and effect of climate change will have a bearing in all matters related to environmental management issues. Therefore the concept of “Think global – act local” is becoming more prominent and participants of such training will be able to contextualise global discussions within the local and regional framework.

**4.4.1.1. Courses Available**

Development of custom courses to meet the specific ORASECOM context requirements to address the topics of Sustainable Development (including ecosystems approach) climate change and the World Commission on Dams and Global Water Partnerships are recommended.

Various courses focusing on specific aspects are available from various commercial and academic institutions in the member countries. These will apply to the experts and specialists according to specific needs and requirements.

**4.4.1.2. Recommendation**

Development of one day courses on sustainable development, that includes the ecosystem approach, and climate change, for presentation to Commissioners and TTT members, and similar, but more in-depth 3 day course on sustainable development and 5 day course on climate change for stakeholders is recommended.

A custom one day course on the World Commission of Dams and Global Water Partnerships will be suitable for all levels of capacity building.

Experts should attend existing 1 - 3 week courses on sustainable development and climate change available at academic institutions or from commercial sources.

#### 4.4.1.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Sustainable Development Course (including Ecosystems Approach)	1 day	Introductory
	Climate change	1 day	Introductory
	WCD and Global Water Partnerships	1 day	Introductory
TTT Members	Sustainable Development Course (including Ecosystems Approach)	1 day	Introductory
	Climate change	1 day	Introductory
	WCD and Global Water Partnerships	1 day	Introductory
Experts	Sustainable Development Course	1 - 3 weeks	Specialist
	Climate change	1 - 3 weeks	Specialist
	WCD and Global Water Partnerships	1 day	Introductory
Stakeholders	Sustainable Development Course	3 day	Specialist

#### 4.4.2. International Laws

##### 4.4.2.1. Courses Available

Most universities as well as some private service providers in the four basin countries provide courses in this focus area. Unfortunately most of these courses are too comprehensive for the needs of ORASECOM. They are also lengthy in time, on average probably two weeks.

The courses provided by the private service providers have not been verified for the purpose of this study, although some of them may be approved by government organisations for training purposes. On the other hand, a course provided by a university usually complies with the accreditation standard of that university.



The needs for this focus area should be addressed by means of customizing an existing course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Any one of the universities in the four basin countries could customize its existing course.

#### 4.4.2.2. Recommendation

It is recommended that expressions of interest from some of the universities in the four basin countries be invited to customize their existing courses. From this, one or two universities from each of the basin countries should be invited to submit a proposal for a customized course. The best proposal is then selected and the relevant university is appointed to customize its existing course and provide the necessary training for the role-players.

To customize one course will save money in the developing cost and it could standardize the contents of the course. Monitoring the standard of the course would also be easier than for example a course developed by more than one service provider.

As all participants would have to travel to attend the course (probably at the university concerned), it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.4.2.3. Intervention Status

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	None		
Stakeholders	None		

### 4.4.3. Environmental Principles

#### 4.4.3.1. Courses Available

Currently the concepts and applications of environmental principles are incorporated within other courses related to environmental management and IWRM. There is no specific course which will address the topic of environmental principles as a separate subject. Therefore while some of the principles may be covered in the material of other key focus area courses, a dedicated initiative for environmental principles is required.

#### 4.4.3.2. Recommendation

Although a dedicated course does not exist for this topic, it will not be viable to develop a custom course for this topic. A more beneficial route which can be followed is that of an in-house workshop or seminar focused on the environmental principles. Knowledgeable and experienced personnel from all four member states should be invited to make presentation on the environmental principles and their applications within the policies of the member states.

#### 4.4.3.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Workshop/Seminar	1 Day	Introduction
TTT Members	Workshop/Seminar	1 Day	Introduction
Experts	Workshop/Seminar	1 Day	Introduction
Stakeholders	Workshop/Seminar	1 Day	Introduction

### 4.4.4. Water Legislation

#### 4.4.4.1. Courses Available

This course should cover the legislation dealing with water resource management in each of the four basin countries.

Most universities as well as some private service providers in the four basin countries provide courses in this focus area. These universities and private service providers, with some exceptions, only provide courses dealing with the water legislation relating to that country.

Due to various reasons, such as the technical nature of the subject and the small number of lawyers practicing in this field, water law is incorporated into other fields of law for the purposes of training. Further, the emphasis of some of these courses might focus more on

services delivery, environmental issues and fundamental rights than actual water resource management.

The courses provided by the private service providers have not been verified for the purpose of this study, although some of them may be approved by government organisations for training purposes. On the other hand, a course provided by a university usually complies with the accreditation standard of that university.

The needs for this focus area should be addressed by means of customizing four existing courses into one course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. The course would then consist of four modules, each module dealing with a specific country's legislation. Some of the universities and service providers in the four basin countries could customize their existing courses.

#### **4.4.4.2. Recommendation**

It is recommended that expressions of interest from some of the universities and/or private service providers in each of the four basin countries be invited to customize their existing courses. From this, three universities and/or service providers from each basin countries should be invited to submit proposals for a customized course dealing with the water laws relevant to the country concerned. The best proposal from each country is then selected and the four relevant universities and/or service providers are appointed to customize their existing courses and to provide the necessary training for the role-players.

The course will therefore have four equal length modules, each module provided by a specific university or private service provider, one from each country. This will require that the trainers would have to travel to the different training venues.

As each participant would have to travel to the course, it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed four service providers travel to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### **4.4.4.3. Intervention Status**

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Days	Introductory
TTT Members	Short Course	2 Days	Introductory
Experts	Short Course	2 Days	Introductory
Stakeholders	None		

#### 4.4.5. International Water Rights

##### 4.4.5.1. Courses Available

Most universities in the four basin countries provide courses in this focus area. Unfortunately most of these courses are too comprehensive for the needs of ORASECOM and probably also lengthy in time. These courses usually comply with the accreditation standard of the universities.

The needs for this focus area should be addressed by means of customizing an existing course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Most of the universities in the four basin countries could customize their existing courses.

##### 4.4.5.2. Recommendation

It is recommended that expressions of interest from some of the universities in each of the four basin countries be invited to customize their existing courses. From this, one or two universities from each of the basin countries should be invited to submit a proposal for a customized course. The best proposal is then selected and the relevant university is appointed to customize its existing course and provide the necessary training for the role-players.

To customize one course will save money in the developing cost and it could standardise the contents of the course. Monitoring the standard of the course would also be easier than for example a course developed by more than one service provider.

As all participants would have to travel to attend the course (probably at the university concerned), it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.4.5.3. Intervention Status

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	0.5 Day	Introductory
TTT Members	Short Course	0.5 Day	Introductory
Experts	None		
Stakeholders	None		

#### 4.4.6. Environmental Legislation

##### 4.4.6.1. Courses Available

This course should cover the legislation dealing with environmental management in each of the four basin countries.

Most universities as well as some private service providers in the four basin countries provide courses in this focus area. These universities and private service providers, with some exceptions, only provide courses dealing with the environmental legislation relating to that country.

The courses provided by the private service providers have not been verified for the purpose of this study, although some of them may be approved by government organisations for training purposes. On the other hand, a course provided by a university usually complies with the accreditation standard of that university.

The needs for this focus area should be addressed by means of customizing four existing courses into one course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. The course would then consist of four modules, each module dealing with a specific country's legislation. Some of the universities and service providers in the four basin countries could customize their existing courses.

##### 4.4.6.2. Recommendation

It is recommended that expressions of interest from some of the universities and/or private service providers in each of the four basin countries be invited to customize their existing courses. From this, three universities and/or service providers within each of the basin

countries should be invited to submit proposals for a customized course dealing with the environmental laws relevant to the country concerned. The best proposal from each country is then selected and the four relevant universities and/or service providers are appointed to customize their existing courses and to provide the necessary training for the role-players.

The course will therefore have four equal length modules, each module provided by a specific university or private service provider, one from each country. This will require that the trainers would have to travel to the different training venues.

As each participant would have to travel to the course, it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed four service providers travel to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.4.6.3. Intervention Status

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Days	Introductory
TTT Members	Short Course	2 Days	Introductory
Experts	Short Course	2 Days	Introductory
Stakeholders	None		

#### 4.4.7. Bilateral and Trilateral Agreements

##### 4.4.7.1. Courses Available

The training needs for this focus area are very specific to the organisational goals and objectives of ORASECOM. There is currently no course available which will satisfy the requirements in this area.

The needs for this focus area should be addressed by means of developing a course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Various universities and private service providers in the four basin countries could develop such a course.

#### 4.4.7.2. Recommendation

It is recommended that expressions of interest from some of the universities and/or private service providers in each of the four basin countries be invited to develop such a course. From this, one or two universities and/or service providers from each of the basin countries should be invited to submit a proposal to develop such a course. The best proposal is then selected and the relevant university or service provider is appointed to develop the course and provide the necessary training for the role-players.

As all participants would have to travel to attend the course, it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.4.7.3. Intervention Status

Since this objective is important to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a necessary component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	Short Course	1 Day	Introductory
Stakeholders	Short Course	1 Day	Introductory

#### 4.4.8. SADC Protocols

##### 4.4.8.1. Courses Available

The training needs for this focus area are very specific to the organisational goals and objectives of ORASECOM. There is currently no course available which will satisfy the requirements in this area.

The needs for this focus area should be addressed by means of developing a course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Various universities and private service providers in the four basin countries could develop such a course.

#### 4.4.8.2. Recommendation

It is recommended that expressions of interest from some of the universities and/or private service providers in each of the four basin countries be invited to develop such a course. From this, one or two universities and/or service providers from each of the basin countries should be invited to submit a proposal to develop such a course. The best proposal is then selected and the relevant university or service provider is appointed to develop the course and provide the necessary training for the role-players.

As all participants would have to travel to attend the course, it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.4.8.3. Intervention Status

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	0.5 Day	Introductory
TTT Members	Short Course	0.5 Day	Introductory
Experts	None		
Stakeholders	None		

### 4.5. FACILITATING INVESTIGATIONS RELATED TO INFRASTRUCTURE

#### 4.5.1. Understanding Basic Modeling

##### 4.5.1.1. Courses Available

Water resource modeling is a highly specialized field practiced by only a few experts, and for that reason there are no ready-made courses available. However, more recently practitioners in the field have started to present one day courses as part of water resource management courses. These courses tend to focus on one model, but on the other hand the principles stay the same. The course can be adapted to serve the ORASECOM training needs at small cost.



The tendency in Southern Africa is to standardize on specific models, such as the water Resources Yield Model and the Water Resources Planning Model, while the catchment rainfall-runoff model that is most frequently used is the WRSM2000 model. In order to address the identified needs, a specific course will have to be developed. The course that is available focuses on the Water Resource Yield Model.

#### 4.5.1.2. Recommendation

As there are no available courses that address the specific needs of the ORASECOM, it will be necessary to design a course that addresses modeling in its broadest sense, yet specific to what is common practice in Southern Africa. The course should not be longer than one day.

The advantages of developing a course by and for the ORASECOM are:

- ORASECOM owns the course and no other fees than the original development cost will be payable,
- The course addresses the very specific needs within the ORASECOM,
- The course can be taken to where the need is, and not *vice versa*, and
- Courses can be organized as and when they are required.

#### 4.5.1.3. Intervention Status

The objective of the course will be to enable the participants to interpret the results of a water resource model with the necessary understanding to recognize the inherent limitations of such a model. No specialist knowledge is required, and this is not seen as a vital component of the capacity building programme. The need is limited to Commissioners, TTT Members and some stakeholders as part of a project on a need-to-know basis. Specialists will not benefit from the course; their development can only be addressed in the form of on-the-job training

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	No courses available, only on-the-job training		
Stakeholders	Short Course (Only when Required)	1 Day	Introductory

## 4.5.2. Resource Economics and Accounting

### 4.5.2.1. Courses Available

There are a number of courses available on all levels, varying from graduate courses at universities to one day courses on resource economics, and especially accounting. However, as far as is known, none of these courses consider water resources specifically. This does not mean that those courses are not beneficial, but it does mean that attendees have to distinguish what applies to water resources and what not.

It may be of benefit to develop a one day course on resource economics that is specifically aimed at the requirements of ORASECOM. The advantages of developing a course by and for the ORASECOM are:

- ORASECOM owns the course and no other fees than the original development cost will be payable,
- The course addresses the very specific needs within the ORASECOM,
- The course can be taken to where the need is, and not *vice versa*, and
- Courses can be organized as and when they are required.

### 4.5.2.2. Recommendation

It is strongly recommended that a course is developed specifically for ORASECOM.

### 4.5.2.3. Intervention Status

The course will be a high level course that will allow Commissioners and TTT members to consider recommendations for development projects objectively on the basis of economic benefits and costs. No training for experts is foreseen, as those active in the field should already have adequate background knowledge and training. Equally, it is not foreseen to train stakeholders, as they are normally not part of the decision-making process.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	None		
Stakeholders	None, but can attend course if required or desired		

## 4.5.3. Project management

### 4.5.3.1. Courses Available

There are a large number of short courses available commercially, a number of which are endorsed by reputable organizations such as the SA Institution of Civil Engineering. These

are normally built around specific software such as MSProjects, but still have the advantage of addressing the generic principles of project management.

#### 4.5.3.2. Recommendation

No courses need to be developed; there are a wide variety of courses available.

#### 4.5.3.3. Intervention Status

The objective of the course will be to equip Commissioners with basic project management skills so that they can receive already set-up project schedules from service providers and use it for their own project management purposes.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 days	Intermediate
TTT Members	Short Course	2 days	Intermediate
Experts	None		
Stakeholders	None		

#### 4.5.4. Monitoring and Evaluation Techniques

##### 4.5.4.1. Courses Available

As far as could be established there are no short courses available on monitoring (monitoring is the term used to describe the full process from sample taking/measuring to reporting). A short course for TTT members can be developed.

For specialists there are a number of graduate courses that address different aspects of monitoring, such as data analyses, laboratory analyses, etc. However, there is no specific course for water resource monitoring, and training at the specialist level is obtained by working at an organization that specializes in monitoring.

##### 4.5.4.2. Recommendation

A short course that addresses the needs of TTT members must be developed. This should consider the generic elements of resource monitoring, but be water specific.

##### 4.5.4.3. Intervention Status

The intention is to equip TTT members to evaluate any proposed monitoring to ensure that it will address the question that needs to be answered (will satisfy the information expectations). At the same time, knowledge of monitoring techniques will allow a better understanding and assessment of an available data base.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Not required		
TTT Members	Short Course	2 Days	Introduction
Experts	Graduate Courses	Semester	Specialist
Stakeholders	None		

#### 4.5.5. Financial Management

##### 4.5.5.1. Courses Available

There are commercial courses available on financial management that will satisfy every training and/or development need. However, it is accepted that the training need that is addressed here is to refresh or develop already instilled knowledge and expertise, and possibly to ensure a common approach to financial management of ORASECOM projects by member states. For this purpose there may be value in developing a course specifically for ORASECOM that is aimed at acquainting Commissioners and TTT members with the financial management requirements of the different donor organizations.

##### 4.5.5.2. Recommendation

An ORASECOM specific financial management course should be developed that will inform Commissioners and TTT members on the financial management requirements of donor organizations. For any other financial management needs, commercially available courses can be used.

##### 4.5.5.3. Intervention Status

As financial management is one of the most important aspects of project management, the ORASECOM course should be compulsory for all Commissioners and TTT members.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Days	Specific
TTT Members	Short Course	2 Days	Specific
Experts	None		
Stakeholders	None		

#### 4.5.6. Technical Understanding related to Infrastructure

##### 4.5.6.1. Courses Available

Technical understanding related to infrastructure is essentially a specialist field where engineers and technicians undergo formal education and gain experience in the course of their work. There are short courses available, but these are aimed at persons with the necessary training and background, and not at non-technical persons. For this reason a short course at the introductory level will have to be developed that is specifically aimed at water infrastructure.

##### 4.5.6.2. Recommendation

A short course for Commissioners, TTT members and stakeholders who do not have a technical background must be developed. This course should be at the introductory level, and address the basics of water related infrastructure, how it works and what works for specific applications (for instance the difference between different river outlets and flood gates, different dam designs, etc). The objective is to provide attendees of the course with a working knowledge of water related infrastructure in order to allow them to make informed decisions.

##### 4.5.6.3. Intervention Status

The need for this course is not rated very high, but rather as of interest. No intervention is required for experts.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Days	Introductory
TTT Members	Short Course	2 Days	Introductory
Experts	None		
Stakeholders	Short Course	2 Days	Introductory

#### 4.5.7. Safety of Dams and Tunnels

##### 4.5.7.1. Courses Available

There are a number of courses available through learned societies such as the SA Institution of Civil Engineering, but they normally fall within the category of continued professional development for engineers. However, these courses are accessible to non-engineers as well. The courses are presented infrequently, but can be presented on request.

The subject is highly specialized and not essential to Commissioners and TTT members.

#### 4.5.7.2. Recommendation

Specialists and some stakeholders will find benefit from attending these courses. No course development is required.

#### 4.5.7.3. Intervention Status

No intervention is required, other than to assess the need and to approach the relevant organizations to present the courses when there is enough interest.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	None		
TTT Members	None		
Experts	Sort Course	2-3 Days	Continued Professional Development
Stakeholders	Sort Course	2-3 Days	Continued Professional Development

## 4.6. CONTINGENCY PLANNING FOR EMERGENCIES

### 4.6.1. Emergency preparedness and Contingency Planning

#### 4.6.1.1. Courses Available

In South Africa there was a concerted effort to develop a flood management plan by the DWAF. It was however realized that this actually forms part of the duties of the local government. Water related infrastructure is normally designed to withstand extreme events, and the operational procedures under these circumstances are developed as part of the design.

This issue is therefore not seen as essential for ORASECOM, but it may be of interest to all role players to at least understand what the design criteria are, as well as the operational procedures under extreme events. A short course can therefore be prepared.

#### 4.6.1.2. Recommendation

There is enough material readily available to develop a course, and a one day course can be developed.

#### 4.6.1.3. Intervention Status

The need for a short course on emergency preparedness and contingency planning is deemed to be low.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	Short Course	1 Day	Introductory
Stakeholders	Short Course	1 Day	Introductory

#### 4.6.2. Risk Assessment

##### 4.6.2.1. Courses Available

Risk assessment is essential to all water related infrastructure and varies from the risk of floods (too much water) to droughts (too little water). The science of risk assessment is well developed, and courses are available. These courses tend to be highly specialized and a sound background knowledge of statistical analysis is required to gain any benefit. The courses are therefore aimed at specialists.

It would be of benefit to develop a course that would focus on the principles of risk assessment, rather than the mechanics of determining the quantum of the risk. A good understanding of the data requirements would assist in making informed decisions about monitoring.

##### 4.6.2.2. Recommendation

A short course on the principles of risk assessment must be developed.

##### 4.6.2.3. Intervention Status

As risk assessment is an integral part of water resource management, the course should be aimed at all the role players, except experts. Experts should attend the available university courses in statistical analysis.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	University Course (Post Graduate)	Semester	Specialist
Stakeholders	Short Course	1 Day	Introductory

### 4.6.3. Flood forecasting (Modeling)

#### 4.6.3.1. Courses Available

Flood forecasting is a highly specialized field where the expertise is scarce. It depends on models and real-time rainfall and flow monitoring. Implementation has been limited to areas where the necessary infrastructure is available. Courses for the setting up and calibration of models are available, but these are aimed at specialists who have a thorough understanding of the underlying principles.

#### 4.6.3.2. Recommendation

No course development is recommended.

#### 4.6.3.3. Intervention Status

The intervention should be limited to experts, and any course will be model-specific.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	None		
TTT Members	None		
Experts	Modeling Course	Model-specific	Specialist
Stakeholders	None		

## 4.7. REGULAR EXCHANGE OF INFORMATION AND CONSULTATION

### 4.7.1. Communication Skills

#### ***Presentation skills and Public Speaking***

Presentations and reports are ways of communicating ideas and information to a group. But unlike a report, a presentation carries the speaker's personality better and allows immediate interaction between all the participants. Communication in the public domain is an essential skill that most participants in ORASECOM activities will require. The art of public speaking or presenting to an audience with poise and confidence does not come naturally to most people but it is an acquired skill that can be learnt.

#### ***Facilitation Skills***

Facilitation of meetings will be required by some ORASECOM delegates. Some people are naturally good at facilitating discussion. Other people may initially lack confidence and will benefit from training and the opportunity to first practice using facilitation skills in a learning situation. Relevant personnel will need to be able to deal with groups with necessary dynamic facilitation skills and tools to manage the group process and keep the balance between process and outcomes. Members will gain participatory learning skills, understand



the qualities and skills of a good facilitator and gain confidence in dealing with groups of people as well as the ability to deal with conflict and difficult behaviours.

### ***Public Participation***

Participants of public participation training will be equipped to conduct public participation in a constructive way that enriches decision-making and engage stakeholders meaningfully. Participants will be able to manage single-issue, vociferous and emotional viewpoints and turn conflict into informed decisions.

### ***Team Building***

Team building activities provide a mechanism whereby people can learn to work and bond together in a non-threatening, competitive and creative atmosphere. Groups can accomplish complex, creative tasks while learning about their fellow workers. They learn about each other through cooperative working efforts. The objective of team building is to create and develop a sense of team in a group of people in order to improve their ability to work together.

### ***Written Communication and Report Writing***

Written communication guarantees that everyone concerned has the same information. It provides a long-lasting record of communication for future. Written instructions are essential when the action called for is crucial and complex. To be effectual, written communication should be understandable, brief, truthful and comprehensive.

Participants who have acquired good written communication skills will be able to evaluate the effects of content, language and style or written reports. They will be able to write effectively and creatively on a range of topics by choosing language structures to suit communicative purposes as well as edit writing for fluency.

### ***Computer Software Skills***

In the modern age of information technology, being computer literate is a vital component of being able to communicate and function in the modern world. Having basic computer skills is essential in every business environment. Computer skills are essential for operating at an optimum level in the corporate environment.

#### **4.7.1.1. Courses Available**

Commercial and institution courses are available from various service providers in all of the member countries for the topics in this section, or can be custom developed.

Presentation skills training should provide members with a multitude of options, from speaker tips, right through to acquiring the valuable presentation skills required of a top class business presenter or a professional speaker. A well structured training programme to develop good presentation skills should focus on the following elements:

- Practical use of various equipment mediums and software;
- Preparation of visuals;
- Awareness of relaxation techniques, body language, paralanguage;

- Personal image;
- Voice projection;
- Audience rapport and targeting;
- Handling questions;
- Presentation time management; and
- Personal attitude and self-belief.

A facilitation course should include:

- Meeting etiquette;
- Setting up agendas for meetings;
- Setting the boundaries (meeting rules);
- Facilitation skills and techniques;
- Facilitation vs. chairing;
- How to handle dysfunctional participants;
- How to diffuse tension; and
- How to handle special challenges.

The International Association for Public Participation (IAP2) is the internationally recognized body that promotes the Best Practice of Public Participation. It certifies practitioners that fulfill its training and experience requirements. IAP2 provides a certificate program in public participation. Some individuals in or associated with ORASECOM that are responsible for public participation activities would benefit from attending this course (which is presented by several trained individuals internationally, including in South Africa).

Participation programs will benefit from a course that covers the following topics:

- What is public participation?
- Stakeholder identification;
- Foundations of public participation (value-based, decision-based and goal-driven);
- The five steps of public participation (Gain internal acceptance, Learn from the public, Select the level of participation, Defining the process and participation objectives, and designing a public participation plan);
- Communications and Techniques for effective public participation;
- Evaluation of public participation programs; and
- Conflict Handling in Public Participation.

A team building course should be tailored to meet the specific size, group of people, time available and specific requirements and may include:

- Self awareness (Identifying what kind of person you are and how you interact with others);
- Other awareness (increasing personal/general/background and working knowledge of other team members);

- Team dynamics;
- Interaction skills; and
- Team building exercises.

A written communication and report writing course should include:

- Correct formats (for letter, faxes and memos);
- Compiling agendas, minutes of meetings and attendance registers;
- Structure of a report (Introduction, body, conclusion);
- Basic grammar and language;
- Styles of writing (formal, official, technical, emotive); and
- E-Mail etiquette.

Computer software training should include the following aspects:

- Basic computer skills (Operating system and settings);
- MS Word;
- MS Excel;
- MS Presentations;
- MS Projects;
- MS Outlook (e-mail); and
- Internet Use.

#### 4.7.1.2. Recommendation

Commercial and institution courses are available from various service providers in all of the member countries for the topics in this section, or can be custom developed. Some topics could be combined.

It is recommended that an annual team building exercise for Commissioners and TTT members be linked to other meetings/activities, such as a Strategic Planning Session.

The requirement for presentation, public speaking, facilitation and written communication and report writing courses will vary from person to person depending on their background and training. Provision should be made for each Commissioner TTT member, stakeholder and expert to attend one of these courses every second year.

Commissioners and TTT members are expected to have adequate knowledge of public participation. Existing commercial or custom developed courses should be attended by experts and stakeholders as required.

Commissioners and TTT members should all have adequate computer software skills. Specific training is recommended when new software or versions of software are implemented. This is estimated to be required once every two years, and will require one day of training for Commissioners. TTT members, experts and stakeholders are expected to obtain this training from within their organisation of origin.

### 4.7.1.3. Intervention Status

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	New or Upgrade of software course presentation, public speaking, facilitation and written communication and report writing	5 x 1 Day over 10 years	Introductory
TTT Members	New or Upgrade of software course presentation, public speaking, facilitation and written communication and report writing	5 x 1 Day over 10 years plus 20% to attend 1 3 day course	Introductory and intermediate
Experts	Variety of existing courses	3 weeks	Advanced
Stakeholders	Variety of existing courses	1 week	Intermediate

## 4.8. DISPUTE RESOLUTION

### 4.8.1. General Principles of Law

#### 4.8.1.1. Courses Available

Most universities as well as some private service providers in the four basin countries provide courses in this focus area. Unfortunately most of these courses are too comprehensive for the needs of ORASECOM. They might also be too lengthy in time.

The courses provided by the private service providers have not been verified for the purpose of this study, although some of them may be approved by government organisations for training purposes. On the other hand, a course provided by a university usually complies with the accreditation standard of that university.

The needs for this focus area should be addressed by means of customizing an existing course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Any one of the universities and/or private service providers in the four basin countries could customize their existing courses.

#### 4.8.1.2. Recommendation

It is recommended that expressions of interest from some of the universities and private service providers in each of the four basin countries be invited to customize their existing courses. From this, one or two universities and/or private service providers from each of the

basin countries should be invited to submit a proposal for a customized course. The best proposal is then selected and the relevant university and/or private service provider is appointed to customize its existing course and provide the necessary training for the role-players.

To customize one course will save money in the developing cost and it could standardise the contents of the course. Monitoring the standard of the course would also be easier than for example a course developed by more than one service provider.

As all participants would have to travel to attend the course (probably at the university concerned), it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.8.1.3. Intervention Status

Since this objective is not regarded necessary to the functioning of the organization, it may assist in the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	0.5 Day	Introductory
TTT Members	Short Course	0.5 Day	Introductory
Experts	None		
Stakeholders	None		

#### 4.8.2. Dispute Resolution: Legal Processes, Instruments and Mechanisms

##### 4.8.2.1. Courses Available

Most universities and probably also some private service providers in the four basin countries provide courses in this focus area. Unfortunately most of these courses are too comprehensive for the needs of ORASECOM. They might also be too lengthy in time.

The courses provided by the private service providers have not been verified for the purpose of this study, although some of them may be approved by government organisations for training purposes. On the other hand, a course provided by a university usually complies with the accreditation standard of that university.

The needs for this focus area should be addressed by means of customizing an existing course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Any one of the universities and/or private service providers in the four basin countries could customize their existing courses.

#### 4.8.2.2. Recommendation

It is recommended that expressions of interest from some of the universities and private services providers in each of the four basin countries be invited to customize their existing courses. From this, one or two universities and/or private service providers from each of the basin countries should be invited to submit a proposal for a customized course. The best proposal is then selected and the relevant university or private service provider is appointed to customize its existing course and provide the necessary training for the role-players.

To customize one course will save money in the developing cost and it could standardise the contents of the course. Monitoring the standard of the course would also be easier than for example a course developed by more than one service provider.

As all participants would have to travel to attend the course (probably at the university concerned), it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.8.2.3. Intervention Status

Since this objective is not regarded necessary to the functioning of the organization, it may assist in the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	0.5 Day	Introductory
TTT Members	Short Course	0.5 Day	Introductory
Experts	None		
Stakeholders	None		

### 4.8.3. Conflict Management

#### 4.8.3.1. Courses Available

There are many private service providers in the four basin countries that provide courses in this focus area of the correct length and contents. None of them have been verified for the purpose of this study. Universities in general do not provide this type of courses.

The needs for this focus area should be addressed by means of any one of the current existing courses.

#### 4.8.3.2. Recommendation

It is recommended that each basin country identify a suitable service provider based in that country and that the role-players in that country attend that identified course. It might be difficult to monitor the standard of the courses of all four the service providers.

If one service provider is appointed for training all the role-players, it could have an impact on travel and accommodation cost to travel to attend the course.

#### 4.8.3.3. Intervention Status

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	None		
Stakeholders	None		

### 4.8.4. Negotiation Skills

#### 4.8.4.1. Courses Available

There are many private service providers in the four basin countries that provide courses in this focus area of the correct length and contents. None of them have been verified for the purpose of this study.

Universities in general do not provide this type of courses.

The needs for this focus area should be addressed by means of any one of the current existing courses.

#### 4.8.4.2. Recommendation

It is recommended that each basin country identify a suitable service provider based in that country and that the role-players in that country attend that identified course. It might be difficult to monitor the standard of the courses of all four the service providers.

If one service provider is appointed for training all the role-players, it could have an impact on travel and accommodation cost to travel to attend the course.

#### 4.8.4.3. Intervention Status

Since this objective is critical to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a vital component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	None		
Stakeholders	None		

#### 4.8.5. Assertiveness Training

##### 4.8.5.1. Courses Available

There are many private service providers in the four basin countries that provide courses in this focus area of the correct length and contents. None of them have been verified for the purpose of this study.

Universities in general do not provide this type of courses.

The needs for this focus area should be addressed by means of any one of the current existing courses.



#### 4.8.5.2. Recommendation

It is recommended that each basin country identify a suitable service provider based in that country and that the role-players in that country attend that identified course. It might be difficult to monitor the standard of the courses of all four the service providers.

If one service provider is appointed for training all the role-players, it could have an impact on travel and accommodation cost to travel to attend the course.

#### 4.8.5.3. Intervention Status

Since this objective is important to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a necessary component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	1 Day	Introductory
TTT Members	Short Course	1 Day	Introductory
Experts	None		
Stakeholders	None		

#### 4.8.6. International Dispute Resolution Legislation

##### 4.8.6.1. Courses Available

Most universities and probably also some private service providers in the four basin countries provide courses in this focus area. Unfortunately most of these courses are too comprehensive for the needs of ORASECOM. They might also be too lengthy in time.

The courses provided by the private service providers have not been verified for the purpose of this study, although some of them may be approved by government organisations for training purposes. On the other hand, a course provided by a university usually complies with the accreditation standard of that university.

The needs for this focus area should be addressed by means of customizing an existing course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Any one of the universities and/or private service providers in the four basin countries could customize their existing courses.

#### 4.8.6.2. Recommendation

It is recommended that expressions of interest from some of the universities and private services providers in each of the four basin countries be invited to customize their existing courses. From this, one or two universities and/or private service providers from each of the basin countries should be invited to submit a proposal for a customized course. The best proposal is then selected and the relevant university or private service provider is appointed to customize its existing course and provide the necessary training for the role-players.

To customize one course will save money in the developing cost and it could standardise the contents of the course. Monitoring the standard of the course would also be easier than for example a course developed by more than one service provider.

As all participants would have to travel to attend the course (probably at the university concerned), it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.8.6.3. Intervention Status

Since this objective is important to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a necessary component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	0.5 Day	Introductory
TTT Members	Short Course	0.5 Day	Introductory
Experts	None		
Stakeholders	None		

### 4.9. GENERAL TRAINING NEEDS

#### 4.9.1. Lobbying and Advocacy

##### 4.9.1.1. Courses Available

Most universities in the four basin countries provide courses in this focus area. Unfortunately most of these courses are too comprehensive for the needs of ORASECOM

and probably also lengthy in time. These courses usually comply with the accreditation standard of the universities.

The needs for this focus area should be addressed by means of customizing an existing course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Most of the universities in the four basin countries could customize their existing courses.

#### 4.9.1.2. Recommendation

It is recommended that expressions of interest from some of the universities in each of the four basin countries be invited to customize their existing courses. From this, one or two universities from each of the basin countries should be invited to submit a proposal for a customized course. The best proposal is then selected and the relevant university is appointed to customize its existing course and provide the necessary training for the role-players.

To customize one course will save money in the developing cost and it could standardise the contents of the course. Monitoring the standard of the course would also be easier than for example a course developed by more than one service provider.

As all participants would have to travel to attend the course (probably at the university concerned), it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

#### 4.9.1.3. Intervention Status

Since this objective is important to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a necessary component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Days	Introductory
TTT Members	Short Course	2 Days	Introductory
Experts	None		
Stakeholders	None		

## 4.9.2. Good Governance

### 4.9.2.1. Courses Available

Most universities in the four basin countries provide courses in this focus area. Unfortunately most of these courses are too comprehensive for the needs of ORASECOM and probably also lengthy in time. These courses usually comply with the accreditation standard of the universities.

The needs for this focus area should be addressed by means of customizing an existing course to cater for the role-players of ORASECOM so as to achieve the objectives of this focus area. Most of the universities in the four basin countries could customize their existing courses.

### 4.9.2.2. Recommendation

It is recommended that expressions of interest from some of the universities in each of the four basin countries be invited to customize their existing courses. From this, one or two universities from each of the basin countries should be invited to submit a proposal for a customized course. The best proposal is then selected and the relevant university is appointed to customize its existing course and provide the necessary training for the role-players.

To customize one course will save money in the developing cost and it could standardise the contents of the course. Monitoring the standard of the course would also be easier than for example a course developed by more than one service provider.

As all participants would have to travel to attend the course (probably at the university concerned), it could have an impact on the travel and accommodation cost. The alternative to this might be that the appointed service provider travels to the different basin countries to present the course there, if the numbers are sufficient. The advantage of having all role-players attend the same course would be that they would be able to also learn from each other's experience.

### 4.9.2.3. Intervention Status

Since this objective is important to the functioning of the organisation together with the effective capability of key role-players, it is considered to be a necessary component of the capacity building programme for all levels of role-players.

The table below provides an indication of the key members who should consider capacity building in this aspect.

Role-Players	Intervention Type	Duration	Intervention Level
Commissioners	Short Course	2 Days	Introductory
TTT Members	Short Course	2 Days	Introductory

## 5. CONCLUSION

As mentioned earlier in this report, during the development of this programme every effort was made to avoid being prescriptive. In general terms the programme has been developed to allow flexibility among the users and managers who will be responsible for the implementation of the programme.

In order to facilitate this process **Appendix A** provides a list of institutions and organisations which will be able to provide the required training. The table in this appendix has been developed according to the key focus areas which were identified. This will enable the easy identification of possible service providers per KFA. The table also provides an indication of contact details for the specific service providers.

### 5.1. KEY DELIVERABLES

#### 5.1.1. Capacity Building Programme

The project was undertaken as an integrated exercise and therefore the various phases of the project have been consolidated into a single report. This report is a culmination of the Needs Assessment and the Capacity Building Programme phase.

The report provides a detailed breakdown of the KFAs and the associated areas of learning. An indication of the results of the TNA has also been provided for each of the objectives with specific descriptions related to the KFAs where relevant. In essence the information provided in Section 3 will allow users to obtain an idea of the content of a course which will cover a specific topic.

#### 5.1.2. Capacity Building Matrix Spreadsheet

The CBP is also accompanied by an Ms-Excel based spreadsheet which should be used as an interactive and dynamic tool which will facilitate the identification of courses, priority focus areas and allow the user to determine the cost associated with the various training and course development options which may be exercised. This spreadsheet has been provided as a soft copy tool to ORASECOM with a hard copy depicted in **Appendix B**.

While the spreadsheet has been based on the assumptions which have been mentioned in Section 2 of the report, the design of the spreadsheet allows easy adjustment of the assumptions which have been made. The macros in the spreadsheet have been designed to automatically calculate costs based on base costs and allowances. As a safeguard, the user also has the option to reset the spreadsheet to default values should the need arise. A summary sheet has been included in the spreadsheet which allows the user assess various cost components at a glance.

Base costs have been assigned to the different types of courses which were identified in terms of the following parameters:

Course Data		
Course Type	Development Cost/Day	Base Cost/Day
Develop New Course	R 40 000.00	R 3 000.00
Customise Existing	R 10 000.00	R 3 000.00
Amalgamate Courses	R 20 000.00	R 3 000.00
Existing course	R 3 000.00	R 3 000.00
Workshop	No development cost	R 0
Seminar	No development cost	R 0
Conference	No development cost	R 2 500.00

The assumption of no development costs associate with the workshop and seminar options is based on the fact that these types of interventions will generally be based on internal and in-house expertise which would be drawn upon for such capacity building exercises. However, should the expertise required be sought from outside the member state governmental organisations, a development cost may become applicable. In either case, the disbursement costs would still be applicable.

The disbursement costs have been based on the following assumptions:

Disbursements	
Travel	R 2 000.00
Accommodation/day	R 1 000.00
Per Diem/day	R 500.00

As mentioned previously, all the assumption figures can be adjusted as more definite figures become available. Using the “reset to default” option will cause the spreadsheet to reflect the above figures.

## 5.2. KEY FINDINGS

The CBP and the spreadsheet when used together can provide an indication of the costs associated with the implementation of the different types of intervention options. This information can be obtained by using the filter options in the spreadsheet. Assessing information in this context will allow managers to obtain an overall estimate of the costs associated with the various options which are available. This assessment will also allow the implementers to plan and budget according to the priorities identified and the needs of the organisation at any given time.

The tables below provide an indication of the various course options which can be adopted to address the specific needs. This information, drawn from the spreadsheet provides an indication of courses options for each phase linked to the specific Objective and KFA. It is also possible to obtain an idea of the total cost associated with each option.

### 5.2.1. Develop new custom course

This would essentially entail the creation of a brand new course based on specific criteria required to meet the ORASECOM objectives. In essence a course of this nature would incur a once off development course most likely through the appointment of a Professional Service Provider (PSP). Once this has been achieved, standard training and disbursement costs would be applicable.

<b>Development of New Custom Courses</b>			
<b>Phase</b>	<b>Key Focus Area</b>	<b>Objective</b>	<b>Proposed Course Name</b>
Phase 1	Objectives of the ORASECOM Action Plan	1	Introduction to ORASECOM
	SADC Protocols	4	SADC Protocols
	Eradication of exotic alien species	3	Eradication of exotic alien species
	Pollution Control and Prevention	3	Pollution Control
Phase 2	Bi- & Trilateral Agreements	4	International Agreements
	Penalties and Liabilities for Pollution	3	Legal Liabilities
	Understanding Basic Modelling	5	Basic principles of Modelling
	Resource Economics	5	Resource Economics
	Safety of Dams & Tunnels	5	Safety of Dams & Tunnels
	Emergency Preparedness Contingency Planning Disaster Management Flood Forecasting	6	Emergency Preparedness
	Risk Assessment	6	Basic Risk Assessment
Phase 3	Technical Understanding related to Infrastructure	5	Understanding Infrastructure
<b>Total Estimated Cost : R 9, 137, 000.00</b>			

### 5.2.2. Customise existing course

Many courses currently exist for some of the key focus areas. However, based on the strategic nature of the functions of ORASECOM, the detail and length of the existing courses become too cumbersome and therefore such courses may need to be trimmed in terms of length and content to suit the needs of ORASECOM. In such as case, most of the institutions which present such courses will customise the existing course to meet the requirements specified. Such a course will also incur a smaller development cost, after which standard training and disbursement costs would be applicable.

<b>Customise Existing Courses</b>			
<b>Phase</b>	<b>Key Focus Area</b>	<b>Objective</b>	<b>Proposed Course Name</b>
Phase 1	IWRM	2	IWRM Introductory course
		2	Catchment Management
		2	IWRM specialist courses
	Principles of Sustainable Development	4	Climate Change: Introduction
	Principles of Sustainable Development	4	WCD & Global Water Partnerships
	Principles of Sustainable Development	4	Climate Change: Intermediate
	International Laws	4	International Law
	International Water Rights	4	International Water Rights
Phase 2	Dispute Resolution Legislation	8	Dispute Resolution - Legal Basis
	Resource Quality Objectives	3	Resource Quality Objectives
Phase 3	General Principles of Law	8	General Principles of Law
<b>Total Estimated Cost : R 4, 538, 500.00</b>			

### 5.2.3. Amalgamate existing courses

This approach would entail the combination of two or more courses into a customised package for the needs of ORASECOM. This is a slightly longer process than customizing existing courses but not as intensive as developing a brand new course. Once again a development cost will be incurred while standard training and disbursement costs would also be applicable.

<b>Amalgamation of Existing Courses</b>			
<b>Phase</b>	<b>Key Focus Area</b>	<b>Objective</b>	<b>Proposed Course Name</b>
Phase 1	Principles of Sustainable Development	4	Sustainable Development
	Water Legislation	4	ORASECOM Water Law
	Environmental Legislation	4	Environmental Law - ORASECOM
Phase 2	Resource Monitoring	3	Resource Monitoring
<b>Total Estimated Cost : R 2, 555, 500.00</b>			



### 5.2.4. Utilise existing courses

In many instances the needs of ORASECOM can be met through the utilisation of “off the shelf” courses which are suitable in terms of format, content and length to meet the specific requirements. These courses would only incur the standard training and disbursement costs.

Utilise Existing Courses			
Phase	Key Focus Area	Objective	Proposed Course Name
Phase 1	IWRM	2	Environmental Flow Requirements
			Groundwater Management
			IWRM Masters **
	Conflict Management	8	Conflict Management
	Negotiation Skills	8	Negotiation Skills
	Principles of Sustainable Development	4	Sustainable Development
			Climate Change: Advanced
	Environmental Management	4	Environmental Assessment: An introductory Course
			Introduction to Environmental Management: An Overview of Principles, Tools and Issues
			HIV Aids and Water in Southern Africa
			Environmental Law (in South Africa) for Environmental Managers
			Environmental Risk Assessment
			Social and Heritage Impact Assessment
			Critical appraisal of EIA and external review (for decision-makers)
			Strategic Environmental Assessment
Biodiversity and EIA decision-making			
Introduction to Environmental Impact Assessment (EIA) Procedures			
Environmental Impact Assessment: The South African National Environmental Management Act Regulations: A			

			practical approach
	Conflict Handling in Public Participation	7	Module 2 of IAP2 certificate Program in PP
	Written Communication and Report Writing	7	Technical and Business Report Writing Course
Phase 2	Transboundary Diagnostic Analysis -Introduction	2	The TDA/SAP approach in the GEF International Waters Programme
			The TDA/SAP approach in the GEF International Waters Programme
	Data Assessment Techniques	2	Water Quality Monitoring
	Assertiveness training	8	Being Assertive
	Dispute Resolution Procedures and Mechanisms	8	Dispute Resolution
	Remediation Strategy and Tools	3	Ecological Rehab and Mine Closure Remed. & handling contaminated sediments
	Presentation Skills	7	Module 1 of IAP2 certificate Program in PP
	Public Speaking	7	Public Speaking
	Facilitation Skills	7	Facilitation Skills
	Principles and Practice of Public Participation	7	Public participation in Environmental Assessment
	Project Management	5	Project Management
	Risk Assessment	6	Advanced Risk Assessment
Phase 3	Team Building	7	Custom Course to be Developed
	Financial Management	5	Financial Management
<b>Total Estimated Cost : R 14, 040, 500.00</b>			

### 5.2.5. Seminars and Workshops

In some instances, certain topics are of such a nature that they are organisation, strategy or policy specific and therefore cannot be addressed by means of formalised training. In this case, knowledgeable personnel from the member states and associated organisations would be invited to make presentations on specific topics. Such sessions would ideally be combined with pre-planned PIU or similar strategic meetings in order to maximise on time and reduce costs. Since this initiative would largely be an in-house endeavour, the costs associated with this will largely be related to disbursements. Professional fees may be incurred in the event that an external expert is invited to such sessions.

<b>Workshops and Seminars</b>			
<b>Phase</b>	<b>Key Focus Area</b>	<b>Objective</b>	<b>Proposed Course Name</b>
Phase 1	Environmental Principles	4	Environmental Principles
Phase 3	Resource Based Approaches	3	WRM Strategies
	Source Management Strategy	3	WRM Strategies
<b>Total Estimated Cost : R 278, 500.00</b>			

### 5.3. RECOMMENDATIONS

As a general principle, in order to implement the CBP, ORASECOM may need to appoint personnel dedicated to the management of capacity building. The staff appointed must also take responsibility for the management of the procurement process for training initiatives, managements of service providers appointed for such a purpose as well as the co-ordination of the in-house initiatives to ensure synchronization with existing meetings and sessions.

- The overall CBP has been divided into three phases and it is recommended that personnel within the institution and the member states prioritise the key focus areas which have been included in Phase 1 over a period of 1 to 3 years. Phases 2 and 3 should be implemented in a logical sequence.
- As a general trend many of the key focus areas cannot be incorporated into existing course and therefore require a customised course to be developed for ORASECOM. It is recommended that the courses which need to be developed be drawn out separately. The detailed contents for each of the key focus areas are available in the TNA component of this report. Based on this information a professional service provider, universities and other training institutions can be approached to develop an individual custom course or a suite of customised courses.
- An overarching recommendation is that ORASECOM should consider the option of becoming a member of CAP-NET, Water-Net, and Fet-Water. All these organisations will provide a structured and focused basis for the development and presentation of organisation specific courses targeted at the objectives.
- In addition to the formal courses which may be attended by personnel, the following initiative should be implemented for ongoing continuous capacity building:
  - Conferences
  - On-the job training
  - Newsletters
  - E-Forums and discussion groups

- Study tours
- In order to also facilitate the ongoing empowerment of the young professionals, ORASECOM could consider the implementation of a bursary scheme to develop and capacitate young professionals in IWRM.
- The underlying purpose of this project is to level the playing field amongst the member states of ORASECOM in order to facilitate effective and efficient co-operative water resource management on a strategic level. Therefore in the selection of service providers, ORASECOM must ensure that the same service provider is appointed or selected for all the four member states. This will ensure that the information and capacity building imperatives are uniform in their application.

In conclusion it must be stressed that capacity building is an ongoing process which must be continually re-assessed and adjusted as the organisation grows and the needs evolve. The fact that personnel are continually being trained will also influence the needs of experienced staff members.

**APPENDIX A: List of Service Providers**



**NATIONAL UNIVERSITIES**

Country	Universities	Address	Contact Details
Botswana	University of Botswana	4775 Notwane Rd. Gaborone, Botswana	Tel: +267 355-0000 Fax: +267 395-6591
		Private Bag UB 0022 Gaborone, Botswana	
South Africa	North West University	Potchefstroom Campus Private Bag x6001 Potchefstroom 2520	Tel: +27 18 299-1111/2222 Fax: +27 18 299-2767 <a href="mailto:Elbie.Steyn@nwu.ac.za">Elbie.Steyn@nwu.ac.za</a>
		Potchefstroom Campus 11 Hoffman Street Potchefstroom 2531	
	Rhodes University	P.O. Box 94 Grahamstown 6140 South Africa	Tel: +27 46 603 8111 Fax: +27 46 622 5049 <a href="mailto:registrar@ru.ac.za">registrar@ru.ac.za</a>
	University of Cape Town	Private Bag X3, Rondebosch 7701, South Africa	Tel: +27 21 650 9111
	University of Johannesburg	University of Johannesburg PO Box 524 Auckland Park 2006	Phone: +27 11 559-2911 Fax: +27 11 559-2191 <a href="mailto:myfuture@uj.ac.za">myfuture@uj.ac.za</a>
	University of KZN	University of KwaZulu-Natal Durban 4041	Tel: +27 31 260 1111 Fax: +27 31 260 2201 <a href="mailto:education@ukzn.ac.za">education@ukzn.ac.za</a>
		King George V Avenue, Glenwood Durban	
	University of Western Cape	Private Bag X17 Bellville 7535 Republic of South Africa	Tel: +27 21 959 2911
Modderdam Road Bellville 7535 Republic of South Africa			
University of Witwatersrand	Private Bag 3, Wits 2050,	Tel: +27 11-717-1000 Fax: +27 11-717-1065	

Country	Universities	Address	Contact Details
Lesotho	National University of Lesotho	P.O. Roma 180 Maseru 100  Email : <a href="mailto:registrar@nul.ls">registrar@nul.ls</a>	Tel: 34 0601 Fax: 34 0000
Namibia	University of Namibia	Private Bag 13301, Windhoek, Namibia  340 Mandume Ndemufayo Avenue, Pionierspark, Windhoek, Namibia	Tel: +264-61-206-3111
	Polytechnic of Namibia	Private Bag 13388 Windhoek, Namibia  13 Storch Street Windhoek, Namibia	Tel: +264-61-207-9111 Fax: +264-61-207-2444

### RESOURCE CENTRES

	Location	Address	Contact Details
African Centre for Water Research	Cape Town, South Africa	<a href="http://www.acwr.co.za">www.acwr.co.za</a>	Tel: +27 21 424 4738 Fax: +27 21 422 3810 E-mail: <a href="mailto:poziswa@acwr.co.za">poziswa@acwr.co.za</a>
International Water Management Institute: Southern Africa	Pretoria, South Africa	<a href="http://www.iwmi.cgiar.org/africa/south">www.iwmi.cgiar.org/africa/south</a>	Tel: +27 12 845 9100 Fax: +27 12 845 9110 <a href="mailto:iwmi-africa@cgiar.org">iwmi-africa@cgiar.org</a>



## SERVICE PROVIDERS

KFA Supported	Institution	Location	Address	Contact Details
Assertiveness Skills	Imsimbi Training	South Africa	<a href="http://www.imsimbi.co.za">www.imsimbi.co.za</a>	Tel: +27 11 678-2443 Fax: +27 11 678-6496 <a href="mailto:tammy@imsimbi.co.za">tammy@imsimbi.co.za</a>
	Pumalo Africa	South Africa	<a href="http://www.pumalo.com">www.pumalo.com</a>	Tel: +27 12 991 7623 Fax: +27 86 675 5376 <a href="mailto:info@pumalo.com">info@pumalo.com</a>
	Dynamic Seminars	South Africa	<a href="http://www.drjude.co.za">www.drjude.co.za</a>	Tel: + 27 11 485 2150 Fax: +27 11 640 4916 <a href="mailto:info@winningresults.co.za">info@winningresults.co.za</a>
Business Writing Skills Professional Minute Writing	Abelusi Training Network	South Africa	<a href="http://www.abelusi.co.za">www.abelusi.co.za</a>	Tel: +27 16 986 3888 Fax: 086 669 3511 <a href="mailto:info@abelusi.co.za">info@abelusi.co.za</a>
	CESA	South Africa	PO Box 68482 Bryanston Johannesburg	Tel: +27 (011) 463 2022 Fax: +27 (011) 463 7383 <a href="mailto:sce@cesa.co.za">sce@cesa.co.za</a>
	Imsimbi Training	South Africa	<a href="http://www.imsimbi.co.za">www.imsimbi.co.za</a>	Tel: +27 11 678-2443 Fax: +27 11 678-6496 <a href="mailto:tammy@imsimbi.co.za">tammy@imsimbi.co.za</a>
Climate Change	Imbewu Sustainability Legal Specialists	South Africa	<a href="http://www.imbewu.co.za">www.imbewu.co.za</a>	Tel: +27 11 325 4928 <a href="mailto:admin@imbewu.co.za">admin@imbewu.co.za</a>
	UNESCO - IHE	Delft, The Netherlands	<a href="http://www.unesco-ihe.org">www.unesco-ihe.org</a>	Tel:+31 15 215 1715 Fax: +31 15 212 2921 <a href="mailto:info@unesco-ihe.org">info@unesco-ihe.org</a>
Computer Skills	Southern African Wildlife College	South Africa	Private Bag X3015 Hoedspruit 1380	Tel:+27 15 793 7300 Fax:+27 15 793 7314 <a href="mailto:ckafoteka@sawc.org.za">ckafoteka@sawc.org.za</a>
Conflict Management	Imsimbi Training	South Africa	<a href="http://www.imsimbi.co.za">www.imsimbi.co.za</a>	Tel: +27 11 678-2443 Fax: +27 11 678-6496 <a href="mailto:tammy@imsimbi.co.za">tammy@imsimbi.co.za</a>
	SAIEA	Namibia	P.O. Box 6322 Windhoek	Tel: +26 46 122 0579 Fax: +26 46 127 9897 <a href="mailto:peter.tarr@saiea.com">peter.tarr@saiea.com</a>
	Dynamic Seminars	South Africa	<a href="http://www.drjude.co.za">www.drjude.co.za</a>	Tel: + 27 11 485 2150 Fax: +27 11 640 4916 <a href="mailto:info@winningresults.co.za">info@winningresults.co.za</a>
	Pumalo Africa	South Africa	<a href="http://www.pumalo.com">www.pumalo.com</a>	Tel: +27 12 991 7623 Fax: +27 86 675 5376 <a href="mailto:info@pumalo.com">info@pumalo.com</a>
Contract Law	CESA	Johannesburg, SA	PO Box 68482 Bryanston	Tel: +27 (011) 463 2022 Fax: +27 (011) 463 7383

KFA Supported	Institution	Location	Address	Contact Details
			Johannesburg	<a href="mailto:sce@cesa.co.za">sce@cesa.co.za</a>
Environmental Law	Rhodes Investec Business School	Rhodes University - SA	P.O.Box 94 Grahamstown 6140	Tel: +27 46 603 8852 Fax: +27 46 603 8613 <a href="mailto:N.Craig@ru.ac.za">N.Craig@ru.ac.za</a>
	Centre for Environmental Management	North-West University - SA	<a href="http://www.cem.puk.ac.za">www.cem.puk.ac.za</a>	Tel: +27 18 299 2714 Fax: + 27 18 299 2726 <a href="mailto:ceminfo@nwu.ac.za">ceminfo@nwu.ac.za</a>
Environmental Management	SAIEA	Namibia	P.O. Box 6322 Windhoek	Tel: +26 46 122 0579 Fax: +26 46 127 9897 <a href="mailto:peter.tarr@saiea.com">peter.tarr@saiea.com</a>
	Centre for Environmental Management	North-West University - SA	<a href="http://www.cem.puk.ac.za">www.cem.puk.ac.za</a>	Tel: +27 18 299 2714 Fax: + 27 18 299 2726 <a href="mailto:ceminfo@nwu.ac.za">ceminfo@nwu.ac.za</a>
	CES			
Facilitation Skills	Karin Bowler			
	Pumalo Africa	South Africa	<a href="http://www.pumalo.com">www.pumalo.com</a>	Tel: +27 12 991 7623 Fax: +27 86 675 5376 <a href="mailto:info@pumalo.com">info@pumalo.com</a>
Financial Management	Rhodes Investec Business School	Rhodes University - SA	P.O.Box 94 Grahamstown 6140	Tel: +27 46 603 8852 Fax: +27 46 603 8613 <a href="mailto:N.Craig@ru.ac.za">N.Craig@ru.ac.za</a>
	Imsimbi Training	South Africa	<a href="http://www.imsimbi.co.za">www.imsimbi.co.za</a>	<b>Tel: +27 11 678-2443</b> <b>Fax: +27 11 678-6496</b> <a href="mailto:tammy@imsimbi.co.za">tammy@imsimbi.co.za</a>
IWRM	UNESCO - IHE	Delft, The Netherlands	<a href="http://www.unesco-ihe.org">www.unesco-ihe.org</a>	Tel:+31 15 215 1715 Fax: +31 15 212 2921 <a href="mailto:info@unesco-ihe.org">info@unesco-ihe.org</a>
	Cap-Net	Pretoria, SA	<a href="http://www.cap-net.org">www.cap-net.org</a>	Tel: +27 12 3309077 Fax: +27 12 3314860 <a href="mailto:info@cap-net.org">info@cap-net.org</a>
	Global Water Partnership Southern Africa	Pretoria, SA	<a href="http://www.gwpforum.org">www.gwpforum.org</a> <a href="http://www.gwpsa.org">www.gwpsa.org</a>	Tel: +27 12 845 9159 E-mail: <a href="mailto:r.beukman@cgiar.org">r.beukman@cgiar.org</a>
	Fet-Water	Stellenbosch, SA	<a href="http://www.fetwater.co.za">www.fetwater.co.za</a>	Tel: +27 21 887 7161 Fax: +27 21 887 7162 <a href="mailto:dana@bluescience.co.za">dana@bluescience.co.za</a>
	Waternet	Harare, Zimbabwe	<a href="http://www.waternetonline.ihe.nl">www.waternetonline.ihe.nl</a>	Tel: +263-4-336725 Fax: +263-4-336740 <a href="mailto:bgumbo@waternetonline.org">bgumbo@waternetonline.org</a>
IWRM - Introduction	Centre for Environmental Management	North-West University - SA	<a href="http://www.cem.puk.ac.za">www.cem.puk.ac.za</a>	Tel: +27 18 299 2714 Fax: + 27 18 299 2726

KFA Supported	Institution	Location	Address	Contact Details
				<a href="mailto:ceminfo@nwu.ac.za">ceminfo@nwu.ac.za</a>
IWRM – Catchment Management	Southern African Wildlife College	South Africa	Private Bag X3015 Hoedspruit 1380	Tel:+27 15 793 7300 Fax:+27 15 793 7314 <a href="mailto:ckafoteka@sawc.org.za">ckafoteka@sawc.org.za</a>
IWRM - Groundwater	University of Western Cape	UWC – South Africa	Earth Sciences Department University of the Western Cape Private Bag X 17 Bellville 7535	Tel: +27 21 959 2683 Fax: +27 86 605 3198 <a href="mailto:hsolomon@uwc.ac.za">hsolomon@uwc.ac.za</a>
	Premier Conferencing	South Africa		Tel: +27 11 626 9000 Fax: +27 11 615 9447 <a href="mailto:info@premierconferencing.co.za">info@premierconferencing.co.za</a>
Negotiation Skills	Imsimbi Training	South Africa	<a href="http://www.imsimbi.co.za">www.imsimbi.co.za</a>	<b>Tel: +27 11 678-2443</b> <b>Fax: +27 11 678-6496</b> <a href="mailto:tammy@imsimbi.co.za">tammy@imsimbi.co.za</a>
	SAIEA	Namibia	P.O. Box 6322 Windhoek	Tel: +26 46 122 0579 Fax: +26 46 127 9897 <a href="mailto:peter.tarr@saiea.com">peter.tarr@saiea.com</a>
	Pumalo Africa	South Africa	<a href="http://www.pumalo.com">www.pumalo.com</a>	Tel: +27 12 991 7623 Fax: +27 86 675 5376 <a href="mailto:info@pumalo.com">info@pumalo.com</a>
Project Management	CESA	South Africa	PO Box 68482 Bryanston Johannesburg	Tel: +27 (011) 463 2022 Fax: +27 (011) 463 7383 <a href="mailto:sce@cesa.co.za">sce@cesa.co.za</a>
	Abelusi Training Network	South Africa		Tel: +27 16 986 3888 Fax: 086 669 3511 <a href="mailto:info@abelusi.co.za">info@abelusi.co.za</a>
	Imsimbi Training	South Africa	<a href="http://www.imsimbi.co.za">www.imsimbi.co.za</a>	<b>Tel: +27 11 678-2443</b> <b>Fax: +27 11 678-6496</b> <a href="mailto:tammy@imsimbi.co.za">tammy@imsimbi.co.za</a>
Public Participation	IAP2	Colorado, USA	<a href="http://www.iap2.org">www.iap2.org</a>	Tel: 1-303-254-5642 Fax: 1-303-255-2382 <a href="mailto:moira@iap2.org">moira@iap2.org</a>
	SAIEA	Namibia	P.O. Box 6322 Windhoek	Tel: +26 46 122 0579 Fax: +26 46 127 9897 <a href="mailto:peter.tarr@saiea.com">peter.tarr@saiea.com</a>
	Tisha Greyling			
Public Speaking	Deborah Nel			
Remediation	Centre for Environmental Management	North-West University - SA	<a href="http://www.cem.puk.ac.za">www.cem.puk.ac.za</a>	Tel: +27 18 299 2714 Fax: + 27 18 299 2726 <a href="mailto:ceminfo@nwu.ac.za">ceminfo@nwu.ac.za</a>
		Delft, The	<a href="http://www.unesco-ihe.org">www.unesco-ihe.org</a>	Tel:+31 15 215 1715

KFA Supported	Institution	Location	Address	Contact Details
		Netherlands		Fax: +31 15 212 2921 <a href="mailto:info@unesco-ihe.org">info@unesco-ihe.org</a>
Resource Economics Environmental Economics	Centre for Applied Research	Gaborone, Botswana	<a href="http://www.car.org.bw">www.car.org.bw</a>	Tel: +267 390 3401 Fax: +267 390 3401 <a href="mailto:info@car.org.za">info@car.org.za</a>
	Rhodes Investec Business School	Rhodes University - SA	P.O.Box 94 Grahamstown 6140	Tel: +27 46 603 8852 Fax: +27 46 603 8613 <a href="mailto:N.Craig@ru.ac.za">N.Craig@ru.ac.za</a>
	Southern African Wildlife College	South Africa	Private Bag X3015 Hoedspruit 1380	Tel:+27 15 793 7300 Fax:+27 15 793 7314 <a href="mailto:ckafoteka@sawc.org.za">ckafoteka@sawc.org.za</a>
Resource Monitoring	UNESCO - IHE	Delft, The Netherlands	<a href="http://www.unesco-ihe.org">www.unesco-ihe.org</a>	Tel:+31 15 215 1715 Fax: +31 15 212 2921 <a href="mailto:info@unesco-ihe.org">info@unesco-ihe.org</a>
	Centre for Environmental Management	North-West University - SA	<a href="http://www.cem.puk.ac.za">www.cem.puk.ac.za</a>	Tel: +27 18 299 2714 Fax: + 27 18 299 2726 <a href="mailto:ceminfo@nwu.ac.za">ceminfo@nwu.ac.za</a>
TDA	UN TSC Programme	New York, USA	<a href="http://www.iwlearn.net">www.iwlearn.net</a>	Tel; 1 202 518 2054 Fax: 1 202 387 4823 Email: <a href="mailto:info@iwlearn.org">info@iwlearn.org</a>
	SAIEA	Namibia	P.O. Box 6322 Windhoek	Tel: +26 46 122 0579 Fax: +26 46 127 9897 <a href="mailto:peter.tarr@saiea.com">peter.tarr@saiea.com</a>
Team Building	Dynamic Seminars	South Africa	<a href="http://www.drjude.co.za">www.drjude.co.za</a>	Tel: + 27 11 485 2150 Fax: +27 11 640 4916 <a href="mailto:info@winningresults.co.za">info@winningresults.co.za</a>
Water Quality Assessment	Centre for Environmental Management	North-West University - SA	<a href="http://www.cem.puk.ac.za">www.cem.puk.ac.za</a>	Tel: +27 18 299 2714 Fax: + 27 18 299 2726 <a href="mailto:ceminfo@nwu.ac.za">ceminfo@nwu.ac.za</a>
	UNESCO - IHE	Delft, The Netherlands	<a href="http://www.unesco-ihe.org">www.unesco-ihe.org</a>	Tel:+31 15 215 1715 Fax: +31 15 212 2921 <a href="mailto:info@unesco-ihe.org">info@unesco-ihe.org</a>

**APPENDIX B: CBP Spreadsheet**



PHASE 1								
Key Focus Area	Objective	Course Name	Course Type	Comm	TTT Member	Expert	Stake Holder	Total Cost
Objectives of the ORASECOM Action Plan	1	Introduction to ORASECOM	Develop New	R 22 000.00	R 66 000.00	R 33 000.00	R 22 000.00	223 000.00
IWRM	2	IWRM Introductory course	Customise	R 22 000.00	R 66 000.00	R 33 000.00	R 22 000.00	R 163 000.00
		Environmental Flow Requirements	Existing	R 22 000.00	R 66 000.00	R 33 000.00	R 22 000.00	R 149 000.00
		Catchment Management	Customise	R 22 000.00	R 66 000.00	R 33 000.00	R 22 000.00	R 163 000.00
		Groundwater Management	Existing	R 34 000.00	R 102 000.00	R 51 000.00	R 34 000.00	R 227 000.00
		IWRM specialist courses	Customise	R	R 1377 000	R 688 500.00	R	R 2 215 500
		IWRM Masters **	Existing	R	R	R 495 000.00	R	R 555 000.00
Conflict Management	8	Conflict Management	Existing	R 19 000.00	R 57 000.00	R	R	R 79 000.00
Negotiation Skills	8	Negotiation Skills	Existing	R 19 000.00	R 57 000.00	R 28 500.00	R 19 000.00	R 126 500.00
Principles of Sustainable	4	Climate Change: Introduction	Customise	R 33 000.00	R 99 000.00	R 49 500.00	R 33 000.00	R 224 500.00
		WCD & Global Water Partnerships	Customise	R33 000.00	R 99 000.00	R 49 500.00	R 33 000.00	R 224 500.00
		Sustainable Development	Amalgamate	R53 000.00	R 159 000.00	R 79 500.00	R 53 000.00	R 364 500.00
		Climate Change: Intermediate	Customise Existing	R 91 000.00	R 273 000.00	R 136 500.00	R 91 000.00	R 621 500.00

		Sustainable Development	Existing course	R 249 000.00	R 747 000.00	R 373 500.00	R 249 000.00	R 1 663 500
		Climate Change: Advanced	Existing course	R 249 000.00	R 747 000.00	R 373 500.00	R 249 000.00	R 1 663 500
International Laws	4	International Law	Customise Existing	R 33 000.00	R 99 000.00	R	R	R 142 000.00
International Water Rights	4	International Water Rights	Customise Existing	R 31 000.00	R 93 000.00	R	R	R 134 000.00
Environmental Principles	4	Environmental Principles	Workshop	R 7 000.00	R 21 000.00	R 10 500.00	R 7 000.00	R 45 500.00
Environmental Management	4	Environmental Assessment: Introduction	Existing course	R 64 000.00	R 192 000.00	R 96 000.00	R 64 000.00	R 428 000.00
		Introduction to Environmental Management: An Overview	Existing course	R 79 000.00	R 237 000.00	R 118 500.00	R 79 000.00	R 528 500.00
		HIV Aids and Water in Southern Africa	Existing course	R 64 000.00	R 192 000.00	R 96 000.00	R 64 000.00	R 428 000.00
		Environmental Law (in South Africa) for Environmental Managers	Existing course	R 79 000.00	R 237 000.00	R 118 500.00	R 79 000.00	R 528 500.00
		Environmental Risk Assessment	Existing course	R 79 000.00	R 237 000.00	R 118 500.00	R 79 000.00	R 528 500.00
		Social and Heritage Impact	Existing course	R 79 000.00	R 237 000.00	R 118 500.00	R 79 000.00	R 528 500.00
		Critical appraisal of EIA and external review	Existing course	R 64 000.00	R 192 000.00	R 96 000.00	R 64 000.00	R 428 000.00



		Strategic Environmental Assessment	Existing course	R 64 000.00	R 192 000.00	R 96 000.00	R 64 000.00	R 428 000.00
		Biodiversity and EIA decision-making	Existing course	R 64 000.00	R 192 000.00	R 96 000.00	R 64 000.00	R 428 000.00
		Introduction to EIA Procedures	Existing course	R 79 000.00	R 237 000.00	R 118 500.00	R 79 000.00	R 528 500.00
		EIA: The South African NEMA Regulations: A practical approach	Existing course	R 79 000.00	R 237 000.00	R 118 500.00	R 79 000.00	R 528 500.00
Water Legislation	4	ORASECOM Water Law	Amalgamate Courses	R 102 000.00	R 306 000.00	R 153 000.00	R	R 601 000.00
Environmental Legislation	4	Environmental Law - ORASECOM	Amalgamate Courses	R 102 000.00	R 306 000.00	R 153 000.00	R	R 601 000.00
SADC Protocols	4	SADC Protocols	Develop New Course	R 93 000.00	R 279 000.00	R	R	R 412 000.00
Eradication of exotic alien species	3	Eradication of exotic alien species	Develop New Course	R 182 000.00	R 546 000.00	R	R 182 000.00	R 990 000.00
Pollution Control and Prevention	3	Pollution Control	Develop New Course	R 271 000.00	R 813 000.00	R 406 500.00	R 271 000.00	R 1 881 500
Conflict Handling in Public Participation	7	Module 2 of IAP2 certificate Program in PP	Existing course	R 19 000.00	R 57 000.00	R 28 500.00	R 19 000.00	R 126 500.00
Written Communication and Report Writing	7	Technical and Business Report Writing Course	Existing course	R 34 000.00	R 102 000.00	R 51 000.00	R 34 000.00	R 227 000.00
<b>Total Cost : R 19, 276, 500.00</b>								



PHASE 2								
Key Focus Area	Objective	Course Name	Course Type	Comm	TTT Member	Expert	Stake Holder	Total Cost
Transboundary Diagnostic Analysis -Introduction	2	The TDA/SAP approach: Introduction	Existing course	R 34 000.00	R 102 000.00	R 51 000.00	R 34 000.00	R 227 000.00
		The TDA/SAP approach in the GEF International Waters Programme	Existing course	R	R 237 000.00	R 118 500.00	R	R 370 500.00
Data Assessment Techniques	2	Water Quality Monitoring	Existing course	R 79 000.00	R 237 000.00	R 118 500.00	R 79 000.00	R 528 500.00
Assertiveness training	8	Being Assertive	Existing course	R 19 000.00	R 57 000.00	R	R	R 79 000.00
Dispute Resolution	8	Dispute Resolution	Existing course	R 19 000.00	R 57 000.00	R	R	R 79 000.00
Dispute Resolution Legislation	8	Dispute Resolution - Legal Basis	Customise Existing	R 33 000.00	R 99 000.00	R	R	R 142 000.00
Bi- & Trilateral Agreements	4	International Agreements	Develop New Course	R 93 000.00	R 279 000.00	R 139 500.00	R 93 000.00	R 644 500.00
Pollution Penalties and Liabilities	3	Legal Liabilities	Develop New Course	R 182 000.00	R 546 000.00	R 273 000.00	R 182 000.00	R 1 263 000
Remediation Strategy and Tools	3	Ecological Rehab and Mine Closure	Existing course	R	R 237 000.00	R 118 500.00	R	R 370 500.00
Resource Quality Objectives	3	Resource Quality Objectives	Customise Existing	R 33 000.00	R 99 000.00	R 49 500.00	R 33 000.00	R 224 500.00
Resource	3	Resource	Amalgamate	R	R 747 000.00	R	R	R 847 000.00

Monitoring		Monitoring	Courses					
Presentation Skills	7	Module 1 of IAP2 certificate Program in PP	Existing course	R 19 000.00	R 57 000.00	R 28 500.00	R 19 000.00	R 126 500.00
Public Speaking	7	Public Speaking	Existing course	R 34 000.00	R 102 000.00	R 51 000.00	R 34 000.00	R 227 000.00
Facilitation Skills	7	Facilitation Skills	Existing course	R 34 000.00	R 102 000.00	R 51 000.00	R 34 000.00	R 227 000.00
Principles and Practice of Public Participation	7	Public participation in Environmental Assessment	Existing course	R 64 000.00	R 192 000.00	R 96 000.00	R 64 000.00	R 428 000.00
Understanding Basic Modelling	5	Basic principles of Modelling	Develop New Course	R 93 000.00	R 279 000.00	R	R 93 000.00	R 505 000.00
Resource Economics	5	Resource Economics	Develop New Course	R 93 000.00	R 279 000.00	R	R	R 412 000.00
Project Management	5	Project Management	Existing course	R 34 000.00	R 102 000.00	R	R	R 142 000.00
Safety of Dams & Tunnels	5	Safety of Dams & Tunnels	Develop New Course	R	R	R 406 500.00	R 271 000.00	R 797 500.00
Emergency Preparedness Contingency Planning Disaster Management Flood Forecasting	6	Emergency Preparedness	Develop New Course	R 93 000.00	R 279 000.00	R 139 500.00	R 93 000.00	R 644 500.00
Risk Assessment	6	Basic Risk Assessment	Develop New Course	R 93 000.00	R 279 000.00	R	R 93 000.00	R 505 000.00
Risk Assessment	6	Advanced Risk Assessment	Existing course	R	R	R 495 000.00	R	R 555 000.00
<b>Total Cost: R 9, 847, 000.00</b>								

<b>Phase 3</b>								
<b>Key Focus Area</b>	<b>Objective</b>	<b>Course Name</b>	<b>Course Type</b>	<b>Comm</b>	<b>TTT Member</b>	<b>tExper</b>	<b>Stake Holder</b>	<b>Total Cost</b>
General Principles of Law	8	General Principles of Law	Customise Existing	R 33 000.00	R 99 000.00	R	R	R 142 000.00
Resource Based Approaches	3	WRM Strategies	Seminar	R 7 000.00	R 21 000.00	R 10 500.00	R 7 000.00	R 45 500.00
Source Management Strategy	3	WRM Strategies	Seminar	R 7 000.00	R 21 000.00	R 10 500.00	R 7 000.00	R 45 500.00
Team Building	7	Custom Course to be Developed	Existing course	R 19 000.00	R 57 000.00	R 28 500.00	R 19 000.00	R 126 500.00
Financial Management	5	Financial Management	Existing course	R 34 000.00	R 102 000.00	R	R	R 142 000.00
Technical Understanding related to Infrastructure	5	Understanding Infrastructure	Develop New Course	R 82 000.00	R	R 273 000.00	R 182 000.00	R 717 000.00
Lobbying and Advocacy	General	Existing university course should be customized	Existing course	R 34 000.00	R 102 000.00	R	R	R 142 000.00
Good Governance	General	Existing university course should be customized	Existing course	R 34 000.00	R 102 000.00	R	R	R 142 000.00
<b>Total Cost: R 1, 502, 500.00</b>								



**APPENDIX C: TNA Questionnaire**





## Training Needs Analysis

### Introduction

The Orange-Senqu Commission (ORASECOM) was established on 3 November 2000 in Windhoek, Namibia, and this multilateral commission has been meeting regularly since then. It is a legal entity in its own right, with certain functions to execute. Bilateral commissions (between South Africa and Lesotho, and between South Africa and Namibia) remain in place, but the activities are subject to scrutiny by ORASECOM. The ORASECOM is an advisory body with powers only to advise the parties and is not a development agency.

Transboundary water management has always been of key importance in the Orange-Senqu basin, with individual agreements existing between Lesotho and South Africa (Lesotho Highlands Water Project) and Namibia and South Africa respectively on the use of the shared water resources.

ORASECOM aims to develop the Orange River for the benefit of all the respective states and is the first formal body established for the management of shared water resources since the Protocol on Shared Watercourse Systems became an instrument of international water law in the Southern African Development Community (SADC). The commission plans to develop a comprehensive perspective of the Orange River Basin, study the present and proposed uses of the river system, and determine future requirements for flow monitoring and flood management. It is expected to strengthen regional solidarity and enhance socio-economic cooperation. The multilateral commission will not replace existing bilateral commissions between any of the watercourse states, but rather will provide a broader forum for overall consultation and coordination between the states for sound integrated water resources management and development in the Orange River Basin.

### Capacity Building Project

ILISO Consulting (Pty) Ltd was appointed on 12 September 2008 under the FGEF supported programme to ORASECOM to carry out a capacity building needs assessment and based on this to develop a detailed Capacity Building Programme (CBP) for the next 5 years. The main objective of the study is to provide ORASECOM with a definitive and implementable needs-based CBP which will support ORASECOM in carrying out its functions as defined in the 2000 ORASECOM agreement.

ILISO is currently busy with the first part of the study, the needs assessment and this questionnaire has been drawn up to provide information for this assessment. More specifically, the objective / aim of this questionnaire is to identify the areas in which capacity is required to be built based on the functions and responsibilities of ORASECOM (Council, technical task teams, steering committees etc) and the national institutions upon

which ORASECOM and its members/representatives depend for technical advice, information, data etc.

Once the answers to these questions have been obtained, (as expressed by ORASECOM reps and the countries (Ministries, consultants, experts) a gap analysis can be carried out in order to obtain a clear list of capacity building needs. This list will then be converted into a list of interventions of different types.

You are therefore requested to indicate your perception of the areas in which capacity needs to be built within your organization (or the country or ORASECOM) in order to support ORASECOM in carrying out its functions properly.

The questionnaire has been drawn up according to the mandated functions of ORASECOM. Under each function we have listed our preliminary view/opinion of the various areas/topics/subjects in which sufficient capacity is required to support the proper/sufficient carrying out of the function. Provision has also been made for an indication of any additional areas or topics which you may consider relevant to the specific objective being assessed.

Please provide an indication of the training or capacity building needs which will be required to achieve the objectives from a generic and organisational viewpoint. The answers provided should not be based on person needs but rather on the overall needs of the water sector and organisation which you represent.

The questionnaire has been divided into assessment of needs for each functional activity of ORASECOM. Provision has also been made for an indication of organisations or groups which may require capacity building.

**Once complete, please return the form to:**

**Kavita Pema : [kavita@iliso.com](mailto:kavita@iliso.com)**

**Fax: 012 665 1886**

**Respondent Information**

First Name

Last Name

Years of Experience

Occupation/ Job Title

Organisation Represented

Primary Employer

Employer's Address

Phone

Fax

Cell Phone

E-mail Address

**1. Objectives of the ORASECOM Action Plan**

An understanding and knowledge of the background of the organisational structure, institutional arrangements and strategic management philosophies are critical in the efficient function of the organisation.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

- 1. Critical
- 2. Important
- 3. Optional
- 4. Not Applicable

	1	2	3	4
Knowledge and understanding of the ORASECOM Agreement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clear understanding of the Mission and Vision of ORASECOM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Knowledge of the primary role of ORASECOM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Understanding ORASECOM's role in the larger governance area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Knowledge of the structure and organisation related to functions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Goals of ORASECOM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ORASECOM Action Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1

Additional Focus Area 2

Additional Focus Area 3

Additional Focus Area 4

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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**2. Taking Measures and Making Arrangements to Determine the Long Term Safe Yield of the Water Resources of the System: Surface Water and Groundwater**

ORASECOM is responsible for the integrated Water Resource Management of the Orange-Senqu River Basin and as such the relevant personnel instrumental in the execution of this task will be required to be knowledgeable in the area of surface and groundwater management. This aspect will have to be linked to water quality and quantity management in order to understand and management system yield requirements and options.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

1. Critical
2. Important
3. Optional
4. Not Applicable

	1	2	3	4
Water Resource Development Management – Principles and Applications				
Surface Hydrology – Principles and Applications				
Groundwater – Principles and Applications				
Environmental Flow Requirements (quality and quantity)				
Integrated Water Resource Management				
Transboundary Diagnostic Analysis				
Catchment Management				
Basic Principles of Modeling				
Data Assessment Techniques				

**Additional Focus Areas for Objective**

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1	
Additional Focus Area 2	

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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**3. Prevention of Pollution and Control of Aquatic Weeds**

Prevention and control of pollution are the basic building blocks for implementation of Integrated Water Resource Management. It is therefore vital to understand the dynamics of the receiving water as well as the aquatic ecosystems water quality requirements, in terms of the IWRM approach where water quality management consists of an integrated source, remediation and resource directed management approach.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

- 1. Critical
- 2. Important
- 3. Optional
- 4. Not Applicable

	1	2	3	4
Authorisation Processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pollution Control and Prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Penalties and Liabilities for Pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resource Based Approaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Source Management Strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remediation Strategy and Tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resource Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Additional Focus Areas for Objective**

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1

Additional Focus Area 2

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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**4. Ensuring the Equitable and Reasonable Utilisation of Water Resources in the River System to Support Sustainable Development in the Territory of Each Party**

Since the ORASECOM deals with the management of transboundary water resources a clear understanding of the relevant legislation of the partner countries as well as international regulatory mechanisms which may impact on the operational management of the organisation is required. In this context it is also vital to understand the international initiative which are being undertaken and implemented in order to ensure sustainable development.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

- 1. Critical
- 2. Important
- 3. Optional
- 4. Not Applicable

	1	2	3	4
Principles of Sustainable Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UN Protocols	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Laws	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Principles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bilateral Agreements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SADC Protocols	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Additional Focus Areas for Objective**

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1

Additional Focus Area 2

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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**5. Facilitating Investigations and Studies Related to Development, Operation and Maintenance of Infrastructure on the River System**

Infrastructure management is a very specialized field which requires specialized training. Usually this would entail a tertiary education in the engineering field. However, in order to make management decisions and recommendations a basic understanding of the development, operation and maintenance of infrastructure may be required.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

- 1. Critical
- 2. Important
- 3. Optional
- 4. Not Applicable

	1	2	3	4
Understanding Basic Modeling				
Resource Economics				
Project Management				
Financial Management (budget, invoicing, basic financial policy)				
Technical Understanding related to Infrastructure				
Safety of Dams				

**Additional Focus Areas for Objective**

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1

Additional Focus Area 2

Additional Focus Area 3

Additional Focus Area 4

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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**6. Contingency Planning for Emergencies Including Drought, Flood and Pollution**

In the ever-evolving global environmental change sphere, disasters and emergencies are becoming more and more prevalent. It is the responsibility of all organisations which are involved in some aspect of safety and management to ensure that emergency preparedness plans as well as contingency plans are developed, updated and communicated to stakeholders.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

- 1. Critical
- 2. Important
- 3. Optional
- 4. Not Applicable

	1	2	3	4
Emergency Preparedness				
Contingency Planning				
Risk Assessment				
Disaster Management				

**Additional Focus Areas for Objective**

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1

Additional Focus Area 2

Additional Focus Area 3

Additional Focus Area 4

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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**7. Regular Exchange of Information and Consultation**

Regular exchange of information between the member states is vital in order to share information as well as transfer skill and enhance capacity building by learning from experts within each country. This would best be facilitated by means of workshops and seminars with participants from all four countries and relevant experts and specialists. Public consultation is also essential in order to ensure that stakeholders are well informed of the functions and responsibilities of ORASECOM.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

- 1. Critical
- 2. Important
- 3. Optional
- 4. Not Applicable

	1	2	3	4
Presentation skills				
Public Speaking				
Facilitation Skills				
Principles and Practice of Public Participation				
Conflict Handling in Public Participation				
Team Building				
Written Communication and Report Writing				

**Additional Focus Areas for Objective**

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1

Additional Focus Area 2

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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**8. Dispute Resolution**

In any cooperative and international management system it is inevitable that disputes will arise related to various management, operational and implementation aspects. Negotiations and discussions related to various aspects will also become critical as the organisation grows and implementation factors become more pronounced. Member should be able to manage and deal with conflict situations and possess the skills to undertake fruitful negotiations.

Mark this as relevant to the organisation or sector in general in terms of the following criteria:

- 1. Critical
- 2. Important
- 3. Optional
- 4. Not Applicable

	1	2	3	4
General Principles of Contract Law	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Principles of Common Law	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Legal Processes and Instruments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conflict Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Negotiation Skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assertiveness Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dispute Resolution Procedures and Mechanisms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dispute Resolution Legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Additional Focus Areas for Objective**

Please list any additional information relevant to this objective which you consider important.

Additional Focus Area 1

Additional Focus Area 2

Please provide an indication of organisations which may benefit from or require capacity building to achieve this objective.

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## 9. General Training Needs

If there are any training needs you have which may have been missed, please include them here. If you have a preference for a method of achieving this training please include it here.

General Training Need 1	
General Training Need 2	
General Training Need 3	
General Training Need 4	
General Training Need 5	

### Managing Expectations

While this process will aid you and the ORASECOM to identify capacity building needs, it is vital to understand that the final CBP to be developed will focus on the long term achievement of the objectives listed in this needs analysis. While this assessment makes allowances for individual training wishes, it must be emphasised that the final CBP will be based solely on the needs of the organisation in achieving the stated objectives.

Delivery mechanisms may include coaching, on the job training, e-learning, courses, guided reading etc.

Factors such as time, cost, availability, relevance and personal learning preferences will all be contributory to identifying the most appropriate delivery solution.

### Next steps:

This plan will be collated into a CBP to ensure that the relevant members are able to provide constructive participation in operational matters.

Thank you for completing this Training Needs Analysis.