Intergovernmental Oceanographic Commission
Workshop Report No. 172

IOC-Flanders-IPIMAR Workshop on Ocean Data Management in the IOCINCWIO Region (ODINEA Project)

Organised in cooperation with the:
Fisheries and Sea Research Institute (IPIMAR)

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This is the third and final in a series of three training workshops within the framework of the Ocean Data and Information Network for Eastern Africa (ODINEA), an oceanographic data management capacity building project implemented in the IOCINCWIO region, jointly sponsored by the Government of Flanders and IOC.
In this final workshop, the participating countries (Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania) reviewed the successes and failures of the 3-year project and formulated concrete recommendations that can be taken into consideration within the ODINAFRICA-II project.

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1. INTRODUCTION AND OPENING

The IOC-Flanders Workshop on Ocean Data and Information Management in the IOCINCWIO region (ODINEA Project) was held at the Fisheries and Sea Research Institute (IPIMAR), Lisbon, Portugal from 25-27 October 2000. This was the fourth workshop on ocean data and management organised within the framework of the Ocean Data and Information Network for Africa (ODINEA). The purpose of the workshop was to review the implementation of the ODINEA project, in order to identify successes and failures and recommend actions that need to be taken to improve on the implementation of the second phase of ODINAFRICA, based on lessons learnt during this phase.

Welcoming the participants, the Vice President of IPIMAR, Dr Costa Monteiro expressed great pleasure that the workshop is being held in his institution. Dr Monteiro outlined the activities of IPIMAR which are implemented within the framework of the following programmes: aquatic environment, fishing technology and exploration, marine resources, scientific and technical information and documentation, fisheries socio-economics, aquaculture, and fish product innovation and development. IPIMAR has several cooperation programmes with Portuguese speaking African countries. He invited participants to make use of available opportunity to visit the IPIMAR libraries, which is one of the most important for marine sciences in Portugal.

Mr Peter Pissierssens, the Head of Ocean Services at the Intergovernmental Oceanographic Commission of UNESCO, thanked Portugal for agreeing to host the workshop, and in particular IPIMAR which is meeting the local costs for the workshop. This workshop which marks the end of the first phase of the ODINAFRICA project comes at an important time when the sixteenth session of the IODE is about to commence. Though rapid development of technology has meant easy access to data and information, the quality of this data/information is not assured. IODE therefore still has a major role in assuring the quality of data since bad data will lead to bad results.

The workshop was officially opened by Professor Mario Ruivo, the Chairman of the Portuguese IOC committee, as well as the intersectoral oceanographic commission on which all ministries involved on ocean affairs are represented. Prof. Ruivo stated that Portugal, which has a long history of navigation has been actively involved in IODE activities and also those of IOCs regional committee for the Central Atlantic (IOCEA). Portugal appreciates the progress made in developing the new data centres by the African member states, inspite of difficult economic situation they are in.

2. PARTICIPANTS.

The workshop was attended by participants from Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania. Resource persons from Australia, the United States of America and IOC who have been actively involved in training within the framework of ODINEA also attended. The opening session was also attended by observers from various Portuguese institutions.

3. REVIEW OF ODINEA

The regional coordinator will presented a report on the activities during the duration of the project, highlighting achievements and problems encountered in the implementation of the ODINEA. The project set out to:

a) Establish an operational data management structure, composed of a regional data centre (RNODC) as well as national data centres (NODC, DNA)

b) Build and maintain regional human and infrastructural capacity to collect, quality-control, archive, analyse, repackage and disseminate the data and information at the international, regional, national and local levels
c) Actively search, retrieve and archive historical ocean data sets in- and outside the region related to the Eastern Africa (and South Africa) region.
d) Provide access to the internet for marine scientists in the Eastern Africa region
e) Ensure inclusion of scientific information produced in Eastern Africa (and South Africa) in the bibliographic database ASFA

3.1. National Reports

The Heads of the National Oceanographic Data and Information Centres (NODCs/DNAs) will an overview of the activities of their centres during the project period. The full text of the reports are available in Annex III:

(i) Kenya

The Kenya National Oceanographic Data Centre (KeNODC) was set-up in 1996 and begun operating in 1997. It has three people working full time and access to a pool of scientists. Two have attended all the training workshop as well as two month internships at the US- National Oceanographic Data Center, Silver Spring, Maryland USA and the Australian National Oceanographic Data Centers respectively.

The center has three PCs, laptop, three printers, a scanner, zip drive and a plotter. The PCs are linked to the institutional intranet. Access to the internet is available via a dial-up connection. Poor quality of lines impacts on the access. KeNODC has developed a metadatabase, and provides prepares poducts including maps and atlases, as well as various services to users. Though the staff were very optimistic about getting huge amounts of data at the start, collection of meta data has proved much harder than expected.

(ii) Madagascar

The Madagascar National Oceanographic Data Center was formally established in 2000 at the Institut Halieutique et des Sciences Marines (IHSM). The institute had been participating in the ODINEA project since 1997. Four people are working full-time at the center which also combines the information center.

The center has two PCs, printer, a scanner and a zipdrive. The library database has been developed and has about 2000 records, including books and journals. A metadatabase with 100 records, including information on data available from various institutions in Madagascar has been developed. The center plans a national workshop on oceanographic data and information management in order to increase visibility for the center as well as get to know the user requirements. Dial-up access to the internet is available on one PC for the whole institution. A website has been developed and will soon be launched. Further training is still required for staff of the data center.

(iii) Mauritius

Products were not prepared. Initially the need to take up issue at high levels was not thought of. The project document was sent to prime ministers office for review. Permanent secretary requested to send people who can take decisions to meeting. National oceanographic committee with commitment at highest level has been created. Full time head of data center would be difficult to create at the university. MOI would be able to have a data manager.

(iv) Mozambique

Following the ODINEA workshop in 1997, a national workshop was held at which it was agreed that the Instituto Nacional de Hidrografia e Navegacao (INAHINA) would host the Centro Nacional de Dadas Oceanograficos (CENADO). A distributed model in which each of the institutions would retain its data, but provide metadata information to CENADO. Data from international centers, and rescued data would also be archived at CENADO. Both INAHINA and Instituto Investigacao Peaqueira (IIP) have participated in the ODINEA workshops and received equipment, including PCs and printer (one per institution), and a laptop for INAHINA. The institute (INAHINA) has assigned one person full-time to CENADO and another one half time, while IIP has assigned a person half time.

Dial-up access to the internet is available on one PC,and a website- with the metadatabase has been developed (URL: http://www.cfmnet.co.mz/inahina). Linkages have been developed with ICAM programmes, including collaborative work with MICOA (environment ministry) in digitization of the Zambezi river.

Collaboration with other institutions has not been easy. Though people were very positive in the meeting, it is difficult to get information from them later. However the situation is improving slowly.

(v) Seychelles

Seychelles designated the Seychelles Fishing Authority (SFA) as the DNA in 1997. One person is assigned part time to manage the center and has attended the three ODINEA training workshops. The center has a PC, printer, scanner, zip drive. Most of the research and monitoring in Seychelles has been done in the framework of international programmes and the priority of the center has been to trace the data from these programmes and archive them. Metadatabase of these with about 100 records has been developed. In order to optimize on resources, the data center operates in close cooperation with the documentation center. SFA plans to dedicate more staff time to the center to enable it work on data products. Dial-up access to the internet is available on one PC, and a website is expected to be on-line by end of 2000.

Overall coordination of scientific data and information is done by the Centre for Information, Science, Technology and Development with the Ministry of Industry, with the responsibility for marine data and information delegated to SFA.

(vi) South Africa

A secondary data center was established at the Marine & Coastal Management (MCM) directorate in 1997 within the framework of the ODINEA project to complement the Southern Africa Data Centre for Oceanography (SADCO). One person is assigned part time to coordinate the activities of the center, while SADCO provides resources to hire one person for data entry. MCM concentrates on management of data produced within its own programmes, and submitting these to SADCO. To this end a data management committee has been created. Equipment provided within the framework of ODINEA include a PC, printer, scanner and a laptop. The training, experience and other forms of support has resulted in significant data flow. Information on the institute, data and products are available at http://www.environment.gov.za and http://www.environment.gov.za/mcm/offshore/squid/index.htm respectively).

The center has provided training within the BENEFIT project. Emphasis of responsibility of staff attached to the center has changed to be oriented to data management.

(vii) Tanzania

The Institute of Marine Science was officially nominated a DNA in 1996. The center has one person assigned to it full time and two part time. Two people have attended the three ODINEA workshops. Equipment available include PC, printers, scanner and zip drive. Access to internet is available to all the PCs in the institute via the institutional intranet. The center has developed a comprehensive metadata base and maintains excellent linkages with the scientific and resource management community. National data management workshops have been held, and training provided to several institutions to assist them in developing capacity to manage their data. The center also provides maps of coastal resources and marine protected areas. A website has been developed for the institution with URL: www.ims.udsm.ac.tz

3.2. SUCCESSES AND FAILURES OF ODINEA

On the basis of the reports presented, the participants evaluated the successes and failures of the ODINEA project, especially in the aspects listed below, and on the basis of this recommend actions that should be implemented to ensure that the ODINAFRICA-II project addresses the shortfalls identified in ODINEA.

Three models have been used:

- Informal discussions with producers (Kenya)
- Semi-Formal structure, but people not forced (Mozambique)
- Formal everybody must give data to the center (Mauritius)

Approaches also differed. Some used the integrated Coastal Area Management (Tanzania), others used pure science approach (South Africa)

It may be necessary to have one full person year, and another half person. These should be spelt out clearly. In ODINAFRICA-II the countries committed full-time staff.

The new resource kit shows how everything can be put in GIS (ARC explorer).

The participants recommended that an item should be included in the ODINAFRICA-II workshop agenda on the experiences of all these methods.

3.2.1. Capacity Infrastructure (equipment)

The participants identified the minimum equipment and software requirements for a data centre and their availability in the institutions participating in the project as indicated in Table 1 a) and b).

Though all the centres now have the basic equipment, there is need to replace some of these which are approaching the limit of their useful life like the printers, and also to up-grade the hard drives.

The operating system should also be up-graded to WINDOWS 2000 or NT. Similarly the centres should up-graded to Office 2000 professional suite. The data centres should also acquire software which will be necessary for products development like acrobat 4.0, surfer 7.0, paintshop 8.0 and Digital Postman.

	Kenya	Madagascar	Mauritius	Mozambique	Seychelles	South Africa	Tanzania
CD writer	A	A	N	N	A	A	A
Back-up drive/ZIP	A	A	A	A	A	A	A
PC (PIII)	A	A	A	A	A	A	A
Windows2000/NT	N	?	N	N	N	N	N
Printer A4	A	A	A	A	A	R	A
Printer A3	N	N	N	N	N		N
Scanner	A	A	N	A	A	A	N
Hard Drive	R	R	R	R	R	R	R
Laptop	A	N	A	A	A	A	A
UPS	R	R	R	R	R	R	R
Mouse (intel)							

Table 1 a) Hardware requirements as identified at ODINEA appraisal workshop.

	Kenya	Madagascar	Mauritius	Mozambique	Seychelles	South Africa	Tanzania
Office 2000	A	A	A	A	A	A	A
Acrobat4.0							
Surfer7.0						A	
Paintshop PRO 8.0							
Digital postman							

Table 1 b) Software requirements as identified at ODINEA appraisal workshop.

A: Available
N: Not available
R: Replacement required

3.2.2. Capacity Human Resources (Training & Education)

Though the data centres have now received basic training for data management through the ODINEA workshops over the last three years, in most instances the trained staff do not spend all their time working for the data centre. Due to the busy schedule of most of the participants, only Kenya was able to make use of the opportunity provided for internship by the project. The participants felt that internships were brought too early in the programme to be useful as the data center personnel had not yet acquired the necessary skills. All the centres have access to a pool of scientists and other experts who can assist in administration, maintenance of equipment and products development. However the level of access differs from institution to institution as listed in the tables below:

	Kenya	Madagascar	Mauritius	Mozambique	Seychelles	South Africa	Tanzania
Coordinator (management skills)	1/3	1/3	¼	1/3	1/10	1/9	½
Assistant(mailing, receiving requests, punch data)	1	1	½+1/2+1/2	1/2	1/10	1	1/3
Data base specialist	1+1/3	2+1/3	¼	1/3	1/10	1/9	½+1/3
Products developer	1/3	1/3		1/3+1/2	1/10	1/9	1/3
TOTAL	3	4	2	2	4/10	1+1/3	2

Table 2 a): Human resources available in the centres in terms of fraction of time spent on data centre activities

MINIMUM	Kenya	Madagascar	Mauritius	Mozambique	Seychelles	South Africa	Tanzania
Pool of Scientists	+++	+++	+++	++	+++	+++	+++
Computer handyman	+++	+++	+++	+++	+++	+++	+++
Public Relations	+++	+++	++	++	++	++	+++
Accountant	+++	+++	+++	+++	+++	+++	+++
Librarian	+++	+++	+++	+	+++	+++	+++
Graphic Artist	+++	+					+++

Table 2 b): Level of access by the data centre to other professionals in the institution
+++ maximum access
++
+ minimum access
no access

There is a need for in-house training for additional personnel to assist in the running of the data centres. These people trained in-house could then be provided with extra training on products development during the second phase of the project so that the first group can concentrate on running of the centres. However in some of the institutions the people to train are lacking. The following were identified as the possible areas of coverage:

- Detailed training in web-page development, especially writing html.
- GIS training. Could try and get trainers from ESRI and involve Harrison too.
- Training on Visual Basic for in-house pool of experts.
- Within operational budget you can incorporate local training which is not too costly.
- A combination of basic learning at home. Then a short visit to an expert center to apply these skills to a specific area of oceanography. These skills can then be used in the region

(the funds will have to be sourced from else where for this type of training).

3.2.3. Development of Data Services and Products (Meta database/MEDI-WIO, Data Archive, Data Services)

The participants reviewed the range of services and products offered by the data centres. All the centres have now developed a metadatabase. Some have already started preparing different types of products as listed below:

SERVICES	Kenya	Madagascar	Mauritius	Mozambique	Seychelles	South Africa	Tanzania	
Products	+	+	+	+	+	+	+	7
Raw data	+	+	+	+	+	+	+	7
Quality control	+		+	+	+	+	+	6
Guidelines (sampling)			+		+	+		3
Documents	+	+	+	+	+	+	+	7
Referrals	+	+	+	+	+	+	+	7
specifications	+			+	+	+	+	5
Repository	+	+	+		+	+	+	6
Software	+	+	+	+	+	+	+	7
Training	+	+	time	limitation	+		+	4
Communication	+	+	+	+	+	+	+	7

Table 3 a) Services provided by ODINEA data centres

PRODUCTS	Kenya	Madagascar	Mauritius	Mozambique	Seychelles	South Africa	Tanzania	
Raw data	+	+		+	+	+		5
Metadata	+	+	+	+	+	+	+	7
Maps	+	+		+	+	+	+	6
Atlas	+						+	2
Realtime data	+		+		+			3
Brochures					+			1
Web site	+		+	+		+	+	5

Table 3 b): Products developed by ODINEA data centres.

Few of the centres kept a log of the services offered. This should be implemented immediately as it is the only way of judging the usefulness of the cen

3.2.4. Development of Bussiness plans

The participants agreed on the urgent need to prepare "Bussiness Plans" for each of the data centers, outlining what they need to achieve in the next one, three, five or ten years with specific targets. Information included should include: organizational profiles, competitive profiles, strategic direction, operational plans, financial plan, organizational plan and performance indicators.

The plans will serve to inform users of services and products availability, as well as convincing data providers and other institutions of the importance of having the data centers.

4. REVIEW OF RECOSCIX-WIO

The regional coordinator presented the document "RECOSCIX-WIO in the year 2000 and Beyond" which provides on the background, objectives and activities.of the RECOSCIX-WIO project, as well as the recommendations of the workshop held in 1999 to review the achievements of the RECOSCIX-WIO project. The document is given in Annex…..

5. CONCLUSIONS AND RECOMMENDATIONS.

The ODINEA project has been able to achieve its objectives in the three years since its launch in 1997. Starting with just two National Oceanographic Data Centres (NODCs) in Kenya and South Africa at the start of the project, NODCs/DNAs have been established in Madagascar, Mauritius, Seychelles, Tanzania, and a subsidiary national oceanographic data centre in South Africa.

The capacity of the data centres to collect, process, analyse, store and interpret various categories of data sets was strengthened through the provision of up-to date computer equipment and peripherals, software as well as training for data centre personnel.

The centres have used this capacity to develop national meta databases, thereby enabling users to know what data sets are available and how to access them. The development of national data archives has contributed to the preservation of data sets which were in danger of being lost. Through linkages established within the framework of the project, the centres have been able to access data sets from regional and international data centres.

Email and Internet connections provided through the project have improved communication between the institutions, communications with other outside the region, as

well as access to international data and information sources. The connections have also enabled the centres to publicize their activities, services and products to a wider audience by developing web sites.

The training provided to the RECOSCIX-WIO staff has greatly increased the coverage of articles, published by scientists from the region, in the Aquatic Sciences and Fisheries Abstracts (ASFA) database.

The data and information centres that have been established in Africa will play a key role in the Integrated Management of the Coastal Environment and Resources in the region by providing the necessary data and information for informed decision making. This role has been recognised by the Pan African Conference on Sustainable Coastal Management (PACSICOM) held in Maputo, Mozambique in July 1998.

In order to further strengthen the centres to be able to effectively discharge their responsibilities, and on the basis of the experiences in the first phase of the ODINEA/ODINAFRICA, the participants made the following recommendations:

i. the data centre equipment and software should be up-graded, especially the operating system which should move to WINDOWS 2000/NT, the hard drives of the PCs and the printers purchased in the initial stages of the project should be replaced since these usually have a life of about 3 years.

Additional software and equipment should be acquired for products development.

ii. Each of the instutions should dedicate at least one full person year, and another half person year of staff time for running of the data centres.

In house training should be undertaken to increase the number of people with skills in data management. The centres should also organise local training in areas where they require additional skills. Short term training/attachment of about one or two weeks could then be arranged to gain experience and skills in specific areas that will assist the data centres in preparing data products.

iii. The data centres should raise their profiles through development of:

1. Data products
2. Web presence
3. Brochures and corporate folders
4. Links to the African Process and GOOS-Africa.

The centres must develop a corporate image that is easily recognised.

iv. Each centre should prepare a detailed business plan outlining its objectives, capabilities, achievements, products etc

v. The experiences garnered in the implementation of ODINEA should be compiled and included in the agenda of the next ODINAFRICA-II planning workshop so that the member states which are embarking on development of NODCs/DNAs can benefit from them.

ANNEX I

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ANNEX II

RECOSCIX-WIO IN THE YEAR 2000 AND BEYOND

The project RECOSCIX-WIO (Regional Cooperation in Scientific Information Exchange in the Western Indian Ocean) was launched in February 1989 by the Intergovernmental Oceanographic Commission of UNESCO at the request of IOCINCWIO to:

- provide marine scientists in the region with the necessary scientific information;
- enhance the use of indigenous scientific information in the region;
- promote and facilitate communication between the scientists, both intra- and inter-regionally;
- disseminate information on scientific research activities in the region.

To achieve these goals the project set out to develop a number of services and products such as:

(i) provision of bibliographic search and document delivery services;
(ii) provision of equipment and software to marine science libraries in WIO region;
(iii) provision of training to staff of marine science libraries and documentation centres in the region;
(iv) support for internet connectivity for marine scientists in the region;
(v) development of the regional directory of marine scientists (WIODIR);
(vi) development of a regional library holdings database (WIOLIB);
(vii) publication of the newsletter WINDOW (Western Indian Ocean Waters);
(viii) development of MASDEA (Marine Species Database for Eastern Africa);
(ix) inclusion of indigenous scientific publications in ASFA through the regional ASFA input centre in Mombasa, Kenya;
(x) publication of WIOBASE (integrated Western Indian ocean data and information sources CD-ROM).

After the initial pilot phase (1989-1992), the government of Belgium through the Flemish Inter-University Council (VLIR) funded the implementation of the operational phases of the project. The VLIR support ended in April 1999. IOC has been gradually increasing its support for the project to fill in the gap left by VLIR. This support has been provided within the framework of the IOC/Sida-SAREC, and IOC/Flanders initiative for development of an Ocean Data and Information Network in Africa (ODINAFRICA).

2. OVERVIEW OF RECOSCIX-WIO ACTIVITIES

The RECOSCIX-WIO network consists of three components: (i) Cooperating Institutions (CIs), which are the marine science institutions from the region participating in the project. The CIs have received training and equipment to use in developing an elecronic catalogue of their holdings; (ii) the Cooperating Libraries (CLs) world-wide, which assist in the supply of documents requested by marine scientists from the region; and (iii) the Regional Dispatch Centre (RDC) which co-ordinates the provision of services and development of the various project products.

The two-year pilot phase started in February 1989. IOC-UNESCO provided an Associate Expert and funds for operational expenses while KMFRI accepted the invitation from the second session of IOCINCWIO to host the Regional Dispatch Centre. In addition KMFRI provided support staff and office equipment, including computers. Fourteen CI's in eight countries (Ethiopia (1), Kenya (3), Madagascar (1), Mauritius (2), Mozambique (1),

Seychelles(2), Somalia (1), and Tanzania (3)), were recruited from the institutions that had been visited by a UNESCO mission in 1987. In this phase the services which were provided include: bibliographic search service on ASFA CD and DIALOG on-line, and document delivery using the services of LUC. Computers were delivered to institutions in Madagascar and Seychelles. Email services were commenced at RDC. Other activities implemented in this phase included the development of a directory of marine scientists in the region (WIODir), and the publication of the WINDOW newsletter.

The first operational phase of the project, from 1991-1995, was supported by the government of Belgium. A memorandum of understanding for implementation of this phase was signed between the governments of Belgium and Kenya. LUC and KMFRI respectively were designated as the implementing agencies by the governments.

The second operational phase from 1996-1999 was also funded by the government of Belgium. In addition to activities from the previous phases, there was an emphasis on the development of data products as requested by the third session of IOCINCWIO meeting in Mauritius in 1992. These included the development of the Marine Species Database for Eastern Africa (MASDEA). RECOSCIX-WIO was designated as an ASFA input centre. RECOSCIX-WIO also spearheaded the implementation of the Oceanographic Data Information Network for East Africa (ODINEA), which entailed the establishment of National Oceanographic Data Centres (NODC), and Designated National Agencies (DNAs) for oceanographic data and information management in the region. Two training workshops on data management course were organised for the DNAs and NODCs.

1.0 RECOSCIX-WIO Information Services

1.1 Query Handling:

Query handling was one of the services introduced at the inception of the project. Searches are done using ASFA CD and DIALOG on-line. In order to improve on relevance of searches, and speed of response to queries, the CIs which actively used the project's query handling service were provided with subscription to the ASFA CD. These include: Moi University (Kenya), Institut Halieutique et des Sciences Marines (Madagascar), University of Mauritius (Maurtius), Seychelles Fishing Institute (Seychelles), Univicersity of Dar es Salaam- Zoology and Marine Biology Department, and Institute of Marine Sciences (Tanzania). IOC together with FAO, will avail another 40 subscriptions to ASFA CD's to Low Income Food Deficient Countries in Africa and elsewhere. Access to ASFA Internet Database Service (IDS) on line at the RDC.

1.2 Document Delivery:

Document delivery has been one of core services of the project. Through a network of document suppliers world wide, the project is able to access documents requested by users. Currently the main supplier of documents is the Limburg Universitaire Centrum, with which IOC has been signing contracts for provision of ILL services to RECOSCIX-WIO. Other suppliers include National Institute of Oceanography (Goa, India), ICLARM, Oregon State University, NEMR, Freshwater Institute (Canada), Southampton Oceanography (United Kingdom). The service should be strengthened by recruiting more document suppliers. The International Association of Marine Science Libraries and Information Centres (IAMSLIC) is a useful forum for establishing such contacts.

The delays in delivery of documents continues to be a cause of concern to the project. In order to improve on this, requests are now sent to RDC, and from RDC to CLs by Email. The RDC requests the CLs to send the document directly to the requestor. The drawback here is that the RDC is not able to efficiently monitor whether or not the document has been

delivered. Electronic document delivery open's up the possibililty of significantly reducing the delays, and cutting down on delivery costs since the mailing charges are relatively high in the region. Tests are already underway between the RDC and several CLs.

1.3 WIOCURRENT:

The project, with support from IOC subscribes to the following journals: 1) Bulletin of Marine Science, 2). *Indian journal of Fisheries*, 3). Current Contents-Agric.Biol and env. Sciences, 4). JMBA-Journal of the Marine Biology Association of the U.K, 5) Indian Journal of marine sciences, 6) Limnology and oceanography, 7) *Mahasagar*, 8) Mangroves and salt marshes 9) Marine Ecology, 10) Nature, 11) Science

On a fortnightly basis, the content pages of the journals and details of other reprints received at RDC are circulated to libraries and scientists in the region.

2.0 RECOSCIX-WIO DATA BASES

2.1 WIOLIB: Holdings of Marine Science Libraries in the Western Indian Ocean region.

The project maintains a database of holdings of marine science libraries in the region (WIOLIB). The development of WIOLib has been rather slow. Kenya Marine & Fisheries Research Institute, Seychelles Fishing Authority, Institute of Marine Science (Tanzania), Univesity of Nairobi, Kenyatta University, and the Albion Fisheries Research Centre have already submitted entries for WIOLib. However the Centre National de Researches Oceanographiques-CNRO (Madagascar), Instituto Investigacao Pesqueira-IIP (Mozambique) and the Division of the Environment (Seychelles) have not submitted any entries inspite of receiving computers, software, and training (workshop and internship). Poor grasp of the basics of the software used, lack of commitment by some of the personnel, and staff mobility are some of the reasons for this poor productivity. These problems should be addressed so that all the CI's are active participants in the project activities.

2.2 WIOPUB: Database of Marine Science Publications about the region

The project is collecting also documents published about the region and availing this through a database- WIOPUB. Started in October 1999, WIOPUB has developed very rapidly. There are already more than 3000 records in the database. RECOSCIX-WIO endevours to ensure that hard-copies of all the articles/publications that appear in the database are available at RDC. The database will be availed over the internet in the year 2000.

2.3 ASFA: Aquatic Sciences and Fisheries Abstracts database

KMFRI/RECOSCIX-WIO is an input centre for ASFA. Inputs into the ASFA database has increased tremendously since October 1999 after the input staff received training on ASFA input methodologies at FAO. In the first half of 2000 more than 500 records were submitted for inclusion in ASFA.

2.4 WIODIR: Directory of Marine Scientists in the Western Indian Ocean region.

The project developed and maintains the Directory of Marine Scientists for the Western Indian Ocean (WIODIR). This database is updated annually for the Intergovernmental Oceanographic Commission of UNESCO. WIODir is now available on the internet via the IOC webserver. The directory was distributed in book and electronic versions in 1992 with support from the United nations Environment Programme (UNEP). The updated version has also been distributed as part of WIOBase. The printing of a revised version of the book should be explored as the edition available is now very out of date. The electronic version is

maintained using the FILEMAKER software which allows individuals to edit their entries via the internet.

2.5 FAO Directory of Aquatic and Fisheries Information Sources in Africa

The FAO directory was finalised and submitted to FAO in October 1999. There were a total of 183 entries in the database

2.6 MASDEA: Marine Species Database for Eastern Africa

The Marine Species Database for Eastern Africa (MASDEA) is one of the more recent products of the project. Developed using ACCESS software the database now has close to 13,000 taxonomic records on the marine species available in the region. MASDEA has already been distributed as part of WIOBase.

2.7 WIOBase: Western Indian Ocean Data and Information CD

WIOBase, the CD containing marine science information and data from the region, including all the databases developed by RECOSCIX-WIO is the "flag-ship" of the project. The CD's has an Altavista interface for searching for information, which gives even those who do not yet have access to internet and the WWW a feel of how it operates. The latest version of WIOBase was released towards the end of 1998.

3.0 COMMUNICATION

3.1 WINDOW Newsletter.

Since 1990, RECOSCIX-WIO has produced a newsletter- WINDOW. The WINDOW Newsletter is produced in English and French and distributed to over 1000 addresses world-wide 3-4 times a year. Initially the whole process (editing, lay-out, printing, distribution) was done in Mombasa, but this changed because of the rather high mailing costs which could no longer be sustained within the project budget. Currently the editing and lay-out are done in Mombasa with the printing and distribution being done by UNESCO. The majority of articles in WINDOW have come from Kenya and Tanzania. Maybe this is a reflection of the larger number of marine scientists in these two countries.

3.2 Email/Internet Connectivity

The project has registered a new domain http://www.recoscix.org to replace http://www.recoscix.com. The project web-site and email addresses, which includes those of KMFRI have also been moved to the new domain. RDC staff have ftp access to the Africaonline server which enables them to update the website remotely.

IOC has also provided email/internet access to several institutions in the region within the framework of the project. This includes:

4.0 CAPACITY BUILDING

RECOSCIX-WIO has organised three training workshops which covered various subjects including: use of computers in library management, development of electronic library databases, and electronic document delivery. In addition internships have been arranged for librarians to expose them to practical applications of the information acquired during the training workshops. The project has also enabled some of the librarians to get fellowships to

attend the course on Management of Information in Science and Technology (MIST) at the Free University of Brussels in Belgium.

The project provided computers and software to ten institutions in the region. IOC-UNESCO has also, within the framework of the RECOSCIX-WIO/ODINEA provided support for internet/email access to eight institutions.

In conclusion, RECOSCIX-WIO has strived to promote and support the development of marine sciences in the western Indian ocean through improving access to information and data, improving of communication and networking between marine science institutions and scientists, development of capacity for data and information management.

In this endevour RECOSCIX-WIO has received financial and material support from a number of countries and organisations including Belgium (ABOS, LUC, VLIR), Canada, Sweden (Sida-SAREC), USA (NOAA), IOC, UNESCO, UNEP, IAMSLIC and the marine science institutions in the region, and libraries world-wide.

4 APPRAISAL AND RECOMMENDATIONS OF OF RECOSCIX-WIO WORKSHOP.

The tenth anniversary of the project provided an opportunity to look back and evaluate where the project had achieved its objectives and where it had failed. With this in mind a Workshop 'RECOSCIX-WIO in the year 2000 and beyond' was held in Mombasa, Kenya between 14-17 April 1999. The participants evaluated the project's structure and activities in order to and recommended actions that should be implemented to enhance the relevance of the project and improve on delivery of service to marine scientists in the region.

The workshop marked a departure from the tradition of previous RECOSCIX-WIO workshops and training courses where only information managers were invited. For this event each of the institutions participating in the project was invited to nominate both marine information managers AND scientists to attend. This was in recognition that scientists are the main users and beneficiaries of the RECOSCIX-WIO services and products, and therefore should be involved in the planning of the project's future.

Noting the achievements made by the RECOSCIX-WIO Project in the region, especially in the provision of information services and the development of useful marine information databases and other products, the participants and expressed their appreciation to the Intergovernmental Oceanographic Commission (IOC) of UNESCO, the government of Belgium through the Limburg University Centrum (LUC), and the Kenya Marine & Fisheries Research Institute for the support that they have provide to the project.

They recognized that the next phase of the project should strongly address the agenda of sustainability. Future activities must be tailored into a transition phase that would entail the development of a regional information and data exchange network utilizing the available electronic systems. The participants therefore urged the IOC and other donors to provide support for the implementation of this transition phase.

Recognising further the need for a similar service to freshwater scientists, the participants resolved that ways should be explored to either develop a freshwater component of the project, or formally incorporate freshwater into the project.

Recalling that the project had provided hardware, software and training to the cooperating institutions in the region, the participants noted that with the rapid change in technology most of these equipment which are now out-dated should be replaced with new ones. The participants stressed the need for training and retaining personnel to manage the library and

information centres in the institutions participating in the project. The participants noted that though the training workshops and the MIST course introduced librarians to various subjects, there is a need for more in-depth training. However, since most of the libraries have limited staff, extended training away from the institutions would adversely affect their operations. Local training opportunities, and distance learning programmes should therefore be explored to strengthen the capacity of the libraries.

6 RECOCIX WITHIN ODINAFRICA-II (PROPOSAL FOR THE WAY FORWARD)

The discussions during the RECOSCXI-WIO workshop, and subsequent consultations with researchers and other users of the RECOSCIX-WIO services show that the services of the project are still needed though changes in focus and delivery are necessary to address the changed circumstances in the region. Whereas the project initial focused on researchers, this should be changed to encompass a wider user base than at present. This will include policy makers, resource managers, educational institutions, NGO's and even private companies. The project will have to pro-actively develop information products addressing the needs of these new category of users, while at the same time improving on delivery of its current core services and products.

In order to ensure that all these users know of the existence of the services and products an aggressive public awareness campaign must be implemented. The first phase of the projects did little to cultivate partnerships between the link institutions in each of the member states and other potential users in the member states. This will have to change in order to ensure that the project addresses the national data and information, rather than the priorities of the hosting institutions only. This ties closely with Integrated Coastal Area Management which is now the accepted approach for managing marine and coastal resources and environment.

In the first phase of the project, information and data were considered as separate entities, with different projects: RECOSCIX-WIO/RECOSCIX-CEA and ODINEA managing them. During the implementation of ODINAFRICA-II it may be advisable to have the same institution being the focus for both data and information so that the two services are integrated.

The host institution must see the data and information centre as a service centre rather than just an archive. Product development should be done in close consultation with potential users so that the products have a market. This will ensure sustainability of the project beyond donor funding. The host institution must see the data and information centre as a service centre rather than just an archive. Product development should be done in close consultation with potential users so that the products have a market. This will ensure sustainability of the project beyond donor funding.

Intergrated Marine Information System

On a regional basis a facility providing on-line access an integrated information system including databases and products developed by the project and news from the region should be put in place to enable users to have easier access to the information. The current services and products offered by the project have to be reviewed to determine their continued relevance and see how they can fit in within this system.

The should have the following information, which will be organised according to the needs of different categories of users:

- Marine Science Country Profiles
- National Institutional profiles (links to their websites)
  Facilities available (infrastructure, equipment)
  Staff (linked to Professionals directory)
  Library database, including list of journal subscription (linked to merged catalogue)
  Activities and achievements
  - NGO's
  - Regional bodies (links to their website)
  - International organisations operating in the region (links to their websites)
    Focus on their activities in the region
- Marine Science Professionals
- Publications about/from the region
- Merged Catalogue of library holdings
- Marine Species Database for Eastern Africa
- Meta database
- On-going projects
- Results of major meetings/conferences
- Training opportunities in the region
- Relevant training opportunities outside the region
- News pages
  Key issues of concern
  Include workshops, conferences, symposia

The query handling service is now done by most of the cooperating institutions in-house since they have been provided with subscription to the ASFA CDROM. The advent of the internet has provided immediate access to more up-to date information to the scientists, including access to ASFA database on-line. However problems with access in some of the member states has led to a disparity in access to information. The project should therefore explore mechanisms to improve access to the internet where it is feasible and the increamental cost is reasonable.

The project should emphasis delivery of documents by electronic means to cut down on delays which have plagued this services. The publication of WIOPUB and WIOLIB as part website will enable scientists to browse through the holdings of RDC and other libraries in the region and select required documents which can then be sent to them electronically. The cost of subscribing to a few popular journals for each of the institutions can also be explored as a way of providing documents closer to the users.

Other products developed by the national centers can be availed on their sites with link this the intergrated information site.

The availability of this information should be widely published so that users are aware of its existence.

Action 1: Improve internet access. This will require adequate terminal equipment and telecommunication facilities.

Action 2: setting up and strengthening of internal computer networks in the institutions to improve local access to data, and to the internet

Action 3: development of web pages/websites by the national centres through which their products and services are availed (access can be restricted for some users)

Action 4: training of institution personnel and other users on how to access and use data, information and products available

Action 5: Converting all the products and services previously developed by RECOSCIX-WIO Project into electronic forms and making them available on RECOSCIX-WIO website.

Action 6: provision of software/hardware for electronic document delivery

Action 7: Review of facilities already available in both libraries and NODCs/DNAs

Action 8: Developing internal cooperation arrangements between libraries and NODCs to enable the inclusion of library databases within the overall information system

Action 9: involvement of researchers and other users in development of products

Action 10: development of distance learning tools (and follow-up mechanisms) for librarians and data managers (recall that no provision for further training workshops)

ANNEX III

NATIONAL REPORTS

1. KENYA

1.1 Background

Kenya has a National Oceanographic Committee comprising a number of governmental agencies. The Secretariat of the Committee is located at the Kenya National Commission for UNESCO, in Nairobi. The formation of the Kenya National Oceanographic Data Center was formally adopted by the Committee during its meeting held on 20th August 1996 at a meeting held at the Kenya National Commission for UNESCO. Kenya Marine and Fisheries Research Institute was elected to be the host institution.

1.2 Internships

The two chances provide for the data center to attend internships at the NODCs and WDCs were used as follows:

Harrison Ong'anda

20th Sep. – 20 Nov. 1997 : Internship at the United States National Oceanographic Data Center. Silver Spring, Maryland, USA.

Clive Angwenyi

30 July 1999 - 30 Sept 1999: Internship at the Australia National Oceanographic Data Center. Sydney, Australia

1.3 ASFA

KMFRI/RECOSCIX-WIO has been represented at the following annual ASFA board meeting Kennedy Ochego (Gydnia, Poland, 1998), Mika Odido (Maryland, USA- 19-22 May 1999), and James Macharia (Goa, India- 19-22 September 2000) with support from the project..

The number of records submitted for inclusion in ASFA increased tremendously after training on ASFA input methodology was provided for James Macharia at the FAO/ASFA Secretariat in Rome, Italy, 25-29 Oct 1999. From January-September 2000 a total of 874 records were sent to the publisher (CSA). Another 800 records are in processing stages.

The following institutions in Nairobi were visited in 1998-2000 to collect documents for the ASFA database.- Chiromo Library, Fisheries Department, National Museums of Kenya, Kenya Wildlife Service and Jomo Kenyatta University of Agriculture and Technology. A total of 150 records were collected.

Funds should be set aside for the ASFA database for purposes of abstracting, indexing, scouting for the documents and , bibliographic descriptions. Much travelling in the region is inevitable in future if we are to remain as an active centre.

1.4 Data Management Training

Staff of the data center attended the following regional data management training workshops:

- Training Course on Management of Marine Data and Information for the IOCINCWIO Region; Mombasa, Kenya, 1-11 December 1997
- IOC-Sida-Flanders-SFRI Workshop on Ocean Data Management in the IOCINCWIO Region (ODINEA project), Cape Town, South Africa, 30 November - 11 December 1998
- IOC-LUC-KMFRI Workshop on RECOSCIX-WIO in the year 2000 and beyond (and training course for librarians). Organized with support from the Government of Flanders and SAREC of Sida, Kenya Marine and Fisheries Research Institute, Mombasa, Kenya, 12-17 April 1999.
- IOC-Sida-Flanders-MCM Third Workshop on Ocean Data Management in the IOCINCWIO Region (ODINEA project, Cape Town, South Africa, 29 November–11 December 1999
- ODINEA Review Workshop, 2000, Lisbon, Portugal

More data management training is recommended in view of staff turn over and expansions in the Data Center.

1.5 Access to the Internet

At KMFRI/RECOSCIX we have a dial up connection to the Internet through a NT server with approximately 20 Windows 95/98 workstations which can brows the Internet at the same time using Netscape proxy sever (Ver 1.0) software. There are plans to use either Wireless connection or analogue/digital-leased line, but so far the current budget cannot allow this plus some other complications from the ISPs. Individual email addresses are available for the scientists and a few personnel at the RECOSCIX. The mail software is licensed for 50 users, which cannot now accommodate all the people who are interested in electronic communication. We would like to explore using a license for about 100-200 users.

The connection speed is fast enough. This remains so long as the telephone lines are not down or noisy which often reduce the speed and frequent disconnection to these sites. A digital leased line is recommended optimum Internet access. We use Netscape (Version 4.5) and above or Internet Explorer (up to version 5.0)

1.6 National Workshop

A national workshop on data management is scheduled to take place on 18-19 October 2000. Key government departments and interest groups from private sector are invited to deliberate on information management with the aim of:

- *reviewing available information systems and accessible information resources about key areas and identifying the critical knowledge gaps for policy and management;*
- *determining a strategy for information sharing and interaction between scientists and decision makers in key thematic areas related to aquatic resources;*
- *defining information tools indispensable for policy formulation or technical improvements in the respective fields:*

Deliberations of the Workshop can be used to formulate proposals for fulfilling the aims listed.

1.7 Equipment Support

In order to support the operations of the data center, IOC has supplied a number of computer equipment, as listed below:

Computers : Three computers were provided -DELL Pentium (1997), DELL Intel 350 Mhz Pentium II (1998), and DELL Intel 500 Mhz Pentium III (1999)

Printers: Three printers were supplied with the computers- HP Deskjet 692C, HP Deskjet 832Cx and HP Deskjet 895Cxi

Document Scanner: Scanjet 4c

Zip Drive: Iomega ZipDrive

1.8 Operational Support

The Data Center continues to receive requests in the average five per month for information on various subjects, and from a wide variety of coastal managers and scientists. The data is normally extracted from the large set of data holdings available in GIS format and other ocean observations. Over 90% of the requests are concerned with the near shore ecosystems of the mangroves and coral reefs.

The KeNODC meta-database describes the content, condition, and other characteristic of data sets wherever the data is located. This will identify potentially useful data sets to interested parties. The database structure is similar to MEDI (see MEDI for more details). The database has been implemented in MS-Acess'97, and is now being converted to FILEMAKER for ease of Web page design.

One of the important products from the Data Center is tide prediction. This is now produced in KMFRI. Predictions are in form of High-low listings and hourly values. They are based on sea level observations from two GLOSS tide gauges installed at the ports of Mombasa and Lamu. Software prepared by the Toga Sea Level centre in collaboration with the University of Hawaii is used to produce the predictions.

Local Internship at the Data Center has been encouraged. A member of staff from the Kenya Meteorological Office has followed a two-month internship in July-August to learn how to use spread sheet for data management. Also following consultations with the fisheries office, the Assistant Director of Fisheries has nominated two officers from the Coast Provincial Office to liase with the data Center in setting up collaborative data management activities.

Operational funds to support these activities have been provided by IOC for the years 1998, 1999 and 2000.

1.9 Conclusions

Priority areas would continue to be defined in line with feed back mechanisms including workshops, data requests and personal judgements

.

2. MADAGASCAR

2.1 Name of Data Centre

Madagascar National Oceanographic Data Center (MD-NODC)

2.2 National IODE Coordinator

Name: MARA Edouard Remanevy
Address: Institut Halieutique Et Des Sciences Marines (IH.SM)
PO Box 141- Route du Port, Mahavatse II - TULEAR 601, Madagascar
Tel/Fax.: (261) 94 435 52; E-mail: mara@syfed.refer.mg

2.3 Data Centre Address

Institut Halieutique Et Des Sciences Marines (IH.SM)
PO Box 141- Route du Port, Mahavatse II - TULEAR 601, Madagascar
Tel/Fax.: (261) 94 435 52; E-mail: ihsm@syfed.refer.mg

2.4 Data Centre URL

Website under preparation.

2.5 IODE Data Center designation date

October 2000

2.6 Data Center description

Born in 1992 out of the three entities (Marine Station, Department of Applied Oceanology and the Department of Fisheries High Training), the IH.SM has the task of training and Applied Research on Development. Attached to the University of Toliara, the Ministry of University studies (MINESUP). It is equipped with laboratories, aquaculture farm, specialized library. Thus, it regularly receives foreign trainees. We have built in its premises a house for the implementation of our NODC. Composed of 35 members (national and international residents), the IHSM only has 04 peoples for the ODINEA and RECOSCIX-WIO projects.

2.7 Brief History

Within the frame of the Integrated Management Program of Coastal and Marine areas, the UNESCO-IOC has undertaken to create a network of exchange of ocean data and information among countries of IOC, especially countries of East Africa and Indian Ocean. A training workshop was organized in that respect in Mombasa (Kenya) from 1st to 11th December 1997, in which the following countries had taken part (Kenya, Madagascar, Mozambique, Seychelles, South-Africa and Tanzania).

At the end of the training, some computer equipments were given to participating countries. Then, they convened during this session the countries which were represented there had the task of setting up a National Oceanographic Data Center (NODC).
As an institution member of IOC-IODE network, the IHSM through its Direction is completely favour of the setting up of this NODC. So the Direction of the IHSM had consecrated some rooms in the premises for this Center.

2.8 Mission Statement

The main objective of Madagascar is to establish a functional National Oceanaographic Data Centre (MD-NODC). If this principal goal is achieved, the Center will in charge of:

- national inventory and collect of relative data in oceanographic research fields;
- cataloging, inputing, control the data quality;
- disseminate these data to the different level of users ;
- its participation in the IODE, either by giving information via RDC or to the requesting services.

2.9 Policy Statement

To achieve the objective and goal fixed above, we need to set up the followings:

- Capacity building both on human and equipment. This through training data managers according to the technology developments. Infrastructure needs the contribution of both UNESCO-IOC and local government itself.
- Set up a network with local, regional and international coastal and marine institutions to facilitate collect and exchange of data and information. Since few years, efforts have been taken within that way. Permanent collaboration exist between the IHSM and the following institutions: Integrated Coastal Zone Management with UNESCO/WB; Marine Park Project with WCS; tourism, marine erosion and coral reef degradation with PRECOI[1]/FED[2]; marine pollution and environmental problem with ONE[3]/EMC[4]/CNRO[5]/CNRIT[6]/CNRE[7]; mangrove area management, with PRECOI/UE[8]; setting up a network on coral reef health monitoring , marine ecotoxicology, poison due to marine animal consummation with "Institut Pasteur de Madagascar"; coastal zone Atlas production with FTM[9]/CFSIGE[10]/ONE/EMC-France/BM[11]; etc.
- Using the modern technology tool to disseminate data (Internet).
- Organize a national workshop to convince local and collaborating institutions on the importance of the project.

2.10 Website holding

Due to the delay this year on allocated funds releasing for the Project, website building was interrupted at this level.

2.11 Metadata directory

Since 1998, two metadata have been held within our Center : a metadata for the database available up to now including softwares, projects and documents from WOCE, JGOFS and CLIVAR. This using an ACCESS local created software. The second one is the metadata for the library using ASFISIS software at the beginning as it was agreed by RECOSCIX-WIO at this period.

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[1] *Programme de Recherche Environnemental-Commission de l'Ocean Indien;*
[2] *Fond Europeens pour le Developpement;*
[3] *Office National pour l'Environnement;*
[4] *Environnement Marin et Cotier;*
[5] *Centre National de Recherches Oceanographiques;*
[6] *Centre National de Recherche Industriel & de Technologie;*
[7] *Centre National de Rechercehe Environnementale.*
[8] *Union Europeenne;*
[9] *Office National de la Cartographie;*
[10] *Centre de Formation sur les Sciences de l'Information Geographique;*
[11] *Banque Mondiale.*

Therefore, as it was requested on April 1999 during the "RECOSCIX-WIO IN THE YEAR 2000 AND BEYOND" in Mombasa, the use of standard software for CIs was felt and the conversion from ASFISIS to FILEMAKER was proposed. This will permit to link the metadata through Internet. Roughly, 1400 records were converted in that way till now and recording is still ongoing to automatize our library which holding about 2000 titles of books and journals.

As for the first one, all records are imported from our local made ACCESS software into MEDI strucrure. The last informations to input are now those from the cruise carried out between Capetown and Seychelles during last March and April 2000.

2.12 Data report for 1999

1999 have been the year of inventories, collect and input of data and informations available within our Centre (IHSM) and national institutions (CNRO[12], METEO[13], ONE-EMC[14], cf. last year rep.).
CNRO : type ASFISIS. The convention of work which has recently been signed between both institutions will give easy access to these data that we will hopefully get by the end of this year.
METEO: type Temperature, rainfall parameters, atmospheric humidity, wind parameters (speed, direction). These data were stored vulnerably written in paper instead of with magnetic supports. Nevetheless, access to these data is free for the public institutions as the case of IHSM.
ONE-EMC: unknown for the moment.
In fact, the access to these coastal environment data seem to be difficult and thus require a long administrative process.

All these data are now available within our Centre and already used by local users.

2.13 Services and Products

Seeing the increasing need of help on their research area, and as it was planned during Cape Town workshop, we organized 1 day conference last may 2000. This focused on what is available within the Center and how scientists can use the data and information available. To help our librarian, two advanced students were trained to the fact on ASFA CD-ROM using. Local scientists have to contact them for bibliography search. Another student has been trained for input data into ASFISIS, MEDI and FILEMAKER software.

[12] CNRO: Centre National pour la Recherche Oceanographique
[13] METEO: Centre Météorologique
[14] ONE-EMC: Office National pour l'Environnement-Environnement Marin et Cotier

Listed below are the products available to the Center up to now:

PRODUCTS	QUANTITY		SUPPORT
	1999	end 2000	
1. WIOBASE 1.0	02	03	CD-ROMs
2. TOGA DATA	06	06	CD-ROMs
3. ATLAS OF OCEAN SECTIONS	01	01	CD-ROM
1.0	01	01	CD-ROM
4. GEBCO97	01	01	CD-ROM
5. BILKO MODULE 7 FOR WINDOWS	01	01	CD-ROM
6. WORLD OCEAN ATLAS 1994	04	04	CD-ROMs
7. ADVANCED TRAINING	02	06	CD-ROMs
OPPORT. IN THE ACP			
COUNTRIES (ed. 1 & 2)	01	01	CD-ROM
8. ASFA CDs(1997-2000/03 & /06)			
9. CAPETOWN WORKSHOP	03	01	CD-ROM
WORKING FILES	01	01	CD-ROM
10. MOMBASA WORKSHOP	03	01	CD-ROM
WORKING FILES	04	07	Newsletter
11. SPOT IMAGES KJ 163-397	03	06	Newsletter
12. FILEMAKER PRO 4.1	02	08	Newsletter
13. International WOCE Newsletter	02	06	Newsletter
14. GLOBEC International Newsletter	01	08	Newsletter
15. CLIVAR Newsletter	03	03	Newsletter
16. U.S. JGOFS NEWS	02	05	Newsletter
17. GEWEX NEWS	01	08	Newsletter
18. EARTH SYSTEM MONITOR	01	01	CD-ROM
19. WINDOW	-	07	CD-ROMs
20. WIOMSA NEWSBRIEF	-	01	CD-ROM
21. ASFISIS SOFTWARE			
22. World Ocean 1998 Atlas and figures			
23. Cruise Data CD-ROM			

2.14 Comments

Facing the enormity of the tasks we faced, the lack of equipment available in time up to now for the Center forced us to skip some items during the implementation. Thus, we judge necessary that the inadequacy of computer equipment and accessories should be rapidly settled during ODINAFRICA-II.

3. MAURITIUS

3.1 Introduction

The first phase of the ODINEA project, which was initiated in November 1997 in Mombassa, Kenya, recently ended at Lisbon, Portugal in October 2000. This first phase has witnessed lots of events of which some are very encouraging while others required closer support and assistance. For instance, the case of the Mauritian NODC is quite peculiar. Though there seemed to be no obstacle in the setting up of an NODC at the University of Mauritius in 1998,administrative sloppiness and the disagreement of the Meteorological station concerning the eventual set up of the NODC at U.O.M. complicated the whole process. In April 1999, the Senate, at its 402nd session, approved the setting up of NODC at the University of Mauritius. However, the Meteorological Station, via its chairperson Mr Ragoonaden, informed that his institution has already got the governments approval for the setting up of an NODC. It is only during a meeting at the Meteorological station in August this year that it was agreed that the NODC will be officially located at the Meteorological station but the University of Mauritius will remain the contact point of IOC. In a nutshell, the Mauritian NODC is lagging behind in terms of achievements, which were set in the very objectives of the project. Nevertheless, we are confident that we will be able to catch up the group in the coming year, i.e. in phase II of the project.

3.2 Chronicle of main events since 1997

After getting a very thorough training on the fundamentals of PC operations with standard computer utilities and the use of software related to marine metadata and data manipulation during the Mombassa workshop in 1997, much of the year 1998 was spent in practicing on these software and the main assignment was the creation of a metadata directory. An almost extensive list of metadata was presented at the workshop held in Cape Town in November 1998.
The 1998 workshop was another very resourceful training in terms of software knowledge and web page creation. Note that the NODC of Mauritius was still not set up. Hence, amongst the major activities in the work plan of the following year was the establishment of a NODC. Otherwise, activities like metadata and data mining were carried on and services were being provided ad hoc to clients.

In April 1999, the Senate, at its 402nd session, approved the setting up of NODC at the University of Mauritius. But the Meteorological station was objecting the idea of the NODC being set up at the University. Because of such confusion IOC allocated no budget for the running of the NODC (just like in 1998).

The Meteo was eventually successful in obtaining the approval of the Mauritian government to set up a National Marine Database at its premises. This was announced during a working session chaired by Mr Ragoonaden on 5th July 2000 at the Meteorological Station. Major data holders were invited to participate, amongst were the University of Mauritius, Albion Fisheries Research Centre (representing the Ministry of Fisheries); The Ministry of Environment; The Ministry of Housing and Land; The Mauritius Institute of Oceanography; The National Remote Sensing Centre of the Ministry of Agriculture and the Meteorological Services. I was invited to give a presentation on the ODINEA project, including the work I have done until now and the workshops I have attended. The major outcome was the designation of a working group consisting of members from each contributing institution. Mr Ragoonagen proposed to carry out an extensive survey so as to collect detailed information about the contributing institutions and stakeholders - the data they are collecting or wish to have, their future works etc.

3.3 Input of Metadata:

A number of activities, which were already started before the 1999 workshop, were carried on. As a result, mining of metadata was continued. It is to be noted that the majority of metadata were already mined last year. However, with the survey that will be carried out soon more information will be obtained as well as the actual database will be updated. It is also important to note that data rescue activities will also be undertaken as there are quite a substantial amount of data which were or which are collected by foreign research vessels and also by Foreign Scientific groups like the Shoals of Capricorn.

3.4 Conversion of metadata from MEDI to Filemaker 4.1

It is to be noted that, due to the phasing out of the previous version of MEDI, some of the metadata, which remained to be transferred to FILEMAKER 4.1, were blocked. With the acquisition of the new MEDI version, the remaining metadata will be transferred. Also note that, the new survey, which is being currently carried out, will enable us to update our metadata.

3.5 Conclusions

To summarize, all our future activities will now be undertaken by the working group. Hopefully, all the activities or decisions which were left pending due to absence of such a group will now be considered and wherever appropriate, be implemented. The activities are as follows:

3.5.1. Mission and Policy Statements:

The Mission statement as well as the Policy statement of the data centre has already been drafted. The drafts will be submitted to the working group to work on and finalize them.

3.5 2. Training of staffs

As per my activity plan for the year 2000, I myself proposed to provide training to officers of institutions concerned. I am already prepared to give demonstrations of the application of the various software and tools provided in the last Class_CD. Nevertheless, the delay being brought in carrying out this activity is again due to the absence of a formal structure. However, I hope to do so somewhere around early next year.

3.5.3. Website

Part of the website was presented during the workshop of 1999 ODINEA Workshop. Here also plan has been made to include information about the contributing institutions, their activities and their contribution to the data centre. Being also a national issue, the website will have to be subjected to the critics and suggestions of the working group before bringing it on-line.

3.5.4. Products and services

It is quite evident that, due to the absence of a formal structure or committee the products and services offered have been very haphazard. For example, there have been requests of certain specific products, especially from research students of the University and their requests have been promptly granted. Uses of the GEBCO digital atlas and Surfer have been made. Nevertheless, a definite idea of the main products and services to offer to the different “customers” can only be obtained after analysing the survey questionnaire, which the Meteorological station has recently distributed. It is to be noted that, regarding the peculiarity of the institutions and stakeholders needs, specific products and services have to be formulated.

3.5.6 Functions of the NODC of Mauritius

Keeping in view the particularities of the types of data collected and the categories of people of concern in this field, the NODC of Mauritius, when fully operational, will be expected to perform the following functions:

- Receiving data from researchers in the traditional manner, performing quality control, archiving and disseminating it on request.
- Provision of sufficient documentation about the data so the user can apply it to his problem with confidence of its value.
- Receiving data from buoys, ships and satellites via electronic networks on a daily basis, processing the data and providing outputs to various research and engineering users, forecasters, experiment managers, or to other centres participating in the data management plan for the data in question.
- Reporting the results of quality control directly to data collectors as part of the quality assurance module for the system.
- Participating in the development of data management plans and establishing systems to support major experiments, monitoring systems, processing and publishing data on the Internet and on CD-ROMs.
- Developing standards for the data documentation and processing.
- Publishing statistical studies and atlases of oceanographic variables.
- Participating in international oceanographic data and information exchange.
- Participation in ASFA.

4. MOZAMBIQUE

4.1 Introduction

Mozambique has been participating in the program ODINEA – Ocean Data and Information Network for Eastern Africa – from December of 1997. Two participants from Mozambique have joined others from the countries of the region, in a training course about Ocean Data and Information Management, held in Mombassa, Kenya in the above-mentioned year.

4.2 The Need For Setting Up An NODC in MOZAMBIQUE

Following the orientation given during the mentioned course, the two participants have disseminated the idea of creation of a specific board for data and information management in Mozambique. Two institutions, INAHINA (The National Institute of Hydrography and Navigation) and IIP (Fisheries Research Institute) have leaded and promoted the realization of an Inter-institutional workshop for reflection about Ocean Data and Information Management.

Aside of the project ODINEA, the participants of the workshop have strongly stressed the need for creation of a NODC. This National conclusion is a support and a commitment to the ODINEA program for establishment of the regional network.

4.3 Building Up Human And Infrastructure Capacity

Mozambique has gain benefits by joining this program. As was early mentioned, Mozambique was represented in this program by two technicians from INAHINA and IIP. Some support was provided to both institutions. This support included informatics equipment constituted by two sets of workstation (one for each institution); communications support (Internet); financial support for instalments expenses. In parallel with this external support, the National contribution was directed for the necessary support to build up a minimal infrastructure to accommodate the NODC. INAHINA has contributed by giving in a furnished office to the NODC; INAHINA is hosting the NODC; most of the stationary expenses are being supported by INAHINA (space, electricity, water, communications, etc). Aside the infrastructural component, other important component is the human resources, which Mozambique had gain benefits:

- Two technicians (from INAHINA and IIP) have full participated in all trainings occurred within the ODINEA Program. The trainings consisted in collection, quality control, and archive, analyse, repackage and disseminate data and information at different levels. They had a chance to visit SADCO (The South African Oceanographic Data Centre).

- One technician from INAHINA is taking a Computer Science (distance learning course), which is partly covered by IOC.

- One librarian (from INAHINA) had participated in a training course for librarians, held in Mombassa in 1999. This technician had also a local training; she is working at the library of INAHINA within the framework of RECOSCIX.

4.4 Historical Ocean Data

Mozambique has adopted a Distributed Model of Data Centre.
The Central Data Centre is responsible for collect and maintenance of the national Metadata, although “non country data” maybe processed and archived in this Data Centre. Regarding to Metadata,

Cenado is actively establishing among collector institutions a network for updating the information about the collection of data..
Aside this, Cenado has started a huge program for Rescue Data, which is divided in two subprograms,

- Rescue Data at National Level
- Rescue Data in Foreign countries

The Rescue Data at National Level, is being run in parallel with the Metadata collection. It has been identified that the data among institutions are in the following situation:

a) Institutions which collect or hold data without having specific routines for data management
b) Institutions which collect and do data management
c) Institutions holding data which are not of their interest (mostly historical data)
d) Institutions which hold unknown amount of unknown historical data, believed to be marine data.

Beside data from the sea, Mozambique has got an expressive fresh water resources, which include important rivers, like Zambezi River, important dams – Cahora Bassa, Massingir and others – important lakes, likes Niassa Lake. In this group, the most important which has a big volume of data (data in collection and historical data) is Zambezi River and Cahora Bassa Dam.

The rescue data in foreign countries, will be taken progressively with collaboration of the Ministry of Foreign Affairs. This is a program, which will take long time and specific negotiations.

4.5 Access To Internet

CENADO has published its Web Site in March of the current year. In this Site it was included the available Metadata. Those Metadata can be retrieved using ACCESS 97 (this DBMS is of the most widespread). It was planned to update the Site regularly, but this first edition took long time before being updated because some users from provinces have called to extend the period of the first edition, which is in essence, an introduction of what is NODC – In the rest of the country, the number of institutions, which have facilities of Internet are few.

5. SEYCHELLES

5.1 Centre Name: Seychelles Oceanographic Data Centre

5.2 National IODE Co-ordinator:

Rondolph J. Payet
Seychelles Fishing Authority
Fishing Port
Victoria, P. O. Box 449
Mahé
Seychelles
Tel: +248 224597
Fax: +248 224508

E.mail: sfasez@Seychelles.net / rpayet@hotmail.com

5.3 Data Centre URL: None

5.4 Designation Date: 1997 (d National agency for Oceanographic Data)

5.5 Introduction

The development of marine information and data management systems may be viewed initially in terms of those concerned with marine environment itself; with uses and industries; and with the professional context in which information is used in public, private and voluntary. The integration of information has become a key activity – even, the cornerstone of both development and management of marine industries on one hand and the science and management of marine and coastal environment on the other. It is this very purpose that the Seychelles with the assistance of IOC of UNESCO set up is data centre in 1997.

5.6 Background

The Seychelles Oceanographic Data Centre (SODC) –Designated Agency for Oceanographic Data- was established in 1997 under the umbrella of the Seychelles Fishing Authority in accordance with the IODE-ODINEAFRICA project objectives.

5.7 Mission Statement

To enhance the capabilities of marine institutions in data and information management; provide the means of acquiring, archiving, dissemination of data and improve technological advances in Seychelles.

5.8 Objectives of the Centre

The Seychelles Oceanographic Centre will fulfil the role of a Marine data bank, carry out national services in oceanography, data dissemination and exchange, and promote good data management nationally. It will also carry marine environment monitoring in relation to its influence on the ecosystem. The centre will also main close relations with other DNA's, NODC's and WODCs in marine related data.

5.9 Data Policy

It is a policy of the data centre to share and exchange data on the national level and international level. This however, relies on how sensitive the data is in terms of national integrity. Usually all oceanographic data are available and public domain after 2 years of original research.

Whilst, all effort will be done to ensure that the data is of correct format, the centre cannot guarantee or be liable for usability and interpretation of the data by a third party.

5.10 Organisational Arrangements

The structure of marine information management in Seychelles is centred round specific organisational purposes and their related topics, and lacks comprehensive interdisciplinary management. Nonetheless, there are a number of developments worth noting, concerned, respectively bibliographic databases, geographical information system of environmental resource management and fisheries databases.

The issue of strategic approach to marine information management system in Seychelles remains an important policy issue. Overall coordination of all scientific programmes has been delegated to the Centre for Information, Science, Technology and Development within the Ministry of Industry, however, the responsibility of marine data management is under the management of the Seychelles Fishing Authority.

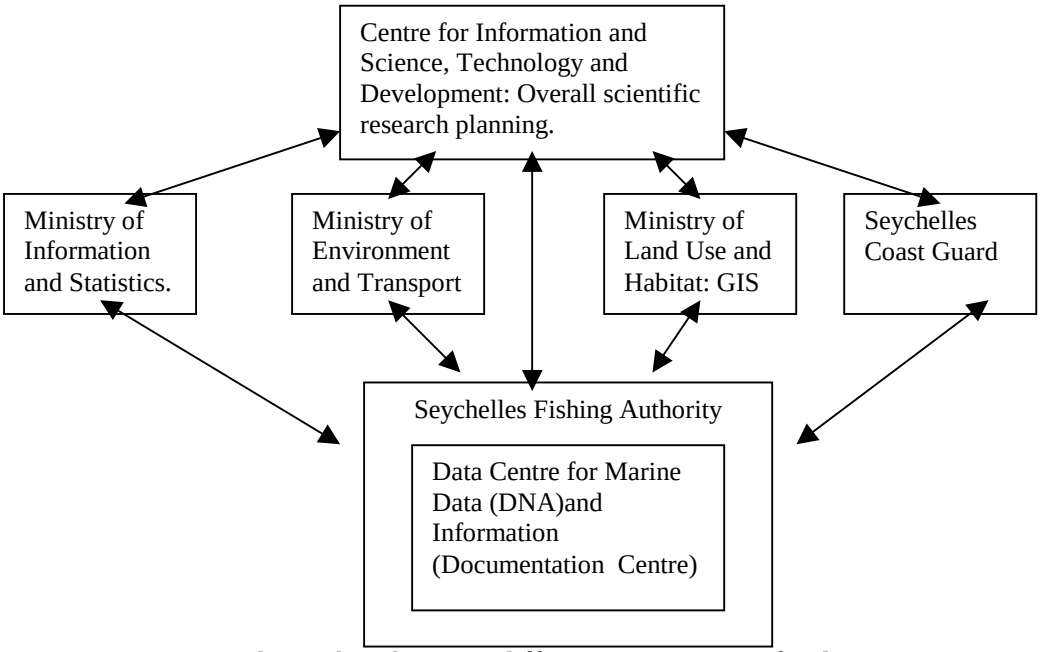


Figure 1: Interrelationships between different organisations for data management.

Table 1:Inventory of Data

AGENCY	**SHIP**	**AREA**	**No of Cruises**	**Data Transmission**	**PERIOD**	**Data Types**				
NORAD/Norway	Dr.Fridtjof Nansen	Seychelles EEZ	1	Unknown	1978/07/13-1978/07/27	B	D	H	-	-
Netherlands	NIOP-JGOFS-Tyro	Seychelles	1	JGOFS	1992/12/11-1993/01/09	B	D	H	M	-
US WOCE	R/V Knorr	W Indian Ocean	1	WOCE	1995/07/15-1995/08/24	M	G	D	H	-
BODC	Compilation of current data	Equatorial Indian Ocean	1	Unknown	1854-1974	D	-	-	-	-
JGOFS Germ	Meteor – met32/1	WIO	1	WOD' 98	1995/01/06-1995/03/22	M	B	D	H	G
JGOFS Germ	Meteor – met32/5	Seychelles-Oman	1	JGOFS	1995/07/14-1995/08/14					
GLOBTEC	Malcolm Baldridge	Indian Ocean	1	Unkown	1995/04/27-1997/04/24	B	H	-	-	-
JGOFS Germ	Meteor – met33/1	Seychelles	1	JGOFS	1995/09/22-1995/10/31	M	B	D	H	G
NIO	RRS Discovery	Indian Ocean	1	WOD' 98	March-April 1964	G	M	-	-	-
SFA/ORSTOM	RV Etelis	Seychelles	6	SFA	1993/03/26-1994/03/30	H	-	-	-	-
USSR/	Akademik Vinogradov	Seychelles	12	WOD' 98	March 1987	B	D	G	-	-
	R/V Gaveshani									
India		Seychelles	3	WOD' 98	1985	G	B	D	H	-
SFA		Seychelles	1		1983-1997	B	-	-	-	-
MET Office SEY	Tide gauge data	Seychelles	1		1904-1997	M	-	-	-	-
Tides Data	Oil exploration Prg.	Seychelles	1	SNOC	1993-1998	M				
Seismic Data	Oil exploration Prg.	Seychelles	2	SNOC	1973-1991	D				
Aeromagneic	Oil exploration Prg.	Seychelles	1	SNOC	1992	D				
Geochemistry		Seychelles	1	SNOC	1993-1999	H				

M: Meteorology; D: Physical Oceanography (Currents); H: Physical (Salinity & Temperature) & Chemical Oceanography; P: Contamination, B:Biological.

5.11 Other data housed at the centre include:

The World Ocean Data Atlas 1998
Tsitsilkamma National Park Oceanographic Data (South Africa), August 1999
WOCE Global Data: TOPEX/POSEIDON Sea Surface Height (1992-97 and AVHRR Sea Surface Temperature (1990-96).
NOAA/NASA AVHRR Ocean Pathfinder Monthly Sea Surface Temperature
Volume 11
GEBCO Digital Atlas 97
NASA Monthly Mean Distribution of Satellite-Derived Sea Surface Temperature and Pigment Concentration; Volume 1 to 5.

5.12 Data Centre Activities

Archiving

The data are situated on the main computer of the Data Centre with back ups. However, the centre awaits a CD- Writer to archive all the available data.

Data Catalogue/information leaflet

Due to the limited data available we have instead produce a brochure indicating the function, purpose of the centre in terms of national interest. The leaflets have been distributed to all the major Ministries. Feedback seems to be favourable.

Web-site development

A web page is being developed to present the Seychelles Oceanographic Data Centre. The page primary objective is to make aware to users what the centre is offering; it purpose and how it can be contacted. Dissemination of data over the web is not the primary purpose. The cost involved in doing so in the Seychelles is prohibitively expensive. However, we hope that by 2002 will be able to offer such a service, bearing in mind that this relies on the amount of data that can be offered.

Table 2: Data Types and potential users.

Data Types	Potential Users
1) Pollution data (marine pollution, chemistry) • BOD • Bacterial Count • Heavy metals in Crustaceans	Ministry of Environment (MOE Seychelles Bureau of Standards (SBS)
2) Physical Oceanography • SST • Currents • Sub Surface Temperature	Seychelles Fishing Authority (SFA) Marine Parks Authority (MPA) Seychelles Coast Guard (SCG)
3) SST	SFA, MPA
4) Meteorological data (climate studies) • Climate Studies • Rainfall, Air temperature, Sun Shine, • Tidal data	Meteorological Station SFA, MPA Fishermen
5) Chemical Oceanography • Historical Data	SBS, SFA
6) Geophysical data • Oil Exploration • Seismic Data • Tar ball/I\Oil slicks data	Seychelles National Oil company (SNOC), SFA, MOE
7) Biological/fisheries data • Mercury level data in fish • Biometric Data • Fish Aging Data • Fecundity • Genetics Studies • Plankton data • Aquaculture • Socio economic data	SFA
8) Sedimentology • Sediment trap data • Beach erosion • Offshore Sand Mining data	MOE MPA SFA

5.13 Metadata database

The Seychelles Oceanographic Centre has its own meta database and presently holds about200 entries on the data available at the centre and at other organisation within the country, including data products from other data centres around the world.

5.14 Request of data and information

The following table show the number of request made to the data centre.

Data and information request	No of request	Details
Ocean Data (SST, CTD)	6	
Software (Gebco, viewing, analysis)	3	Ocean PC,
Guidelines, documents	8	Guidelines for data collection and quality control

The scientific community in Seychelles is very small and the extent to which the data centre is used in terms of data request is limited. However, the data centre has been excellent in terms

on providing guidelines to data collection and management. The requests of data is administered through the Seychelles Fishing Authority Documentation Centre.

5.15 Funding

The major part of funding for the ODINEA project is derived from the IOC of UNESCO and The Government of Flanders. The counterpart funding of IOC amounted to approximately 7000 U$ per year and from SFA amounts to approximately 10, 000 U$ per year.

5.16 Status and progress

Since its inception, the centre has gone through various stepping stones. In 1997 the centre received computer equipment from IOC to assist the project and data management course which runs every year from 1997 to 2000. The centre also benefited from Internet and e-mail funding. This was a vital component of the project as it creates the opportunity of access to vital resources over the World Wide Web. The centre has developed a Meta database for its data and those available elsewhere nationally and internationally. Whilst every effort was done to attend an internship at an NODC it was not possible within the given time frame due to other commitment and responsibilities of the data manager. The centre so far has not produce any specific data products. It is the intention of the centre, however, to publish a CD-ROM of all Seychelles specific oceanographic data in the near future.

The centre are not without it problems. These problems come in terms of collaboration with other organisation. The difficult of creating an awareness of good data management is vital for future work and analysis and to avoid duplicating effort. The centre was limited in terms of capacity to develop data products. Oceanographic data in Seychelles, is limited to the data that individual organisation collects for their use and function. Consequently limits the extent to which it can participate in exchange programmes.

In terms of Data Management for ICAM no progress has been made, simply because no data and ongoing programme has been identified. It is important to point out that ICAM activities in Seychelles are slow.

To conclude the SFA expresses it gratitude to the IOC and funding partners in initiating the project and for its continuity. The SFA feels it has done quite well in fulfilling the project objectives, though there are still some constraints to overcome.

6. SOUTH AFRICA

6.1 Background information:

The Chief Directorate: Marine and Coastal Management (MCM) became part of the ODINEA-project at the end of 1997 and have been identified as a Secondary Data Center for South Africa during the 2 workshops held on data management (Mombasa, Kenya 1997 and Cape Town, South Africa 1998). The recognized NODC for Southern Africa is SADCO (Southern Africa Data Center for Oceanography) and MCM has been submitting oceanographic data to SADCO on a regular basis.

The main reason for the establishment of a "Secondary Data Center" for South Africa was due to the fact that MCM is one of the main contributors to the SADCO data center and that the oceanographic/environmental data collected by the research component of MCM is vast and includes discrete bottle data, CTD data (discrete and continuous), ocean current data, ship borne ADCP data, long term sea surface temperature monitoring data, temperature profiling time-series data, satellite imagery and wind data. It was also established before the first workshop held in Mombasa, Kenya (1997) that there was a great need for data-management training within MCM.

Since the inception of the ODINEA project in 1997 great progress has been made within MCM with regard to data management. Before the start of the project individual scientist and oceanographers kept datasets and meta-data on datasets to themselves and there was no system in place to collate the datasets or even know which datasets were available within MCM. At the start of the project, MCM was mainly concentrating on the oceanographic data that was being, due to the fact that oceanographic data was being submitted to SADCO, but this has recently expanded to also include biological data. With the experience and knowledge gained during the first training workshop held in Mombasa, Kenya (1997) it was decided that a proper system for archiving and quality control be initiated and to be managed by Marcel van den Berg for all oceanographic data collected within MCM.

After the 2nd training workshop held in Cape Town (1998) and September 1999 report back sessions were held with all relevant researchers and people managing the various datasets within the department. At the meeting the importance of establishing a meta- database for MCM and the rest of the scientific community was agreed upon and it was agreed to establish a committee or working group to create and oversee this meta-database

6.2 Main planned activities during ODINEA project:

1. Establish a committee comprising of all the research components within MCM to initiate the establishment of a meta database
2. Produce a Meta database for all oceanographic/environmental data collected within MCM
3. Produce a Meta database for all biological data collected within MCM
4. Publish data collected under certain programs and projects on CD-ROM and on the MCM homepage.
5. Establish methodology for the verification, quality control and archiving of data.
6. Capturing of oceanographic data found to be only available on hardcopy
7. Continue with the preparation of oceanographic data for submission to SADCO.

6.2.1 Establish a data management committee/working group:

The establishment of a data management committee was achieved after two report back sessions were held in December 1998 and September 1999. The report back sessions were held with all the relevant researchers and people managing various datasets within MCM. At the meeting the importance of establishing a meta- database for MCM and the rest of the scientific community was agreed upon and it was agreed to establish a committee or working group to create and oversee this meta-database. Mr. Ashley Naidoo was appointed as coordinator for this project. One of the first aims of the working group was to establish a mission statement and data policy on meta-data for MCM and have this approved by MCM management. This was achieved during 2000.

(See Appendix I and II for Mission and Policy Statements for MCM.)

6.2.2 Oceanographic Meta database:

During the 1999 ODINEA workshop it was decided to use "Filemaker Pro" as the preferred database to hold oceanographic metadata, due to the fact that the above-mentioned database is easier for publishing to the WEB. All the information that has been previously captured on the database that was created in ACCESS, based on the "MEDI" system, was converted to the new "Filemaker Pro" format. The fields that are being used in the database are along the same fields that were specified in the Blue Pages for the management of marine meta data by the Australian Oceanographic Data Center.

The database **(See Appendix III)** was designed to suit the needs of MCM and has proved to be a very helpful tool in the location and obtaining information on data collected during research surveys undertaken by MCM. The database is at the moment only accessible on the local intranet, as a service provider that runs "Filemaker" is needed to enable publishing on the Internet.

6.2.3 Biological Meta database:

The first phase of collecting biological meta data information from the various sections within MCM was initiated during 2000. Three documents regarding metadata were circulated to all sections, the first contained the motivation for such a directory and described all the fields required to describe a dataset, the second contained a completed example of metadata and the third contained a template that could be filled by the metadata provider. This template once filled could then be E-mailed to the data manager via the local intranet system. Sections are currently identifying datasets to be described and are to set reasonable time frames in which to provide the data manager with the metadata.

With the acquisition of new computer hardware during 2000 the process of capturing the different biological datasets will be started by the end of the year and it is hoped to have this completed in the early stages of 2001. Upon completion, the biological metadata and oceanographic metadata will be combined into one meta database which will then be available on the local intranet for use by the various research component within MCM. It is also hoped to place this meta database on the Internet at a later stage.

6.2.4 **Data Products:**

During 1999, an oceanographic data CD-ROM was published on data collected within one of the countries national marine parks, Tsitsikamma National Park. The CD-ROM was published after request from scientist doing research within the park for oceanographic data. After the success of the CD-ROM it was decided to create a web page that would consist of data products, data analysis, interesting articles and publications, but that covered the major datasets collected within MCM. The web page was placed on the official MCM web page during the middle of 2000 and can be found at the following Internet address:

http://www.environment.gov.za/mcm/offshore/squid/index.htm

The web page at present consist mainly of datasets collected for long-term monitoring projects and contains the following:

- Monitoring and individual current meter deployments
- Sea Surface Temperature Monitoring
- Temperature profiling sites
- Wind data

6.2.5 Establish methodology for the verification, quality control and archiving of data.

The process for the establishment of set methodologies for the verification, quality control and archiving of data within MCM has been continuing through out the duration of the ODINEA project. Two in-house manuals were produced for use during research cruises on the collection and initial post-processing of CTD data collected, whilst still at sea. These two manuals mainly assist with the software used for acquiring and processing CTD data.
The process used for the final verification and quality control of continuous CTD data has also been documented and the formats for submitting of CTD data to SADCO has been standerdised.
At the moment MCM and SADCO are working on the formats for submitting current meter and ADCP data onto the SADCO database.

6.2.6 Capturing of oceanographic data found to be only available on hardcopy

Since the start of the ODINEA project, datasets were found during the establishment of the meta databases that were only available on hard copy and due to staff shortages at MCM the data has not been converted to an electronic format. All the hardcopies of the data that has been found has been catalogued and stored and it is hoped with the recent acquisition of a dual scanner that the process of converting the data to an electronic media will be started in the near future (early 2001). Motivations to MCM management have also been submitted for financial assistance to enable us to employ a student to assist with this process.

6.2.7 Continue with the preparation of oceanographic data for submission to SADCO.

One of the main aims of the "secondary data center" at MCM is to verify oceanographic data and submit this data to the recognised data center for South Africa, SADCO.
At the moment only discrete bottle and CTD (discrete and recently continuous) data is being submitted to SADCO and since the start of the ODINEA project a total of 33 surveys (1257 stations) have been submitted to SADCO.

6.3 CTD Data submitted to SADCO by MCM

	No of Surveys	No of Stations
1998	7	313
1999	11	679
2000 (until Sept 2000)	15	547

Due to staff shortages at MCM, SADCO has been contributing financial support, to enable the employments a student on a yearly basis to assist with the verification of data before submission to SADCO.

In the next few months (end of 2000; beginning of 2001) plans are being made to also include current meter deployments and ship based ADCP current measurements for submission to SADCO.

6.4 ICAM Linkages for MCM

During the 1999 workshop held in Cape Town, South Africa participants from ICAM (Integrated Coastal Area Management) were introduced to the ODINEA group to facilitate a better working relationship between the two groups. It was found, from discussions with individual participants from ICAM, that the mayor concern for them was the lack of long term monitoring data sets along our coast. If these datasets were available it would assist them in the better management of the coastal regions along our coast.

During the last year one of the programs within MCM, The South African Climate Change and Squid Program, have been having discussions with members of SEACAM (Secretariat for Eastern African Coastal Area Management) to initiate a sea surface temperature and weather station monitoring program at selected sites along the east coast of Africa, to mainly monitor the environmental impacts and reasons causing the bleaching of corals along our coast and the effect it has on tourism. At the beginning of next year a yearlong scientific study will be started on the border between South Africa and Mozambique, in collaboration with various research institutes, to study the effect of environmental parameters on the bleaching of corals. This will include the measurements of current and sea surface temperatures at five selected sites in the area.

This and the availability of monitoring products, collected by MCM, on the Internet will hopefully assist ICAM with the better management of our coastal regions.

6.5 Conclusion:

During the last 4 years of the ODINEA project lots of experience and knowledge has been gained on the management and analysis of marine data and a lot of new ideas and programs have been initiated to enable MCM to manage their data better. At the start of the ODINEA program data management within MCM was not very organized, with datasets residing with the scientists that collected the data and the other scientist within the research component not knowing about the data. After report back sessions to management of MCM and relevant scientific personal about the importance and advantages of efficient data management within the organization and the establishment of a data management working group things have been improving. The main improvement being the establishment of oceanographic and biological meta databases and the standardisation of data formats for the archiving of data. The methods of data archiving and verification has also improved with the setting up of standards to test data against before being archived, placed on in house databases and submitted to the recognized data center for South Africa, SADCO. One of the main beneficiaries of this process has been SADCO, with more oceanographic data being submitted on a regular basis and the quality of the data being of a higher standard, with more emphasis being placed on the correct calibration and verification of scientific data.

Also with the publication of an oceanographic data-product web page on the official MCM web page, the data collected within MCM has also been made more readily available to other institutions and people that show an interest in data and it is hoped to be able to publish a data inventory of all the data collected within MCM in the near future. This will enable other research institutes and participants of the ODINAFRICA project to get an overview of the data available within MCM and details of obtaining the data for research projects and collaborative work.

One of the main shortcomings during the project was the number of staff that is able to assist with the management of data collected within MCM. Within the environmental group alone, there are only 2 people working, on a semi-permanent basis, on the capturing, verification and quality control of data collected. Although assistance have been received from the IOC of UNESCO, through the ODINAFRICA program, in the form of financial assistance and infrastructure support and from SADCO, in the form of financial assistance for student, the magnitude of data collected over the years that still needs to be verified and archived is enormous.

With the first phase of the ODINAFRICA (ODINEA) project, mainly consisting of participants of east African countries, coming to an end and the start of the second phase of the project, ODINAFRICA II, with participants from African countries on the west and east coasts of Africa, starting it is hoped that MCM can continue with the progress that has been made on the management of marine data within MCM and that the experienced and knowledge gained through the first phase of the project be used to assist the other African countries that have recently joined the project. Especially since South Africa is in the unique situation of being bordered by both the Indian and Atlantic oceans and collecting marine data on both side of its coast.

APPENDIX I

Mission of Biological and Oceanographic Data[15] Management within Marine and Coastal Management

Data management initiatives at Marine and Coastal Management (MCM) endeavour to support the overall purpose of MCM by ensuring the optimum use and availability of all scientific data collected and maintained by MCM. The aims and objectives of MCM are achieved by the conservation of marine and coastal ecosystems, the long-term sustainable utilisation of marine living and coastal resources, and the orderly access to exploitation, utilisation, and protection of certain such resources. For these purposes, provision is made for the exercise of control over marine living and coastal resources in a fair and equitable manner to the benefit of all the citizens of South Africa and to provide for matters connected therewith.

Data management must encourage the proper and effective use of valuable data collected at great cost to the citizens of South Africa and donor agencies. This will be achieved through a policy of data and information sharing with key areas of focus being, encouraging the effective use of data and data descriptions and the maintaining of accessible and permanent archiving systems for data and data descriptions.

APPENDIX II

Policy of Biological and Oceanographic Data Management within Marine and Coastal Management

[15] Data refers to biological and oceanographic data and data products collected and produced by scientific staff of MCM.

Data management policy serves the mission of data management.

Data management will function as a combination of centralised and decentralised processes.

Centralised Processes: Primary responsibilities of Data Manager

Developing and maintaining an accessible, permanent and current inventory of descriptions of datasets (metadata) maintained by the various research sections within MCM. Metadata will describe all relevant aspects of the datasets to allow for an efficient assessment of the suitability of a dataset for any potential study. The metadata will be archived in an easily accessible database programme. The structure of this database allow MCM metadata to be compatible with regional, continental and other international data management initiatives.

Data and information sharing and exchange will be encouraged by the readily accessible metadata inventory, which when complete will be situated on the MCM intranet system. Establishing links to a wider internet audience will be explored later. While data sharing remains a focal point, MCM recognises the "proprietorship" (rights to first analysis / publication / authorship) of researchers responsible for data collection and or analysis.

The development of guidelines in conjunction with data management officers within individual research sections with regards to data standardisation; verification and long term archiving.

Co-ordinate the compilation of a list of both internal and external data users. This can be achieved through the creation of a database on the internal computer network into which data requests can be entered when received by each section. This system will allow an evaluation of the use of data collected by MCM.

Co-ordinating MCM data management initiatives with national, regional and international initiatives, standards and norms.

Develop data management policy and methods of implementation.

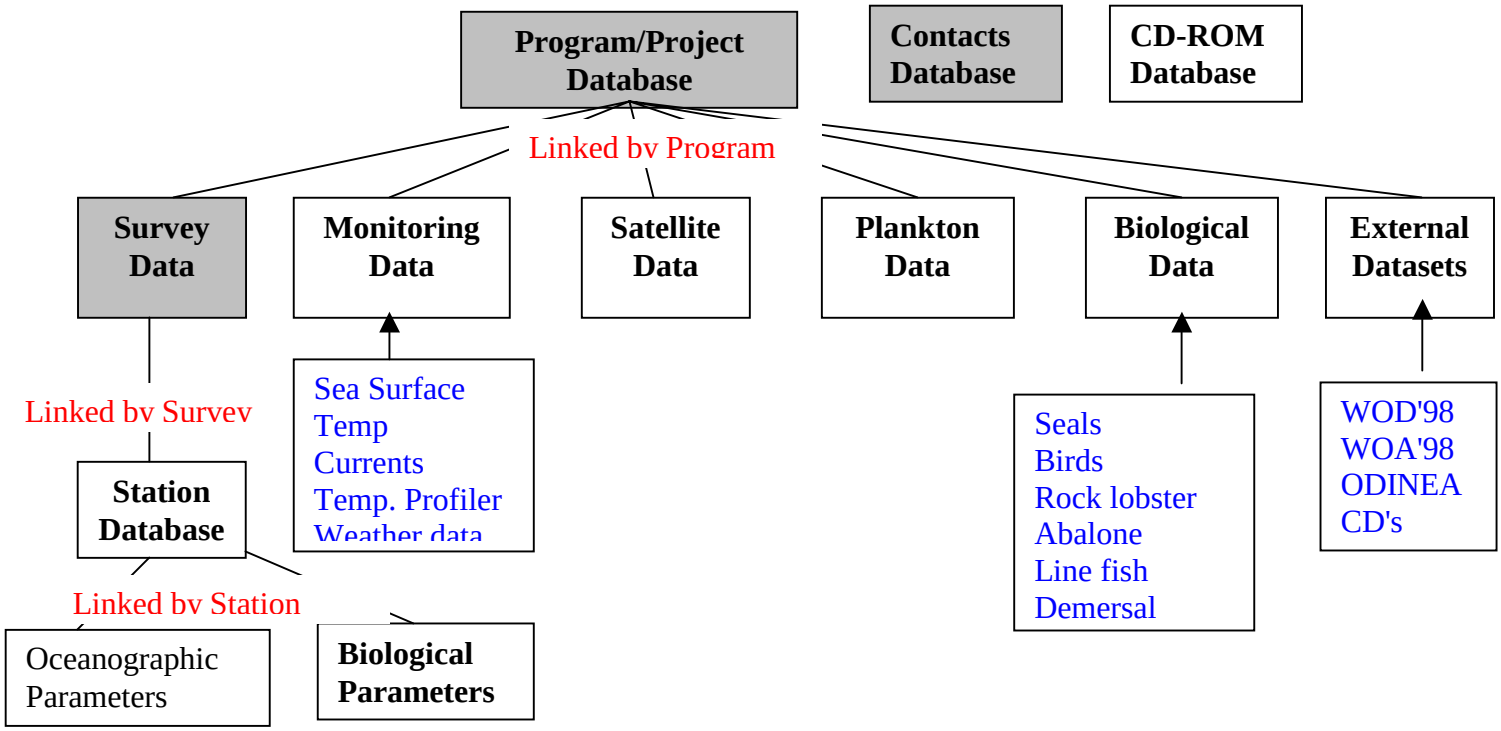
Decentralised Processes: Primary responsibilities of data management officer within each section

- Maintain datasets.
- Data quality and assurance.
- Data storage and archiving.
- Providing centralised processes with all necessary information with regards to metadata.

- Providing timely up-dates to metadata archive to maintain the archive in the most current condition possible.
- Responding to requests for data together with data manager where necessary.
- Respond to requests for data products e.g. suitable summaries in particular where the low level data are confidential.
- Record requests for data and data products.

APPENDIX III

Marine and Coastal Management Meta Database



7. TANZANIA

7.1 Intoduction

The ODINEA (Oceanographic Data and Information Network for Eastern Africa) project started in 1997 by a meeting that was held in Mombasa, Kenya, that brought together East African coastal nations. Following that meeting ODINEA activities begun in 1998 after funding for the project was available through the IOC of UNESCO. The ODINEA project was born from the great and obvious need of East African nations to efficiently manage their oceanographic as well as coastal area data and information. However, oceanographic data and information management concept was really quite new to most of our countries, thus we lacked the capacity.

The ODINEA project was therefore established along the lines of capacity building in our countries that includes both human and infrastructure capacity building. Capacity building therefore is the major keyword for ODINEA. Additionally, because the problem of lack of capacity in oceanographic data and information management is really affecting mostly all African coastal countries, the ODINEA project was actually the start of similar efforts for all African coastal countries. Thus, the ODINEA project was really phase I (ODINAFRICA-I) of the ODINAFRICA (Oceanographic Data and Information Network for Africa) project that started in September, 2000 as ODINAFRICA-II. The new regions and the Ocean Service Department of the IOC will draw from the experiences in Eastern Africa.

This report is the final for ODINAFRICA-I as we enter into ODNIAFRICA-II, and will therefore focus mainly on the achievements of our data centre during the two years of ODINEA, i.e., 1998 – 2000.

The Institute of Marine Sciences (IMS) which belongs to the University of Dar Es Salaam was nominated to be the Designated National Agency (DNA) for Tanzania in 1996, taking over from the Ministry of Natural Resources and Tourism. IMS which is based in Zanzibar was established on July 1st, 1979 to undertake research in all aspects of marine sciences, to provide postgraduate training and later undergraduate training in accordance with the national manpower requirements, and to provide advisory and consultancy services in marine affairs. For that reason, IMS has been involved in various coastal zone management programmes at national level as well as at regional level.

Since its nomination as a DNA, efforts are being done to lay foundations for the establishment of a full National Oceanographic Data Centre (NODC) for Tanzania. These efforts are being coordinated under the ODINEA/ODINAFRICA project activities.

7.2 Main Objectives Set for ODINAFRICA-I

As mentioned above, the main objectives of ODINAFRICA-I is capacity building in coastal African countries to enable them to efficiently manage data and information from their oceans. Efficient management of data and information will make them readily available to decision makers and thus contribute significantly for decision making and management issues on coastal and marine environment as well as resource utilization. Thus, ODINAFRICA will also play a key role in integrated coastal area management (ICAM) in our countries.

In order to achieve the main objectives of the project, the main objectives was broken into several planned activities/sub-objectives as follows:

1) Establishment of an operational data management structure, composed of a Regional Data Centre (RNODC) as well as National Data Centres (NODC, DNA).

2) Build and maintain regional human and infrastructure capacity to collect, quality-control, archive, analyze, repackage and disseminate the data and information at the international, regional, national and local levels.

3) In line with (2) provide data management training through a series of training courses and workshops.

4) In line with (2) provide information management training as a follow-up to RECOSCIX-WIO and ensure that information managers in the region keep up with the advances in information management technology and methodology.

5) In line with (2) provide internship training opportunities for NODC/DNA staff in well established NODCs and WDCs (World Data Centre) to make staff member familiar with the activities and procedures used in the IODE (International Oceanographic Data Exchange) system, and more particularly in a data centre.

6) Actively search, retrieve and archive historical ocean data sets in- and outside the region related to Eastern Africa and local levels.

7) Provide access to the internet for marine scientists and/or national institutions in the eastern Africa region.

8) Ensure inclusion of scientific information produced in eastern Africa in the bibliographic database ASFA which is the core reference database in the field of aquatic sciences.

In carrying out and implementing the ODINAFRICA-I project, IMS as the DNA for Tanzania had set its objectives and planned activities for each year of the project, i.e., for 1999 and 2000. These objectives are clearly stated in the ODINEA proposals for the respective years (*Proposal*, 1998; 1999). In summary, the various objectives and/or planned activities are as follows:

For the year 1999, which was actually the first year of a functional ODINEA objectives and planned activities (*Proposal*, 1998) were:

a) Publicizing ODINEA and its objectives to stakeholders in Tanzania.
b) Data and information collection/acquisition from coastal regions and/or relevant institutions and scientists.
c) Establishing a functional meta-database.
d) Provide in-house training.
e) Attend internship.

For the year 2000, the objectives and/or planned activities (*Proposal*, 1999) are as follows:

a) Continue with collection of data and information for inclusion in the database.
b) Continue with efforts of publicizing ODINEA and the meta-database.
c) Start dialogue with relevant authorities on the establishment of a full NODC for Tanzania at IMS.
d) Continue with in-house training in data entry and other themes related to activities of the NODC.
e) Attend internship.

7.3 Achievements of ODINAFRICA-I at IMS Versus Planned Objectives and Activities

Several important achievements have been realized during the ODINAFRICA-I project at IMS (and Tanzania in general). Because this is the final report for ODINEA (ODINAFRICA-I) it is an important opportunity for us to assess how much the project have achieved as far as IMS, the Tanzania DNA, is concerned. This assessment is provided below here serially with respect to each of the major eight objectives of ODINAFRICA-I enlisted above.

1) **Establishment of an operational data management structure:** This objective/activity was the first one to be implemented to enable the project to go on. For Tanzania this was implemented by the nomination of IMS by the government of Tanzania to be the DNA, taking over from the ministry of Natural Resources. Efforts are now underway to up-grade IMS to a full NODC.

2) **Build and maintain regional human and infrastructure capacity:** Building and maintaining regional human and infrastructure was accomplished at two levels, i.e., regional/project level and national level. For infrastructure capacity at project level, IMS received various computer equipment and accessories e.g., computer and various software, printer, Zip drive, etc from IOC of UNESCO in 1998, as part of infrastructure support. This marked the actual start of ODINAFRICA-I activities. Additionally, from that period, each year IMS received support from IOC for the same purpose, i.e., infrastructure support by which we have been able to acquire equipment that were found to be needed in the implementation of the project like the CD-writer etc.

IOC also have been providing support for operational expenses which cover for many of the operational activities of the DNA. This support was used in such activities as data and information collection, which involved visiting all coastal districts and most of coastal ICAM programmes, relevant institutions etc, in the country. Most of this work was done in 1999.

However, before we could secure good cooperation of the various stakeholders, it was also important to publicize ODINEA and sensitize the stakeholders to cooperate. This was done successfully using the support of operational expenses and e-mail connectivity support, and now the project is continuously becoming accepted by marine scientists and stakeholders in Tanzania. These achievements are clearly explained in our annual report for 1999 (*Annual Report*, 1999).

We were also able to establish a good and reliable relationship with the Tanzania Coastal Zone Management Partnership (TCMP), a project by the government of Tanzania and the Rhode Island University to develop integrated coastal management structure in Tanzania. In 1999 we participated in one of the TCMP retreat workshops and presented ODINEA, where it was accepted enthusiastically (*Annual Report*,1999).

In summary, currently the Centre have sufficient equipment to start the going.

Human capacity development was implemented at project level as well as at national level. At project level, first, a series of training workshops on data management were conducted since 1997 to train data managers on various issues of data management and expose them to the current issues on the subject. These are briefly explained in (3 and 5) below. Similarly, a series of information management workshops were conducted for participating countries under the RECOSCIX-WIO project to train information managers as briefly explained in (4).

At national level efforts various efforts have been done under what we call in-house training. Although each year we had planned to conduct a training workshop for data and information management for marine and coastal scientists in Tanzania, we have never been successful due to the lack of funds. However, the data centre, following its fast increasing acceptance by the scientific community and the public in general, we have had two opportunities in this year of

2000 of providing in-house training. First, the Centre was asked by the Computer Science Department of the University of Dar Es Salaam to play host to two undergraduate students during their fourth term practical training under one of the Centre's staff. We accepted the request and played host for 8 weeks for those students since 19th June 2000. During that period we exposed them to the concepts and importance of data and information management. Furthermore, we taught them various data and information management systems and/or software. Secondly, at the beginning of August, we requested by the Tanzania Fisheries Research Institute (TAFIRI) to teach/expose (for two days) one of their research officers on the concepts of data and information management using ACCESS. We willingly accepted their request, the officer come and was well trained at our Centre.

These two requests are evidence of increasing visibility and acceptance of ODINEA project in Tanzania.

3) **In line with (2) provide data management training through a series of training courses and workshops:** This was successfully done at project level. Three data management training workshops were organized, one each year. The first one was held in Mombasa, Kenya and the second and third one in Cape Town in South Africa. The workshops were very informative and vital for data managers from the participating countries, most of whom, the concept of data and information management was new. In addition to these training workshops, last year (1999) a workshop on ICAM requirements for data and information management was organized back to back with the ODINEA training workshop. This workshop brought together data managers from countries participating in ODINEA and various experts from World Data Centres and ICAM projects from allover the World. The workshop was a success as it explicitly exposed the mutual needs for each other among the groups. The importance of coastal and marine data and information management for the sustainable use and management of marine and coastal areas and their resources was underscored. Tanzania participated actively in all the workshops including the ICAM workshop, and was always represented by two staff from IMS.

4) **In line with (2) provide information management training:** Same as in (3) above a series of training workshops were provided to information managers through the RECOSCIX-WIO project that is closely linked to ODINEA. The aim of these workshops was to ensure that information managers in the region keep up with the advances in information management technology and methodology. In April 1999 RECOSCIX-WIO celebrated its 10th anniversary and the workshop for that year brought together data and information managers. The RECOSCIX-WIO project has been a success in serving the marine science community in Eastern Africa as well as other parts of the World by searching and delivering required scientific documents in a relatively short time. The success and importance of this project can not be overemphasized in this region. As more and more participating libraries acquire reliable communication e.g., internet connectivity, the time for document delivery will be reduced even more. IMS is participating actively and fully in RECOSCIX-WIO and the number of users of this services is increasing each year (*Nyika*, 1999). Additionally, Tanzania also participated actively in all training workshops for information managers.

5) **In line with (2) provide internship training opportunities for NODC/DNA staff:** Another approach adopted by ODINAFRICA-I for developing human capacity in Eastern Africa countries was to provide internship training for NODCs/DNAs at a well established NODCs and WDCs (World Data Centre) to make staff member familiar with the activities and procedures of a data centre as well as those used in the IODE (International Oceanographic Data Exchange) system. Although this opportunity was available at project level, very unfortunately none of the IMS staff could make use of it. This is due to the tight schedule of the staff because they must also attend to other issues

and/or assignments. However, our information manager did two month internship at KMFR (Kenya Marine and Fisheries Research Institute) in Mombasa, Kenya. We do hope that if this important facility is still available, we may be able to utilize it next year.

6) **GODAR participation:** ODINAFRICA-I was supposed to provide support for national institutions to participated actively in the GODAR project. The support would include (i) participation in international GODAR workshops and training courses; (ii) retrieval of historical data; and (iii) reformat and archiving historical ocean data sets in- and outside the region related to Eastern Africa and local levels. IMS could not make use of this important facility. In the first and second years of ODINEA, most of the efforts were directed towards sensitization, publicizing of ODINEA and development of a functional meta-database oceanographic and coastal data and information in Tanzania. As far as Tanzania is concerned, more time was needed before we could make use of this important facility comfortably.

7) **Provide access to the internet for marine scientists and/or national institutions in the Eastern Africa region:** Another objective of ODINAFRICA-I was to help Eastern African countries to have access to the communication super highway i.e., internet connectivity. This was done through provision of operational support from IOC. This was an important objective because it was supposed to bring about reliable and efficient communication/exchanges between scientists and different institutions at local, regional, and international levels. It was supposed to link Eastern Africa scientists, institutions, including the DNAs and NODCs, with the rest of the World.

Since the start of ODINAFRICA-I, IMS established email-only connectivity through a dial-up system with the Computing Centre of the University of Dar Es Salaam. Full internet connectivity was a not possible due to the absence of Internet Service Providers (ISP) in Zanzibar, and technical reasons for linking direct with Dar Es Salaam. By lacking full internet connectivity, IMS could not publicize itself fully and could not access a lot of wealthy information and data that are published on the Web.

However, this situation have changed drastically this year. In mid of June IMS for the first time got full internet connectivity through a dedicated phone line from TTCL (Tanzania Telecommunication Company Limited). The HTTP (Web Server) was installed and the Domain Name Server (DNS) was partially configure on our server during the first week of August by a TTCL telecom engineer. Completion of DNS configuration and moving of IMS web page from the WIOMSA (Western Indian Ocean Marine Science Association) at the Computing Centre of the University of Dar Es Salaam in Dar Es Salaam, to our server was done by Dr MASALU during the first half of September. This included editing and updating the IMS web page which is still under construction now. The URL address for this page is www.ims.udsm.ac.tz and the email address is odinea@ims.udsm.ac.tz . IMS have now started publicizing itself and publishing all other relevant information on the World Wide Web.

The IMS web needs major editing to update and include all relevant information on IMS, including a homepage for ODINEA. The work of planning, designing and writing the ODINEA web page is going on, and we plan to launch it before October (*Progress Report*, 2000).

8) **Ensure inclusion of scientific information produced in Eastern Africa in the bibliographic database ASFA:** IMS through its library services in collaboration with the RECOSCIX-WIO project, has been participating actively in efforts to ensure inclusion of scientific information produced in Eastern Africa in ASFA database. IMS sends/provides inputs for all scientific information produced in Tanzania to RECOSCIX-WIO office at KMFR (which is a member of ASFA), for inclusion in ASFA.

7.4 Products And Services Produced From The Project

The main product of the Centre so far is the fully functional meta-database, a copy of which has been installed at various relevant institutions in Tanzania. Other than this, so far, we have not been able to produce other products because of the limitation of funds, equipment and staff. Last year we acquired a CD-Write, and trials of producing data CD products were done by Mr. MUHANDO in January using the CD-writer. The trials were successful and we hope to design and produce the first CD-product in the near future. Along with this we plan to produce several types of brochures about ODINEA.

Despite the difficulties mentioned, the Centre has however, managed to provide services to its clients in several ways:

- Maps of coastal resources and Marine Protected Areas of Tanzania. These can be viewed and printed from the meta database.
- The Centre is developing national archives of oceanographic data and information.
- Providing information about marine and coastal scientists in Tanzania.
- Provides an inventory of its data and information holdings and information about other data and information sources.
- Provides copies of its data and information to requesting clients.
- Acts as a referral Centre for other national and international oceanographic data and information.
- Acts as a link between scientists at local, regional and international level.

7.5 Problems Encountered During Implementation of ODINAFRICA-I

During the implementation of ODINAFRICA-I several problems were encountered, some of which needed patience rather than the wish to accomplish fast. Some of the problems encountered are:

- ODINEA (ODINAFRICA-I) is still new and not well perceived in Tanzania, therefore more publicity and sensitization needed to be done.
- Many institutions and departments do not have a system of cataloguing reports produced on their behalf, or those produced by their staff. ODINEA activities awakened most of them and they promised to establish proper record keeping (cataloguing) of all reports.
- Some scientists were not ready/happy to share their data and/or information with others, sometimes for no good reasons.
- Accessibility to some of the coastal districts e.g., Kilwa, Mkulanga and Rufiji is very poor (especially during the rain season) due to bad roads.

7.6 Contribution Of ODINAFRICA-I Project to National Efforts In Data Management

Although ODINAFRICA-I (ODINEA) project is still quite new it has generated a great impact on national efforts in data management as follows:

Now many scientists and government staff in relevant departments/institutions are aware and appreciate the need and usefulness of proper oceanographic data and information management. This awareness and appreciation was not there before ODINEA.

Because we already have a substantial amount of data and information in our meta-database, many scientists, researchers and decision makers can now find many information easily. This is saving a lot of time that would otherwise be wasted looking for some information that you don’t know where to get it.

The importance of data management is also given high priority in the proposed ICAM policy for Tanzania, because good data and information management would allow for the sustainable utilization/development of coastal areas. That is, data and information management is in deed part and parcel of environmental protection/management.

7.7 ODINAFRICA-I and ICAM Linkages in Tanzania

The Centre successfully established close collaboration with ICAM activities in Tanzania by the end of last year (*Annual Report*, 1999). This was possible through close collaboration with the TCMP which oversees all ICAM programmes and projects in Tanzania. Following this important success we have enjoyed good cooperation from all coastal ICAM projects in Tanzania in terms of data and information exchange. Furthermore, during 1999 we were able to visit most of the ICAM projects and programmes when we visited all coastal districts in Tanzania.

For this year, due to budget limitations we have planned to visit Tanga region where among other we will visit the Tanga Coastal Zone Programme, which is a major ICAM programme in that area. The Tanga Coastal Zone Programme have requested us to install a copy of our meta-database at their site. We have also planned to visit various relevant institutions and projects in Dar Es Salaam. However, because of the delays in receiving the funds from IOC, we have not been able to visit these places. We hope we will be able to do so very soon.

Nevertheless, we have maintained our lively collaboration with TCMP where last year we installed a copy of our meta-database.

7.8 Towards ODINAFRICA-II - Lessons Learnt During ODINAFRICA-I

During the execution of the ODINAFRICA-I project we have gained a lot of wealthy experience that is vital as we enter ODINAFRICA-II. One very important experience or lesson that we leant is the fact that don't be to ambitious in planning you activities for the year ahead of you. Although, it is important to aim higher, but this should be carefully balanced with the actual situation on the ground, especially where you are dealing/interacting with many other people and/or institutions. For the first year of ODINAFRCA-I many participating DNAs and NODCs could not satisfactorily accomplish their goals. Most of them were accomplished in the second year of the project. What we see here is that, to be able to actually start implementing your objectives, preparation is important. So, for most of our DNAs/NODCs the first year of ODINAFRICA-I was useful only as a preparatory period. In the second year most of the Centres achieved some appreciable results because scientists as well as the public were already sensitized and aware of what is ODINEA and its benefits. This lesson is especially important to our brothers who just joined ODINAFRICA-II.

Secondly, though related to the first lesson, whilst most scientists working in research and training institutions keep a record of scientific reports and publications, officials working in government sectors and some of the NGOs rarely kept records. In Tanzania this was a general situation observed though might be different in other countries. Most institutions did not have a system of cataloguing reports and/or publications produced on their behalf by their staff and those produced by their staff. ODINEA activities awakened them and they promised to start cataloguing systems for their documents/publications. The problem was two fold; generally it was simply due to lack of awareness but sometimes the lack of facilities contributed.

Some scientists/researchers were not happy or ready to share their data and/or information, worrying that some body else without their accent may use their data for publications. Here we see that more sensitization is needed to build confidence in stakeholders to share the data and information they posses.

Technology may also be a serious hindrance in project implementation. A good example is perhaps the internet connectivity issue of IMS.

Likewise, logistics may impact seriously the implementation. For instance, until now IMS have not yet received the operational support funds from IOC, and we are already heading towards the end of year.

All the staff at the Centre are engaged in other duties as per their employment. This has been a big hindrance in implementation of the project as these people, principally must give priority to their permanent employment. Furthermore, on top of the tight schedule due to their employment, there is no any incentive that will keep them wanting to do the job.

7.9 General Overview of ODINAFRICA-I

The ODINEA (ODINAFRICA-I) project has been a success in Tanzania. Currently, we have a functional meta-database, copies of which are widely distributed to relevant institutions. We have started converting this database into FileMaker system from ACCESS so that we can hook it easily on the ODINEA web page, now that IMS has full internet connectivity.

The full internet connectivity at IMS will help us along many fronts including increasing visibility of ODINEA activities. Additionally, we plan to make use of the facility to poll various stakeholders on various pending issues such as the development of the Mission (a draft exists) and Policy statements of the Centre (*Progress Report*, 2000). Development of Mission and Policy statements requires inputs from many different stakeholders. Generally, this can be achieved by conducting a seminar, workshop or meeting which involves various stakeholders. However, because of the limitations of funds this has been very difficult for us. Due to the same reasons explained above we have not yet attempted so far to develop a policy statement but if successful with the internet, we plan to develop it immediately.

Because ODINEA activities are already known and increasingly being accepted in Tanzania. The main focus of our activities in ODINAFRICA-II will be on providing services and production of various relevant products.

7.10 Concluding Summary

The ODINAFRICA-I (ODINEA) project, in overall, has been a success in Tanzania. All the necessary foundations needed for swift implementation of the project e.g., publicity and acceptance by stakeholders have been created. This guarantees a better future and relatively swift implementation of ODINAFRICA-II. It is however, important not to loose track of the success obtain during ODINAFRICA-I. Sensitization campaigns as well as efforts to increase the visibility of ODINAFRICA-II activities should continue.

We hope that scientists as well as the public will make use of the ODINAFRICA-II project and its new up-coming facilities to increase efficiency in their work, management of resources, and decision making.

7.11 References

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