



ANNEX I - A

BCLME Project Reference Number: BCLME/EEWS/05/01
Development of and making operational, a viable and integrative
Environmental Early Warning System (EEWS) for the BCLME

Background:

The Benguela Current Large Marine Ecosystem (BCLME) Programme is a multi-sectoral initiative by Angola, Namibia and South Africa to facilitate the integrated management, sustainable development and protection of the Ecosystem. It is funded by the Global Environment Facility through the United Nations Development Programme with financial and in-kind contributions by the three member countries.

Assessment of environmental variability, ecosystem impacts and improvement of predictability is a key policy action of the BCLME Strategic Action Programme (SAP). Two important components of this policy action are the development of an environmental early warning system and the improvement of predictability of extreme events. To enable these, the Environmental Variability Activity Group (EVAG) has since 2003 commissioned a suite of relevant projects that are intended to provide the essential building blocks for the development and implementation (making operational) of the envisaged EEWS for the BCLME region, and a significant step forward was taken in November 2004 when the International Workshop on Forecasting and Data Assimilation in the Benguela and Comparable Systems, sponsored by ten international, regional and national organizations, was held in Cape Town. Drawing on the body of information derived from the commissioned work and the Workshop, the BCLME Programme is now embarking on the final step of the development and implementation of a cost-effective EEWS for the region. The output from this project will be consistent with the requirements of the BCLME Project Document (and the LOGFRAME as revised in 2003) and BCLME Programme Mid-Term Review Report.

Objective:

The objective of Project BCLME/EEWS is to develop and make operational, in close collaboration with appropriate management and academic institutions in Angola, Namibia and South Africa, an affordable, sustainable and user-friendly Environmental Early Warning System for the BCLME region (relevant to activities in the EEZs of the three countries) to complement resource-based data and information and thereby enable the Interim Benguela Current Commission to make informed decisions to ensure the integrated management, sustainable development and protection of the Benguela Current large Marine Ecosystem.

Scope of Project BCLME/EEWS/05/01

The EEWS which this project aims to develop and implement is intended to provide managers and decision makers in the BCLME region with information about, and advanced warning of, extreme and unusual natural environmental events (cf. hazard warning) and environmental changes that will or may impact significantly on the distribution and abundance of key harvested resources and/or on the ecosystem as a whole, as well as on other activities within the EEZs of Angola, Namibia and South Africa. The BCLME EEWS will be system wide, address a range of time and space scales relevant to resource and operational management, and augment national early warning systems where these exist. High priority geographical areas that fall within the scope of this project are the marine boundary zones between Angola and Namibia (Angola-Benguela Front - ABF) and between Namibia and South Africa (Lüderitz-Orange River Cone area).

The Contractor will be expected to do the following:

- Collaborate closely with the relevant management, industry and academic institutions in Angola, Namibia and South Africa that have a need for, or which are involved in the provision of, data, information and understanding of the environment and environmental processes which impact on the living marine resources of the BCLME and on other activities relevant to activities within the EEZs of the three countries

- Build on, develop further, and help implement the emerging State of Environment Information Sub-System for the BCLME. [Note: This Sub-System is Component A of the broader State of Ecosystem Information System, under development. BCLME Project: BCLME/SEIS/05/01]
- Be familiar with the numerical ocean circulation models and modeling work undertaken by the BCLME Programme to date and be competent to utilize these fully (and adapt where necessary) as well other appropriate models.
- Through the use of various ocean circulation models (with proper inter-comparison between models) together with remotely sensed and in situ measurements such as may be provided by State of Environment Sub-System etc develop an EEWS as per the Objective (above), and make this EEWS operational. In particular, the EEWS should address: ABF variability that impacts on resources shared between Namibia and Angola– including Benguela Niños and Niñas; inputs needed to improve the predictability of low oxygen events that impact on hake and benthic resources; processes and variability in the Lüderitz-Orange River Cone area *vis-à-vis* e.g. hake to support decisions about resources that are shared between or straddle the geopolitical boundary between Namibia and South Africa; other aspects of environmental variability that are relevant to various activities in the EEZs of Angola, Namibia and South Africa, e.g. early warning of outbreaks of harmful algal blooms, hydrogen sulphide events (northern Benguela) and rock lobster walkouts
- Play an active and integrating role to enable the Environmental Variability Advisory Group (EVAG) of the BCLME Programme to meet its obligations as specified in the BCLME Strategic Action Programme, Project Document and Revised LOGFRAME.

Outputs Required:

- Suitable numerical model derived environmental products delivered in near real time (e.g. sea temperature, currents, thermocline structure at specific locations).
- Various products relevant to the forecasting of low oxygen water, harmful algal blooms, hydrogen sulphide events, transfer of pollutants, etc. as required for operational resource management
- Various products that are or may be relevant to operational activities in the EEZs of Angola, Namibia and South Africa

- User-friendly interpretations of all of the above.
- Various modeling inputs required by other BCLME projects.
- A fully operational EEWS for the BCLME region. (Note that the EEWS should be capable of being adapted/expanded to incorporate future elements as they become operational.)
- A viable (affordable, implementable and sustainable) plan, developed in close consultation with management agencies, academic institutions and other users, for consideration by the IBCC that will enable the continuation of the EEWS after completion of the present contract.
- Build local capacity and assist with technology transfer wherever possible

Note: The above outputs will need to take into account and be harmonized with outputs of BCLME/SEIS/05/01 - Component A: State of Environment Information Sub-system.

[Potentially important output products from BCLME/SEIS/05/01 relevant to EEWS would include, *inter alia*,

- Suitable environmental observational products (e.g. weekly and monthly satellite derived sea surface temperature, chlorophyll, sea level, wind speed and direction etc.) fields and anomalies for the equatorial Atlantic Ocean, the Angola Benguela Frontal Zone, and the Lüderitz-Orange River Cone regions and Agulhas Retroflexion area.
- Suitable vertical observational transects of temperature, salinity, oxygen and other environmental parameters (e.g. sections from the monthly transects from Swakopmund and St. Helena Bay)]

Timetable:

- The project should commence during November 2005, and run until the end of the BCLME Programme.
- April 2006: anticipated beginning of the RSOEIS observational products (both satellite and vertical observations).
- August 2006: Results of suitable model investigations.
- January 2007: First near real time model output.
- March 2007: Consultative Workshop/Meeting
- April 2007: Pilot integrated Environmental Early Warning System in place.

- November 2007: Hand over of fully functional EEWS to appropriate operational agency (IBCC) for continued EEWS operations.

Criteria for Participation:

Potential contractors

- Would be expected to include nationals of Angola, Namibia and South Africa in their team
- Should involve at least one international partner organization which has competence in ocean numerical modeling and information systems in the execution of the project
- Must have a proven track record of delivery
- Must have demonstrable capability to lead and undertake the work and project management, *inter alia*,
 - expertise and capacity to undertake the necessary numerical modeling, data assimilation, interpretation and assessments
 - in collaboration across disciplines and with government management agencies
 - in developing operational strategies to address the needs of integrated management and sustainable development
 - in production of reports, hand books, computer generated products, peer-reviewed technical publications etc

Attention of potential contractors is drawn to the penultimate bullet of the Proposal/Tender Requirements in respect of co-financing.

Budget:

Please note that the estimated maximum budget for this Project (Reference Number: BCLME/EEWS/05/01) is 100 000 US Dollars (\$)

PROPOSAL/TENDER REQUIREMENTS

Contractors wishing to submit proposals/tenders in respect of the above project are required to provide the following:

- Name of organisation/firm or individual/s submitting Tender
- Full particulars of Project Leader, Co-leaders and personnel who will be involved in the project (Abridged CVs for each participant outlining qualifications and quantifiable experience should be appended.) In the event of the designated Project Leader not being available for all or part of the project execution, please indicate who would be the responsible leader.
- Detailed work plan and timetable showing clearly how the Tenderer proposes to address the Project objectives, scope of work and meet the output requirements. The intended approach should be fully specified and linked to the timetable and incorporated into the work plan.
- Full details of capacity building and training that will be undertaken by the Tenderer must be specified.
- The Tenderer should indicate how the Criteria for Participation will be met.
- The Tenderer should specify value of their in-kind contribution to the project and the amount of co-finance they are able to lever or contribute directly.
- The Tenderer must state the total tender price for undertaking the work as specified. In addition, a comprehensive breakdown of costs (in the requisite UNOPS format of: labour/salaries, running and capital equipment), and linked to the timetable must be provided. Costs associated with capacity building and/or training should be clearly specified.
All costing should be in US\$.