

Annex V: Training and capacity building (TCB) strategy for ecosystem management

FOR THE PROPOSED PROJECT:

IMPLEMENTATION OF THE BENGUELA CURRENT
LME STRATEGIC ACTION PROGRAM FOR
RESTORING DEPLETED FISHERIES AND REDUCING
COASTAL RESOURCES DEGRADATION (SAP-IMP)

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

One of the outcomes of the BCLME programme was acknowledgement that further strengthening of human resources and infrastructure capacity and the maintenance of existing capacity would be a prerequisite in order for the Strategic Action Programme (SAP) to be successfully implemented. The Benguela Environment Fisheries Interaction and Training Programme (BENEFIT) was commissioned to conduct a needs assessment in order to propose a strategy for a Training and Capacity Building (TCB) component of the SAP-IMP project.

Problems experienced in the region with the lack of skills and experience have reached alarming proportions. Providing training for staff addresses only the lack of skills but does not address the loss of skills. For TCB to be successful, a holistic approach is required and will depend on actions taken by the Benguela Current Commission (BCC).

A significant amount of planning has already been completed in respect of TCB in the BCLME region, and has been drawn upon in this study. In order for the requisite impact to be made a comprehensive and well coordinated approach should be adopted and this document presents such an approach which attempts to provide a broad strategy to TCB for marine ecosystem management of the BCLME. The costs of such an effort will be substantial (\$1.8M) and most likely beyond the reach of the GEF SAP-IMP project alone. Therefore a fund-raising strategy will need to be implemented which should comprise not only the procurement of funds, but also will need to consider ways to reduce costs. The most obvious way of achieving this is to share resources and TCB activities among programmes which have similar aims.

This document presents a brief analysis of the status of, and the result of the needs assessment for TCB in the BCLME region. The scope of needs along with the content of TCB interventions is addressed. These are sorted into the following categories:

- Ecosystem Management
- Numerical Skills
- Biology, Ecology & Taxonomy
- Computer Skills & Data Management
- Physical Oceanography
- Technical Skills
- Social & Economic Sciences
- Other / Cross Cutting

The report further provides a brief description of a wide range of relevant programmes, projects, institutions, courses and service providers in addition to a monitoring and evaluation strategy.

The recommendations in this document are summarized below:

1. A fund raising strategy for TCB is recommended which includes careful coordination and cost sharing among the various programmes discussed as well as utilizing opportunities from international programmes such as the FAO , ICSU, IMBER and START.
2. Active engagement of the responsible officials from the SAP-IMP project and the NACOMA, ASCLMEs programme in particular should be arranged as soon as possible to assess the feasibility of cost-sharing options.
3. Regional Training Coordinator should be appointed by the SAP-IMP project or the BCC (TORs provided).
4. Inter-ministerial national training coordinators should be appointed in each country.
5. The SAP-IMP project should commission a professional study of the prevalent human resources problems (e.g. quantification of staff loss implications) in the national research institutes and facilitate the development of regional staff retention and career path strategy.
6. The SAP-IMP project should facilitate the establishment of a professional association for marine scientists and technicians in the region.
7. The SAP-IMP project should facilitate the process of regionalization of skills by creating structures for the sharing of scarce skills among stakeholders.
8. The SAP-IMP project should support the establishment of a mentoring system.
9. The SAP-IMP project should facilitate the establishment of strategic relationships among research institutions and universities in the region.
10. A series of courses targeting the identified needs should be implemented by the SAP-IMP project.
11. The TCB effort should be monitored for both implementation and impact.

1. Introduction

1.1 Background and context

The Benguela Current Large Marine Ecosystem (BCLME) is one of the most productive and dynamic systems of the world. It borders on the coastline of three countries, namely Angola, Namibia and South Africa and plays an important role in terms of goods and services it provides. The BCLME Programme was developed with the principal objectives of better understanding and protection of this unique ecosystem, through the harmonization of policies followed by the implementation of these policy actions.

In order to address the identified policy actions required and to follow through on their implementation, a Strategic Action Programme (SAP) for the BCLME was devised and a baseline was established by the BCLME programme (2002-2007). A follow-up project, entitled “Implementation of the Benguela Current LME Strategic Action Programme for Restoring Depleted Fisheries and Reducing Coastal Resources Degradation (SAP-IMP)” has been proposed for the next five years (2008-2012) and this project is aimed at full implementation of the SAP. One of the outcomes of the BCLME programme was acknowledgement that further strengthening of human resources and infrastructure capacity and the maintenance of existing capacity would be a prerequisite in order for the SAP to be successfully implemented. Following on from this the Benguela Environment Fisheries Interaction and Training Programme (BENEFIT) was commissioned to conduct a comprehensive consultative study of human capacity, training and infrastructure needs assessment in order to propose a strategy for a Training and Capacity Building (TCB) component of the SAP-IMP project.

Since a significant amount of planning (and some implementation) has already been completed in respect of Training and Capacity Building (TCB) in the BCLME region, we felt that it is necessary to try and develop a definitive approach to this topic. We contend that a substantial and well coordinated approach should be adopted in order to ensure real impact. This document therefore, while remaining cognizant of the SAP-IMP project’s parameters, does not limit itself entirely to the SAP-IMP delivery but rather attempts to provide a holistic approach to TCB for marine ecosystem management for the Benguela Current Commission. This will have a significant implication for funding and it is expected that aside from funds made available through the SAP-IMP project, additional funds will have to be sourced for at least some of the TCB activities proposed here.

Problems experienced in the region with the lack of skills and experience have reached alarming proportions despite the interventions of several programs. Providing training for staff addresses only the lack of skills but does not address the loss of skills. No amount of funding for training is going to solve human resource problems faced in the relevant government research agencies. For TCB to have a sustainable impact an approach is required that will facilitate intervention in the working

conditions and career paths of professional staff along with the more traditional direct TCB skills development activities. Addressing these items will raise some contentious and challenging issues that will need to be dealt with at the regional level. Since regional integration is one of the over-arching goals of the Benguela Current Commission (BCC), the SAP-IMP project will be suitably positioned to raise and address these items through the BCC. Doing so has the justification of advancing the BCC's integration agenda but will require creative and bold leadership to succeed. The authors also feel that the myriad of programmes and service providers (with overlapping goals and strategies) in the region require careful co-ordination as the ever present danger of duplication is clear. If the proposed programme is adopted, funding will be a limiting factor and thus sharing of the effort and collaboration among programmes will be the only way to make it affordable.

1.2 Scope

This study brings together a range of previous efforts that were conducted by the BCLME Programme and other entities which were comparable in nature but are either out-of-date or more narrowly focused. In addition, this study includes an implementation strategy that will be hard-wired into the SAP-IMP project to ensure successful delivery of training objectives. Furthermore this study will also hopefully be used as a blue-print to help design in-house training programmes at the national institutions. One of the goals of this report is to clearly demonstrate that capacity development is a process and not an end in itself and the authors strongly recommend that continued capacity development persist not only through the national institutions but is circuited into the workings of the Benguela Current Commission after its completion.

The scope of this study involves making a comprehensive but by no means exhaustive assessment of the training and capacity building needs of the region. Furthermore, a review of existing programmes and initiatives within the countries and the region was carried out, followed by the identification of national and regional institutions and agencies that are capable of delivering training and capacity building services and finally the drafting of a proposed strategy for delivery.

1.3 Process and Approach

1.3.1 Documents and other Reports:

As is earlier stated this study is by no means unique hence there exists a wide range documents, reported and published material which were sourced and referenced in this study. The BCLME Programme itself has conducted five studies which have been directly related to the TCB needs of the region, these are listed in chronological order below in Table 1.

Table 1: List of relevant BCLME TCB documents consulted.

<i>Title</i>	<i>Date</i>
Training & Capacity needs assessment for the BCLME	02/04
Consultative meeting on Capacity Building & Training for effective management of the BCLME	03 /04
BCLME Strategic Planning Workshop on Training and Capacity Building	07/04
Integration and review Training & Capacity building in the BCLME	07/06
BCLME Project – EV/03/05 – Building Capacity for Angola (3 Reports)	07/04

Other documents that were utilized for this study were TCB plan of actions developed by similar regional programmes such as BENEFIT as well as national initiatives by relevant Ministries. These are listed in Table 2.

Table 2: List of other relevant TCB documents consulted.

<i>Title</i>	<i>Date</i>
BENEFIT Training Plan	06/98
RFIS - Training Institutes in the SADC Region	11/01
Project Document for BENEFIT-Norway Contract	09/05
Ministry of Fisheries and Marine Resources (Namibia) – Annual Research Meeting	06/06

Finally by way of documents a suite of published material was used from a special edition on Capacity Building & Training in *Ocean & Coastal Management Vol. 38*, 2002 emanating from the World Summit on Sustainable Development (WSSD). Once all these data were consolidated and reviewed, a survey, followed by interviews and consultations with appropriate stakeholders were conducted to update the TCB needs of the region (a list people, institutes and organisations consulted is provided as Annex 1). From this exercise, the current status of human and infrastructure resources were also ascertained.

1.3.2 The Survey

Given the fact that the stakeholders would be best at identifying the TCB gaps within their organisations and knowing wise-practices, a short survey was designed with the purpose of ascertaining their capacity development needs and how they envisioned these needs being met. To allow for coverage of as many stakeholders involved in the BCLME as possible, the BCLME country focal points, who are national representatives for the programme, were engaged. They were requested to actively distribute the survey to all relevant academic institutions, government agencies, research institutions and government ministries and individuals which were identified

beforehand by the consultants and were discussed with the country focal points (Annex 2).

1.3.3 Interviews and consultations

To ensure optimal coverage, both within the three countries (the range of national stakeholders) and between countries, follow-up interviews were conducted and an informal consultation meeting was held during the recent BCLME Climate change workshop in Cape Town where all three stakeholder countries were represented. At this consultation many of the appropriate people from the region were asked to take the survey as well as many opinions and views on TCB needs and strategies were expressed and captured for this report.

Limited consultations were also conducted telephonically with stakeholders who were unable to make face-to-face meetings or where the electronic survey proved to have limited success.

Once the scoping exercise of identifying all the training and capacity building needs across the various ministries, sectors, agencies and institutions in the region, was completed it was analyzed in the following manner. In order to demonstrate the scope of the needs, a matrix was constructed which sets out the five LME modules (Sherman & Duda, 1999) against the needs domains defined as Human Resource Development (staff & career issues), Infrastructure, Skills Development (basic training) and Skills Improvement (advanced training). The authors added physical oceanography to the list of LME modules as it was felt that this discipline is not adequately represented in the other modules (for this purpose) and due to its importance in the study of the Benguela system, warranted its own domain.

It is a basic assumption that the SAP-IMP project will be able to fund only a part of the extensive set of needs recorded in this study. Thus the authors have focused attention primarily on the Skills Development and Improvement categories with limited emphasis on the remainder (see Table 3 below). The blue columns represent areas that the SAP-IMP programme could fully engage in its training strategy while the red and yellow areas would receive limited and indirect attention.

Table 3: Matrix of needs: LME modules vs. Needs Domains

	Human Resource Development	Infrastructure	Skills Development	Skills Improvement
a) Productivity				
b) Fish & Fisheries				
c) Pollution & Health				
d) Socio-Economics				
e) Governance				
f) Physical Oceanography				

- Limited intervention by the SAP- IMP policy development & common strategies
- Limited intervention by the SAP-IMP to various degree
- SAP-IMP training plan and programme

In order to deal with the TCB content of the information gathered, the data were consolidated, sorted and prioritized into more specific categories, and a viable strategy for meeting these needs was devised. These categories are:

- Ecosystem Management
- Numerical Skills
- Biology, Ecology & Taxonomy
- Computer Skills & Data Management
- Physical Oceanography
- Technical Skills
- Social & Economic Sciences
- Other / Cross Cutting

Only needs common to at least two of the three countries were used (with one exception: English Training), prioritized for the SAP-IMP and strategic actions are recommended. Non-regional TCB activities are included for completeness (Table 8) of the study and it is recommended that these are taken up by the national institutions. This has been done in the light of the TCB needs which may be unique to one of the partner countries but impinges on the success of transboundary management for the region.

1.4 Structure of the report

With respect to the TORs (see Annex 3) the authors have chosen to consolidate the elements into the following structure:

Our report comprises five sections. Section 1 (Introduction), Section 2 (Needs assessment – Point 1 of the TORs), Section 3 (Review of Programmes / Projects - Point 2 of the TORs, in conjunction with a Review of Courses / Institutions – Point 5 of the TORs), followed by Section 4 (Strategy – Point 4 of the TORs) and Section 5 (Budget – Point 4 of the TORs). A bibliography of documents consulted and a list of people consulted are provided at the end of the document along with a copy of the questionnaire used in face-to-face and telephonic interviews/consultations in Annex 1.

2. Needs Assessment Outcomes

2.1 Survey Outcome - Scope of needs

This section of the report describes the scope of needs in the region. The goal is to illustrate the range and kind of needs that exist. This is more qualitative than the section below (2.2) which deals with TCB content. The outcome of the data gathering exercise is presented in table form. The information is presented according to the domains defined above for each country separately and then brought together regionally (2 of the 3 countries).

2.1.1 Angola

While the matrix suggests that the scope of needs covers all domains this does not imply that the needs in Angola are basic. In other words, many of the needs have been met but there remains more to be done to improve the capacity that exists.

Table4: Summary of needs for Angola

	Human Resource Development	Infrastructure	Skills Development	Skills Improvement
a)Productivity	✓	✓	✓	✓
b)Fish & Fisheries	✓	✓	✓	✓
c)Pollution & Health	✓	✓	✓	✓
d)Social & Economic Sciences	✓	✓	✓	✓
e)Governance	✓		✓	✓
f)Physical Oceanography	✓	✓	✓	✓

2.1.2 Namibia

Similarly in Namibia, the scope of needs is broad, but this does imply that the needs in Namibia are basic as well. It is noteworthy that infrastructural requirements were not as prominent, which is a trend that follows into the South African outcomes. Infrastructural needs identified were mainly directed at aquaculture research.

Table 5: Summary of needs for Namibia

	Human Resource Development	Infrastructure	Skills Development	Skills Improvement
a)Productivity	✓		✓	✓
b)Fish & Fisheries	✓	✓	✓	✓
c)Pollution & Health	✓	✓	✓	✓
d) Social & Economic Sciences	✓		✓	✓
e)Governance	✓		✓	✓
f)Physical Oceanography	✓		✓	✓

2.1.3 South Africa

Again in South Africa, the scope of needs remains wide, but is not basic. Infrastructural requirements are lower and also were directed at aquaculture research. Also, human resources and career path issues were returned at higher frequency than any other items (at the time of the study).

Table 6: Summary of TCB needs for South Africa

	Human Resource Development	Infrastructure	Skills Development	Skills Improvement
a)Productivity	✓		✓	✓
b)Fish & Fisheries	✓		✓	✓
c)Pollution & Health	✓	✓	✓	✓
d) Social & Economic Sciences	✓		✓	✓
e)Governance	✓		✓	✓
f)Physical Oceanography	✓		✓	✓

2.1.4 Regional

Table 7 represents an amalgamation of Tables 4-6 and reflects the broad scope of needs across the region. This shows that there is a continuing need to address a wide range of capacity requirements in the BCLME region and that the SAP-IMP project intervention is imperative and timely.

Table 7: Summary of TCB needs integrated for the region

	Human Resource Development	Infrastructure	Skills Development	Skills Improvement
a)Productivity	✓	✓*	✓	✓
b)Fish & Fisheries	✓	✓*	✓	✓
c)Pollution & Health	✓	✓*	✓	✓
d) Social & Economic Sciences	✓	✓*	✓	✓
e)Governance	✓	✓*	✓	✓
f)Physical Oceanography	✓	✓*	✓	✓

NB: ✓* This is an Angolan need most of the time not so much for RSA and Namibia. For Namibia and RSA it is in reference to aquaculture.

2.2 Survey Outcomes - TCB content

The following table contains the detailed information assembled via the survey and sorted into the categories described above (section 1.3). All information was included and duplication was avoided by consolidating similar contributions. The information received and gleaned from the documents varied considerably in nature with some the request being very academic while others are better described as research questions. Some items that were clearly outside the brief of the SAP-IMP project but belonged more in the domain of national interest and / or related to course content at tertiary institutes were not included. On the other hand, some of the contributions were too narrowly defined and were not of general interest and thus were also excluded from further consideration.

An area which has been neglected before (by BENEFIT and others) has been in the realm of management skills. Much of the management of the ecosystem is being conducted by erstwhile scientists who have limited experience or formal tuition in management options and methodologies and therefore it is evident that this is a growing and significant need. Other than this, needs (such as stock assessment training, acoustic methods and GIS etc) that have been addressed previously continue to require attention and some new technical skills are becoming more prevalent. These are scarce skills (and highly marketable) that require expert knowledge and years of experience to become proficient and therefore the need for training in these fields is continuous.

Table 8: TCB content detail categorized according to discipline

<i>TYPE OF TRAINING</i>	<i>COMMON TO ALL 3 COUNTRIES</i>	<i>COMMON TO 2 OF THE 3 COUNTRIES</i>	<i>EXCLUSIVE TO 1 COUNTRY</i>
Ecosystem Management	<ul style="list-style-type: none"> - Ecosystem based management - Transboundary Management - EIA and EIA review - What models mean and how can we utilize this information in management - Aquaculture <ul style="list-style-type: none"> o Management of aquaculture systems , risk analysis, evaluation of impacts - Training in monitoring, control and surveillance - Environmental law & legal issues - Resource economics - Pollution management and monitoring and lack of waste management plan 	<p><i>Namibia & Angola</i></p> <ul style="list-style-type: none"> - Policy formulation and implementation - Biodiversity conservation and land-use planning * - Understanding GIS outputs* <p><i>RSA & Namibia</i></p> <ul style="list-style-type: none"> - Coastal zone management - Law enforcement <p>Marine/Maritime/Fisheries</p>	<p><i>Angola</i></p> <ul style="list-style-type: none"> - Design and implementation of monitoring systems <p><i>RSA</i></p> <ul style="list-style-type: none"> - Marine tourism - Training on the different fishing sectors, how they operate and the economics of the different sectors*
Numerical Skills	<ul style="list-style-type: none"> - Ecological modeling and decision analysis for an EAF - Stock Assessment <ul style="list-style-type: none"> o Case study courses - Statistical skills – Primer & Statistica - Mapping and GIS training - Acoustics techniques and utilizing acoustic software 		<p><i>Namibia</i></p> <ul style="list-style-type: none"> - Wind and Current data analysis* - Data Analysis using MATLab and IDC *

Biology, Taxonomy & Ecology

- Understanding of the linkage between environment and fish stocks *
- Plankton research and taxonomy
- Fish Aging & histology
- Pollution – research, monitoring & mitigation, pollution control and environmental sanitation
- Aquaculture – research on nutrition and feeding, animal health & physiology and biology of species
- Fish biology & life history *
- Interpretation of results from genetic analysis and outcomes*
- Invertebrate taxonomy

Computer Skills and Data Management

- Basic computer literacy *
- Experimental design
- Data Curation
- Training in software systems of Vessel Monitoring Systems

Technical Skills

- Aquaculture – technical skills – water quality, production of food, maintenance of farms
- Instrumentation deployment and survey design
- Instrumentation calibration and maintenance
- Scientific Diving
- Water quality monitoring pollution, oil spills, land-based pollution, mining

Angola & Namibia

- Maintenance and repair of marine technical equipment, Boat/Auto/Motor/Electronics/Radio operation and maintenance
- Weather station service and maintenance

Angola

- Marine biotechnology*

Namibia

- Invasive species management

RSA

- Demersal species – biology and research*

RSA

- Data mining of large databases

Namibia

- Time series analysis from data preparation, cleaning, to frequency analysis e.g. wavelet analysis*

Namibia

- Bird handling and ringing and setting up monitoring programmes *
- Basic safety & health at Sea/Rivers*

RSA

- Gear technology and fish tagging methods (telemetry)*

- Social & Economic Sciences**
 - Public relations
 - Co-management with coastal communities
- Physical Oceanography**
 - Physical and chemical oceanography*
 - Applications of satellite remote sensing data
- Other/Cross-cutting**
 - Communication skills - proposal, report & scientific writing, presentation & negotiation skills
 - Mentoring programmes for both researchers and technicians
 - Project management
 - Library skills
 - Fisheries inspectors and observers training*
 - Life skills
 - Expert exchange system*

Angola

- English language training
- The development of an academic marine science “stream”*

* - Many of the needs expressed in the survey are too specialized (such as time series analysis etc.), while others are very board basic, non-specific topics which should be covered at university (such as physical and biological oceanography and marine biotechnology). Both of these categories would warrant intervention at a national level. Needs such as the “understanding the link between the environment and fish stocks” are issues that are tackled at targeted workshops where discussions and interactions will prove more productive as opposed to a formal course.

3. Review of Capacity Building Programmes, Projects and Institution

This section refers to the TOR Points 3 and 5 and presents a consolidated review of what is available in and beyond the BCLME region (limited mostly to SADC). The review considers those facilities that can offer TCB beyond the immediate and obvious needs of the BCC / SAP-IMP project and include some generic management, communication, governance and administrative tuition (as examples).

The review was compiled using several documents as well as consultations and web-based research. Also the authors drew on their own experience and knowledge in TCB in the region via BENEFIT.

Appropriate and relevant (to the needs identified in section 2) information has been assembled for each of the programmes, projects and institutions selected. In accordance with the TORs, sub-selection of relevant institutes and programmes / courses which are capable of delivering suitable training has been proposed as possible service providers.

3.1 Training and Capacity Building Programmes

3.1.1 BENEFIT

BENEFIT is terminating at the end of the year (2007) before the commencement of this project, but the model for the capacity building programme developed at BENEFIT is the basis of the strategy being recommended for implementation in this project. Details can be seen at www.benefit.org.na

3.1.2 BCLME

Likewise, the BCLME programme, the forerunner to this project, will have terminated. Several relevant documents emanating from BCLME activities have been sourced for this document. While the BCLME did not have a TCB component *per se*, the intent has been to implement TCB through the activities by ensuring that this was attended to by contractors and also via some *ad hoc* direct investments.

3.1.3 DLIST Benguela

DLIST is a GEF funded project that has developed TCB tools and other resources – focused on the BCLME and set to expand to other LMEs. “DLIST stands for Distance Learning and Information Sharing Tool. More than a website, it is a place where anyone interested in coastal development can meet, talk, exchange information, and learn about how to use and manage our natural resources in a sustainable manner. The DLIST-Benguela community focuses specifically on issues relevant to the coastal area from Cape Point to Northern Angola - the Benguela Current Large Marine Ecosystem” DLIST is also offering a facility on on-line course development and delivery: “DLIST is a place to learn more about

coastal development. Supported by all the information available in the library, links and hotspot sections, as well as the network of partners, DLIST provides an ideal web-based platform for distance learning. Anyone along the coastal areas of Angola, Namibia and South Africa or anywhere in the world can enroll in the accredited courses offered on DLIST to enhance their knowledge. Key focus areas for DLIST distance learning are coastal development, coastal populations and livelihoods, coastal and marine resources of the BCLME, threats, transboundary problems and solutions, and co-management of coastal and marine resources.

Currently there is one course available online, Environmental Engineering – Sustainable Development in Coastal Areas, offered by the Cape Peninsula University of Technology (CPUT) in South Africa to both students at the campus and distance learners. This was the first course tested on the DLIST portal during the pilot phase and more than 10 distance students from different areas of South Africa, Namibia and Tanzania have already graduated. More courses are expected to become available in the next 3 years. Existing courses in Namibia and Angola that have a strong focus on coastal development and transboundary LME resource management will be adapted to be offered online to a wider audience. The University of Namibia, the Polytechnic of Namibia and the University of Agostinho Neto are DLIST partners that have showed interest in creating distance learning versions of courses in English and Portuguese.

The SAP-IMP / BCC TCB Coordinator should follow developments closely and potential co-operation with DLIST might prove fruitful.

See <http://www.dlist-benguela.org>

3.1.4 Namib Coast Conservation and Management (NACOMA) Project

The NACOMA Project is a GEF funded project focused specifically on the Namibian coast line but with highly significant overlaps with the SAP-IMP project goals. The focus of NACOMA is however more at the local governance levels within Namibia. NACOMA aims to enhance coastal and marine biodiversity conservation through the mainstreaming of biodiversity conservation and sustainable use into coastal policy, legislative framework, and institutional and technical capacity and by supporting targeted investments for biodiversity conservation in critical ecosystems on the coast. The project's four components are: • Policy, Legal and Institutional Framework for Sustainable Ecosystem Management of the Namib coast, • Targeted Capacity-Building for Coastal Zone Management and Biodiversity Conservation • Targeted Investments in Critical Ecosystems for Biodiversity Conservation, Sustainable Use and Mainstreaming, • Project Management and Performance Monitoring.

With respect to TCB in particular the substantially funded (US\$1.52M) TCB component aims to fill the capacity gap at local, regional and national level in support of integrated coastal zone management, biodiversity conservation and

sustainable use in particular related to mainstreaming of coastal biodiversity and resources into development planning and key economic activities. Three subcomponents have been identified and this will involve training for ICZM, biodiversity monitoring and information management with a range of activities. Significantly, one of the activities currently being undertaken is the development of a TCB strategy. Thus it is pivotal that at this juncture interaction between the responsible officials from both projects should be facilitated by the GEF to avoid duplication and develop synergies where possible and appropriate.

See <http://www.nacoma.org.na>

3.1.5 Angola - Bilateral with Norway, Portugal, Brazil

It is significant to note that Angola has established bilateral agreements concerning the environment with other Portuguese speaking countries and that these agreements do provide facilities for exchanges of staff and capacity building opportunities. In addition a substantial bilateral agreement with Norway for fisheries related matters under the aegis of economic development has been established. This programme is focused specifically on artisanal fisheries and the development of infrastructure and institutional strengthening (organization of fishers). Capacity building is envisaged at the local level.

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3.1.6 Namibia – Spain Bilateral

As a component of the Namibia – Spain bi-national agreement, some collaborative work between staff at National Marine Information & Research Center (NatMIRC) and Spanish Ministry of Agriculture and Fisheries has been undertaken. The RV *Vesconde de Eza* has already completed two surveys off Namibia and is planning another one with the focus on deep (3000-5000m) demersal communities and fish stocks.

3.1.7 RSA – Norway (NORSA)

This programme, entitled “Marine Fisheries Cooperation between Norway and South Africa” is managed by the Norwegian Embassy in Pretoria and Marine and Coastal Management (M&CM, DEA&T) in RSA. The objectives of NORSA are to promote sustainable utilization of South Africa’s marine and coastal resources, to enhance economic growth, to contribute to poverty alleviation and to address the need for capacity building within the M&CM with the use of Norwegian fisheries competence. A joint Steering Committee identified 16 sub-projects which currently receive Norwegian funding. In each case the focus areas are wide-ranging namely, resource management, marine research, skills development and integrated coastal management. There are several management oriented activities in this programme which could be extended and made available to the other stakeholders in the region.

See: <http://www.norway.org.za/development/bilateral/Fisheries/Marine+Fisheries+Co-operation.htm>.

3.1.8 Gesellschaft Technische Zusammenarbeit (GTZ)

The GTZ is an international cooperation enterprise for sustainable development with worldwide operations. It does not fund research directly and neither is it a funding agency. However through its many partners it provides funds for training and capacity development with the aim of improving people's living conditions on a sustainable basis. The GTZ also provides in-house capacity development by hosting and facilitating a wide array of course/workshops in the technology and management arena. They have active offices in both Namibia and RSA and have been a key international partner of the BENEFIT programme. They have a Southern Africa Desk at headquarters in Eschborn in Germany and also have an official who is located in the SADC Directorate of Food, Agriculture and Natural Resources (FANR).

See: <http://www.gtz.de>

3.1.9 CAPE Action Plan for the Environment (CAPE)

This programme was developed in South Africa with initial funding from the Global Environment Facility in 1998 focusing on the Cape Floristic Region. The programme has identified the key threats and root causes of biodiversity losses that need to be addressed in order to conserve the floral kingdom. Subsequently the recognition of areas which need to be conserved and a series of broad program activities, which needs to be undertaken over a 20 year period, were acknowledged and a spatial plan was proposed. The long term goal of the CAPE programme is to ensure that "by the year 2020, the natural environment of the Cape Floristic Region will be effectively conserved and restored wherever appropriate, and will deliver significant benefits to the people of the region in a way that is embraced by local communities, endorsed by government and recognized internationally".

The programme has three over-arching themes which are its core drivers. These are to "establish an effective reserve network, enhance off-reserve conservation, and support bioregional planning; to strengthen and enhance institutions, policies, laws, co-operative governance, and community participation; and to develop methods to ensure sustainable yields, promote compliance with laws, integrate biodiversity concerns into catchment management, and promote sustainable eco-tourism".

The CAPE programme has several core projects which have been designed to meet its goals. Projects worth mentioning that would compliment the SAP-IMP project would be the Conservation Planning Unit, whose overall aim it is "to make a significant contribution to ensuring that comprehensive information and biodiversity pattern and process influence decision making for land use planning,

development control, and setting conservation priorities within the Cape floristic region”.

[The Wilderness Concepts and Practice: Training Courses for Western and Eastern Cape](#) This project aims to enable the staff of the Department of Nature Conservation of the two provinces in managing designated wilderness areas in the region, the habitats, biodiversity resources of critical importance and the water resources they protect through management training courses.
See: <http://www.capeaction.org.za/>

3.1.10 Agulhas Somali Currents LMEs (ASCLMEs) & South West Indian Ocean Fisheries Project (SWIOFP)

ASCLME: The objective of the ASCLME programme is to fill gaps in understanding transboundary living resources of the two LMEs and to build capacity of the participating countries to utilize this improved understanding for more effective management by use of an ecosystem approach. There is a substantial tranche of funds which has been allocated to TCB activities in the ASCLMEs programme. Since the programme is about to commence (in conjunction with the WIO-LAB and SWIOFP projects) it is proposed that a meeting of the responsible officials from the various projects should meet to identify TCB overlaps and common needs. This would provide an opportunity for joint TCB development thereby avoiding duplication and increasing efficiency.

SWIOFP: This project is part of the suite of projects including the WIO-Lab project for the WIO. SWIOFP whose stated goal is to “promote the environmentally sustainable use of fish resources through adoption by SWIO-riparian countries of an LME-based ecosystem approach to fisheries management in the Agulhas and Somali LMEs that recognizes the importance of preserving biodiversity” has several relevant objectives including “to develop institutional and human capacity through training and career building needed”. The current status of this project is unclear but as with stated above, careful and close co-operation between these projects and the SAP-IMP / BCC is essential.

3.1.11 Ocean Data and Information Network for Africa (ODINAFRICA)

The ODINAFRICA programme is supported by the Government of Flanders and implemented by the [IODE programme](#) of the [Intergovernmental Oceanographic Commission](#) of UNESCO (IOC). The programme aims to bring together marine institutions from twenty-five Member States of the Intergovernmental Oceanographic Commission of UNESCO from Africa, of which all three countries in a region are members. The programme’s initial phase was to enable the participating member states to essentially gain access to data available on other worldwide data centres, develop skills for the manipulation and preparation of data and information products. Furthermore it was to develop infrastructure for

archival, analysis and dissemination of the data and information products. This phase focused on training librarians and data managers in the various member states through facilitated training courses and workshops including the purchasing of the necessary hardware and software for the various institutions within the member states.

The goal of the current phase of ODINAFRICA is to improve the management of coastal and marine resources and the environment in participating countries by: “enhancing data flows into the national oceanographic data and information centres in the participating countries, strengthening the capacity of these centres to analyze and interpret the data so as to develop products required for integrated management of the coastal areas of Africa, and increase the delivery of services to end users.”

The focus will be on preparing data and information products to enable the Member States to address the key issues identified in the African Process: (i) coastal erosion, (ii) management of key ecosystems and habitats, (iii) pollution, (iv) sustainable use of living resources, and (v) tourism. This phase of the programme will also meet its goals through training courses and workshops. See:<http://www.odinafrica.org/>

3.1.12 Global Biodiversity Information Facility (GBIF)

GBIF, the Global Biodiversity Information Facility, was established in 2001 and is donor and government funded. The mission of the GBIF programme is to facilitate the digitization and global dissemination of primary biodiversity data, which may in turn be made available to the global populations (from policy- and decision-makers, research scientists to the general public) to have access to the world’s supply of primary scientific data on biodiversity. GBIF has several thematic areas (listed below), through which it is attempting to meet its mandate:

- *Data Access and Database Interoperability (DADI)* - Answering complex questions involving many disparate types of data from many sources depends on the development of standards for data and metadata.
- *Digitization of Natural History Collections (DIGIT)* - GBIF encourages and supports the online provision of primary biodiversity data from natural history specimens and observational databases.
- *Electronic Catalogue of Names of Known Organisms (ECAT)* - Scientific names are the key to all scientific literature about species. A complete electronic listing is even more important for digital searching.
- *Outreach and Capacity Building (OCB)* - GBIF aims to provide software tools and training to bridge biodiversity information technology gaps for all countries around the world. GBIF also addresses scientific and technical collaboration in many areas, including repatriation of data and intellectual property rights.

GBIF strategy is to achieve its goals by setting up a worldwide network of participating nodes. A South Africa node called SABIF exists. This node is funded by the Department of Science and Technology through the National Research Foundation. See <http://www.gbif.org>

3.1.13 Global Ocean Observing System (GOOS)

GOOS is a global system for sustained observations of the ocean comprising the oceanographic component of the Global Earth Observation System of Systems (GEOSS). It plays a vital role in the international cooperation for sustained observations of the oceans, the generation of oceanographic products and services and the interaction between research, operational, and user communities. GOOS along with its funders have a comprehensive training programme and it has been “designed for the long-term, to be a true partnership between recipient and donor, be tailored to national and/or regional requirements, be flexible in scope, be sustainable and involve the user community.” This programme is implemented through an array of physical oceanographic workshops and training courses. From ocean colour courses and remote sensing courses to courses on sea level observation analysis. GOOS has also hosted Global Sea Level Observing System (GLOSS) courses in Portuguese and Spanish. In partnership with ODINAFRICA, GOOS also hosts courses and training workshops on data and information management. See: <http://www.ioc-goos.org>

3.1.14 System for Analysis, Research and Training (START)

START is an international programme whose core mission is to establish and foster regional networks of collaborating scientists and institutions in developing countries to conduct research on regional aspects of environmental change, assess impacts and vulnerabilities to such changes, and provide information to policy-makers. START also provides a wide variety of training and career development opportunities for young scientists. START's capacity building include fellowships, small grants, collaborative research networks and projects and research linked training - all primarily focused on developing and enhancing research capacity.

START's first capacity building efforts were research driven capacity building and closely twinned with the biophysical system oriented projects of the Global Change Research Program. The second generation of capacity building activities will be more integrative and will give greater prominence to human systems and their interactions with biophysical systems. This follows current trends in capacity development where emphasis is being placed on the important linkages between global and regional environmental change with human wellbeing and sustainable development, and focuses more explicitly on the application of global change science to better manage environmental risks. This is aligned with the mandates of the Millennium Development Goals.

Specifically the next stage of Capacity Building will focus on:

“1) Needs of the least developed and low-income countries. Opportunities will be directed to countries identified as most vulnerable to the impact of global change and which have been underrepresented in the first decade of START's capacity building programmes. These will include selected countries in Africa, South and Southeast Asia, and the Pacific.

2) In many instances this will mean initial capacity building with quality MA programmes, not only doctoral and postdoctoral programmes as in the first decade.

3) In this new phase greater emphases will be given to training in emerging cross-disciplinary and integrative approaches, e.g., those addressing assessment of impacts of environmental change, vulnerabilities and risks and of management and adaptation options.

4) A related thrust in the next phase of Capacity Building will be training of what has been termed “science policy amphibians” - individuals who are well trained in global change science but also capable of translating science findings into the policy arena. Such individuals are still lacking or in short supply in most developing countries and are especially needed in the least developed countries which commonly lack a cadre of scientists to serve as advisors to their policymakers. In the absence of such advisors, the LDCs remain greatly disadvantaged in international negotiations as well as in the application of scientific advances to national development needs.”

Point number 4 being of high relevance to the SAP-IMP project as it will go a long way to advancing the outcomes of the SAP-IMP project and in the near future the Benguela Current Commission. It is recommended that dialogue between the SAP-IMP /BCC and START is facilitated. See: <http://www.start.org/>

3.1.15 Scientific Committee on Oceanic Research (SCOR)

SCOR was established in 1957 and over the years has become one of the leading non-governmental organizations for the promotion and coordination of international oceanographic activities. SCOR in itself does not have the resources to fund research directly; therefore SCOR activities focus on promoting “international cooperation in planning and conducting oceanographic research, and solving methodological and conceptual problems that hinder research”. Thirty-five countries, of which South Africa is a member, are represented and participate in SCOR working groups and scientific steering committees for the large-scale ocean research projects.

SCOR promotes capacity building for marine scientists in developing countries and countries with economies in transition through special efforts to include such

scientists in SCOR activities. Through travel grants as many as 75 individuals each year are funded, and this set to expand through a new activity entitled Regional Graduate Schools of Oceanography and Marine Environmental Sciences. See: <http://www.scor-int.org>

3.1.16 SADC – Food Agriculture & Natural Resources (FANR) Directorate

The SADC FANR is a regional facility through which the SADC protocol for responsible fisheries has been developed. While the FANR has had its own capacity problems, it is currently undergoing a resurgence and is an important partner for the SAP-IMP programme especially in the exchange of information and networking for TCB and other activities. See <http://www.sadc.int>

3.1.17 New Partnership for Africa's Development (NEPAD)

It is noteworthy that the NEPAD programme has developed a fisheries component and is running a Coastal & Marine Programme (COSMAR) and has appointed a fisheries expert. The Fish For All initiative has identified capacity building in African countries as a priority investment area and interactions with NEPAD is recommended for the SAP-IMP project in order that emerging opportunities are identified. See <http://www.nepadcosmar.org>

3.1.18 International Council for Science (ICSU)

ICSU was established in 1931 with the aim of promoting international scientific activity in the different branches of science and its application for the benefit of humanity. ICSU is funded through grants from other organizations and foundations, including a subvention from UNESCO. In the way of capacity development, ICSU provides opportunities for collaborative research through providing short-term seed funding of specific projects through the ICSU strategic grants programme. This programme is partially funded by UNESCO and is designed to “foster the interdisciplinary, international links which are necessary for the exploration of new scientific ideas and development of future international initiatives”. A typical proposal might be for a workshop or meeting to develop a specific scientific programme or assessment, although the range of activities supported is very broad.

ICSU also co-sponsors with UNESCO and the Third World Academy of Sciences (TWAS) a small-scale Visiting Scientist Programme. The aim of this is to enable institutions and research groups in least developed countries to establish links with leading international scientists. The grant provides travel support for short-term visits by senior scientists to institutions in developing countries. See: <http://www.icsu.org>

3.1.19 Food and Agriculture Organization (FAO)

The FAO main thrust is in information distribution, sharing policy expertise and knowledge dissemination. One avenue through which it fulfills this mandate is through the production of comprehensive and exhaustive material which can be used as training and capacity development material. These multi-media products called FOA Technical Guidelines include resources on ecosystem approach to fisheries, the economics of different fishing sectors (resource economics), fisheries management etc. While the FAO does not directly provide training, these resources can be fully utilized along with the FAO's virtual library to which all developing countries can receive access to.

See: http://www.fao.org/waicent/portal/virtuallibrary_en.asp

3.1.20 Integrated Marine Biogeochemistry and Ecosystem Research (IMBER)

IMBER is an IGBP-SCOR project focusing on ocean biogeochemical cycles and ecosystems. Its vision is "to provide a comprehensive understanding of, and accurate predictive capacity for, ocean responses to accelerating global change and the consequent effects on the Earth System and human society". Although IMBER does not provide financial support for research, it serves to help coordinate national and regional IMBER research activities. IMBER does however provide funds for workshops, meeting and educational activities and applications can be made online. As a service to early stage researchers, IMBER posts all available conferences and short courses as well as cruise opportunities and fellowships on their website. See: <http://www.imber.info/index.html>

3.1.21 Global Ballast Water Management Programme (GloBallast) in conjunction with the National Ports Authority South Africa

The GloBallast programme has been operational since March 2000. It is funded through the GEF with its implementing agency being the International Maritime Organization (IMO) and its executing agency being the United Nations Development Programme (UNDP). The GloBallast programme is assisting developing countries "to reduce the transfer of harmful aquatic organisms and pathogens in ships' ballast water, implement the IMO ballast water guidelines and prepare for the new IMO ballast water Convention". The programme is currently being implemented in several countries by using one demonstration site.

In the Benguela region, the South African Global Ballast Water Management Programme was launched in 2001 with support from the Department of Environmental Affairs and Tourism, (DEA&T) and the National Ports Authority. Saldanha Bay has been the demonstration site where approximately eight million tons of ballast water is received from international sources annually. The South African component of the programme has also been very involved in developing

capacity within the region to implement and enforce the IMO's voluntary ballast water management guidelines through various courses aimed at different stakeholders and users of the marine environment.

See: <http://www.globallast.imo.org/index>

3.1.22 ECO-UP

ECO-UP is a French initiative involving countries within the major upwelling areas of the globe. This project is “based on the question of the structure and functioning of upwelling ecosystems, which are subject to climatic fluctuations and anthropogenic pressures. Using an ecosystem approach to fisheries, it proposes to tackle this issue using an integrated and comparative approach”. Through the development of strong partnerships priority will be given to the following capacity development initiatives: 1) the transfer of knowledge to developing countries and 2) the training of young researchers from countries associated with this project (South Africa, Namibia and Angola; Chile and Peru; Morocco, Mauritania and Senegal) in various fields such as modeling, collection and analysis of data, information systems, satellite remote sensing and environmental assessment.

See: <http://www.ur097.ird.fr/index.htm>

3.1.23 African Coelacanth Ecosystem Programme (ACEP)

At the end of 2000, recreational divers discovered a group of coelacanths in the Greater St Lucia Wetland Park, South Africa. This created the impetus for the development of the African Coelacanth Ecosystem Programme (ACEP). The programme was initiated in March 2002 with an expedition using the FRS *Algoa* and the German submersible *Jago*.

ACEP is a multidisciplinary project of South Africa, Mozambique, Tanzania, Kenya, the Comoros, the Seychelles and Madagascar, that uses science to explore the deep unknown and develop sustainability, and ultimately to benefit people. The programme has taken advantage of the unique opportunity to lay the foundation for a project that should ultimately become a world leader in developing scientific excellence in offshore marine research. This programme has developed extensive experience on outreach and might provide some lessons learned for the SAP-IMP. See: <http://acep.co.za>

3.1.24 South East Atlantic Fisheries Organization (SEAFO)

SEAFO is a regional fisheries management organization which is an important role player in the international waters adjacent to the BCLME region. The organization operates under the aegis of the Law of the Sea. SEAFO has a scientific programme and collaboration in raising funds for various activities including TCB should be considered.

3.1.25 Western Indian Ocean Marine Science Association (WIOMSA)

WIOMSA is a regional professional, non-governmental, non-profit organization based in Tanzania. The organization is dedicated to promoting the educational, scientific and technological development of all aspects of marine sciences throughout the region of Western Indian Ocean with a view toward sustaining the use and conservation of its marine resources. Since 1994, when WIOMSA was established, capacity building has been one of its core activities. The overall goal being to build technical and managerial capacity and professionalism to produce experts and practitioners capable of developing, disseminating and implementing effective coastal governance practice.

The objectives of the WIOMSA capacity building programme are to: “Build and strengthen the institutional and human capacity for integrated coastal Management (ICM) and Marine Protected Areas Management (MPA). Strengthen technical capability to implement international conventions related to coastal and marine environment. Strengthen the capacity to use science for management in areas such as remote sensing modeling and mariculture. Support to institutions, upon request in the development and implementation of the capacity building activities in the WIO region.”

In addition to the on-going capacity building program in ICM and MPA, WIOMSA has organized/hosted a number of regional workshops and meetings that provided the linkage between science and management.

See: <http://www.wiomsa.org>

3.1.26 Addressing Land-based Activities in the Western Indian Ocean (WIO-Lab)

This project addresses some of the major environmental problems and issues related to the degradation of the marine and coastal environment resulting from land-based activities in the Western Indian Ocean region. It represents a strong partnership between the countries of the WIO Region, the Norwegian government, UNEP, and the GEF and is designed to serve as a demonstration project for the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. One of the main objectives of the project is to develop regional capacity and strengthen institutions for sustainable, less polluting development. The programme has hardwired training and capacity building issues into its demonstration projects.

See: <http://www.wiolab.org>

3.1.27 The South African Environmental Observation Network (SAEON)

SAEON is a research facility of the South African National Research Foundation. It has established and maintains “nodes” (environmental observatories, field stations or sites) linked by an information network to serve as research and education platforms for long-term studies of ecosystems. The long term data series that the research facility/node will house will aim to provide for incremental advances in our understanding of ecosystems and our ability to detect predict and react to environmental change. The core research programme will strive to distinguish between anthropogenic and natural change as well as to unravel the relations between social change and ecosystem change. It maintains a SAEON network of students and has an outreach programme.

See: <http://www.saeon.ac.za>

3.1.28 Swedish International Development Cooperation Agency (SIDA)

SIDA is a government agency under the Ministry for Foreign Affairs and its main goal is to contribute to making it possible for poor people to improve their living conditions. SIDA supports projects from poverty alleviation to HIV Aids and multi-disciplinary research. Its marine initiative is to promote long-term ecologically and economically sustainable development of oceans and coasts. Currently SIDA operates in all three partner countries in the region different levels and builds capacity in the region through its international training programme and through the provision of grants for research. One of its training initiatives worth mentioning which compliments that SAP-IMP process is a marine management – “good governance in practice” lecture course targeted at managers and senior management of marine and coastal institutions.

See: <http://www.sida.se>

3.1.29 Southern African Network for Coastal and Oceanic Research (SANCOR)

SANCOR is essentially an information sharing network designed to provide a platform for cooperation among southern African marine researchers, technicians, students and other interest groups and national (South African) funding agencies. SANCOR has a research programme and also facilitates the disbursement of bursaries for post-graduates and also hosts the South African Marine Science Symposium every three years.

See: <http://www.botany.uwc.ac.za/sancor>

3.1.30 There is a wide variety of international organizations, institutes, companies and individuals who have in the past, and could continue to provide some TCB input to the SAP-IMP. Instead of listing them each separately we have listed them here with the field of expertise that they have traditionally been involved with in the BCLME region:

- Institute of Marine Research (IMR, Norway): Key technical Partners in all areas of marine science, Management of the RV Dr. Fridtjof Nansen
- Institut de Recherche pour le Développement (IRD, France): Ecosystem Modeling, Remote Sensing among other expertise from associated Institutions \ (Individuals) including Brest University
- Institut für Ostseeforschung Warnemünde: (IOW, Germany): Technical Training
- National Institute of Water and Atmospheric Research (NIWA, New Zealand) – Zooplankton Identification
- Center for Tropical Marine Ecology (ZMT, Germany) - Biological Oceanography

3.1.31 Private Consultants: There are a wide variety of private companies and individuals who have in the past, and could continue to provide some TCB input to the SAP-IMP. Instead of listing them each separately we have listed them here with the field of expertise indicated:

- GreenMap – Namibia - GIS, Mapping.
- Eco-Africa – RSA - Community based management.
- Aquaknowledge – RSA -Report Writing, Life Skills.
- Ocean & Land Resource Assessment Consultants (OLRAC) – RSA - Statistics and stock assessment modeling.
- Creatively Functional - Namibia - Life and Communication Skills.
- SonarData – Australia – Acoustics and Echoview
- Fisheries Research Surveys (FRS) – RSA – Acoustic
- OceanAnalysis – RSA – Remote Sensing & Data Analysis

The information provided above is not exhaustive and reflects more what was deemed most relevant rather than a universal directory of all programmes and projects that could contribute to TCB in the BCLME region. For instance there are several international programmes that could be accessed if the TCB Officer of the SAP-IMP / BCC pursued these opportunities. The strategy proposed has drawn from the above list as potential service providers or partners in the TCB activities of the SAP-IMP project.

3.2 Training and Capacity Building Institutions

Angola

3.2.1 University of Agostinho Neto (UAN)

This university based in Luanda offers a five-year graduate diploma in general biology, physics, geology, geophysics, chemistry and mathematics. The course consists of four years of theoretical training and one year of experiential training.

Recently the university has also introduced a Masters degree in marine science by course-work. The degree programme is run under a cooperation agreement between University Agostinho Neto (UAN) and University of Algarve, Portugal (UALG). The Masters degree, called “Marine and Coastal Resources and Science”, has four main specialization areas, (a) Fisheries (with an emphasis on Fisheries Research and Management, but some items relevant to industry), (b) Marine and Coastal Environmental Science and Management, (c) Marine Science (Oceanography), and (d) Marine Geological Resources. Not all specialization areas open every year, and usually at most two will open in any given year. A part of the lecturers come from UALG, and some students travel to Portugal for a part of their dissertation. Most subjects are lectured in Portuguese. The programme targets graduates in different Natural Sciences and Engineering, from both public administration and private companies. It admits up to 30 candidates in each edition, to be split among the two specialization areas to open in that year. The rapid growth of Angola, and the importance of marine resources to its economy, indicates that the programme should be important for at least one decade more. BENEFIT and the BCLME did support a number of Instituto Nacional de Investigação Pesqueira (INIP) staff for participation in the inaugural M.Sc course. Since tuition is offered only in Portuguese, access is limited.

3.2.2 Centro de Formação Profissional de Pescas (Cefopescas)

The Cefopescas School is based in Luanda and was opened in the early 1980's. The training school was built for purpose of supplying the fishing industry with skilled manpower, e.g. skippers, mechanics, marine electricians, refrigeration technicians, gear technologists and deckhands. Over the last few years Cefopescas has become more of a general vocational training institute, but is still maintaining navigation and marine engineering up to the level of Mestre Costeira e Largo and Motorista 1st class (Portuguese system R.I.M).

It appears Cefopescas is now the only functional fisheries vocational training institute in Angola and is still capable of delivering basic training in navigation and fishery, marine engineering, refrigeration techniques and marine electronics. Short term courses include artisanal fishery, community training, engine maintenance, IT and English.

3.2.3 Escola Helder Neto

This school is based in Namibe. Its curriculum is open and often designs and presents courses catered to the needs of the fishing industry. Information about the current state of operation of the facility is unknown.

3.2.4 Escola de Linguas

This relatively new institute is based in Luanda. It designs and conducts tailor-made English courses at various levels.

Namibia

3.2.5 University of Namibia (UNAM)

The University of Namibia through the Faculty of Agriculture and Natural Resources and the Department of Natural Resources and Conservation offers a Bachelor of Science degree in Fisheries and Aquatic Science. The Fisheries and Marine Science is supported by the Norwegian Ministry of Foreign Affairs, this aims to ensure the provision and high standard of laboratory, teaching and research facilities including support facilitating teaching, practical classes and lectures at the Namibian coastal town of Swakopmund.

Although the Department is young, it has developed steadily since its inception in 1996. The programme has trained students from other SADC countries such as Angola, Zambia, Tanzania, and Mauritius. The programme offers a range of courses such as fish processing and quality control, fisheries management, physical oceanography, chemical and biological oceanography, chemical oceanography, aquaculture, aquatic ecology, fisheries economics, law of the sea, population dynamics and biosystematics. Most modules have a practical component that is strengthened by attaching the students to various industries and institutions in order for them to acquire hands on experience and strengthen students' research skills. A research project is undertaken in the final year these may cover a range of topics such as biodiversity, taxonomy, aquaculture, marine and coastal environmental research or socio-economic issues.

This university department seeks to grow and develop and is embarking on a programme of expansion. It is also seeking to develop a closer relationship with other academic institutions in the region and specifically with the ministries of fisheries.

3.2.6 Fisheries Observer Agency (FOA)

The agency has been tasked with providing appropriate expertise, facilities and logistical support to recruit, employ, deploy, supervise, train and discipline fisheries observers for monitoring, compliance and enforcement in Namibia. This programme is funded by the Norwegian Agency for Development Co-operation. There is some discussion about embarking on a programme to train scientific observers as well.

3.2.7 Polytechnic of Namibia

The Polytechnic of Namibia offers several qualifications from a one-year national certificate, two-year national higher certificates, three-year national diplomas and four-year bachelor degrees in the full-time or part-time and distance education

modes. The Polytechnic is responsible for the training of Fisheries Inspectors and Fisheries Observers in conjunction with the Namibia Maritime and Fishery Institute and the Ministry of Fisheries and Marine Resources. The Polytechnic in conjunction with the University of Namibia also provides tailor-made short courses in the fields of English communication, law enforcement, introduction to computers and geographic information services (GIS).

3.2.8 Desert Research Foundation of Namibia (Gobabeb Training & Research Centre)

The Gobabeb training centre is funded by various international and national donors, the GTZ being one of the main contributors. The training centre focuses on desert ecology. Furthermore the centre also provides desert sensitivity and land degradation courses of which scientific methods and field courses play an integral part. Students gain additional fieldwork experience to supplement their traditional classroom work. Other courses include desert climate and climate change as well as water and energy saving through appropriate technology.

3.2.9 Namibia Maritime and Fisheries Institute (NAMFI)

One of NAMFI's primary initiatives has been the training of fisheries inspectors and observers in conjunction with the Polytechnic of Namibia. The institute also focuses on the training of deck and engine officers for the fisheries surveillance and fishing fleets. NAMFI offers various maritime related courses such as marine motorman grade 1 to higher level, fisherman grade 1 and deck officer class 4 as well as all the ancillary courses required for marine safety. NAMFI designs courses to meet the specific needs of industry such as courses in productivity, basic hygiene, safety and supervisory training.

3.2.10 Southern African Institute for Environmental Assessment (SAIEA)

The SAIEA's mission is to "support sustainable development in Southern Africa through promoting the effective and efficient use of Environmental Assessment as a planning tool". This organization provides support to government authorities and other stakeholders by offering the following services:

- Guiding, monitoring and reviewing EA studies
- Monitoring the implementation of EA's and the impact of mitigation measures
- Basic and advanced training in EA
- Strategic research (e.g. EA effectiveness studies, sustainable development planning, Strategic Environmental Assessments, etc.)
- Needs-based information and networking

Furthermore the organization offers a variety of courses which can be tailor-made to the specific needs of the user. These include:

- Public Participation in Environmental Assessment
Cleaner Production for SMEs
- Tools for Sustainable Development in Africa
Environmental Assessment
Environmental Assessment Quality Control

South Africa

3.2.11 Council for Scientific and Industrial Research (CSIR)

The CSIR is a parastatal research institute that has a wide variety of foci. With the division of Natural Resources and Environment there are specific modeling and other technical expertise that have been engaged in the BCLME programme. The CSIR does not do training per se, but could and should be contracted to develop training for pollution and water quality management.

3.2.12 International Ocean Institute (International) & IOI-SA

The IOI- International subscribe to the mission of ensuring the sustainability of the oceans as the "source of life" and uphold and expand the principle of the common heritage as enshrined in the United Nations Convention on the Law of the Sea. Its core strength is in training and capacity development for coastal communities through various programmes, some of which focus on training the youth and women. It also produces research and policy-related publications dealing with ocean governance and ocean science.

IOI-SA (one of IOI-International's operational centres) based at the University of the Western Cape, mission is to "develop and offer high quality capacity building and research programs that improve upon the sustainable livelihoods of poor and underprivileged people living in coastal areas. IOI-SA responds to on-going assessment of the factors that contribute to livelihoods within the southern African region. IOI-SA maintains a particular focus on rural coastal communities, decision-makers, university students at postgraduate level, and schools. It achieves its mission through networking with other organizations in the region that are active in the sphere of marine and coastal management, and sustainable livelihoods." IOI-SA has been able to undertake a number of training activities through the IOI-SA Training Programme. The programme develops and delivers training in support of good governance of oceans and coasts for various stakeholders. These include programmes under the following four themes people,

oceans and coasts, biodiversity and informatics, education through technology and the IOI- SA online services.

All training and capacity building activities of the IOI network are joined under the OceanLearn banner, co-ordinated by the OceanLearn Implementation Committee (OLIC). This committee facilitates the hosting of network-wide quality standard for all courses run under this brand. One of its current initiatives which the IOI-SA is pursuing in conjunction with the University of the Western Cape is the development of a Master of Science (18 months) with a particular focus on ocean management and governance. The course aims to cover cross-cutting, multi- and inter-disciplinary issues from policy and legislation development to law of the sea and society interactions and communication skills. Currently the course is still in its planning phase and has not been formally adopted by the university.

3.2.13 TRAIN-SEA-COAST (TSC)

The TRAIN-SEA-COAST Programme was established in 1993 by the United Nations Division for Ocean Affairs and the Law of the Sea (DOALOS), Office of Legal Affairs, with first the financial assistance of the United Nations Development Programme (UNDP/BDP). The overall goal of the Programme is capacity building at the local level, thus emphasizing: a) the build-up of permanent national capabilities; b) sustainability of efforts; c) cost-effectiveness; d) responsiveness to the specific needs of the countries involved; and e) long-term impact. This United Nations (DOALOS) based organization has several units internationally including one based at IOI-SA in South Africa. The mission of the TRAIN-SEA-COAST Programme is to create capacity at the local level for the development, delivery and adaptation of high quality training courses that meet TSC standards and are tailored to specific training needs at the local, national and regional levels. The main objective is to enhance national/regional capacity-building through training on key transboundary topics/problems in the area of coastal and ocean matters. TSC has its own course development methodology which it can apply to a range of training courses. One such course in Oil Spill Management has been conducted in the region and it also has access to other relevant courses developed elsewhere for delivery in the region.

3.2.14 University of Cape Town (UCT)

UCT has several departments and in-house research institutes and centres that can play a pivotal role in training and capacity building in the region.

- The zoology department hosts a Masters degree in Applied Marine Science. The overall objective of this degree is to provide education and training in a broad range of marine science disciplines and is composed of both a series of modules conducted in a classroom followed by practical field and laboratory work. The second component is a research project

intended for publication as a scientific paper. This course offers a host of modules such as biostatistics, intro to matlab, intro to ocean circulation modeling, intro to population dynamics modeling, marine meteorology, principles of living marine resource management, population dynamics and fisheries modeling, project management, marine law, data analysis, aquaculture, climate variability, ecosystem models, resource economics, climate change, coastal and shelf oceanography, multivariate analysis and coastal zone management. These modules can be done on an *ad hoc* basis which means that the course can be taken on a piece-meal basis.

- The recently established Marine Research Institute (MA-RE) is an inter-departmental research grouping which is one of only three new research theme supported by the University. These themes are priority areas for service delivery to the marine sector and will provide research and consulting platform for the university.
- The Fitzpatrick Centre of Excellence runs a Masters degree in Conservation Biology which is one-year MBA-like programme and it deals with the conservation and biologically sustainable and economically viable use of biodiversity. It provides the education and training necessary to identify threatened species, ecosystems and ecological processes, and to develop appropriate measures to mitigate against, or reduce the effects of, particular threats to biodiversity. From a utilization perspective, it focuses on biological and socio-economic criteria necessary to select species and areas for utilization and the development of appropriate management and monitoring strategies. The modules cover a range of fields of conservation biology: characterizing biodiversity, modeling, demography of wild populations, population viability analysis, genetics, monitoring and time-series analysis, community-level interactions, invasive aliens, disturbance ecology, ecological socio-economics, landscape ecology (using geographic information systems - GIS), and decision analysis using applied management models.
- Department of Environmental and Geographical Science (EGS). The Environmental Evaluation Unit (EEU) is an independent, self-funded research, consulting and training unit based at the University of Cape Town. The EEU consults, conducts research, training and community outreach as core activities of its operation. Their core areas of expertise are in the four thematic areas of integrated environmental planning, management and assessment, integrated coastal and small-scale fisheries management, biodiversity commercialization, fair trade and social justice, and public participation.
- Institute of Marine Environmental Law at UCT offers a number of options for training, either for a recognized law degree, or for a post-graduate diploma in marine law.

- Department of Oceanography and the Marine Remote Sensing Unit (MRSU): This department runs a series of courses which serves both undergraduate and post-graduate needs focused on physical oceanography and ocean –atmosphere interactions and meteorology. They have a strong research component focused on the Benguela and the east coast of southern Africa as well as the southern ocean. Strong collaboration exists between several international research groups and the department including the IRD in France. The department has strength in ocean modeling. The Oceanography department hosts the MRSU which provides a platform for research and the production of operational oceanographic remote sensing products for the entire southern African coastal region.
- Marine Resource Assessment and Management (MARAM): The focus of the group's work is the assessment and management of renewable marine resources. Two courses are offered by the research unit - both are aimed at training students in biological modeling techniques.
- UCT's Summer and Winter Schools: UCT's Summer and winter schools offer short two-three week courses on project management, report writing, time management and other communication and life skill aspects. Furthermore, biological and ecological topics are also on offer such as key principles & testing evolution hypotheses, genetic, biochemical and morphological similarities among organisms and adaptation, natural selection and the formation of new species. Requests for tailor-made courses can be made to the institute.

3.2.15 University of the Western Cape (UWC)

- Within the Faculty of Natural Sciences in the Biodiversity and Conservation Biology Department has a strong focus on marine biology (botany and zoology) and marine ecology (including biological oceanography and environmental monitoring). The Conservation and Biology departments' strength lies in taxonomy and systematics, ecology and phycology.
- The Programme for Land and Agrarian Studies (PLAAS) is located at UWC's School of Government and the Department of Geography. Their expertise is in fisheries management and aspects of community fisheries. PLAAS “engages in research, training, policy development and advocacy in relation to land and agrarian reform, rural governance and natural resource management.” PLAAS has been designing and developing a range of training short courses customized to meet the needs of different government departments and non-governmental organizations. These courses have utilized a wide range of participatory training methods, combined with analytic activities, scenarios and case studies and related content inputs. Certain courses have involved field-based learning sessions

with participants engaging in guided fieldwork activities. Examples of such courses are Social Science Perspectives on Natural Resource Management & Governance in Community Based Natural Resources.

3.2.16 Rhodes University (RU)

At this institution based in the Eastern Cape of South Africa, a strong focus on fisheries science through the Department of Ichthyology and Fisheries Science (DIFS) which is closely linked to the South African Institute for Aquatic Biodiversity (SAIAB). DIFS offers both undergraduate and post-graduate course in fisheries management which includes a component on aquaculture and have recently offered a Master in Science in Aquaculture. DIF also have a host of aquaculture related projects and has all the necessary facilities for marine and freshwater aquaculture research. Two Diploma courses are also offered, one in aquaculture and the other in fisheries management. Due to its close ties with the SAIAB institute and its primary focus being ichthyology, the institute can offer a host of fisheries related projects as well as offer expertise in fish taxonomy, feeding and reproductive biology and larval dynamics, stock assessment, and spatial analysis and geographic information systems.

Closely linked to the university but an independent consulting firm Enviro-Fish Africa (Pty) Ltd specializes in the fields of conservation of biodiversity, resource management and development, capacity building and marine surveys. Services are also related to the marine and inland environment with particular emphasis on fish, fisheries, parks, catchment conservation and tourism. The organization offers capacity development by way of specialist environmental education services, materials development and programme implementation, management capacity building, development projects, community capacity building, public participation in natural resource related projects, institution building, training of staff and development of educational materials (e.g. participatory resources and CD ROMs)

3.2.17 Nelson Mandela Metropolitan University (NMMU)

This institute offers both undergraduate and postgraduate research opportunities in the areas of estuaries and ecosystems of the coastal zone and hinterland, the functional processes driving these systems, the structure and function of ecosystems, and their interaction within the coastal ecotone. The zoology department specializes in the following fields of research in coastal zone resource management (assessing the utilization and management of shelf fisheries, sustainable exploitation of estuarine, inter-tidal, and in-shore resources by commercial, recreational and subsistence fishers and environmental impact assessments for structural developments in the coastal zone), water quality assessment (ecotoxicological / ecophysiological studies on life stages of key species and sediment contamination in estuaries and coastal zone by industrial

effluents and its impact on ecosystem function) and ecosystem modeling and analysis.

The university also houses the Integrated Environmental and Coastal Management (IECM) unit which provides services on all aspects of coastal zone environment. The institute also works very close with the Department of Geosciences particularly with regard to coastal processes, marine, estuarine and coastal dune deposits, groundwater, marine and estuarine pollution and environmental impact assessments, utilizing tools such as GIS and remote sensing.

3.2.18 Cape Peninsula University of Technology (CPUT)

CPUT runs courses in a wide variety of technical, scientific and commercial subjects at National Diploma, Bachelor of Technology, advanced degree level and short courses. The short courses are run through the Centre for Continuing Education (CCE). It is a formal department and offers courses that are scheduled to make it possible for employees to complete them on a part-time basis. CCE short courses have long-term benefits and are focused on the development of skills. Also, by prior arrangement, most courses can be offered on site at the employers' places of business. Furthermore, customized courses can be developed to meet unique training needs.

Within its Applied Sciences department, the university offers modularized National Diplomas, B-Tech and M-Tech qualifications in environmental management, fisheries resource management and oceanography. The National Diploma in Oceanography has been offered for more than thirty years. This Diploma was developed specifically to meet the needs of the national fisheries management authority (MCM). The National Diploma in Oceanography is offered every second year and can accommodate up to 30 students however due to poor recruitment of students in the Oceanography and Fisheries Resources courses, the university is considering amalgamating the two courses and moving towards a small programmes based approach which would allow for more flexibility by offering it to part-time and full-time students. The university through its Bellville campus also offers an M-Tech Diploma in Environmental health of which modules in environmental law, and marine legal issues.

3.2.19 University of Witwatersrand (Wits)

In the School of Animal, Plant, Environmental Sciences, the Department of Zoology, houses the Phycology unit. The unit conducts research on phytoplankton (toxic and non-toxic species) ranging from identification, taxonomy, developmental and cell biology studies as well as ultrastructural and phylogenetic studies.

3.2.20 University of Pretoria (UP)

Through the Zoology Department, this institute conducts research on seals and as well has many projects that are being conducted on Marion Island. The university also has a marine mammal unit based at the South African National Museum in Cape Town which focuses on whales and dolphins and top predator interactions and roles within the ecosystem. The university's genetics department is also conducting stock separation studies on many fish and invertebrate species such as oysters.

3.2.21 Stellenbosch University (SUN)

The university has an aquaculture division within the natural science department which was established in 1988. This division offers two semester aquaculture courses with a curriculum comprising of aspects such as water quality, nutrition, physiology, production systems, management systems, disease management and processing. These courses form part of the undergraduate system. With postgraduate option, the division offers MSc's and PhD's in animal physiology, animal sciences, food sciences, genetics, zoology and nature conservation with an aquaculture focus. The aquaculture programme also offers practical training whilst undertaking these courses such as placement within the industry, hatchery management, production management and processing and marketing.

This molecular aquatic research group within the Department of Genetics at the university focuses on the study of levels of genetic diversity and patterns of gene flow of various aquaculture species including among others: abalone, eel and the African catfish. The information generated is applicable to management strategies for the conservation of species and enhancement for breeding/commercial purposes by identifying the representatives of individual stocks.

3.2.22 African Centre for Climate and Earth Stewardship Science (ACCESS)

ACCESS is a relatively new concept that is still to be formally established. Its main goal is "building on, coordinating closely with, and complementing related, ongoing activities in the earth sciences in Africa. The focus is on climate related phenomena that range from severe floods and prolonged droughts to climate changes in Earth's distant past that can shed light on future global warming." In terms of capacity and building ACCESS will play an active role in the development of e-courses, documentaries and other forms of communication and teaching resources. However, the core of ACCESS is a master's degree in earth system science linked to research projects which will involve the mentoring and tutoring of students. This, the core of the educational programme, offers courses, to students with a strong background in mathematics, physics, and chemistry, in topics such as: weather and climate, ocean-atmosphere interactions, biogeochemical cycles (of carbon, nitrogen, oxygen, rocks...) the history of

planet earth, numerical (computer) modelling and mathematical and statistical methods.

ACCESS will also be actively involved in translating scientific findings to the benefit of society. This will be a measure of the effectiveness and impact of the programme on policy adjustment, adaptation strategies and in building societal resilience to global warming. In terms of operational oceanography, ACCESS will develop tools necessary for routine measuring and information dissemination of anticipated conditions in coastal waters, which will be of value to those who are involved in fisheries, shipping, tourism and the management of coastal zones in general. “The long-term plan is to transfer this capability (computer models etc.) to agencies, such as weather services, that have the infrastructure and that are experienced in providing the public with operational services.”

It is evident that there is a wealth of training and tuition facilities and courses available in the region (with the bulk in South Africa). However, much of what is on offer is at the tertiary level for undergraduate and post-graduate academic tuition. There are a number of suitable short course, but more importantly, a number of the institutions listed have the capacity of developing and hosting tailored courses to meet some of the needs presented in section 2.

4. Training and Capacity Building Strategy

The strategy proposed in this document is based on the model used in the BENEFIT programme which has proved to be highly successful. It comprises 3 elements:

- Training Institutional Arrangements
- Human Resources and Infrastructure
- Skills Development and Skills Improvement

The strategy presented in this document makes the following assumptions:

- TCB activities in this project are designed to target managers of the BCLME and those contributing to management (i.e. managers, scientists and technicians). It does not target user groups.
- The TCB interventions will be limited and will preclude financial support for human resources (salaries), bursaries for formal studies and major infrastructural requirements.
- The bulk of the intervention will be to co-ordinate TCB activities in the region and to deliver a series of training courses and activities targeting the identified needs.
- The intervention is designed to last for the period of the project – 4 years.

4.1 Training Institutional arrangements:

The fact that dedicated funding is being allocated to a TCB component in this project is a novel and significant development for the BCLME/ GEF programme and responds to a frustration expressed by the stakeholders in the BCLME phase. For the effective implementation of a TCB strategy fundamental institutional arrangements will have to be created in order that the intervention is efficiently and effectively implemented.

4.1.1 Regional Training Coordinator

It is strongly recommended that the post of Regional Training Coordinator is supported for the duration of this project. This is essential if delivery is to be assured. The role of the TCB coordinator is defined in the following Terms of Reference. A decision will need to be made as to whether this position will be located in the BCC itself or whether it will be located in the SAP-IMP project secretariat.

*Benguela Current Commission
Training and Capacity Building Coordinator*

Proposed Position Motivation and Terms of Reference

One key function of the Benguela Current Commission (BCC) will be to standardize the scientific endeavours in the research institutes of the contracting parties and to ensure that data and information generated by the scientific staff for use by the commission are of the highest standard. To this end it is essential that the staff of the scientific institutes that will participate in transboundary activities, and who will populate the working groups established under the aegis of the BCC, are trained to perform their function in a consistent and expert manner. The need to train and continuously upgrade the expertise of resource managers in the BCC domain is also acknowledged. These sentiments are recognized in the Interim Agreement of the Benguela Current Commission in Article 4(a) and 9(2).

Experience has proven that the central co-ordination of training and capacity building activities are an important element of success in this field. This is not only because of the need to manage the logistics of joint training activities, but it is also strategically important, in that a consolidated and mandated training plan of in-service training will need careful and hands on management. While the training needs of the participating institutions have been well documented in the preceding BCLME phase, the dynamics of the institutions (turnover and recruitment of new staff) and the continuously evolving scientific needs, require that existing programmes are continuously evaluated and updated. The need to make the best use of resources (financial and expert human resources) requires that joint training among institutes is facilitated and that a TCB programme is implemented that is

adaptable and can address the needs of all scientific and technical staff.

For the above reasons, the post of Training and Capacity Building Coordinator is proposed for the Benguela Current Commission. The post could be located in the BCC Secretariat or at one of the country focal points. The post would be similar to that performed currently by the Training Coordinator for the BCLME / BENEFIT programmes. A Draft Terms of Reference are given below:

In General: The Benguela Current Commission Training and Capacity Building Coordinator (TCBO) will be responsible for the development and implementation of a training programme under the auspices of the Benguela Current Commission. The TCBO will manage the day-to-day training activities of the programme and assist the Executive Secretary and Ecosystems Coordinator and the in organizing consultative meetings, raising funds for training, tracking and assessing the impact of the training programme and assisting with the administration of funds allocated to training activities.

In Particular, the TCBO will:

- Develop, implement and evaluate a Training Plan*
- Develop, implement and evaluate a medium term in-service training programme*
- Develop, implement and evaluate an annual training programme in consultation with the chairs of the subsidiary bodies of the BCC.*
- Promote the Training Plan and assist in raising dedicated funds.*
- Liaise with training Coordinators in Angola, Namibia and South Africa regarding national training activities, respond to short-term needs as they arise.*
- Report progress to the BCC Secretariat and Management Board.*

Minimum Qualifications:

- A Honours degree (or equivalent) with a minimum of five years experience in a marine science or related field and significant experience in training, project management and budget administration.*
- Extensive knowledge of the range of programme and projects and service providers' in the region is essential.*

Desirable Attributes:

- *Self-motivated, Multilingual (Portuguese and English), Spoken and writing fluency, Programme and project management experience, Experience in drafting and managing budgets, Experience in proposal writing and fund raising, Good networking and co-ordination skills, Excellent computer skills (word, excel & PowerPoint), Marine Science experience.*

Costs:

Salary: \$45 000 p.a.

Travel Budget: \$15 000p.a

Administrative Budget: \$10 000p.a.

4.1.2 National coordinators

The Ministry of Fisheries and Marine Resources in Namibia has a training committee and a training Coordinator whose functions include coordinating the formal training of staff of the ministry, managing funds that are disbursed by the ministry and liaising with the regional programmes in co-funding and other logistics. This is unique in that the other ministries in Namibia do not have such a facility nor do any of the stakeholder ministries in South Africa and Angola. This arrangement did not work optimally but should be expanded or developed in order that well organized interaction between the SAP-IMP TCB effort and the stakeholders is facilitated.

It is thus proposed here that the three stakeholder countries appoint a national (inter-ministerial) training Coordinator to serve as a liaison and contact point for the BCC/SAP-IMP Training Coordinator.

The three Inter-ministerial National Training Coordinators:

- *Will be appointed by each of the BCC contracting countries (either in a dedicated post or assigned this function in addition to existing function).*
- *Will represent all national participating ministries and government institutes (respectively in each country) that are contracted into the BCC*
- *Will be the contact point for the Regional Training Coordinator and will thus:*
 - *Assist with promotion and communication of training activities*
 - *Assist with the logistical arrangements for training activities*
 - *Assist with general backstopping and follow up*
 - *Represent the Training Coordinator local meetings*
 - *Participate in TCB planning activities*
 - *Assist with Monitoring & Evaluation of TCB programme*
 - *Conduct exit inter views with staff who have resigned*

4.2 Human Resources and Infrastructure

The need for further development of physical infrastructure has been identified as an important need in all three countries (section 2), with the greatest such need being in Angola. The BCLME programme (and the BENEFIT programme) has invested a significant amount of funding to support infrastructure with contributions to communications (satellite, internet, computers etc), equipment (via many projects, a ski-boat to all three countries, refitting of the *RV Tombwa*, the equipping of the Namibe Laboratory), along with many other examples. As stated above, it is assumed that the funding from the GEF contribution to the SAP-IMP project will preclude direct funding of major infrastructural support.

In terms of human resources, it is quite clear that this is another very fundamental need and challenge to the participating ministries (see section 2). This refers specifically to the conditions of employment of the respective staff members and public service conditions in general. While there have been some interventions (by BENEFIT) in the past to financially augment some staff salaries, this is likely to be impossible via the SAP-IMP project although this issue will need to be raised in the BCC in respect of country contributions.

The skills and experience shortage and staff loss / retention issues have been spoken and written about exhaustively and it is not necessary to repeat this here. Suffice to say that the continuation of the problem is steadily undermining the capacity of the ministries to fulfill their mandate and this is of course, threatening also to the fulfillment of the BCC / SAP-IMP goals. While there is very little that the SAP-IMP project can do as a direct intervention in human resource issues, the pressure that is mounting on the three main research institutes (INIP, NatMIRC and M&CM) justifies some regional assistance or intervention, albeit indirect.

Specific interventions are recommended below whereby the SAP-IMP project can assist to address human resource issues. It is important to stress that these interventions are directed at inter-governmental cooperation and are aimed to assist in manifesting a “cooperation culture”. In other words, while legal and regulatory obstacles to achieving closer cooperation and integration might exist (nationally) these proposed ideas assume that the intention and mandate of the BCC is ultimately to achieve regional integration. Thus full implementation will provide some test cases and will assist in identifying (and eliminating) the obstacles that do exist.

4.2.1 Regional Human Resources Strategy

A regional strategy to deal with staff retention and loss, career pathing and performance assessments is required. It is recommended that an independent professional skills audit, a quantification of the loss of skills and a cohesive regional study of the skills, experience and capacity shortage and its consequent implications for resource management should be conducted by an independent professional Human Resource consultancy. The results of this should be discussed

at a workshop where a regional (standardized where possible) strategy for staff development and retention is discussed. A range of options should be investigated beforehand so that a number of solutions to the problems are proposed. One such idea, a common bargaining chamber for marine professionals, is presented below.

4.2.2 Regional Professional Association

At an internal meeting held at NatMIRC in 2006 it was pointed out that in Namibia, architects and medical professionals have a separate deal in the public service as a result of their belonging to a professional association which represents them in the bargaining council. It is not known whether a similar arrangement exists or is appropriate in South Africa and Angola. Marine scientists (and for that matter technicians and managers) are usually qualified with some sort of tertiary education (diplomas or degrees). It is therefore reasonable that a professional association of marine professionals should be formed which can represent these professionals in the public service or the BCC. Furthermore, such a professional organization could provide services for marine science professionals (the members) including negotiating with a range of service providers for them. It is also suggested that a means of evaluating the skills (a rating system) and an independent performance assessment could be another of the services rendered. It would be of value to the region if the SAP-IMP project could facilitate the implementation of such an entity. Something akin to this idea already exists in the on the African east coast in the form of WIOMSA: *WIOMSA is a regional professional, non-governmental, non-profit, membership organization, registered in Zanzibar, Tanzania. The organization is dedicated to promoting the educational, scientific and technological development of all aspects of marine sciences throughout the region of Western Indian Ocean (Somalia, Kenya, Tanzania, Mozambique, South Africa, Comoros, Madagascar, Seychelles, Mauritius, Reunion(France)), with a view toward sustaining the use and conservation of its marine resources. The Association has about 1000 individual members as well as about 50 institutional members from within and outside the region (See: <http://www.wiomsa.org>).*

4.2.3 Regional deployment of skills

Another intervention that is recommended for the SAP-IMP project is to facilitate the “regionalization” of skills by allowing for the deployment of staff that possess rare and specialized skills. This would mean for example that a NatMIRC scientist or technician could be deployed to Luanda or Cape Town as part and parcel of their job in Namibia. Furthermore, skills groups could be formed so that pools of skilled people could be deployed. Thus for example there might be an acoustic team which could be responsible for acoustic surveys along the entire BCLME region, as opposed to separate groups of acoustic technicians and scientists duplicating the deployment of skills. In this way, the problems of skills shortages in critical areas would require less outsourcing and would also serve to promote capacity building. In order to achieve this, the SAP-IMP project would

have to negotiate visa / work restrictions among the three countries and address remuneration differences among other issues. One of the immediate and priority needs for this is in stock assessment and TAC reporting.

4.2.4 Mentoring and import of expertise

One of the needs that have been identified is the need to supplement local skills with expert skills that might exist elsewhere in the region or internationally. Several of the institutes have in the past developed such relationships whereby an international expert has been seconded or contracted to the institute for short periods (a month or two) in order to review progress or assist with certain tasks (these have most often been associated with TAC reports). This is a function that the SAP-IMP project could support.

4.2.5 Strategic relationships

Strategic relationships with universities and other research institutions. The relationship that exists between the University of Cape Town and Marine and Coastal Management is a model that has been applied elsewhere in the world with equal success. This relationship provides a win-win situation as it provides a source of relatively inexpensive brain-power (in the form of post-graduate students and their professors) for marine research while providing students with a platform (research vessels and other facilities) without which they cannot do effective data assembly. By strategically developing a research programme that addresses the needs of the region, much can be achieved. The extension of this idea is to provide opportunity for international post-doctoral students to work in the Benguela Current LME. This brings in newly qualified, energetic and enthusiastic staff that are usually unencumbered and relatively inexpensive. This provides both research capacity and an opportunity for capacity building. The concept of regional organization of academic courses and standards has been explored cursorily in the past and this activity could become an impetus for a more concerted effort. Even a regional MSc was mooted. Consideration should thus be given to facilitating the standardization of undergraduate and masters courses in the region and implementing a regional rating system / grading system for graduates. This would naturally be an item of interest beyond the BCLME (SADC-wide).

4.3 Skills Development and Skills Improvement

Over the last decade (the life of BENEFIT, the BCLME and other bilateral programmes), it was recognized that political transformation and other social changes resulted in under-qualified staff holding posts for which they were not appropriately trained and/or that assistance was required to address inequity in the research institutes. Thus, a large investment into formal training of staff (i.e. tertiary education at universities and technikons) has been implemented which has been largely successful, but offset to a degree by staff losses. That era of formal training of employed staff has passed and the

emphasis has now shifted to improving and enhancing the skills and experience of the said qualified staff through an in-service training programme. Thus the approach in BENEFIT for the last two years has been to implement an in-service training programme which should serve as a model of the SAP-IMP Project.

Therefore it is suggested that the most effective and direct means of addressing the needs identified in this study, and which will assist the SAP-IMP project of achieving its main outcome (of the overall reduction in degradation of the BCLME, with emphasis on the restoration of its depleted fisheries) is to implement a series of short-training courses targeting the technical and managerial needs identified. Naturally, while a wide range of appropriate skills do exist in the BCLME, they are developed to a variable degree and thus training would have to be tailored to suit the range of skills levels.

The philosophy behind this is that professional and expert skills that are required are often job specific and that the best way to improve these skills is on-the-job. The design of the programme should be cyclical and incremental so that the level of training can increase until the staff themselves can become the tutors of entry level staff. If this system is then entrenched then the skills are captured in the system and should then be secured for the future. This approach should not be confused with the role of formal education or scientific research. The results of our study (section 2) produced several requests for items such as “fish life history” or “fish biology”, “genetics” and “linkage between fisheries and environment.” In-service training cannot provide tuition on academic items or attempt to replace / augment the role of a university and these items should be taken up there. Other items are more research oriented and require a research project to address and are not suitable for short courses. We have thus selected those items from our information that we deem most suitable for an in-service programme and have de-prioritized those items that would be better suited to academic tuition and / or research programmes (see Table 8 section 2).

Table 9 below sets out the estimated cost of running one such training workshop, assuming 5 participants from each country can be trained.

Table 9: Estimate cost of as single regional workshop

Item	ZAR	US\$ (ZAR7.2)	Comments
Flights (x5 Ang)	ZAR 32500.00	USD 4514.00	Rate of ZAR 6500 per flight
Flights (x5 SA)	ZAR 18500.00	USD 2570.00	Rate of ZAR 3700 per flight
Flights (x2 Trainers)	ZAR 7400.00	USD 1028.00	Trainers from South Africa
Per Diems + Accommodation	ZAR 77350.00	USD 10744.00	BENEFIT Rate of ZAR 650 per day
Catering	ZAR 8500.00	USD 1181.00	Lunch plus 2 teas
Consultation Fees	ZAR 40000.00	USD 5556.00	ZAR 20 000 per trainer
Venue Hire	ZAR 4250.00	USD 591.00	Rate of R850 per day
Training course – resources	ZAR 5000.00	USD 695.00	Resource such as CD's and Manuals

Contingencies	ZAR 3000.00	USD 417.00	Contingencies
Total	ZAR 196,500.00	USD 27, 296.00	Estimate

The curriculum presented below is developed from the needs tables in section 2. The total package of courses is limited by available budget and using the figures presented above, a total of 6 courses per year could be accommodated within a reasonable budget. If additional funding were to be obtained for TCB activities under the BCC, this could be expanded. Therefore the table prioritizes the courses for the SAP-IMP project and also suggests a possible expanded set of activities.

The mode of delivery would vary depending on the nature of the course and it would be incumbent on the Training Coordinator to set up these courses by:

- Confirming the sub-selection of courses via consultation with stakeholders (drafting a formal programme)
- Identifying the target group (with help of the national training coordinators)
- Arranging the tuition (either liaising with the teaching institution or contracting a trainer / service provider)
- Arranging the logistics of the course

Table 10: Prioritized list of courses showing the level, mode of delivery and potential service providers for the SAP-IMP / BCC project.

	Topic	Level	Mode / Delivery/	Potential Service Providers
Ecosystem Management				
1	Environmental Impact Assessment and review	General	Lectures and field work, local case studies	SAEIA RU
2	Aquaculture Management	All levels	Lectures, field & practical	SUN RU
3	Resource Economics	General	Lecture using local case studies and fisheries sectors	UCT - Economics Dept. UWC - PLAAS Fitzpatrick Center of Excellence
4	Environmental Law	General	Lectures and case studies	UCT -Marine Law Institute IOI-SA WIO-Lab
5	Pollution monitoring	General	Lectures, field trips and practical exercise	IOI-SA GloBallast / NPA SA CSIR
6	Ecosystem (Transboundary) Based Fisheries Management	General	Lectures and simulated computer modeling (understanding models)	UCT – Zoology Dept. MA-RE Institute FAO (Products) SIDA
7	Coastal Zone Management	General	Lectures	UWC - PLAAS UCT –EEU NMMU– Zoology & IECM Unit WIOMSA ENVIRO-Fish UWC – PLAAS
8	Policy Development	General	Lectures with case studies	UCT – EEU IOI – SA
Numerical Skills				
9	Stock Assessment	All levels	Computer modeling using case studies and local examples, incorporating the disassembly of previous	RU UCT – MARAM UCT – Zoology UCT – MA-RE OLRAC

10	Acoustic methods	All levels	conducted stock assessments Lectures & on board practical dovetailed with acoustic software training	IOW IMR FRS SonarData
11	Ecological modeling and decision analyses for EAF	Senior Management	Lectures and local case studies	IRD UCT-Zoology M&CM Brest University UCT – Zoology
12	Data analysis & experimental design techniques	All levels	Lecture, with examples using local data	UCT – MA-RE ODINAFRICA GOOS IOI-SA Polytechnic of Namibia
13	GIS and Mapping	All levels	Practical examples using biological data (local data if possible)	UCT – EGS RU NMMU – Zoology GreenMAP
Biology, Taxonomy & Ecology				
14	Fish ageing and histology	All levels	Workshop/Lecture type training	M&CM & NATMIRC staff & an invited expert (IMBER /START or ICSU – funding)
15	Plankton identification	All levels	Workshop/Lecture type training including verification and validation sampling and id methods	M&CM & NatMIRC staff & an invited expert (IMBER/START or ICSU –funding) Wits
16	Aquaculture husbandry and health	All levels	Lectures and hands-on field work at established farms	SUN RU
17	Invertebrate taxonomy	All levels	Lectures and microscopy identification and classification methods	UWC IOI-SA & invited expert (IMBER/START or ICSU –funding)

18	Invasive species management	All levels	Formal lectures & site visits	GloBallast
Computer Skills and Data Management				
19	Data curation	All levels	Data basing, archiving, extraction etc, using local data collections	ODINAFRICA GBIF / SABIF GOOS OLRAC
20	Vessel Monitoring Systems	General	Instrumentation use, maintenance & calibration	Suppliers
Technical Skills				
21	Survey techniques & instrument deployment	All levels	Shipboard	In conjunction with CPUT Oceanography and Fish. Management course. Regional / National Cruises GOOS
22	Scientific Diving	Class 4	Lectures and practical training	Diving Unit at UCT
23	Instrumentation maintenance & calibration	All levels	Lecture interspersed with hand-on training (including one day calibration on board a vessel)	IOW / local service provider / electronics lab at M&CM
24	Water quality monitoring	ISO	Lectures and practical training	CSIR WIO-Lab
Social & Economic Sciences				
25	Public Relations	General	Standard course	Local PR Professional EcoAfrica UCT –EEU UWC – PLAAS IOI – SA
26	Co-management with coastal communities	General	Lectures using local case studies	NMMU – IECM C.A.P.E WIOMSA EcoAfrica
Physical Oceanography				
27	Application of Remote Sensing data	General	Lectures and practical applications	Facilitated by the MRSU @ UCT Oceanography ODINAFRICA GOOS

Cross Cutting

28	Communication Skills	All levels	Theory & Practice	EcoAfrica/D-List AquaKnowledge CPUT CCE Polytech of Namibia
29	English Training	All levels	Lectures	Escola De Linguas Cefopescas CPUT CCE CPUT
30	Project Management	General	Lectures with simulated examples	UCT – Summer & Winter School IOI-SA GTZ Creatively Functional
31	Life Skills	General	Interactive lectures followed by inter-sessional discussions	UCT Summer / Winter Schools CPUT CCE AquaKnowledge M&CM Library
32	Library Skills	General	Lectures & practical exercises on site	CPUT ODINAFRICA
33	Mentoring tutorship	General	Interactive lectures and groups	CPUT IOI-SA AquaKnowledge

5. Monitoring and Evaluation (M&E)

There are two aspects to M&E, namely that pertaining to the delivery and the other related to the impact of the strategy on capacity in the region.

The latter is more difficult to monitor in that the measurable indicator will be improved capacity and skill for management of the ecosystem. Therefore it is recommended that the baseline (quantification of current skills and capacity) should be established at the start of the programme and that this should then be monitored and elevated at mid-term and at the termination of the project. This audit should be combined with the study recommended in point 4.2.1 which is a proposed study of skills and capacity status in the region. Staff retention statistics should be included in the above and career path of trainees should be tracked.

With regard to M&E for progress the following table proposes a M&E scheme:

Table 11: Monitoring and Evaluation scheme

Strategy Item	Verifiable Indicator	Means Verification	of	Assumptions
4.1.1 Regional Training Coordinator	Funds are secured and appointment is made	Minutes of SAP-IMP PSC or BCC Management Board		Proposal accepted Funds secured
4.1.2 National Training Coordinators	Funds are secured and appointment is made	Minutes of SAP-IMP PSC or BCC Management Board		Contracting parties make the necessary commitment and that the incumbents have sufficient time to fulfill the role.
4.2.1 Regional strategy for staff retention and loss	A study is commissioned, a workshop is held, a strategy is drafted and accepted by all three countries	Reports of study and workshop, minutes of BCC Management Board / SAP-IMP		That there is sufficient political will to achieve this and subsequent implementation
4.2.2 Improved organization professionals	Constitution of a professional association drafted	The constitution		There is buy in from the countries and professionals is forthcoming
4.2.3 Regional deployment of skills	Decisions are made that staff regionally deployed	Minutes of SAP-IMP PSC or BCC Management Board		Buy-in from countries and staff concerned is forthcoming
4.2.4 Mentoring & import of expertise	Funds are secured and experts contracted	Minutes of SAP-IMP PSC or BCC Management Board		Funding is available
4.2.5 Strategic relationships	MOUs are signed	MOUs		The concept is supported regionally Training officer is appointed.
4.3 Short Courses Delivery	Course & evaluations are conducted	<ul style="list-style-type: none"> • Course Reports • Feedback from trainers and trainees • Post-course performance assessments • Annual Reports of the Training Coordinators 		There are sufficient & appropriate trainees who made available. Post-course Performance assessment is conducted Sufficient funds are procured for the entire programme.

6. Estimated Budget

The budget estimated here is divided into the same three sections as the strategy above. Some augmentation of funds for TCB will be necessary as the funds available from the SAP-IMP project are simply not going to cover the needs.

A fund raising strategy should therefore be implemented by the SAP-IMP or BCC in support of this effort using the GEF funds as leverage. Some of the items identified below might need to be funded from other sources, within the SAP-IMP, or other funds for technical activities or country contributions. The inclusion of non-BCLME regions in the activities as a subsidizing mechanism might also be a suitable option.

It is likely that a funding proposal for the technical activities of the BCC will be developed and presented to potential international partners (including Norway and Germany) to complement the work planned via the SAP-IMP project. It is strongly recommended that TCB activities related to these technical activities should be built in to such a proposal and that this should be presented as co-funding for the TCB strategy developed here. Cost sharing will need to be considered (especially in other UN / GEF / World Bank programmes) and among these NACOMA and the ASCLME projects are the most obvious candidates. Since there are substantial TCB components of those projects, it is highly likely that the respective strategies will include activities that overlap with activities planned in this strategy. The feasibility of cost-sharing and running joint activities (e.g. populating each others courses) should be explored urgently as this could provide one important means of improved efficiency. Use of international organizations such as GOOS, IMBER, ICSU and START that offer support and funding for a number of related activities should be utilized in order to reduce the burden on the project.

Table 12: Final budget for the proposed training strategy

Budget Item	Section	Calculation	Value (USD)
Training Institutional Arrangements	4.1		
Regional Training Coordinator	4.1.2	Includes salary, operating & travel budget (4 years) 4x 70K	280 000
National Training Coordinators	4.1.3	Some support from activities 10K annually x 4 x 3	120 000
Human Resources & Infrastructure	4.2		
Regional strategy for staff retention and loss	4.2.1	1 short term consultancy, workshop and follow up	50 000
Improved organization professionals	4.2.2	Support for seconded national team (3 people) Integrated in other operations of the BCC – to be managed by TCBO and Ecosystem Advisory Committee	20 000
Regional deployment of skills	4.2.3		
Mentoring & import of expertise	4.2.4	1 expert per country per year. 30K*3*4	360 000
Strategic relationships	4.2.5	Some funds for consultation and small workshop	30 000
Skills Development & Improvement	4.3		
Delivery of 33 courses	4.3	27K per course	891 000
Grand Total			1 751 000

List of Acronyms

ACCESS - African Centre for Climate and Earth Stewardship Science
ACEP - African Coelacanth Ecosystem Programme
ASCLME - Agulhas Somali Currents LMEs
BCLME - Benguela Current Large Marine Ecosystem
BENEFIT - Benguela Environment Fisheries Interaction and Training Programme
C.A.PE - CAPE Action Plan for the Environment
Cefopescas - Centro de Formação de Pescas
CETN - Coastal Environmental Trust of Namibia
CPUT - Cape Peninsula University of Technology
DEA&T – Department of Environmental Affairs and Tourism
DIFS – Department of Ichthyology and Fisheries Science
DLIST – Distance Learning and Information Sharing Tool
EEU – Environmental Evaluation Unit
EGS – Department of Environmental and Geographical Science
FAO – Food and Agriculture Organization
FOA – Fisheries Observer Agency
GBIF – Global Biodiversity Information Facility
GloBallast – Global Ballast Water Management Programme
GOOS – Global Ocean Observing System
GTZ – Gessellschaft Technische Zusammenarbeit
ICSU – International Council for Science
IECM – Integrated Environmental and Coastal Management
IMBER - Integrated Marine Biogeochemistry and Ecosystem Research
INIP - Instituto Nacional de Investigação Pesqueira
IOI - International Ocean Institute
IOI-SA – International Ocean Institute – South Africa
M&CM – Marine and Coastal Management
M&E – Monitoring and Evaluation
MARAM - Marine Resource Assessment and Management
MA-RE - Marine Research Institute
MFMR – Ministry of Fisheries and Marine Resources
MRSU - Marine Remote Sensing Unit
NACOMA - Namib Coast Biodiversity Conservation and Management
NAMFI - Namibian Maritime and Fisheries Institute
NATMIRC – National Marine Information and Research Center
NEPAD – New Partnership for Africa’s Development
NIWA – National Institute of Water and Atmospheric Research
NMMU – Nelson Mandela Metropolitan University
ODINAFRICA – The Ocean Data and Information Network for Africa
PLAAS – Programme for Land and Agrarian Studies

RU – Rhodes University
SABIF – South Africa Biodiversity Information Facility
SADC FANR – Food Agriculture & Natural Resources
SAEON – South African Environmental Observation Network
SAIAB – South African Institute for Aquatic Biodiversity
SAIEA - South African Institute for Environmental Assessment
SANCOR - Southern African Network for Coastal and Oceanic Research
SCOR - Scientific Committee on Oceanic Research
SEAFO - South East Atlantic Fisheries Organization
SEAON - South African Environmental Observation Network
SIDA - Swedish International Development Cooperation Agency
START - SysTEM for Analysis, Research and Training
SUN - Stellenbosch University
SWIOFP - South West Indian Ocean Fisheries Project
TCB - Training and Capacity Building
TSC - TRAIN-SEA-COAST
UAN - University of Agostinho Neto
UCT - University of Cape Town
UCT - University of Cape Town
UNAM - University of Namibia
UP - University of Pretoria
UWC - University of the Western Cape
UWC- University of the Western Cape
WIO-Lab - Addressing Land-based Activities in the Western Indian Ocean
WIOMSA - Western Indian Ocean Marine Science Association
Wits - University of Witwatersrand
WSSD - World Summit on Sustainable Development

Bibliography:

- Anon 1998. Report of BENEFIT Training Workshop, Cape Town, 8-9 June 1998. BENEFIT Secretariat, Swakopmund, Namibia. 17 pp.
- Anon 1999a. Report of BENEFIT Training Workshop, Cape Town, 28-29 April 1999. BENEFIT Secretariat, Swakopmund, Namibia. 14 pp + Appendices.
- Anon 1999b. Report of BENEFIT Training Working Group Meeting, Windhoek, 9 – 11 August 1999. BENEFIT Secretariat, Swakopmund, Namibia.
- Anon 1999c. BENEFIT Training Plan. BENEFIT Secretariat, c/o National Marine Information and Research Centre Ministry of Fisheries and Marine Resources, Swakopmund. 51 pp.
- Sherman, K. & Duda, A.M. 1999 An ecosystem approach to global assessment and management of coastal waters. *Marine Ecology Progress Series*, vol. 190:271-287
- Anon 2001d. Training Institutes in the SADC Region, pp. 34. Intergovernmental Oceanographic Commission, Principles for the Global Ocean Observing System (GOOS) Capacity Building, UNESCO 2001. GOOS Report No. 69. IOC/INF-1158
- Cicin-Sain, B. editor-in-chief and Chua, T.E., Yáñez-arancibia A. and Vallega A. associated editors 2002 *Ocean and Coastal Management*, Special Issue. Capacity building – papers from the Global conference on Oceans and Coasts at Rio+10. vol. 45
- [Clark, B., Laros, M.T & Atkinson L.J. 2004 Training and Capacity Needs Assessment for the BCLME. Anchor Environmental Consultants Cc. 184pp](#)
- [Anon 2004a Report on the](#) Consultative meeting on capacity building and training for effective management of the Benguela current large marine ecosystem (BCLME) 15th-16th March 2004, Safari Hotel, Windhoek, Namibia
- [Anon 2005 Report on](#) Strategic workshop on training needs and capacity building for effective, integrated and sustainable management of the Benguela Current Large Marine Ecosystem. Johannesburg, South Africa
- Anon 2005a The Project Ev/03/05 "Built Capacity for Angola" Inventory of existing laboratorial capacity in Angola: Space, Equipment, and Type Of Analyses That Can Be Performed
- Anon 2005b Project ev/03/05 "Built capacity for Angola" evaluation of technical Capacity in terms of numbers of researchers/technicians, degree of expertise (Formal qualifications plus experience with particular analytical techniques and identify deficiencies or gaps which need to be filled in order to meet the countries requirements.
- Anon 2005c Project ev/03/05 "Built capacity for Angola" Proposal of a course of action or recommendations to fill gaps and deficiencies, in terms of numbers, training and equipment of techniques.
- Anon 2005 Project Document: Bridging Benefit in Preparation for the Interim Benguela Commission. Project of the Norwegian Embassy in Pretoria, South Africa in conjunction with the BENEFIT Management Action Committee.
- Clark, B & Duffel-Canham, A. 2006 Integration And Review Of Training And Capacity Building In The BCLME Programme, 42pp

Websites Visited:

<http://www.dlist-benguela.org>.
<http://www.nacoma.org.na>
<http://www.norway.org.za/development/bilateral/Fisheries/Marine+Fisheries+Co-operation.htm>.
<http://www.gtz.de>
<http://www.capeaction.org.za/>
<http://www.odinafrica.org/>
<http://www.gbif.org>
<http://www.ioc-goos.org>
<http://www.start.org/>
<http://www.scor-int.org>
<http://www.sadc.int>
<http://www.nepadcosmar.org>
<http://www.icsu.org>
http://www.fao.org/waicent/portal/virtualibrary_en.asp <http://www.imber.info/index.html>
<http://www.globallast.imo.org/index>
<http://www.ur097.ird.fr/index.htm>
<http://acep.co.za>
<http://www.wiomsa.org>
<http://www.wiolab.org>
<http://www.saeon.ac.za>
<http://www.sida.se>
<http://www.botany.uwc.ac.za/sancor>

ANNEX 1. List of People Consulted/Interviewed
ANGOLA

Name	Position	Organization
Maria de Lourdes Sardinha	Director: BCLME Biodiversity, Ecosystem Health and Pollution Activity Centre	BCMLE Programme/UNOPS
Dr Nkosi Luyeye	Deputy Director of Instituto Nacional de Investigaç�o Pesqueira (INIP)	INIP
Ms. Filomena Vaz Velho	Scientist	INIP
Dr Domingos Neto	Scientist	INIP
Dr Augusta Silva	Head of Microbiology	Faculty of Science, University of Agostino Neto
Prof Pedro De Baros	Professor	University of the Algarve
Mr. Carlos dos Santos	Director	Ministry of Urban Planning and Environment

Namibia

Name	Position	Organization
Dr Mick O’Toole	Chief Technical Adviser	BCLME Programme
Mr. Frikkie Botes	Director: BCLME Living Marine Resources Activity Centre	BCLME Programme
Dr Gabi Schneider	Director, Geological Survey	MME
Mr. Japhet Iitenge	Dep. Director Pollution	Directorate Maritime Affairs, MWTC
Dr Moses Maurihungirire	Director MFMR	MFMR
Mr Chris Batholomae	Scientist	DRM, MFMR
Ms Anja van der Plaas	Scientist	MFMR
Dr Anja Kreiner	Scientist	MFMR
Mr. Rudy Cloete	Deputy Director: Offshore	MFMR
Mr. Titus Iilende	Deputy Director	MFMR
Ms Hilaria Shivolo	Training Officer	MFMR
Mr. Keith Wearne	Director	CETN
Mr Rod Braby	Technical Advisor	NACOMA
Mr. Helen Kolb	Director	Gobabeb Training Center

South Africa

Name	Position	Organization
Ms Lesley Staegemann	Director: Environment Variability Activity Centre	BCLME Programme
Dr Johann Augustyn	Chief Director: Research, Antarctic Islands and	M&CM
Mr. Ashley Naidoo	Deputy Director: Research, Support and Administration	M&CM
Dr Larry Hutchings	Chief Specialist Scientist: Ecosystem Utilization and Conservation	M&CM
Dr Carl van der Lingen	Specialist Scientist: Offshore Resources – Surveys and Fish Behaviour	M&CM
Dr Ray Barlow	Principle Scientist: Phys-Chemistry Oceanography	M&CM
Dr Hans Verheye	Principle Specialist Scientist: Ocean Environment, Biological Oceanography	M&CM
Dr Andy Cockcroft	Principle Specialist Scientist: Inshore Resources	M&CM
Dr Rob Crawford	Chief Specialist Scientist: Ecosystem Utilization and Conservation	M&CM
Mr. Chris Wilke	Control Oceanographic Technician: Inshore Resources	M&CM

Mr. Rob Cooper	Control Oceanographic Technician: Offshore Resources	M&CM
Dr John Field	Director	MA-RE Institute
Dr Frank Shillington	Senior Researcher & Lecturer	UCT-Oceanography
Dr Kim Prochazka	Director	IOI-SA
Dr Mark Gibbons	Senior Researcher & Lecturer	UWC
Mr. Conrad Sparks	Senior Lecturer	CPUT

ANNEX 2: BCLME SAP IMPLEMENTATION PROJECT TRAINING AND CAPACITY BUILDING SURVEY

Instructions for completing this form

The SAP implementation project of the BCLME requires that a plan for Training & Capacity Building and (TCB) is developed and implemented over the life of the programme which is expected to run from 2008-2012. Part of this task is to review the status of TCB and develop a fresh training plan with prioritized activities for each country and the region as a whole. Through the BCLME country focal points, we wish to canvass for input into this process. We request that you contribute to this process by filling the form the form below according to the instructions.

We would like to know what in your view are the prioritized training and capacity building needs of your department / agency / institute. This will be collated and developed into an in service training plan for the SAP implementation project. Aside from the formal training courses or programme, other training needs such as bursaries for formal training, internship programme or mentorship programmes should also be considered.

Please copy the template below as many times as are necessary.
Please fill in completely as per the example below.

ACTIVITY 1

(Give a descriptive name for the training required)

Level

(basic, intermediate and/ or advanced)

Target Group

(please identify to whom the training should be offered and the number of prospective trainees)

Rationale

(Please answer the questions posed):

Why is there a need for this training?

Has there been any training in this regard before?

Additional Information

(Please answer the questions posed):

How should the training be delivered?

What national activities in this area are planned and could these be expanded to include trainees from outside your country?

Any additional notes?

Example Below

ACTIVITY 1

Environmental Impact Assessment Training

Level

Advanced

Target Group

Managers in Ministry of Fisheries, Environment, Petroleum

Rationale

Why is there a need for this training?

There is extensive development happening on our coastline with new industry (e.g. oil and aquaculture) and property development taking place

Has there been any training in this regard before?

Some training has already been affected but this has not been comprehensive and more people who require this skill have been employed and thus extended training is required.

Additional Information

(Please answer the questions posed):

How should the training be delivered?

Formal lectures followed by field trips to sites where EIA have been conducted and sites where EIA's need to be or will be conducted.

What national activities in this area are planned and could these be expanded to include trainees from outside your country?

NatMIRC, aquaculture section will be hosting such a course, facilitated by SAEIA consultancies, the training can be expanded to include trainees from the partner countries provided funding for travel, per diem and accommodation is provided by the countries or the SAP Implementation project.

Any additional notes?

No comment

ANNEX 3: BCLME SAP IMPLEMENTATION PROJECT DEVELOPMENT GUIDELINES ON REQUIREMENTS FROM THE CAPACITY BUILDING & TRAINING

Objective of Review

- A. To identify the various capacity building and training needs for the participating countries in order to meet the requirements of the BCLME Programme and its Interim Agreement.

Elaboration

The three countries have adopted a Benguela Current Commission (BCC) and associated Interim Agreement (details of which can be found on the BCLME Programme website (www.bclme.org)). The BCC represents a formal institutional structure that will help Angola, Namibia and South Africa to implement an “ecosystem approach” to managing the BCLME. This means that, instead of managing living and non-living marine resources at the national level, the three countries will work together to tackle transboundary environmental issues such as pollution, the management of shared fish stocks and the coordination of regional efforts to mitigate the impacts of marine mining and oil and gas production on the environment.

GEF and a number of other regional and international partners are now working together to develop and fund a project that will aid the countries in setting up and sustaining the appropriate structures and governance arrangements in support of this transboundary management approach toward the LME (as defined within the BCLME Strategic Action programme). However, GEF and its partners recognise the need for effective management to include full and transparent stakeholder participation in appropriate areas of policy and governance. They also recognise that there will be a need to strengthen institutional and individual capacities in order to meet the demands and challenges of a transboundary ecosystem management approach.

It is necessary, therefore, to review existing CB&T needs and to align these with the requirements of the BCLME SAP Implementation Project so as to identify a strategy for addressing these needs and delivering effective CB&T to the countries in support of the BCLME Programme and the aims and objectives of the BCC.

Furthermore, it is necessary to develop a plan that will ensure the appropriate involvement of all stakeholders in policy and management decisions related to both the BCLME SAP Implementation Project activities, and the development of the BCC and an associated Treaty.

Report Structure

The following information/sections will need to be incorporated within the two finalised reports in order to satisfy the requirements for the Project Document and its acceptance by GEF. It may be more convenient or practicable for the consultants to re-structure these sections to suit the presentation of the report. This is acceptable as long as the information is provided and is presented in a logical and easily accessible format:

1. Summary of Capacity Building and Training Needs for the BCLME Programme Countries

2. A Review of the Existing Programmes and Initiatives within the countries and the Region for Capacity Building and Training related to the BCLME Programme Although primarily focused on BCLME-related issues, this review should extend beyond the more obvious assistance with CB&T needs related to fisheries and coastal/marine management and should also give appropriate consideration to any CB&T related to good governance, administration, enforcement, etc that may be outside of the immediate BCLME thematic areas but may still be appropriate to the long-term aims of establishing a regional Commission with national implementation.

3. Identification of CB&T Priorities and Requirements by Country and by Sector/Agency as related to the BCLME Programme Again, although primarily focusing on BCLME thematic issues, this section should also identify any general or overarching needs for improvements in capacity and skills related to good governance *per se*.

4. A Proposed Strategy for Delivering the Prioritized CB&T requirements for each country and within the region This Strategy should:

- be presented as a sequential work-plan extending throughout the lifecycle of the BCLME SAP Implementation Project (2008 through 2012)
- address individual country requirements as well as overall regional requirements (the latter focusing on the need for transboundary management of the LME and its resources).
- define, where appropriate, administrative, equipment and personnel needs (nationally and regionally).
- aim to identify appropriate institutions within the region or beyond that could best assist in specific elements of CB&T.
- identify an effective monitoring mechanism to ensure CB&T delivery as scheduled and to assess the efficacy and sustainability of the CB&T
- define a best-estimate budget for delivery of the strategy throughout the Project's lifetime (including any specific personnel requirements to assist in delivery of the strategy)

5. An Annex that identifies national/regional institutions that are capable of delivering CB&T needs as well as international partner organizations that may be able to assist This Annex will consider the various academic and technical institutes within the region and, where appropriate, internationally and will present a case for their use in CB&T, with explanations of their areas of expertise, and identification of positive and negative attributes in relation to the needs of the BCLME SAP Implementation Project.