

Report on the workshop on coastal and marine biodiversity of Indian Ocean held at Goa (12-15 December 2003)

1. Introduction:

During the coastal sessions of the Conference on the Indian Ocean Global Ocean Observing System (IOGOOS) at Mauritius in November 2002, most participants agreed that sustained observations at multiple levels of the coastal habitats and their biodiversity should be developed as a Pilot Project. It was also recognized that the full scope of the problem could not be addressed uniquely within the context of IOGOOS, and that there was also need for a parallel research programme on the topic.

Dr. Shubha Sathyendranath, executive Director of Partnership for Observation of the Global Oceans (POGO) proposed that a regional workshop, with participants drawn from all Indian Ocean Rim countries and some experts from outside the region, could help focus our research efforts on marine biodiversity and foster better co-operation between the countries of the region, that could eventually lend focus to pilot projects on biodiversity. It was also recognized that the international programme Census of Marine Life (CoML) could provide just the right framework for such an initiative. The present workshop owes its origin to these considered thoughts.

2. Funding and other support:

POGO, playing the role of facilitator, secured a support of 45,000 US\$ from Sloan Foundation and 10,000 US\$ from IOC regional office at Perth. The National Institute of Oceanography (India) provided permission to Dr. Wafar to spend a substantial part of his time away from regular assignments in order to organize the workshop and get the proceedings published as well as routine logistic and infrastructure support.

3. Venue and date:

Goa, India. 12-15 December 2003

4. Organization of the workshop:

- Presentations by Sloan Foundation, POGO and IOGOOS representatives of the activities of their respective organizations and their expectations from the workshop.
- Presentation by invited scientists from Indian Ocean rim countries on the current status of coastal and marine biodiversity in the region.

- Discussions in Working Groups to identify new projects and linkages among the regional institutions and existing initiatives.
- Discussions in plenary on mechanisms to take the initiative forward.

(Copy of the agenda attached as Annex 1, list of participants as Annex 2)

5. Formation of working groups:

Midway through the workshop, the participants were asked to discuss and form the working groups. Moderated by Dr. Shubha Sathyendranath, participants of this session identified three themes (coastal, offshore including deep-sea mounts and data and information). The composition of the 3 WGs are as follows:

Coastal:

Offshore: B. Ingole, T. Coslow, S. Bussarawit, S. Nayak and S. Sathyendranath

Data and Information: Dinh Van Vu, H. Negaresten, J. Bijoux, D. Gangapersad, V. Chavan, M. Osore, E. Vanden Berghe, C. Wallace, S. Kumar and V. Agadi

6. Outcomes of the deliberations of the Working Group on coastal biodiversity:

The focus of this WG was defined as being “driven by Keystone Ecosystems because they are critical in coastal regions and because of their economic importance and as habitat for the majority of the region’s biodiversity”. The Keystone ecosystems identified are: Coral Reefs, Mangroves, Seagrass beds and Rocky shores.

The WG identified the following objectives (of research):

1. Improve existing inventories of species, distribution and abundance, Establish baselines of biodiversity, Monitor Changes in biodiversity over time
2. Compare biodiversity within the region and within countries, compare across a gradient of human impact
3. Assess driving forces causing changes in biodiversity in space and time (including through the gathering of indigenous knowledge)
4. Enable some predictive capability based on the above (look to the future of marine diversity in the Indian Ocean)

The following strategies were considered to achieve the above objectives:

1. Consolidate existing information on biodiversity – (link to part of data working group)
2. Establish a list of experts within the region – (link to part of data working group)

3. Develop and implement common protocols and variables to be measured
4. Facilitate capacity building in both taxonomy and use of common protocols and other tools (some in collaboration with existing activities e.g. IOGOOS)
5. Plan and carry out field Program to achieve the objectives and where possible link these to existing national or international programs
6. Develop strategy for long term monitoring (observing system for IOGOOS)

The WG foresaw the practical applications of the knowledge as “Informed advice to Natural Resource Planners and Managers for conservation and restoration”

The following timelines were set:

- Completion of the (realization of) Strategies in 5 years
- Completion of the report in 2009
- Decision on mechanism for post-CoML activities in 2010

During the final discussion, it was agreed that a proposal similar to an IOGOOS proposal on monitoring of keystone coastal ecosystems, integrating the remote sensing and participatory monitoring components, be prepared. The keystone ecosystems identified were coral reefs, mangroves, sea grass beds and rocky shores. An Interim Task Force consisting of Dr. Venkatraman, Dr. Wafar, Dr. Ghaffar, Dr. Gangepersad and Dr. Wagner was constituted to draft the proposal and Dr. Wagner agreed to draft the proposal.

7. Outcomes of the deliberations of the Working Group on deep-sea biodiversity:

The WG recognized that the deep-sea ecosystems of the Indian Ocean remain extremely poorly known, especially in comparison with the Atlantic and Pacific Oceans. The WG noted that substantial fisheries for orange roughy, oreos, alfonsino and other deepwater species have developed over the seamounts in the south-western Indian Ocean and that the deepwater trawl operations for these fisheries may severely impact seamount benthic communities, essentially removing the diverse corals and associated fauna that often cover the seamount summit and slopes.

The Indian Ocean appears to have an intermediate number of seamounts: more than the relatively impoverished Atlantic Ocean (only an estimated 810 seamounts in the North Atlantic > 100 m in height) but fewer than the Pacific with its estimated 600,000 – 1.5 million of similar size, distributed in a diverse system of chains and clusters. Most seamounts in the Indian Ocean are relatively small and distributed along the dominant ridge systems. This led the WG to believe that the diversity of the seamount fauna in the Indian Ocean will also be intermediate between that of the Atlantic and southwest Pacific. Besides, such sea amounts, if those of the southwest Pacific are taken as examples, must have a high degree of endemism.

The WG noted that there has not been a single comprehensive faunal survey of a seamount to date in the Indian Ocean and hence proposed the development of an Indian Ocean deep-sea project focussing on seamounts, that would form part of the proposed CoML Seamounts project and would potentially provide links to other deep-sea and open ocean projects, as well as to IOGOOS. Accordingly, the WG made the recommendations that the WG leaders would approach their respective organizations or government agencies for ship-time and research support and that they may seek support from the Census of Marine Life and its Seamount Project for funds to support international collaborative proposal development and for review of past seamount data and samples from the region.

8. Outcomes of the deliberations of the Working Group on data and information management:

The Data & Information Working Group (DIWG) was entrusted with developing a framework and a work plan for initiating Ocean Biogeographic Information System (OBIS) activities within the Indian Ocean region, referred to as Indian Ocean Biogeographical Information System [IndOBIS]. This group was also expected to come up with suggestions for other biological data and information related activities and issues within the region.

As a first step this group identified data & information issues and activities in the context of the Indian Ocean biodiversity sorted into the following functional groups.

Information Systems

1. Indian Ocean Species Checklist (taxon schema should be taken care).
2. Digital Literature Databank (Identification keys, biogeographical information, original descriptions)
3. Taxonomic expertise (people and institutions) database
4. Database on Datasets (list all existing databases) – Survey
5. Collections (museums and specimens) database both within and outside the region. Access to Biological Collections Outside the region (identified and unidentified).
6. Computer assisted taxonomy and Electronic field guides.
7. Invasive and alien species – can be part of species checklist.

Data Management Issues

Data exchange policy and protocols (IPR, Copyrights, Credits, Acknowledgements, Fair Use)

Data Management including backup and data streams (IO-GOOS help would be essential), IPR, ethics in the research.

Documentation of Working Plan and mechanism so that individual scientists can use this in their home country / institutions to seek support and collaborations.

Who are our clientele and how are we going to attract them?

Infrastructure and Capacity Building

Software and Hardware

Data collection tools (we need distinction between data rescue and archival, capture as it is generated). Data analysis and interpretation tools.

Multilingual dissemination.

Capacity building activities in data management at various levels, and data formats, quality control. We need capacity building for biologists and other for data managers.

Implementation Mechanisms

Coordination with IGOOS on interoperability, what are parameters need to be observed. How can we work with them in concrete manner, how they can assist us in IT aspects both in terms of data repository and archiving our datasets and also in connectivity.

Consultation with other OBIS nodes.

Coordination with Indian Ocean Tuna Commission, and other similar global and regional systems/networks.

Funding and Infrastructure needs and mechanisms.

Documentation of Working Plan and mechanism so that individual scientists can use this in their home country / institutions to seek support and collaborations.

Cross-Cutting Issues

Taxonomic Networking (institutions and people)

Taxonomic Clearing House – certifying, authenticating and validating service.

Visible Products – print publications, CD-ROMs, Websites.

After having prioritized the issues, a small drafting group was constituted to draft vision and mission statements as well as long-term activities. The group also deliberated on the criteria for selection, modalities of selection, and timeline of the potential agency / institute to host IndOBIS secretariat. These are as follows:

Identification of institution as regional node – (agency with technical capability, domain expertise, existing activity). Criteria development for selection. Call for expression of interest (4 month – call for expression of interest, 6 month – regional node is identified). – GBIF Call for interest.

Initial list of criteria for selection of host institution for the IndOBIS Node:

- data/information management expertise
- hardware, software and networking capacity
- administrative & logistical support; ability and willingness to contribute to the funding for the secretariat
- ability to generate funding for sustained operations after OBIS seed funding
- easy to reach
- reliability and past experience
- relevant infrastructure/capacity

The DIWG also discussed the composition of the interim Task Force on Data & Information Management and agreed on the following composition keeping in mind the sub-regional representation, taxonomic, data management, modeling-simulation expertise, and linkages with the OBIS and IODE networks.

Sub-regional representation (2)

- Charlie Griffiths (Western Indian Ocean),
- John Keesing (Eastern Indian Ocean),

Data management expertise (1)

Vishwas Chavan,

OBIS representation (1)

- to be nominated,

Taxonomy expert (1)

- to be decided,

IODE representation (1)

- Edward Vanden Berghe,

Data modeler – population dynamics (1)

- Hossein Negarestan.

A tentative long term plan with 2010 as a deadline was also identified:

- A web page for each species in the Indian Ocean region (commercial, ecological and genetic, distribution, description both morphological and anatomical, illustrations, links to other datasets, conservation, threat and invasive status). Such a page would serve needs of common people, education and needs of the researchers and managers.
- Geography based products. Identification of biodiversity hotspots.
- Ability to generate species list on the fly and also geography based identification keys on the fly.
- Time series, multi-dimensional GIS and RS data integration.
- System that keeps track of all information relevant to biodiversity in the Indian Ocean region (people, institutions, collections, literature, indigenous knowledge, past and ongoing projects).
- Mechanism to capture information as it is generated.
- Data analysis, visualization and interpretation tools, expert systems development.
- Interoperability and integration of other datasets such as geographic, physics, chemical, genetic, meteorological and climatologically and also socio-economic ones.

- Various modes of information dissemination are needed in view of the disparity in information/communication infrastructure.

Dr. Vishwas Chavan, Dr. Edward Vanden Berghe and Dr. Charlie Griffiths were elected to form the representation from DIWG to the regional interim coordinating committee

The DIWG also decided that a proposal to the Global Biodiversity Information Facility (GBIF) for creation of electronic catalogues would be prepared and submitted. The DIWG felt that efforts should be made to secure additional funding from Aquatic Sciences and Fisheries Abstract (ASFA) services for development of Digital Literature Bank for pre-1970 literature.

9. Outcomes of the discussions in Plenary:

A co-ordinating committee with the following composition was proposed: Representation from Eastern (1), Central (1) and Western (1) Indian Ocean and Island States (1), Coastal (1), Open-Ocean (1) and Data and Information Groups (1), CoML (1), OBIS (1) and IO-GOOS (1).

A member elected from among the above (excluding CoML, OBIS and IOGOOS representatives) will act as Chair of the Committee.

The duties and responsibilities of the Coordinating Committee shall be to provide:

- a. Co-ordination between individual programs
- b. Co-ordination between National Efforts and National Committees
- c. Links to International CoML Efforts outside the IO Region
- d. Links to other organizations and programs of relevance
- e. Links to capacity building, data management activities
- f. Opportunities for Education and Outreach
- g. Steps to synthesize and integrate the results

The Committee will participate in raising funds for regional activities, for coordination and international meetings, workshops, etc.

The Committee will meet at least annually to review progress and recommend future activities.

Each member will remain in the Committee for a period of 2 years; (appointment of the initial committee may be for 2 years for half the committee and 3 years for the remaining half). May be renewable for a period of another two years; No more than 1/3 of the committee may rotate out at the same time.

NIO shall be requested to host a secretariat for a period of 6 years.

The Plenary also identified the following composition for the task forces:

Task Force for Data and Information WG: Sub-regional representation of 2 (Eastern and Western), Data Management Expert (1), OBIS (1), Taxonomy Expert (1), IODE (biology side) (1), Modelling, Simulation and Assimilation (1)

Task Force for Coastal Group: 8 regional representatives, ensuring at the same time that there is at least one expert on mangroves, corals, seagrass beds, rocky shores, and taxonomy

Task Force for Offshore and Sea Mounts: Representation from Australia, India, Island Nations, South Africa, New Zealand and selected Extra-region participants.

The following were the duties and responsibilities of Each Task Force:

1. Formulation of international science plan
2. Communicate with national committees/bodies regularly
3. To monitor and report on progress of the particular project
4. Report to coordinating committee
5. Plan and co-ordinate scientific efforts in the particular programs
6. Ensure data transmission to the data and information group
7. Produce sampling protocols
8. Raise funds for regional activities through international agencies to supplement national sources
9. Meet at least annually at the same time as the coordinating committee, and additionally if needed, and if funding permits

The Plenary also recognized that:

Links to National Committees are important and hence representatives from each country should strive to establish formal links between national CoML initiatives and National Committees for Biodiversity.

The Co-ordinating committee needs to facilitate the process of formal contacts of CoML with the National Committees.

There is a need to involve extra-regional countries for augment regional effort