Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean

Third Session

Vacoas, Mauritius, 14-18 December 1992

UNESCO

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IOC/INCWIO-III/3
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* For reasons of budgetary constraints, the Annex III has to remain untranslated and appear in English in the French text of the Report.

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ANNEXES

1. OPENING

1 The Director of the Mauritius Meteorological Service, Mr. Y. Valadon, called the meeting to order at 10.00 on 15 December 1992, in Boname Hall, Mauritius Sugar Industry Research Institute (MSIRI), Reduit, Mauritius.

2 Mr. Valadon welcomed the participants to Mauritius, and noted that almost all Member States of the Region were represented. He noted that Mauritius is much involved in activities of the Intergovernmental Oceanographic Commission (IOC), that it aims to participate fully in the Global Ocean Observing System (GOOS) and that it recognizes the multi-disciplinary nature of ocean research, and the usefulness thereof for society. He emphasized the need for the Regional Committee to make its voice heard in an aggressive and constructive manner in the light of UNCED and recent geo-political events and changes. His speech is given as Annex III.A herein.

3 He introduced the Chairman of the Session, Mr. S. Ragoonaden, Vice-Chairman of the Regional Committee, who would serve as Chairman of the Session in view of the inability of Prof. A. Msangi to be present.

4 Mr. Ragoonaden emphasized the need for the Regional Committee to address matters of priority for the Member States of the region, such as marine pollution, coastal zone conditions and erosion,the follow-up of UNCED in a strategic framework, but with specific and realistic actions. His speech is included here as Annex III.B.

5 Mr. Valadon then introduced the Secretary IOC, Dr. G. Kullenberg, who welcomed all participants on behalf of the IOC, and expressed his great appreciation to the Government of Mauritius and the Meteorological Service for hosting the Session and making such excellent arrangements. He recalled his meetings on 14 December with the Minister of the Environment and Quality of Life, and the Permanent Secretary of the Ministry of Education and Science which emphasized the importance of the marine environment to a nation such as Mauritius, and the inherent cultural dimension in dealing with matters related to the environment; Education, Science, Culture - hence the IOC in UNESCO. His speech is included as Annex III.C.

6 Mr. Valadon then introduced Mr. S. Taukoordass, Representative of the Prime Minister's Office. He gave a very inspiring address, acknowledging the role of marine research, the interest of Mauritius in further strengthening its involvement with the IOC, and the recognition of the importance of the ocean territory for national development. He emphasized that new approaches and concerted action plans are expected from the Regional Committee. This should include effective measures for maintenance of coastal water quality; consideration on how to handle coastal erosion; the re-confirmation of the multi-disciplinarity of ocean research and the related inter-sectoriality of ocean management. He then declared the Third Session of IOCINCWIO open. His speech is given as Annex III.D. The List of Participants is given in Annex VI.

2. ADMINISTRATIVE ARRANGEMENTS

7 The Chairman called the Session to order and introduced the task at hand by recalling the report from the Second Session of the Committee, Arusha, Tanzania, 7-11 December 1987.

2.1 ADOPTION OF THE AGENDA

8 Following the proposal of Tanzania that the Agenda be adopted as circulated dated 16 November 1992, which was seconded by Mauritius, the Regional Committee adopted the Agenda as given in Annex I, hereto.

2.2 DESIGNATION OF THE RAPPORTEUR

9 The Chairman explained that the draft report of the Session would be presented and adopted in English only, and in view of this, only one rapporteur would be needed.

10 Following an enquiry from the Delegate of France, the Secretary IOC confirmed that the report would be officially translated into French and circulated in English and French, including translation of relevant annexes from French to English.

11 **The Regional Committee then elected** Mr. M. Odido (Kenya) as Rapporteur for the Session, following a proposal from Mozambique, seconded by Tanzania. Mr. Odido joined the podium.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

12 The Technical Secretary for the Session, Mr. G. Soares, introduced the timetable, the documentation and the conduct of the Session, referring to the Annotated Provisional Agenda (Document IOCINCWIO-III/2), and the List of Documents (IOCINCWIO-III/4 prov.) reproduced hereto as Annex VII. The Regional Committee adopted the working procedures, took note of the documentation and accepted the timetable with minor modifications.

3. REPORT OF THE SECRETARY ON INTERSESSIONAL ACTIVITIES

13 The Technical Secretary, Mr. Soares, introduced this Agenda Item, referring to the Report of the Second Session of the Committee, Document IOCINCWIO-II/3, and Document IOCINCWIO-III/6, Report on Intersessional Activities.

14 The Secretary IOC recalled the decisions and recommendations adopted at the Second Session of the Committee and also invited the Regional Committee to review these under the relevant Agenda Items. He also invited the Delegations to provide further information on national programmes and actions.

15 **The Regional Committee took note** of the report on intersessional activities with appreciation and endorsed it. It expressed satisfaction with the efforts made to implement the regional programme, and with the further technical assistance received from Member States outside of the region and from several other Organizations, and programmes, including UNEP, WMO, IAEA, FAO, IMO, besides IOC & UNESCO. The increasing co-operation and co-ordination between the agencies was noted, including co-ordination meetings arranged by IOC in co-operation with the Flemish Inter-university Council (VLIR), (Brussels, Belgium, October 1991 & 1992, Document IOC Workshop Report No. 83). The Regional Committee agreed that further co-ordination was required and established a sessional *ad hoc* group to examine the matter and suggest mechanisms to be discussed under Agenda Item 8.

16 Several Delegations provided information on national programmes, as well as activities within other bodies working on a regional or sub-regional basis. These are summarized in IOC/INF-919.

4. PROGRAMME MATTERS

4.1 OCEAN SCIENCES

4.1.1 Ocean Dynamics and Climate

17 The Chairman introduced the item referring to the extensive discussions on these matters during the scientific seminar preceding the Session. Regional activities within TOGA were presented, including systematic ocean observations of thermal structure; he also stated that Mauritius is a member of the Intergovernmental WMO-IOC TOGA Board.

18 **The Regional Committee noted** that TOGA-related ocean observations are planned to be continued in the framework of the Global Ocean Observing System (GOOS) and the Global Climate Observing System (GCOS), and that an international centre for climate research is being planned as part of the TOGA extension. The Regional Committee invited Mauritius to serve as the regional focal point for TOGA so as to help ensure proper communication of TOGA results and further related developments to Member States of the region.

19 With respect to WOCE, the Regional Committee noted that regional participation includes mainly sea-level observations. The regional WOCE workshop considered by the Second Session of the Committee had not been organized, but it was noted that the CCCO Indian Ocean Panel had had several meetings in the intersessional period at which WOCE & TOGA activities in the region were discussed. The Delegate of France informed the Regional Committee that several activities within these programmes were implemented through the mechanism provided by the said Indian Ocean Panel (see IOC/INF-919).

20 **The Regional Committee noted** that regional capabilities to interpret and use the results from large-scale experiments like TOGA & WOCE are very limited. There is a need to enhance this capability and train human resources to both use the data and interpret the results so as to provide the advice on actions to the governments. The TOGA data can be delivered to Member States through the RECOSCIX despatch centre where relevant facilities exist, as demonstrated through the related ASFA activities carried out by the Despatch Centre.

21 **The Regional Committee recommended** that training activities be initiated using the mechanism of the CCCO Indian Ocean Panel, and perhaps building on the basic training in physical oceanography being provided through the regional SAREC-IOC Programme.

22 The Secretary IOC reminded the Regional Committee of the assessment work taking place within the WMO-UNEP IPCC and that the data and results obtained through regional efforts in TOGA, WOCE and related activities should be used in regional assessments of climate change and variability. Hence, it is important that members of the Regional Committee endeavour to provide appropriate information to, and establish a dialogue with the national representations in the IPCC.

23 **The Regional Committee recalled** that several institutions in the region are involved in the formulation of the Regional Indian Ocean JGOFS planned for implementation in 1994/95.

24 Several training activities involving individual scientists from the region are going on, and training workshops are planned for 1993. **The Regional Committee encouraged** these activities to also aim at ensuring sustained involvement of national institutions in such basin-wide studies.

4.1.2 Ocean Science and Living Resources (OSLR)

25 **The Regional Committee noted** that the importance of this subject area had certainly not decreased, and, while regretting that more progress had not been made in the intersessional period, it re-emphasized the project proposal discussed at the Second Session with some adjustments so as to help and ensure a realistic possibility for implementation. The Regional Committee thus agreed that action should be focused on recruitment studies of pelagic species, in inshore and coastal waters for the mainland Member States and in open waters on fishing banks for the island Member States.

26 It was noted that several national programmes relevant to OSLR are taking place in the region, e.g., the shrimp recruitment project in Mozambique, the Fritjof Nansen Programme assessment work, the sea-grass marine plants aquaculture development in Tanzania. An effort should be made to pool these relevant national projects into a coherent regional programme. The influence of physical oceanography conditions on recruitment are clearly important and, at the same time, very complex, also influencing the catch of the fish. It was agreed that in order to obtain information on these conditions in the coastal zone, the projects on physical oceanography, to be carried out as part of the training in physical oceanography being provided through SAREC support, should aim at providing such information, relevant to recruitment studies as well as to pollution assessment and coastal zone management.

27 **The Regional Committee also agreed** that there is a need to update the fish stock assessment carried out 10-15 years ago. It was agreed that the IOC Secretariat and the governments of Member States should approach the Norwegian FRITJOF NANSEN project to obtain support for such an activity in 1994/95. The Regional Committee expressed its sincere wish to be able to use the new FRITJOF NANSEN for a similar cruise on a regional basis with support from Norway. As a general guideline, the programme should include stock assessment (variability of stocks, stock abundance and recruitment).

28 The Delegate of Mozambique informed the Regional Committee that in 1991 a stock assessment on commercially most important stocks had been carried out in Mozambique.

29 **The Regional Committee further considered** that an inventory of the critical habitats, including mangroves, coral reefs, seagrass beds, wetlands should be produced. This is of great importance in view of the increasing pollution load, sedimentation and other disturbances in many parts of the region. The Delegate of Tanzania added biodiversity and marine parks as part of these inventory needs.

30 **The Regional Committee agreed** that an element of the continuing IOC-SAREC supported work in the coastal zone should include studies of coastal water quality and basic oceanographic conditions, in the context of the physical oceanography studies referred to above. Efforts in relation to studies of nutrients and biogeochemical cycles were recalled - these should be diverted towards coastal water quality projects.

31 In order to establish a basis for the initiation of a regionally co-ordinated harmful algal bloom programme, there is a need to provide training in identification of algae and taxonomy with a related manual. A training workshop should be organized looking at all algae in the region, as far as possible.

32 **The Regional Committee noted** that the Large Marine Ecosystem Workshop in March 1993 in Mombasa, Kenya will provide an international forum for exchange of information and creation of contacts in the region and with outside experts. A plea was made for provision of more contributions from the region to the workshop, which was being supported by IOC, SAREC, NOAA, IUCN and others besides Kenya Marine and Fisheries Research Institute in Mombasa.

4.1.3 Ocean Mapping

33 The Chairman of the Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IBCWIO), Prof. W. Bettac, introduced this item and informed the Regional Committee of the manner of production of the chart:

34 The Chief Editor, who is identical to the Chairman of the Editorial Board, collects the source material and, after revising it, passes it as basic material to the countries in the region. They will evaluate the fair sheets by means of the basic material which shows the topography of the sea bottom by means of contour lines and selected depth figures. The fair sheets will then be returned to the Chief Editor and a fair copy on transparent plastic in the scale of the final chart - the chart original - will be prepared in Hamburg. The Bundesamt fur Seeschiffahrt und Hydrogaphie (BSH), the former Deutches Hydrographisches Institut, will carry out the technical process, preparing the printing plates and then printing the charts.

35 The printed bathymetric chart and, if desired, the transparent chart original, will be delivered for further use to the countries of the region.

36 In this way the countries of the region were introduced to the evaluation of bathymetric charts. Later on the chart will be digitized and transferred to a digital data bank. The provision of the data could perhaps be achieved through the RECOSCIX mechanism, as in the case proposed for TOGA data.

37 **The Regional Committee recalled** that a Regional Training Course on Bathymetric Charting in the Western Indian Ocean was held in Nosy Be, Madagascar, and on board RV METEOR during the trip from Nosy Be to Mombasa, with the collaboration of the Federal Republic of Germany in July 1987; and that the Chief Editor had carried out a mission to the region in 1991 to provide further guidance.

38 The Editorial Board, at its last session in 1990, proposed a training course on bathymetric charting to be supported by IOC. The Regional Committee suggested that the course be geared towards the application of the Bathymetric chart and the use of the related digitized data.

39 In this way the usefulness of bathymetric charts for coastal zone management, recruitment studies, marine pollution monitoring, coastal water exchanges and circulation could, *inter alia*, be made clear.

40 **Recommendation IOCINCWIO-III.1** was adopted.

41 The Delegate of France informed the Regional Committee of the arrival in the region of the French oceanographic research vessel ATALANTE in April 1993. This ultramodern ship is participating in a national mapping and resources inventory programme for the French Exclusive Economic Zone. In particular, as far as La Reunion is concerned, the R/V ATALANTE will undertake:

(i) detailed bathymetric mapping of the vicinity of the island with the aid of multibeam sonar EM12 with which it is equipped;

(ii) precise physical oceanography; including measurements of physico-chemical variables (XBT, probes, etc.,), currents (through Doppler profiler along sections down to 800 m. and continuously during bathymetric soundings).

42 **The Regional Committee was informed** by the Delegate of Germany that the RV METEOR will operate in the Indian Ocean in 1995. In view of the importance of ocean mapping, the Regional Committee asked the Delegate to make available and to fund a training course on bathymetric surveying on board the R/V METEOR as a follow-up to the course which took place in 1987.

4.1.4 Ocean Science and Non-living Resources (OSNLR)

43 The Chairman introduced the item, reminding the Regional Committee that coastal erosion is a critical phenomenon in the region, and that most countries are effected by it. He referred to Document IOC/INF-914: Outline of the Project Proposal on Coastal Erosion in the Western Indian Ocean Region "Scientific Appraisal and Management".

44 The Secretary IOC emphasized that this should be seen as a possible regional project, that a step-wise development should be considered, perhaps starting with a regional workshop. He also informed about on-going co-operation between UNEP, FAO and the World Bank in formulating guidelines for integrated coastal area management. The IOC is associated with this work in providing the requirements for a scientifically adequate information base for the management.

45 **The Regional Committee**, in reviewing the project proposal, **noted** that it considers only geology; it lacks the required inter-disciplinarity; it does not contain any reference to work already carried out in this region on coastal erosion and consequently does not properly reflect the competence in this area which exists in this region. The equipment identified may exist in the region with the exception of side scan sonar. The project proposal does not give any costs - these must be established.

46 It was noted that in some parts of the region the human resources required for studies of coastal zone erosion were certainly not available but that on a regional basis the human resources probably do exist.

47 **The Regional Committee considered** that a pilot study could be the first step and that this could be elaborated at a workshop. It was accordingly recommended by the Regional Committee that a "Workshop on Coastal Erosion in the Western Indian Ocean" be organized in the middle of 1993. The Regional Committee noted that this was being planned within the IOC-SAREC co-operation.

48 **The Regional Committee emphasized** that, prior to the workshop, participants must prepare a summary report on the state of coastal erosion in their countries including, as far as possible, information on problem areas, rates of erosion, attempted control measures, national policy, legislation and on-going studies or plans for such and available national expertise. Traditional knowledge in this field should also be collected and presented. The workshop should aim at providing a common method which could be used in a regionally co-ordinated programme, and this method or study approach should then first be tried out in and revised on basis of a pilot study at the agreed-upon site. **The Regional Committee emphasized** that regional expertise should be used as far as possible and that the national plans and programmes should be the foundation for a regional programme, so as to assure national effective involvement.

49 **The Regional Committee also called** for the initiation of modelling of the coastal zone circulation, and modelling dedicated to helping in evaluating the suitability of possible sites for coastal outfalls, e.g., for sewage disposal. This could perhaps be initiated through an appropriate regional workshop on the same basis as has been done by IOC in other regions.

4.1.5 Marine Pollution Research and Monitoring (MARPOLMON)

50 The Chairman recalled that this regional programme had been thoroughly discussed at the Scientific Seminar preceding the Session and therefore referred the Regional Committee directly to the Annotated Agenda (Document IOCINCWIO-III/2) under the heading of marine pollution.

51 The Secretary IOC recalled the priorities set by the Regional Committee at its Second Session. Since then, a UNEP-FAO-IOC regional assessment had been carried out, as well as a second global assessment on the health of the oceans by the Joint Group of Experts on Scientific Aspects of Marine Pollution (GESAMP). These assessments identified priority problems in coastal zones associated with sewage disposal, run-off of nutrients (fertilizers), increased sedimentation and run-off of pesticides, as well as the input of various industries. He also recalled that the UNEP Regional Seas Programme projects EAF-5, EAF-6 & EAF-11 had been formulated during the intersessional period, but had only started in a very limited way. He noted that much of the work within the IOC-SAREC programme was relevant to, or directly addressed marine pollution problems (see IOC Workshop Report No. 83).

52 **The Regional Committee noted** with regret that some equipment provided through EAF-6 was not functioning and strongly recommended the training of technicians and the provision of maintenance of equipment to any project of an experimental nature. Reappraisal of EAF-5 & EAF-6 might also be needed, since they had been formulated some time ago. The need to start EAF-11 on environmental impact assessment was emphasized.

53 **The Regional Committee agreed** that training on, and introduction of EIA techniques should be initiated as a matter of priority. This could be done by addressing the issue of the need of proper EIA's, which would then identify training needs.

54 **The Regional Committee recommended** that a relevant and adequate co-ordination mechanism be put in place for the EAF projects. The Regional Committee also recommended that the Member States of the region who have not ratified the Regional Seas protocol should proceed to do so, so that the project could be properly implemented.

55 **The Regional Committee emphasized** the need for an updated inventory of land-based sources of marine pollution (pesticides, nutrients, sediments, sewage, litter and plastic).

56 **The Regional Committee also recommended** that a regional sentinel organisms monitoring programme be initiated, using oysters and modelled on the IOC-UNEP International Mussel Watch project - in fact being its Western Indian Ocean component. This programme is also important for the monitoring of the conditions for marine produce in view of on-going aquaculture.

57 **The Regional Committee re-emphasized** the need to ensure that equipment be provided together with related training and maintenance (see also Agenda Item 5 in relation to infrastructure development). Past training must now be used and this requires equipment.

58 **The Regional Committee emphasized** that adequate baseline data be obtained through appropriate programmes on a national basis. In this context, the Delegate of Mauritius informed the Regional Committee of on-going activities in his country. He also requested consideration of numerical modelling in relation to coastal zone circulation and siting of outfalls, as referred to above. The regional assessment has also emphasized the need to improve the database. Methods and trained personnel were available; as a matter of priority, the national data and information collection and the related updated assessment must begin.

59 The Secretary IOC recalled that the GIPME programme is now co-sponsored by both IOC & UNEP. This provides a mechanism to harmonize the various regional activities and improve co-ordination. The gradual establishment of a regional project such as the UNEP-IOC Caribbean Environment Programme on Marine Pollution Monitoring, Research Assessment and Control (CEPPOL) could be envisaged.

60 The Delegate of the USA informed the Regional Committee of the work within GIPME related to JGOFS in the context of preparation of protocols and training activities. There was now a need to identify

training and equipment requirements. **The Regional Committee noted** this and **agreed** to help in this process and to provide the information directly to the IOC Secretariat.

4.2 OCEAN SERVICES AND GOOS

4.2.1 Global Sea-Level Observing System (GLOSS)

61 The Chairman introduced the item referring to the Annotated Agenda (Document IOCINCWIO-III/2) and the discussions during the scientific seminar as well as under item 4.1.1.

62 **The Regional Committee noted** the progress in establishing the regional sea level observing network. At the same time, **the Regional Committee expressed** great concern about the lack of maintenance of the installed tide-gauges, and the transmission of the data automatically to a distant receiving station, with the consequence that the local/national operator did not receive the data. This is of course, unacceptable, and a mechanism must be established which ensures that the data are provided in near-real time to the local operator.

63 As regards the maintenance, **the Regional Committee recommended** that a technician be sent around through the support of IOC, to the localities where maintenance was required, upon request of the national member of the Regional Committee.

64 As regards data provision, **the Regional Committee suggested** that the RECOSCIX mechanism could be used.

65 The project proposal on the IOC-UNEP-WMO pilot activity on sea-level changes and associated coastal impacts: draft action plan for implementation in the Indian Ocean (Document IOC/INF-908) was endorsed, but the network proposed therein should be linked to the existing GLOSS network and should be expanded to include an island site in the Western Indian Ocean. **The Regional Committee noted** that there will also be a need for obtaining other data than sea-level, and requested that it be clarified in the project proposal how these data were to be obtained.

66 **The Regional Committee suggested** that consideration of this matter be linked to the Workshop on Coastal Erosion referred to in Item 4.1.4.

67 **The Regional Committee noted** that most of the sea-level observing sites had been established within the region as part of TOGA, recalled that TOGA would phase out by 1995/96, and emphasized that funds need to be identified for the continued support and maintenance of the sea-level observing network. With this in mind **the Regional Committee emphasized** and **requested** that a regional sea-level information product be prepared on a regular basis. This project should start as a pilot experiment. The associated data quality control should be carried out by the data producers in the region. The project could be initiated at the KMFRI in Mombasa, Kenya, or at the Meteorological Service in Mauritius.

68 In this context **the Regional Committee reviewed** and **adopted** the proposal for a regional Indian Ocean sea-level programme as proposed by the IOC-SAREC-KMFRI Regional Workshop on Causes and Consequences of Sea-level Changes on the Western Indian Ocean Coasts and Islands (Document IOC Workshop Report No. 77). **The Regional Committee also suggested** that more tide prediction products should be generated in the region, using modern data. The Regional Committee members were called upon to initiate this in their respective nations, as appropriate. **The Regional Committee recommended** that a workshop be organized on data analysis and interpretation, with the aim of stimulating the preparation of sea-level information products and advice for decision-makers and governments. Such efforts are definitely needed in order to ensure continued support for sea-level observations.

4.2.2 International Oceanographic Data and Information Exchange (IODE), Marine Information Management (MIM) and Regional Co-operation for Scientific Information Exchange (RECOSCIX)

69 **The Regional Committee recalled** and **appreciated** the considerable progress which had been achieved in this area through the RECOSCIX-WIO project, and expressed its great appreciation to Belgium, SAREC, IOC and others who support that project. **The Regional Committee noted** that efforts should be

initiated within the Member States to help ensure that support would be provided when the present support from Belgium terminates in 1995/96. In this context **the Regional Committee called upon** its members to help ensure that the co-operating institutions responded, and were active in the RECOSCIX network.

70 The RECOSCIX Co-ordinator informed the Regional Committee that additional tasks for the regional dispatch centre which the Regional Committee had identified, could be handled, provided suitable expertise from the region was made available at required time periods.

71 In this context, **the Regional Committee called upon** its members to help ensure that experts in the region involved in the IODE programme became involved in RECOSCIX and the data exchange projects now identified (e.g., TOGA, Sea-level products).

72 **The Regional Committee also noted** that the IOC had developed plans for the establishment of a project similar to RECOSCIX-WIO for the Central Eastern Atlantic (IOCEA) Region, and expressed interest in ensuring appropriate inter-regional co-operation.

73 **The Regional Committee also emphasized** that these developments should be seen in the framework of the global ASFIS-ASFA and IODE-MIM programmes.

4.2.3 Regional Component of the Global Ocean Observing System (GOOS)

74 The Chairman recalled that the development of the Global Ocean Observing System by the IOC, in co-operation with WMO, UNEP & ICSU had been endorsed by UNCED and was specifically referred to in Chapter 17 of Agenda 21, part E. He referred to the status report of GOOS in Document IOC/INF-879, to the Draft GOOS Development Plan (Document IOC/EC-XXV/8, Annex I) and to the establishment by the IOC Executive Council of international mechanisms for GOOS development, including the IOC Committee for GOOS as the intergovernmental mechanism (Document IOC/EC-XXV/3). He called upon members of the Regional Committee to ensure that national nominations to the IOC Committee for GOOS be made.

75 The Technical Secretary informed the Regional Committee about the on-going and planned pilot activities within the Long-Term Global Ocean Monitoring System of Coastal and Near-shore Phenomena Related to Climate Change (Documents UNEP-IOC-WMO/GCNSMS-I/3 & UNEP-IOC-WMO/GCNSMS-II/3), in particular the pilot projects on monitoring of coral reefs and mangroves.

76 **The Regional Committee took note** of the information, and observed that the initiation of the regional component of GOOS was underway in the form of the sea-level observing network discussed under Agenda Item 4.2.1, and that other elements were developing in the form of the XBT lines run, for example, by Mauritius. **The Regional Committee emphasized** the need for the region to ensure proper participation in the long-term development of GOOS.

4.3 UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT (UNCED) AGENDA 21

77 The Secretary IOC introduced this item referring to Chapter 17 of Agenda 21 which had been made available to the Regional Committee and to the draft IOC Action Plan for follow-up to UNCED with strategy and goals, prepared by the IOC Secretariat and also made available as a draft to the Regional Committee. He also recalled the considerable discussion of UNCED results which had occurred during the scientific seminar preceding the session, and the several references to UNCED during the opening of the Session. Finally, he referred the Regional Committee to the Annotated Agenda (Document IOCINCWIO-III/2, Agenda Item 4.3) and requested the Regional Committee to take into account the UNCED results, in particular Agenda 21, Chapter 17, in its deliberation of an action plan for 1993/95 and in providing ideas for the next UNESCO Medium Term Plan. He invited the Regional Committee members to provide their comments directly to him on the draft IOC Action Plan.

78 **The Regional Committee reviewed** the information, the available documentation, and decided to take all this into account in its deliberations under item 7. **The Regional Committee strongly endorsed** the importance of the UNCED process and that the regional programme action should aim at implementing

UNCED decisions to the extent possible and in harmony and dialogue with actions within other parts of society. **The Regional Committee drew the attention** of Member States to the importance of co-ordination and dialogue at the national level.

5. CAPACITY BUILDING IN MARINE SCIENCE AND OCEAN SERVICES

79 The Secretary recalled the strong emphasis of UNCED on capacity building and that individual chapters in Agenda 21 address this in subject area context. The co-ordinating role of the UN System in this context is also brought out in Agenda 21. The Framework Convention on Climate Change as well as the Convention on Biological Diversity both emphasize the need for capacity building in order to achieve implementation of the Conventions.

80 The Secretary IOC also recalled that the UN Convention on the Law of the Sea likewise puts emphasis on capacity building, and also identifies the role of regional centres for marine science and technology in this context. He informed the Regional Committee on plans by the International Ocean Institute (IOI) to establish such regional centres with support of GEF.

81 The Secretary IOC recalled the response of the IOC to UNCLOS intentions through the preparation and endorsement by Member States of the UNESCO-IOC Comprehensive Plan for a Major Assistance Programme to enhance marine scientific capabilities of developing countries. This had been discussed by the Regional Committee at the Second Session (Tanzania, December 1987) together with TEMA requirements in support of the approved programmes including activities and requirements for and improved uses of research vessels.

82 **The Regional Committee reviewed** the training which had been implemented and the methods used. **The Regional Committee agreed** that there remained a need for training through seminars and workshops; research grants and short study grants; longer-term fellowships. However, **the Regional Committee also stressed** the need for provision of equipment and support to research so that the training which has been provided could be applied to real problems. The small research grants to be provided through IOC and SAREC were considered very important as were the different bilateral agreements supporting capacity building in the region. The Delegate of France pointed out that the experiences of ORSTOM confirmed the great value of such an approach. **The Regional Committee endorsed** the fact that the mechanism provided through WIOMSA (see Annex IV) could be used in soliciting proposals and reviewing them. The selection of subjects to be supported should take into account regional and national programmes and priorities so as to support also the implementation of regional programmes. There should be some co-ordination in the distribution of research grants and balance at regional level.

83 **The Regional Committee agreed** that some guidelines for the format and content of proposals should be established and requested the Acting President of WIOMSA and the Secretary IOC to prepare these for discussion at the time of the LME symposium in Mombasa, March 1993. The Delegate of France may also provide input to the formulation of guidelines, and the Regional Committee invited France to consider providing some additional funding for the small research grant activity.

84 **The Regional Committee strongly emphasized** the urgent need to review and up-grade the infrastructure in the region. This should be done in a co-ordinated fashion so as to make use of the regional perspective. This means that the priorities and specialties of each Member State could be taken into account so that there would be no duplication but rather a supplementary approach. The region would then really co-operate through a network "centres of excellence" based on upgraded infrastructures with equipment and a critical mass of highly trained personnel which would work on implementing the priority programmes of real need for the region. The WIOMSA mechanism can also be used in this context to arrange circulation and exchange of scientists. The upgrading of infrastructure should also be interlinked with the human resources development.

85 **The Regional Committee also stressed** the need for partnerships and the appeal that regionally co-ordinated programmes tend to have with donors.

86 **The Regional Committee requested** the *ad hoc* group established at the second IOC-VLIR donor meeting (Brussels, Belgium, 11-12 October 1992) to undertake the task of formulating a regional harmonized,

inter-disciplinary high-level training programme based on the FAME idea, to also take this into account. **The Regional Committee recommended** two additional members from the academic staff to join the *ad hoc* group, and **requested** IOC to provide the seed money so that the *ad hoc* group could start its work. The proposal resulting from the work of the *ad hoc* group should be submitted for funding to the EEC, from Member States of the region. In the meantime **the Regional Committee requested** IOC, SAREC, UNESCO including ROSTA, Nairobi and others to provide for fellowships to VLIR for the FAME courses; one fellowship is US$ 8,000 per year for two years. **The Regional Committee also recommended** further training in physical oceanography as initiated within the regional SAREC programme. **It encouraged** other Member States to provide funds for such programmes.

87 **The Regional Committee also endorsed** the joint WMO-IOC course on marine meteorology and physical oceanography to start at University of Nairobi in 1994 or 1995. **The Regional Committee recommended** IOC and WMO to apply to UNDP for funds, and possibly EEC and SAREC for that activity.

88 The Chairman informed the Regional Committee that WMO & IOC had set aside some funds for the activity - but not by far what was totally required.

89 **The Regional Committee recommended** that all Member states prepare Marine Science Country Profiles, and the Delegate of Kenya formally requested support from the IOC to prepare such a profile. However, it should be a short informative document aimed at increasing awareness of the role of marine science in the development of the country. **The Regional Committee requested** the Secretary IOC to prepare simplified guidelines for the preparation of Marine Science Country Profiles and send these to the Delegates of this Session. **The Regional Committee considered** that the heads of national institutions should be able to prepare at least a first draft of an MSCP which could be further elaborated in consultation with the Secretary IOC and published in a suitable form. The WIOMSA mechanism could also perhaps be used in this context.

90 The Delegate of Kenya informed the Regional Committee of the large amounts of data obtained through expeditions in the region of the former USSR, now housed in Russia. He suggested that the relevant Russian scientists be contacted in order to bring these data to the region for the benefit of national institutions in the region. This effort could possibly be carried out within the framework of the IODE project on data archaeology and rescue.

91 The Secretary IOC informed the Regional Committee of discussions with the University of Mauritius in regard to the possibility of using an advanced training programme in environmental sciences now being prepared at the University, for regional training purposes.

92 This would amount to about one year's training with fellowships of about US$ 6,000. This possibility should be taken into account by the *ad hoc* Group referred to above. **The Regional Committee suggested** that a representative from the University of Mauritius be invited to join the *ad hoc* Group.

93 Finally the Secretary IOC informed the Regional Committee of a training module IOC presents at the World Maritime University, Malmo, Sweden, on the scientific background to the London Dumping Convention and the MARPOL 73/78 Convention, and related regional conventions. Plans are underway to present this course module at regional level, suitably adjusted to the characteristics of the region in question. This would be done in co-operation between IOC & IMO. Such an activity could possibly be carried out for the region at the Mauritius Sea Training School.

6. CO-OPERATION WITH OTHER BODIES, PROGRAMMES, DONOR AGENCIES AND REGIONAL ORGANIZATIONS

94 Mr. G. Kitaka of the UNESCO Regional Office for Science and Technology in Africa (ROSTA) informed the Regional Committee that ROSTA's marine science activities in the IOCINCWIO region were part of the overall UNESCO-IOC marine science programme in Africa. These activities were jointly planned and executed by ROSTA and as part of the Office of the Intergovernmental Oceanographic Commission and marine science related issues (IOC/MRI) at Headquarters, and funded from UNESCO's Regular Programme and Budget. Since mid-1987, ROSTA's programme has been supplemented by the UNDP-UNESCO Regional Project (RAF/87/038) for Research and Training on Coastal Marine Systems in Africa

(COMARAF) which is executed from UNESCO's Regional Office for Education in Africa (BREDA) in Dakar, Senegal, in co-operation with Headquarters.

95 The programmes, being products of the Major Inter-regional Project on Research and Training leading to the Integrated Management of Coastal Systems (COMAR), are being implemented along 3 mutually supportive, and often overlapping themes coded COMAR, PROMAR and TREDMAR. Under COMAR, activities aimed at the understanding of the characteristics and functioning of coastal major systems have been promoted; under PROMAR a number of institutions in the region received support for strengthening their marine science infrastructures and programmes, while under TREDMAR training and education in marine sciences were promoted through group training workshops, study grants and short term fellowships as well as development of video and computer-based learning modules. He concluded by referring the Regional Committee to document MARINF/87A for more details.

96 **The Regional Committee expressed** its appreciation to UNESCO and ROSTA for the activities carried out in the region during the intersessional period, with the following observations.

(i) When the sums of money spent under COMARAF on activities carried out in the West and Central African Region are compared to those in the IOCINCWIO region, it is obvious that the former benefitted more from COMARAF than the latter; this imbalance should be corrected during phase II of the project;

(ii) future workshops and seminars of the two programmes should aim at bringing together scientists and managers or decision-makers;

(iii) since there is a need to upgrade the current list of national co-ordinators for COMARAF, it would be preferable to appoint such co-ordinators on the basis of their official, rather than individual capacities, in view of the fact that individuals always change;

(iv) there is need to ensure that there is as much overlap as possible in the individuals that attend various meetings in the region and that whoever does so is aware of the activities of the different programmes (also of other Organizations) that are being implemented in his country, as well as in the region.

97 Regarding the Western Indian Ocean Marine Science Association (WIOMSA), the Acting President, Dr. M. Ngoile presented the objectives of this Association which will constitute a platform for fostering better communication between marine scientists and institutions in the Western Indian Ocean and with scientists and individuals outside the region; participate and facilitate effective co-ordination of marine science activities through collaboration with the United Nations, international, regional and national organizations and agencies active in marine science research and development within the Western Indian Ocean region, with a view to contributing and enhancing the building and development of the indigenous marine science and technological capability of the region. The membership of the Association is not restricted to scientists from the region but is also open to individuals and institutions from within and outside the region with interests in the development of marine science in the region. The Secretariat of the Association will consist of not more than 5 staff members headed by the Executive Secretary. It is envisaged to have semi-autonomous national - WIOMSA sections for each of the WIO countries under the stewardship of a national co-ordinator.

98 One of the activities to be initiated by this Association will be the granting of research funds to marine scientists working within the region (Marine Research Grant Scheme - WIOMSA/MARGS). The proposal to establish this Grant Scheme within WIOMSA has been evaluated by a joint IOC-SAREC-WIOMSA Working Group with respect to its viability; the Group also explored the possibility of raising sufficient funds from donor agencies, specifically those involved in marine research development of the Western Indian Ocean. (A more complete presentation of WIOMSA is found in Annex IV).

99 Dr. Ngoile requested the Regional Committee to recognize and endorse the association as a tool which can enhance the development of marine science in the region. **The Regional Committee endorsed** this proposal.

100 Regarding the Indian Ocean Marine Affairs Co-operation (IOMAC), the Delegate of France informed the Regional Committee of the objectives and main recommendations of the first IOMAC

International Scientific Workshop (Colombo, Sri Lanka, 18-25 October 1992) attended by participants from 22 countries.

101 The object of this Workshop, sponsored by IOC, USA and Australia, was to review marine scientific research now under way and proposed for the Indian Ocean region and to suggest future work that IOMAC could co-ordinate on behalf of, and of benefit to IOMAC member countries. The Workshop was divided into 4 working groups - living resources, non-living resources, marine chemistry and geochemistry, and physical oceanography and climatology. Extensive reports were given on the activities of WOCE and TOGA. An inventory of scientists and programmes was recognized as necessary and given a high priority, and the edition of a newsletter was proposed for the exchange of information on all aspects of multi-disciplinary oceanography. A formal recommendation on aquaculture enhancing was made and which encourages countries to participate in international programmes. The possibility of using remote sensing to assess fishing effort was discussed.

102 IOMAC expressed concern about the eventuality of a breakdown of the Indo Pacific Tuna Management Programme (IPTP) during a transitory period before the Indian Ocean Tuna Commission (IOTC) is created.

103 The Delegate of Germany expressed his country's strong interest in co-operating in IOMAC.

104 The Delegate of France expressed the view that, as IOMAC intends to represent the Indian Ocean and co-ordinate marine research activities, co-ordination is important in order to ensure that there is no duplication of activities. Potential duplication may be observed when comparing research programmes already being implemented by IOC and those proposed by IOMAC at its Scientific Workshop (Colombo, Sri Lanka, October 1992). Duplication of activities would be unfortunate, and could weaken the efficiency of all scientific activities by dispersing both the funds and effort.

105 The Secretary IOC pointed out that the possibility of having a memorandum of understanding with IOMAC is being investigated and stated that co-operation implies acknowledgement of each other.

106 The Delegate of the United States informed the Regional Committee of a message from Mr. W. Erb, Programme Chairman of the IOMAC Workshop, encouraging Member States to submit a letter to UNDP by the end of December 1992 indicating their possible willingness to fund IOMAC projects. **The Regional Committee took note** of the request.

107 Regarding co-operation and mechanisms of co-ordination of programmes in the Western Indian Ocean region, the Delegate of Tanzania informed the Regional Committee that through informal discussions, the *ad hoc* group (ref. Item 3) had agreed to make the following suggestions:

A. Co-ordination mechanisms

(i) In order to enhance co-ordination and reporting of the marine and oceanographic activities of the WIO Region, including regional and national donor support, **the Regional Committee strongly recommends** the establishment of a network in IOCINCWIO to be composed of the designated heads of marine research institutions of the WIO region (one from each member State) and observers from outside institutions with interest in the WIO region. The Officers of IOCINCWIO should meet at least once intersessionally, under the auspices of IOC; and it was proposed that ROSTA might host such a meeting and that IOC should provide the financial support.

(ii) **The Regional Committee also recommended** that two representatives of the region be selected to attend the IOC-VLIR donors meeting for the WIO region being held on an annual basis. These individuals will be identified by the Officers of the Regional Committee. **The Regional Committee agreed** that its Officers should also serve as the liaison with national authorities and relevant government representatives, increasing awareness of the role of the Regional Committee.

(iii) **The Regional Committee proposed** that telecommunication facilities between the heads of the institutions for efficient communication be organized.

B. Western Indian Ocean Marine Science Association (WIOMSA)

The scientific community of the WIO region will be co-ordinated by WIOMSA which is a non-profit and non-governmental organization. The scientific community of WIO requested the Regional Committee to acknowledge, endorse and support WIOMSA.

108 **The Regional Committee endorsed** this proposal, and, in this context, **elected** Dr. Ngoile as liaison officer, and to be one of the Officers of the Regional Committee.

109 The Delegate of France informed the Regional Committee that in order to ensure co-ordination, ORSTOM had developed a telemail communication system and IOC could explore with ORSTOM the possibility of using this network. **The Regional Committee supported** this approach and recommended its implementation. In this context, the Secretary IOC suggested that telemail be used to facilitate communication between the heads of national institutions, integrating the proposed network.

110 The Delegate of Tanzania pointed out that links should be ensured between the WIOMSA Secretariat and RECOSCIX-WIO.

111 In this connection, the RECOSCIX-WIO project co-ordinator suggested that this system could be integrated into WIOMSA at the end of the present phase, within 3 years.

7. FUTURE PROGRAMME OF WORK: REGIONAL ACTION PLAN FOR IMPLEMENTATION OF AGENDA 21

7.1 PROGRAMME OF WORK 1993 - 1995

112 The Chairman recommended to the Regional Committee that it prepare an indicative programme for 1993-95 on the basis of deliberations on previous Agenda Items. This should include, as far as possible, cost estimates, timing of events, priorities and required commitments of Member States.

113 **The Regional Committee considered** that it should identify programme actions in 3 categories, namely: (i) projects or actions which are to be supported for implementation through IOC; (ii) projects which should be targeted towards bilateral or multilateral donors; (iii) projects which are of great importance, but for which funds are not available, and for which a process needs to be initiated to make governments aware of needs and requirements for funding. The Regional Committee should not only look to IOC for funding, but also to large donor agencies. **The Regional Committee re-emphasized** the importance for its members of bringing projects to the attention of governments, the need to ensure that sufficient priority was given to those projects, and that donors were accordingly informed by governments. By grouping projects into different categories, the Regional Committee could avoid being unrealistic in its expectation of funds.

114 **The Regional Committee recognized** the importance of the regional multiplier effect, in the sense that the value of individual national actions, e.g., baseline observations, increase very considerably when they can be joined with similar and compatible actions in other nations in the region. This factor should be made clear to governments. **The Regional Committee noted** that common methods and associated manuals for observations, sampling, analysis and interpretation exist in most cases and have been introduced in the training phase. This has been achieved within co-operation between UNEP, IOC, FAO, IAEA, and others within the framework of the Regional Seas Programme.

115 **The Regional Committee noted** the need to differentiate between immediate short- to medium-term needs and actions on projects to be implemented immediately, and the longer term establishment of capacity with upgraded infrastructure and advanced personnel for the implementation of Agenda 21 and UNCED beyond the year 2000.

116 **The Regional Committee reviewed** its discussions under the subject area items and identified the actions which were grouped into tabular form (see Annex to Recommendation IOCINCWIO-III.2 (Annex II to this Report)).

Committee also agreed that the heads of national institutions and the members/delegations of the Regional Committee have a special responsibility to create an increased dialogue with decision makers and governments at the national level.

118 **The Regional Committee further agreed** that it should aim at creating centres of excellence in the region, based on acceptable criteria so that regional co-operation would facilitate the upgrading of institutions, including infrastructure. High-level training beyond the diploma level should be organized through participation of 3 to 4 universities in the region, including Kenya, Tanzania, Mozambique, Mauritius, La Reunion, and possibly others, collaborating with selected universities outside the region, e.g., in Belgium and Sweden. The Director of KMFRI was invited to act as regional co-ordinator for this development.

119 **The Regional Committee also agreed** that efforts should be made to secure data from the region which have been obtained by Member States outside the region, but not delivered to regional institutions. It was agreed to use the RECOSCIX/WIO programme as a mechanism for this, working with IOC/IODE through the IOC Secretariat.

120 Recommendation IOCINCWIO-III.2 was adopted.

7.2 FOURTH UNESCO MEDIUM-TERM PLAN 1996 - 2001

121 The Secretary IOC introduced the item referring to the Report of the Twenty-fifth Session of the IOC Executive Council (Paris, 10-18 March 1992) and the Annotated Provisional Agenda (Document IOCINCWIO-III/2).

122 He emphasized the need to provide a long-term goal, in due course, for regional co-operation, and recalled that the discussions under previous Agenda Items had brought out the need to up-grade national institutions and creation of "centres of excellence" which, when taken together, would cover the disciplinary range of marine science, systematic ocean observations and related applications. He invited the Delegates to provide ideas, and to comment on the draft IOC Action Plan for the follow-up to UNCED.

123 The Delegate of Tanzania suggested that there was a need to amplify actions relating to marine species diversity or biodiversity. He recalled that the Regional Committee had drawn attention to this e.g., in the form of requests for inventories of critical habitats and species and also that marine protected areas should be considered and used in this context. The need to maintain skills in taxonomy was also emphasized. The Delegate informed the Regional Committee on the progress of the work of creating an inventory of the flora and fauna of the region with the support of SAREC. **The Regional Committee noted** these ideas.

124 **The Regional Committee further suggested** that an integrated approach to the study and use of the marine environment and its resources was necessary and should be introduced. The Delegate of Mauritius suggested that integrated marine environmental management and protection plans, together with the appropriate legislative and institutional framework, should be prepared at the national level. All relevant elements could be fitted within such plans, including marine parks, protection of sensitive habitats, identification of vulnerable areas, monitoring, assessment etc. **The Regional Committee concurred** with this idea and **recommended** that guidelines for the preparation of such integrated plans be produced.

125 The Delegate of Tanzania stressed the need to ensure that the UNESCO National Commissions were properly informed of the activities and actions of the IOC so that they could be appropriately reflected in submissions of proposals to UNESCO for the next UNESCO medium-term plan.

126 The Delegate of Kenya stressed the need to push for increased budgets for regional co-operation. He requested that IOC continue to provide funds to the meetings of the Regional Committee at regular 2-3 years intervals. The various implementation mechanisms presently used (workshops, study grants, courses) should also be continued. The work of the TEMA programme was appreciated and should be strong.

127 **The Regional Committee re-emphasized** the need for an integrated approach within the IOC-UNESCO marine-related programme.

8. NATIONAL LIAISON ARRANGEMENTS WITH IOC AND FOR THE IOCINCWIO REGION

128 The Chairman introduced this item stressing the need to improve communications between Member States and IOC Secretariat and also with respect to national liaison arrangements in marine scientific affairs.

129 The Delegate of Tanzania suggested that in order to ensure co-ordination and better communication between all the interested government departments, universities and scientific institutions actively involved in marine science and other related aspects of ocean affairs within each country, Member States should establish National Committees for IOC. He informed the Regional Committee that his country has a National IOC committee and suggested that information on IOC contact points (Action Addresses) be provided to the Delegates. The National IOC Committees should receive lists on a regular basis from the IOC Secretariat.

130 **The Regional Committee encouraged** Member States to form the suggested co-ordination mechanism or similar Body.

131 The Delegate of Kenya said that his country had not yet formed a National IOC Committee but was in the process of forming one; the contact point being at present the Fisheries Department. He requested the Secretary IOC to contact appropriate authorities in Comoros with a view to ensuring the participation of this country in IOCINCWIO activities.

132 The Secretary IOC welcomed this suggestion and informed the Regional Committee that the Report of the Session will be sent to Comoros.

133 The Delegate of Mauritius informed the Regional Committee that the national focal point for IOC (and for IOCINCWIO) is the Meteorological Service, as designated by the Government. Liaison and co-ordination at the national level is carried out through the National Climate Committee Working Group on the Coastal Zone.

134 The Delegate of Tanzania expressed the view that the National Commissions for UNESCO should be kept informed of the regional activities taking place and that links should be established with the IOC Action Addresses.

135 **The Regional Committee took note** of this suggestion.

136 The Regional Committee has been informed by the representative of ROSTA-UNESCO and Secretary IOC of the different procedures followed in the designation of focal points for COMARAF and for IOC. In the case of IOC governments are responsible for the nomination of focal points, and in the case of COMARAF it is the UNESCO National Commission. **The Regional Committee requested** that a list of IOC regional Action Addresses should be included in the report (Annex V).

137 The Delegate of Madagascar expressed concern at the fact that the contact points for IOCINCWIO were not well known by the different participating countries and made some comments regarding the slow progress in the implementation of regional projects. She mentioned the problems related to training in region: should the training be linked to the project implementation or precede this implementation as in the COMARAF programme for example? She indicated that it was the responsibility of Regional Committee to decide on the studies to be undertaken and the appropriate organization to be adopted in order to obtain concrete results. The quality of research in the region should attain the international standards.

9. ELECTION OF OFFICERS

138 The Delegate of Mozambique proposed that the acting Chairman, Dr. S. Ragoonaden be elected Chairman. This was seconded by the Delegate of Tanzania. Dr. Ragoonaden was elected Chairman with acclamation for this intersessional period and the next Session of the Regional Committee. The Delegate of Tanzania then proposed the Head of the Delegation of Kenya, Dr. E. Okemwa as Vice-Chairman. This was seconded by the Delegate of Mozambique. Dr. Okemwa was elected Vice-Chairman with acclamation.

10. DATE AND PLACE OF THE FOURTH SESSION

139 **The Regional Committee agreed** that the next Session should be held in about 3 years time. The Delegate of Madagascar informed the Regional Committee that she would investigate the possibility of Madagascar hosting the next Session, and would inform the Secretariat in due course.

11. ADOPTION OF THE DRAFT SUMMARY REPORT OF THE SESSION

140 **The Regional Committee adopted** the Draft Summary Report of the Session including the Workplan and the Recommendations.

12. CLOSURE

141 The Delegate of Tanzania presented the vote of thanks to all concerned, referring to the excellent arrangements made by Mauritius and the good efforts of the Chairman, the secretary IOC, the staff, interpreters and participants so as to ensure a successful meeting. He also expressed great appreciation and thanks to the Regional Committee, to the retiring Chairman, Prof. M'Sangi. The Chairman closed the meeting at 13h15 on 18 December 1992.

ANNEX I

AGENDA

1. OPENING

2. ADMINISTRATIVE ARRANGEMENTS

   2.1 ADOPTION OF THE AGENDA
   2.2 DESIGNATION OF THE RAPPORTEUR
   2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

3. REPORT OF THE SECRETARY ON INTERSESSIONAL ACTIVITIES

4. PROGRAMME MATTERS

   4.1 OCEAN SCIENCES

      4.1.1 Ocean Dynamics and Climate
      4.1.2 Ocean Science and Living Resources (OSLR)
      4.1.3 Ocean Mapping
      4.1.4 Ocean Science and Non-Living Resources (OSNLR)
      4.1.5 Marine Pollution Research and Monitoring (MARPOLMON)

   4.2 OCEAN SERVICES AND GOOS

      4.2.1 Global Sea-Level Observing System (GLOSS)
      4.2.2 International Oceanographic Data and Information Exchange (IODE), Marine Information Management (MIM) and Regional Co-operation for Scientific Information Exchange (RECOSCIX)
      4.2.3 Regional Component of the Global Ocean Observing System (GOOS)

   4.3 UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT (UNCED) AGENDA 21

5. CAPACITY BUILDING IN MARINE SCIENCES AND OCEAN SERVICES

6. CO-OPERATION WITH OTHER BODIES, PROGRAMMES, DONOR AGENCIES AND REGIONAL ORGANIZATIONS

7. FUTURE PROGRAMME OF WORK: REGIONAL ACTION PLAN FOR IMPLEMENTATION OF AGENDA 21

   7.1 PROGRAMME OF WORK 1993-1995
   7.2 FOURTH UNESCO MEDIUM-TERM PLAN 1996-2001

8. NATIONAL LIAISON ARRANGEMENTS WITH IOC AND FOR THE IOCINCWIO REGION

9. ELECTION OF OFFICERS

10. DATE AND PLACE OF THE FOURTH SESSION

11. ADOPTION OF THE DRAFT SUMMARY REPORT OF THE SESSION

12. CLOSURE

ANNEX II

Recommendation IOCINCWIO-III.1

INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN INDIAN OCEAN (IBCWIO)

The Regional Committee,

Having in mind the importance of availability and adequacy of bathymetric charts for economic and scientific benefits of a coastal state,

Recognizing the need of bathymetric charts for the delimitation of the Exclusive Economic Zone and continental shelf of a coastal state following the rules of the United Nations Convention on the Law of the Sea and for managing effectively the exploration and exploitation of the living and non-living marine resources of their offshore areas,

Being aware of the inadequacy of bathymetric charts in the region of the Western Indian Ocean,

Urgently requests Germany to follow up the task taken over and to accelerate producing of the international bathymetric chart of the Western Indian Ocean.

Recommendation IOCINCWIO-III.2

PROGRAMME OF WORK 1993 - 1995

The Regional Committee,

Recalling the implementation of its programme during the intersessional period,

Noting that a considerable amount of training has been carried out in the region through various mechanisms,

Noting further that competent human resources are available in the region,

Emphasizes that the future regional cooperative programme should be more geared towards active research projects and practical applications than so far;

Stresses the need for an increasing dialogue between the marine science-related institutions and the national decision making and related governmental institutions so as to increase the awareness of the role of marine science-related activities for environment and development;

Recognizes the need for upgrading of national institutions in the field in many cases;

Urges Member States to proceed with such upgrading taking into account the regional perspectives and co-operation;

Noting and taking into account the results of UNCED and the importance of proper response and follow-up on a regional and national level;

Decides to adopt the programme of work for the regional co-operation over the period 1993-1995 as indicated in the Table annexed to this Recommendation;

Urges Member states to participate in the regional co-operative programme to the best of their interests and capabilities;

Expresses its appreciation to SAREC and Belgium for the support provided to the regional activities through the IOC mechanism;

Urges further the IOC, other organizations and donor agencies to support the programme implementation with an increasing budget allocation.

TABLE I

IMPLEMENTATION PLAN 1993-1995

PROGRAMME ACTIVITIES & CATEGORY	PRIORITY & ESTIMATED COST	PARTICIPANTS	IMPLEMENTATION DATE & BY WHOM	RELATION TO UNCED & REMARKS
Ocean Dynamics & Climate ODC 1. TOGA data to RECOSCIX-WIO for distribution [1] (1,2)	High priority No extra cost	All Member States	IOC-WMO Secretariats & RECOSCIX dispatch centre & participating institutions; GLOSS regional co-ordinator; 1993/1994	Chapter 17: Part E
ODC 2. Workshop on use of TOGA WOCE results to enable IOCINCWIO Institute; Group of Experts on ODC	High priority $15,000	Interested Member States	IOC Secretariat & GLOSS Co-ordinator (regional); 1994	Chapter 17: Part E FCCC
OSLR 1. Approach NORAD-FRITJOF NANSEN Project to obtain support for assessment recruitment (3)	Middle priority. Funds not identified, must come from donor	Interested Member States	IOC Secretary & all participating Member States; 1993 onwards	Chapter 17: Part E
OSLR 2. Establish Regional Group of Experts on Recruitment using LME Symposium (1,2)	High priority. Cost of meeting of Group $10,000	All Member States	IOC Secretary Head of KMFRI; 1993	Chapter 17: Part C,D Biodiversity Convention
3. LME (1,2)	$12,000	All Member States	KMFRI & IOC; 1993	Chapter 17; C,D Biodiversity Convention

[1] Note: The numbers 1,2,3 refer to category of project as identified in text (Item 7.1).

PROGRAMME ACTIVITIES & CATEGORY	PRIORITY & ESTIMATED COST	PARTICIPANTS	IMPLEMENTATION DATE & BY WHOM	RELATION TO UNCED & REMARKS
OSLR/HAB Training Course in Algae Identification & Taxonomy, & Preparation of Manual on Phytoplankton; Communication by telemail; (1,2)	Middle priority $20,000	All Member States	IOC Secretariat & Head KMFRI; 1994/1995	Chapter 17: A,B,C,D Biodiversity Convention & FCCC
GIPME/MARPOLMON Participation in EAF-5, -6 possibly EAF-11 (1,2)	High priority	All Member States	Member States; 1993/1995	Chapter 17: A, B
Initiation of EIA activities (in conjunction with Workshop on Coastal Zone Management)	Middle priority	All Member States	IOC Secretariat SAREC; 1993/1994	Chapter 17
GIPME/MARPOLMON Oyster (mussel) watch, regional (2,3)	Middle priority	Interested Member States	Head, KMFRI & IOC Secretariat; 1994/1995	Chapter 17
Coastal Zone Dispersion Modelling (circulation) Workshop (1,2)	Middle priority $20,000	Interested Member States	IOC Secretariat; 1994/1995	Chapter 17: A;E
Establishment of Baseline Stations (water quality coastal to be initiated through Workshop (2,3)	High priority $20,000	Interested Member States	Head of national institutions, IOC, SAREC; 1994	Chapter 17:A,B,C,E,F
JGOFS Training Courses (1,2,3)	High priority	Interested Member States	Participating institutions, IOC Secretariat, SCOR; 1993/1994	Chapter 17: E FCCC Biodiversity
Ocean Mapping Training Course on Use of Bathymetric Charts (1,2)	Middle priority $15,000	Interested Member States	Chief Editor IBCWO & IOC Secretariat; 1994/1995	--

PROGRAMME ACTIVITIES & CATEGORY	PRIORITY & ESTIMATED COST	PARTICIPANTS	IMPLEMENTATION DATE & BY WHOM	RELATION TO UNCED & REMARKS
OSNLR Coastal Erosion Workshop	High priority $15,000	All Member States	IOC Secretariat, SAREC; 1993	Chapter 17: A,E
Workshop on Coastal Zone Management (1,2)	High priority $25,000	All Member States	IOC Secretariat, SAREC; 1993	Chapter 17: A
RECOSCIX-WIO Training Course for Librarians (1,2)	Middle priority $20,000	Interested Member States	RECOSCIX Co-ordinator KMFRI, IOC, Belgium; 1993/1994	
Preparations for MSCP (1,3)	Middle priority	Interested Member States	Heads of institutions, IOC Secretariat 1993 ...	
Provision of Fellowships for FAME (2)	2 X $8,000 for one	Interested Member States	Donors 1993 ...	
Preparation of Regional Programme for High-level Training (1,2,3)	High priority	All Member States	*Ad hoc* Group under Prof. Polk, IOC Secretariat, EEC	
Provision of Mini-grants for Research Projects (1,2)	High priority $1,000 - $5,000 each	All Member States	WIOMSA, IOC Secretariat, SAREC, Heads of institutions; 1993	
Intercalibration Exercise for Nutrient Analysis (1,2)	High priority	Interested Member States	IOC Secretariat, SAREC, Heads of institutions; 1993/1994	
Inventory of Critical Habitats (1,2,3)	High priority	Interested Member states	Heads of national institutions; IOC, FAME; 1994/1995	Biodiversity

PROGRAMME ACTIVITIES & CATEGORY	PRIORITY & ESTIMATED COST	PARTICIPANTS	IMPLEMENTATION DATE & BY WHOM	RELATION TO UNCED & REMARKS
GLOSS Establishment & maintenance of sea-level stations (1,2,3)	High priority $10,000	Relevant Member States	GLOSS co-ordinator, Heads of institutions, IOC, SAREC; 1995	
Pilot Experiment on sea-level data products; Group of Experts (regional) (1,2)	Middle priority meeting; $10,000	Relevant Member States	GLOSS co-ordinator, Heads of institutions, IOC, SAREC; 1994/1995	
Training Course in Time-series Analysis (sea-level & other data) (1,2)	Middle to low priority $20,000	Interested Member States	Heads of institutions, IOC Secretariat, SAREC; 1995	
Preparation of the Bathymetric Chart (2,3)	High priority Cost to be estimated	Interested Member States	Germany	
Course in Marine Meteorology & Physical Oceanography (1,2,3)	High priority $100.000	All Member States	WMO, IOC, Donors 1994/1995	
Intersessional Meeting of Officers (1)	High priority $6,000	Officers	Chairman, IOC, 1994	
Establishment of Network of Designated Heads of National Institutions; Communications by electronic mail (1,2,3)	High priority Cost to be estimated	All Member States	ORSTOM, IOC, SAREC, 1994/1995	
Establishment of Network				
IOCINCWIO-IV (1,3)	High priority $20,000	All Member States	IOC & Officers, 1995-1996	

ANNEX III

ADDRESSES

A. Opening Address by Mr. Y. Valadon
Director, Mauritius Meteorological Services

Thank you all for responding positively to our invitation to attend this opening ceremony which gives the "go" signal for the Third Session of the IOC Regional Committee for Co-operative Investigation in the North and Central Western Indian Ocean.

My special welcome to the Secretary of IOC whom I knew only by his signature on the frequent correspondence between IOC and my Service, and I have now much pleasure in seeing him in person. I also welcome all the participants from the countries bordering the North and Central Western Indian Ocean. With us this morning, we have a total of 22 participants from Kenya, Tanzania, Madagascar, Seychelles, France (Réunion), Mozambique and Mauritius.

I also wish to welcome the scientists, oceanographers from outside the Region, and Mr. Soares of the IOC Secretariat who will be assisting this Committee in updating and strengthening its Action Plan and in suggesting ways and means to implement it. This Committee has indeed a crucial role to play in this post-UNCED era. My advice to you as an old man at the end of his career, is to get off the beaten track, think now. Be more aggressive, otherwise you will be swallowed by other organizations.

As you are aware, Ladies and Gentlemen, the Indian Ocean is the least observed ocean on our planet. It is also quite different from the Atlantic and Pacific Oceans. It is land-locked to the North and rather open to the East. This means that conditions here should be quite different from what is being observed elsewhere; for example, we know that it is the only ocean where the tropical waters in the east are warmer than in the west. Therefore, it is absolutely necessary that we strengthen our observing and monitoring networks by participating fully in the GOOS of IOC, and there is a need to establish a multi-disciplinary research group in this sub-region in order to study and understand the role and peculiarities of this Ocean. These are the main challenges facing this Committee and it is obvious that these challenges are a few of the most important items on the Agenda of this Committee. Obviously, we shall need expertise and training from outside the region. The presence of experts from outside the region today is therefore much appreciated and very encouraging.

We welcome the actions of IOC for keeping this Committee alive and for planning its regular sessions. We are thankful to you, Mr. Secretary, and through you, Sir, your Organization, for the assistance provided to this Committee and, more specifically, for arranging and ensuring that there is almost full participation from member countries at each Session. Indeed, it is to ensure maximum participation that this Session had to be postponed in September last.

My thanks to the Government of Mauritius for accepting to host this Session of the Committee and, in fact, the Government has always supported our efforts in the Mauritius Meteorological Services to collaborate with IOC and to participate in its programme and activities. The Government has, up to now, hosted 3 previous meetings of IOC, In 1985, we hosted the Third Session of the Committee on Climate Change and the Ocean, and in 1990, we had 2 seminars, one on Marine Pollution Monitoring, and the other on Bathymetric Charting of the Western Indian Ocean. Our involvement with IOC has increased our credibility vis-à-vis the donor community, and thanks to their generosity, we are improving our oceanographic observing network. Here also, I must express my gratefulness to the Captain and crew of *MAURITIUS PRIDE* for carrying out the XBT Programme on our behalf. They regularly drop the sondes on each trip and we can obtain valuable temperature data at different depths.

Finally, my special thanks to the Director of MSIRI, Dr. Ricaud, who has so kindly put this conference hall and its facilities at our disposal for 2 successive international meetings. I should not forget the staff of MSIRI and in particular Mrs. Ng who has spared no effort to make us comfortable in this room.

B. Report on Intersessional Activities
by Mr. S. Ragoonaden, Vice-Chairman, IOCINCWIO

Mr. Taukoordass, Representative of the Prime Minister's Office,
Dr. Kullenberg, Secretary of the Intergovernmental Oceanographic Commission,
Mr. Valadon, Director of the Meteorological Service
Mr. Pertaub, Vice-Chairman of the National Committee for UNESCO,
Mr. Soares, Technical Secretary for IOCINCWIO
Distinguished Guests, Ladies and Gentlemen,

It is my pleasure, on behalf of the Chairman of the Regional Committee for the Co-operative Investigation of the North and Central Western Indian Ocean, commonly known as IOCINCWIO, to make a few statements and some remarks about the activities and achievements of the Committee during the intersessional period.

It is unfortunate that Prof. Msangi of Tanzania, the Chairman of IOCINCWIO, has not been able to come to this meeting for reasons beyond his control, and to give some details himself, of his experience in that position during the last 5 years. As some of you will remember, the Second Session of this Committee took place in Arusha, Tanzania, in December 1987. I understand that Prof. Msangi has reached the age of retirement. However, he is being solicited by his colleagues - most of them are here - to continue to guide them in their attempt to enhance marine activities in Tanzania and in the region. I hope he will continue to contribute towards the promotion and development of marine sciences in the region and also to promote the activities of the Intergovernmental Oceanographic Commission.

During the Second Session of IOCINCWIO, we decided to concentrate on a few feasible projects, rather than on an ambitious programme.

You will remember that we adopted 2 main project proposals: (i) a project on Co-operative Investigation of the Oceanography and Pelagic Living Resources of the Western Indian Ocean, and (ii) a project on the development of a regional component of marine pollution research and monitoring. But we must admit that not much has been achieved on those 2 projects during the intersessional period. Reasons for this are many and varied. The first project, as we agreed in Arusha, was ambitious from an operational standpoint, but we did hope that, in the long-term, it would become feasible and responded to the interests of the Member States in general. Lack of funds and trained manpower, and a convenient research vessel were also responsible for the slow implementation of the project.

As regards the second project, which I remind you, was the Development of a Regional Component of Marine Pollution Research and Monitoring, the priority area identified in Arusha, was the need for training and assistance in this field.

We in Mauritius, did understand the importance of this issue and we took the initiative of organizing a training workshop on marine pollution monitoring in October 1990, in collaboration with various organizations such as UNEP, FAO & SAREC.

A further training workshop on marine pollution, for scientists and technicians from the IOCINCWIO & IOCINDIO regions, took place at the National Institute of Oceanography, Goa, India in March-April 1992 and another one on equipment handling and maintenance in marine pollution studies in Mombasa, Kenya, in June 1992. We now have trained manpower in the region in this important field. I told you that implementation of the 2 projects mentioned above was quite slow. Hence, one programme which we should discuss during the next few days and consider for implementation in the next intersessional period, is the project on marine pollution monitoring.

However, on other counts, we can say that we should be proud of our achievements. The regional sea-level network has been strengthened with the establishment of additional sea-level stations. One station has been upgraded and is now transmitting data via satellite in real-time to the TOGA sea-level centre in Hawaii. Progress to upgrade 3 other stations in the region has reached an advanced stage.

Regional Co-operation in Scientific Information Exchange in the Western Indian Ocean region, commonly known as RECOSCIX and initiated as a pilot phase in February 1989, has further been consolidated, thanks

to further support from the Government of Belgium. Many Member States are now taking advantage of the services provided by the Centre. We are grateful to the Kenya Marine Fisheries Research Institute for providing office space and personnel for the Centre.

Another event worth noting during the intersessional period is the agreement in 1990 for a joint programme in the Western Indian Ocean region to support coastal management and related research through regional capacity building between IOC and the Swedish Agency for Research Co-operation with Developing Countries (SAREC). This programme represents a unique partnership between an international organization and a bilateral organization.

Our concern during this present session now is on what we should concentrate in the next intersessional period.

You may recall that during the First and Second IOCINCWIO Sessions, it was made clear that our basic need was for Training, Education and Mutual Assistance in the Marine Sciences. Many training courses have been organized. As a consequence, Member States have now the capability and potential to participate in the implementation of regional marine and related projects. However, in our future activities, we should be guided by important events which have developed during the last few years. The most important one, is of course UNCED. It is quite important that we develop strategies in the region to help towards implementation of decisions taken by the Conference. As you are aware, one of our main tasks is to prepare an Action Plan for the regional implementation of UNCED Agenda 21, Chapter 17, on oceans. We should also seriously consider our participation in the development of a Global Ocean Observing System (GOOS) in the region. It is understood that the funds for the development of such a system will come mainly from developed countries. Some of these countries are present and perhaps will provide us with more information thereon during the Session. However, we should be prepared to contribute our share, within our capabilities, to the development of GOOS, which, it has been recognized, is an essential component in understanding the marine environment and ecosystems and in predicting long-term changes and variability in climate.

Another task we should set ourselves during the present Session, is the development of programmes for the sound management of the coastal region, where most of the population of this region lives. IOC, together with UNEP & WMO, have already proposed a long-term monitoring global programme system of coastal and near-shore phenomena related to climate change. Coastal erosion is another problem which is faced by most IOCINCWIO Member States. A project aims to advise the Governments of participating countries on effective planning and management strategies for the protection of the coastal marine environment, particularly in respect of coastal erosion, and this will be presented and discussed during the present Session.

In the field of capacity-building, IOC, as some of you are aware, is collaborating with WMO in the development of a training programme in Marine Meteorology and Physical Oceanography at the Regional Meteorological Training Institute in Nairobi. More information will be provided to you under the appropriate time during the Session.

I have provided you with some ideas which I hope might serve as guidelines in our deliberations during the present Session. As you can see, we have a lot to do during the next few days. However, with Dr. Kullenberg, Secretary IOC among us, who I am sure he will lead us in most of the discussion and inspire us to reach the right decisions, we can anticipate a fruitful and successful meeting.

Time is short, and we have already spent a day on the scientific seminar, which in fact, was quite worth holding. We touched yesterday on many issues which we would like to develop further. With able and experienced scientists from many of the Member States and contributions from Member States outside the region, I am confident that we are going to achieve a lot during the remaining 4 days.

The authorities are expecting much from this Session. We should not disappoint them. I, for my part, am much looking forward to working with you.

Thank you.

C. Statement by Dr. G. Kullenberg
Secretary IOC

Your Excellency, Your Honours, Distinguished Delegates, Guests, Ladies and Gentlemen,

It is an honour for me to be here today and to participate in the Third Session of IOCINCWIO. I would first like to express, on behalf of IOC, my appreciation to the Government of Mauritius for hosting this Session and for making such excellent arrangements for the Meeting. I am confidant that we will have a successful and productive Session. At the same time, I feel I must convey my deep concern for, and solidarity with, some parts of the region where human suffering is beyond comprehension. I would like to think that a Meeting like this could also contribute towards decreasing this suffering.

It has been almost exactly 5 years since the Second Session of this Regional Subsidiary Body of the IOC met in Arusha, Tanzania, December 1987. Since then much has happened. There has been increased participation of the region in various regional and global programmes: TOGA, WOCE, JGOFS; the first 2 having being referred to at the Second Session of the Committee which urged that regional participation in these programmes be pursued. To a certain extent, this has been achieved. It is too early to determine the outcome of WOCE, but TOGA is providing very interesting results. These results tend to confirm the possibility to forecast seasonal and interannual climate variabilities through a combination of systematic, scientifically sound ocean observations and coupled atmosphere-ocean models capable of using the assimilated data. This major achievement was realized by WCRP-TOGA which IOC is co-sponsoring with WMO & ICSU. Its usefulness at the national level has been demonstrated by its application to the management of agriculture and fisheries in Peru. The result would appear to confirm that once the science base is reasonably accurate, and an information base is available in the form of reliable data, then well-grounded management decisions can be made. Such progress is also an example of the possibilities provided by international research and observational efforts developed and co-ordinated through agreed intergovernmental procedures to help anticipate and forecast environmental events which otherwise would lead to disaster and possible conflicts. Other examples of events which we may soon be able to adequately anticipate and forewarn include droughts, shifts in seasonality, monsoon variability and cyclone frequencies. The ability to adequately forecast these variabilities, as well as climate zone changes, is the essence of preventing environmentally driven disasters and conflicts. The work required in achieving these results is in line with the reinforced peace-keeping role of the UN, and the IOC has been instrumental in this respect through its support of the work of the Joint SCOR-IOC-CCCO, its support to that of TOGA & WOCE, and to related efforts in capacity-building and training. The IOC is the only intergovernmental mechanism wholly devoted to the marine environment and its resources and, thus, has a special role in the UN system.

Since further specific activities have been reported on in the intersessional report as follow-up to the Second Session of IOCINCWIO, I will not dwell on them here. However, I would like to make special reference to the co-operation between IOC & SAREC. Following discussions and negotiations during 1989, the IOC and the Swedish Agency for Research Co-operation with Developing Countries (SAREC) agreed on a joint programme in the western Indian Ocean region to support the implementation of the IOCINCWIO programme with emphasis on research relevant to integrated coastal zone management and related capacity building. A Memorandum of Understanding was established and programme activities agreed upon starting 1990-1991. The programmes activities are reviewed regularly and the yearly programme is prepared in early Spring each year for submission to SAREC. The budget period starts 1 July each year. We are now in the third period 1992-1993, and it is anticipated that co-operation will last until at least 1996-1997. The Committee is invited to provide its views and advice on this development.

In this context, I would also like to refer to the development of the project on Regional Co-operation in Scientific Information Exchange in the Western Indian Ocean Region (RECOSCIX-WIO), which is now firmly established with outside support from Belgium, SAREC & IOC and several libraries. The Regional Dispatch Centre is located at the Kenya Marine & Fisheries Research Institute in Mombasa, and we are grateful for the strong national involvement and participation of Kenya.

I would like to emphasize the great importance of involvement and participation of Member States in the programmes activities. It must be noted that proposals for external funding of large projects through the Global Environment Facility, GEF or UNDP must come from Member States. An organization such as IOC can help prepare the proposal and in doing so, but the Member States must actively support these proposals and must contact relevant GEF or UNDP representatives themselves. This is also the case with co-operation

between the ACP Group and CEC. In this context, this Committee has great potential as an intergovernmental body and can take the necessary responsibility. It would be valuable if this could be discussed at this Session and at the same time if a regional focal point could be identified to facilitate contacts with funding agencies. I suggest we discuss this under an appropriate agenda item. It is particularly important in relation to our follow-up to UNCED and to help towards the implementation of decisions taken by the Conference, including the Conventions and Agenda 21.

Much effort was devoted by the IOC to preparations for UNCED '92 and input to the negotiations for the Framework Convention on Climate Change (FCCC). The IOC actively participated in UNCED and was identified by name as having the leading role to play, in co-operation with WMO, UNEP & ICSU in the development of the Global Ocean Observing System (GOOS). Specific reference is made to the need for IOC to fully formulate a strategy to provide training and technical assistance for developing countries through its TEMA programme (Agenda 21, Chapter 17, para. 17.103). The IOC is also referred to in the context of the role of the oceans and all seas in attenuating potential climate change and the need to carry out analyses, assessments and systematic observations of the role of the oceans as a carbon sink (Agenda 21, Chapter 17, para. 17.102). All of these matters are also of great relevance to the implementation of the UN FCCC.

The programmes of the IOC have a critical role to play in all other parts of Agenda 21, Chapter 17, as demonstrated by the contributions of GIPME, OSLR, IODE & OSNLR to the preparation and drafting of that chapter. The IOC can play an active role in the implementation of several other chapters of Agenda 21, for example, Chapters 9, 31, 36 & 37.

Follow-up to UNCED has been initiated. As regards GOOS development, this is an continuing effort. The TEMA component of GOOS, emphasized by the Assembly, is being developed as a priority.

UNCED confirmed that in the context of an action-oriented programme focussing on environment and development, the oceans cannot be considered without taking into account their links and interactions with the rest of the planet. The Conference also clearly recognized the critical role the oceans play in maintaining conditions of life on Earth; that without a healthy ocean there is no healthy global or regional environment; that the present understanding of interactions between the oceans, the land (especially coastal zone) and the atmosphere is insufficient for adequate forecasting of changes and consequences of human actions.

UNCED put capacity building in focus, including the development of increased knowledge; education, research, infrastructure, equipment, expertise. It recognized that the establishment of knowledge and the capacity to use it means much for the social and cultural development of a country. Capacity building in poor countries is therefore most important. The co-operation programme between IOC & SAREC addresses this issue and is an example of an implementation mechanism.

UNCED also acknowledged that sustainable development and rational use, or management, requires an information basis which has been obtained through the use of scientifically valid methods. Sustainable use of natural resources must be founded on knowledge about the resource base, origin, function and dynamics.

A number of issues of relevance to the marine environment can be defined on the basis of UNCED results.

1. Population pressure on the coastal area is increasing, especially in tropical and sub-tropical zones. About 2 billion people, mostly in the poorest countries, are wholly dependant on marine protein; 50-90% of the protein in developing countries come from marine fishes.

2. Marine pollution and effects of land-based activities on coastal zone conditions are major problems in most regions of the world. These threaten the natural resources in the coastal zone. This issue is of course, linked to the first issue.

3. The effects of climate variability and change are potentially very important for the coastal area through changes in sea-level, meteorology, seasonality, precipitation levels, events like storm surges, cyclones, shifts in marine living resources, coastal erosion and general degradation.

4. The role of the oceans in the climate system and the possibility of forecasting climate changes and variability from adequate observations and modelling can, in combination with economical modelling, help remedy impacts of changes and define economically-valid counter measures and useful response strategies.

5. Changes in the radiation budget, especially UV radiation, can influence the productivity of marine ecosystems and their composition. This cannot as yet be quantified.

6. Maintenance of marine living resources in coastal and shelf seas and the open ocean; this issue is mainly related to the management of fisheries, i.e., of those doing the fishing.

7. Maintaining the biological diversity and ecosystem integrity in heavily exploited and stressed near-shore and coastal ecosystem. e.g., lagoons, wetlands, estuaries, mangroves, sea-grass beds, coral reefs and certain fish species in areas of over-fishing, as well as certain marine mammals.

8. The ocean and the marine environment uses are intersectorial and normally there is no single national authority dealing with marine affairs. Many different sectors of society have an interest in this part of the environment. Co-ordination and co-operation at national and international levels are therefore very important in order to ensure the best use of limited resources and capacities.

Finally, I would like to emphasize the need for co-operation and co-ordination at international and national levels. The IOC co-operates with several agencies in the UN system such as WMO, UNEP, IAEA, FAO, IMO & UN, as well as NGOs, such as ICSU & SCOR. We have several joint programmes, also at regional levels. One co-ordination, co-operation and reporting mechanism is the Intersecretariat Committee on Programmes Related to Oceanography (ICSPRO) where all matters related to oceans are considered.

The Committee is required to review regional programme development, identify needs on the basis of national priorities and national programmes in order to obtain a revised regional programme which takes into account the results of UNCED and to formulate a regional action plan for 1994-1997 which includes regional level implementation of UNCED decisions, in particular with respect to Chapter 17 of Agenda 21.

Thank you for your attention.

D. Statement by Mr. S. Taukoordass
Representative of the Prime Minister's Office

Mr. Chairman of the Regional Committee for the Co-operative Investigation of the North and Central West Indian Ocean,
Dr. Kullenberg, Secretary of the Intergovernmental Oceanographic Commission,
Mr. Valadon, Director, Mauritius Meteorological Services,
Mr. Pertaub, Vice-Chairman of the National Committee for UNESCO,
Dr. G. Soares, Technical Secretary of the Regional Committee,
Delegates and Representatives of International Organizations,
Distinguished Guests,
Ladies and Gentlemen,

It is indeed a great pleasure for me to be with you at this important Session of the IOC Regional Committee for the Co-operative Investigation of the North and Central West Indian Ocean. On behalf of the Prime Minister, the Rt. Hon. Sir Anerood Jugnauth and in my own name, it is my pleasure to welcome you all to this opening session.

We are particularly honoured by the presence of Dr. Kullenberg, the Secretary of the Intergovernmental Oceanographic Commission and other high-ranking officials of various agencies, and of representatives of intergovernmental organizations which have interest in this region. We are also much encouraged by the level of the delegations of Member States of this Regional Committee, which comprises specialists in various marine disciplines. This large and diversified participation is in itself an indication that this Session is destined to be a great success.

I understand that the Intergovernmental Oceanographic Commission, has, in nearly 25 years of activity, contributed through the concerted action of its Member States and of marine scientists and oceanographers from world-famous institutions of the respective scientific communities, to a better knowledge of the oceans. It enjoys a special position within UNESCO due to its high technical and scientific standards. It is currently

engaged in a comprehensive research programme which now covers all relevant marine, scientific and technical disciplines.

Although Mauritius has been a member of IOC for many years, it has only recently been following the work of the Commission more systematically. We plan to strengthen this involvement in matters which are of special interest to our country. In fact, this Third Session of the Regional Committee does provide an unique opportunity for our local scientists to interact with many distinguished specialists in marine science, from the North and West Central Indian Ocean and also those coming from other regions. I have noted that there are delegates from the USA, Germany and France. A special word of thanks to them as they have travelled such a long distance to come here and promote marine sciences in the region. This is very encouraging as we in Mauritius are very keen to collaborate with other countries within and outside the Indian Ocean to conduct research in the fields of oceanography and marine sciences in this region.

Mr. Chairman, the IOC is fully justified to choose Mauritius as host for this Third Session of your Regional Committee. We have a vast oceanic Exclusive Economic Zone of some 1.6 million sq. km. compared to a limited cultivable land area of a few hundred sq. km. No doubt Mauritius will have to turn more and more towards its oceanic territory and exploit its living and non-living resources for food and other products but at the same time, it will have to maintain the beauty of its beaches and avoid pollution of its waters. Therefore, Mauritius is committed to devoting more and more energy towards a better knowledge of its maritime territory and of its potentialities. Regional meetings like the present one can provide the necessary background material and make appropriate recommendations for short- and long-term actions beneficial to the participating Member States. Therefore, the Government readily accepted IOC's proposal for having this Session in Mauritius.

Mr. Chairman, we expect a lot from your Committee. How well we explore and exploit our marine environment will depend largely on the outcome of this Session.

I shall now dwell briefly on a few examples to illustrate our involvement in the field of marine sciences. Mauritius is actively participating in the monitoring of sea-level. We have established 2 sea-level stations, one in Mauritius in June 1986 and the second in Rodrigues in November of the same year. The Mauritius sea-level station was recently upgraded and became one among the first set of stations to transmit sea-level data in real-time, via satellite. The Rodrigues sea-level gauge will soon be upgraded too. We are participating in the monitoring of sea-surface and sub-surface temperature in our region using equipment installed on one of our ships, the "*M.V. Mauritius Pride*". Mauritius has also been identified as one of the 2 countries in this region to participate in a pilot-project within the framework of the UNEP-IOC-WMO long-term monitoring programme of coastal and near-shore regional in relation to climate change. Several institutions are collaborating in the implementation of this pilot-project.

We have been quite active during the intersessional period in promoting regional activities and implementing some of the decisions taken during the Second Session of this Regional Committee in Arusha, Tanzania. The Second Meeting of the Task Team on Bathymetric Charting in the Southwest Indian Ocean was held in Mauritius in July 1990. We also hosted a Training Workshop in October 1990 on Marine Pollution Monitoring which was attended by many scientists in the region. Our scientists also benefit from training activities organized in the region. We are most grateful to IOC for sponsoring them.

Mr. Chairman, I am sure that your Session will give such thought to the major environmental issues currently confronting mankind. These issues concern the protection of the marine environment and the effects of climate change on the oceans and coastal areas.

The issues relating to climate change are at the centre of the international debate these days. This was particularly highlighted during the Earth Summit in Rio de Janeiro in June 1992. I know that it is no longer a matter for dispute that the ocean plays a key role on weather and climate. I understand that IOC is preparing itself to make a substantial contribution to the follow-up of the Conference through the development of a Global Ocean Observing System. Such a system will fill a long-felt vacuum and will contribute significantly to the understanding and prediction of climate variability and climate change and other important environment issues. Mauritius fully supports this programme. We will consolidate our current marine programme and will participate in other activities within our capabilities.

Another major problem facing mankind today is marine pollution. In Mauritius, this problem has started to show itself within our coastal region. We shall have to be extra careful in order to ensure a sustainable

development. The Marine Pollution Monitoring Programme is an important item on your agenda. I hope that in the course of your debate effective measures will be proposed to tackle this problem. As I earlier mentioned, beaches are one of our main attractions. However, we apprehend the problem of coastal erosion which may jeopardize our tourist industry. I am looking forward to the decisions you would take on this issue too.

I have noted that on account of the multi-disciplinary nature of this meeting, the Mauritius Delegation comprises of at least 10 scientists from different local institutions involved in marine affairs. I wish to emphasize the need for such co-operation at the national level as we believe, little progress would be achieved without the effective interaction of experts having different marine backgrounds.

I would like to take this opportunity once again to reaffirm the interest of the Government of Mauritius in the sea, for the well-being of the Mauritian people, of present and future generations. There is a strong political will to encourage the introduction of new technology and methodology in the field of marine sciences.

I wish all the delegates a successful and profitable Session and a most enjoyable stay in Mauritius. Please feel at home and enjoy the warm Mauritian hospitality. I hope you will be able to spare some time to visit our beautiful beaches, taste some of our typical Mauritian dishes and take a souvenir back home.

I also avail myself of this opportunity to wish you all a very merry Christmas and a happy New Year.

I now have the honour to formally declare the Session open.

Thank you.

ANNEX IV

WESTERN INDIAN OCEAN MARINE SCIENCE ASSOCIATION (WIOMSA)

INTRODUCTION

Marine science research in the Western Indian Ocean (WIO) region (Cameras, Kenya, La Reunion, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, Tanzania) started gathering momentum with the implementation of the Indian Ocean Expedition (IOE) in the 1960s. The IOE was initiated by scientists from developed countries who were eager and interested in understanding the monsoon phenomenon. Participation of scientists from maritime countries bordering the Indian Ocean was very minimal and this was largely due to the lack of qualified indigenous personnel and, to a lesser extent, the inability of the newly independent countries to contribute towards the cost of expedition. This deficiency has since been recognized by the international scientific community and efforts have continuously been made to improve on the situation as reflected by the establishment of several marine science research centres in the region. However, in the early days, marine science research concentrated on fisheries science. In this regard, research vessels have been bought or donated to conduct research survey, and training programmes were developed, although these have mainly dealt with the translation of temperate experiences into tropical situations despite major differences between the two areas. Most of these programmes are being executed under the umbrella of the FAO. Research in other aspects of marine science have received less attention and has only recently, through IOC, UNEP and bilateral donor agencies have the importance of these aspects been recognized.

Today there are many donor agencies assisting the development of marine sciences in the WIO region. Co-ordination of these efforts would ensure efficient use of the financial resources, minimize the chances of duplication, allow the sharing of information and encourage a regional approach to finding solutions on common marine environmental problems. IOC has an major role to play in this important aspect and we do pay tribute for these initiatives. Fortunately the position with regard to indigenous expert personnel today is better than it was in the 1960s and consequently there exists an opportunity for co-development and partnership in marine science research and training in the WIO region, between scientists from the region and those from other parts of the world.

The need for collaborative marine science research and co-ordination within the WIO region has been expressed by marine scientists from the region during several national and regional workshops/seminars in the past but the mechanism to achieve this was suggested and recommended during a regional workshop held in Dar es Salaam in November 1989. The Workshop was hosted by the Institute of Marine Science, University of Dar es Salaam and supported by the Swedish Agency for Research Co-operation with Developing Countries (SAREC). This Workshop provided an opportunity for the marine scientists to discuss and assess the level of marine science expertise in the region, the amount of existing information and deficiencies. The scientists were able to draw recommendations and suggested an action plan on how to advance marine science research. One of the recommendations was the need for the marine scientists of the region to act as a team/group/one-community, and this was to be implemented by the formation of an association. The decision to have an association has been welcomed by SAREC and IOC/UNESCO who have responded by providing support for the initial activities which enabled the establishment of the association and have pledged continued support.

THE ASSOCIATION

The name of the association is the Western Indian Ocean Marine Science Association (WIOMSA). It is a non-profit and non-governmental organization. The purpose for establishing WIOMSA is to provide a platform for fostering better communication between marine scientists and institutions in the WIO region and with scientists and institutions from outside the region; and participate and/or facilitate effective co-ordination of marine science activities through collaboration with the UN, international, regional and national organizations and agencies active in marine science research and development within the WIO region with a view of contributing and enhancing the building and development of indigenous marine science and technological capability of the region. The building of indigenous scientific and technological capability in the WIO region is pre-requisite for not only the meaningful utilization of the marine resources but also for active participation and proper implementation of numerous collaborative efforts coming from national, regional and international agencies.

The objectives of the Association are:

(i) to promote and advance the educational, scientific and technological development in all aspects of marine sciences in the Western Indian Ocean region;

(ii) to provide a forum for discussion and dissemination of information and organize meetings, seminars and workshops for the presentation of findings and experiences on subjects related to marine sciences;

(iii) to encourage the support of marine science research, development and educational activities undertaken by governments and private sectors;

(iv) to collect and disseminate scientific, technical and other relevant information in marine sciences;

(v) promote and foster inter-institutional linkages within and outside the region, with a view to sustained use, conservation and preservation of the marine resources of the region.

The membership of the association is not restricted to scientists from the region but also individuals and institutions from and outside the region with interests in the development of marine sciences in the region. Apart from procedural activities, the Association shall promote and support research in the regional waters concerning national and regional problems and issues deemed of importance by the Association; produce a Newsletter, journal, bulletin and/or information brochures and reports, organize workshops, seminars and symposia; and seek/solicit funds from individuals, national governments/private sector and donor agencies.

The Association was officially inaugurated in December 1991 on Inhaka Island, Maputo, Mozambique during a regional workshop on Lagoon Ecosystems. The Workshop was attended by scientists from Somalia, Kenya, Mauritius, Mozambique and Tanzania; and also scientists from outside the region (Sweden and Australia). The constitution was adopted and the interim office bearers for the Association were nominated. During the same sitting, it was decided that the scientists who were present would be part of the founding members of the Association and these were 33 scientists. Mechanisms for formal registration of the Association are being worked out. The funds of the Association shall be derived from membership fees; support from national and international organizations; donations from public/private parties who support the aims of the Association; sales from the Association's publications and consultancies.

The Secretariat of the Association will consist of not more than 5 staff members headed by the Executive Secretary. It is proposed to have semi-autonomous national WIOMSA for each of the WIO countries under the stewardship of a national co-ordinator. The establishment of the national WIOMSA will be in accordance with the laws governing the establishment of non-governmental organizations (NGO) in each country. It is further proposed that membership fees, donations and support funds from national scientists, individuals and institutions shall be deposited into the national sub-accounts, and those from outside the region shall be deposited in the main account. However, any donor may specify and give guidance with regard to the use of the donated funds, and the funds shall be used as specified. Also, mechanisms shall be developed which will guide the transfer of funds to support national and regional activities and initiatives.

MARINE RESEARCH GRANT SCHEME (MARGS)

One of the activities to be initiated by WIOMSA is the granting of research funds to marine scientists working within the region. The Marine Research Grant Scheme (WIOMSA-MARGS) is intended to promote the Association by bringing awareness to the marine scientists and unleashing the force that will enhance the development of an indigenous marine science capability of the WIO region.

The proposal to establish MARGS within WIOMSA has been evaluated by a Joint IOC-SAREC-WIOMSA Working Group with respect to its viability, and the Group also explored the possibility of raising sufficient funds from donor agencies, specifically those involved in marine research development of the WIO region. Although MARGS will cover all aspects of marine sciences, priority will be given to the aspects that fall within the development priorities of the member countries.

The objectives of MARGS are:

(i) strengthen the individual research capacity of marine scientists in the WIO region;
(ii) develop the potentialities of researchers in the WIO region;
(iii) create a national and regional core of marine science researchers.

These objectives will be achieved through the provision of financial assistance to individual marine scientists to pursue research activities of their choice and initiative within the framework of national priorities and needs, travel grants to enable the scientists attend scientific meetings and assistance to enable researchers visit marine science research institutions within and outside the region. The scheme will create productive atmosphere for the researchers in the field of marine sciences and the scientists will in return acquire practical experience in marine research activities.

CALL FOR SUPPORT

1. The scientists of the WIO region request the Member States of the IOC Regional Committee for Co-operative Investigation in the North and Western Indian Ocean to endorse and support WIOMSA.

2. WIOMSA strongly urges IOCINCWIO Member States and donor agencies to:

   (i) contribute to MARGS;

   (ii) support development and partnership research initiatives;

   (iii) collaborate with WIOMSA in its efforts to co-ordinate marine science development within the WIO region;

   (iv) use WIOMSA in negotiating consultancies in marine resource development in the WIO region;

   (v) provide material and financial support to assist in the development of WIOMSA.

3. Although the Association has been inaugurated, suggestions and comments with regard to improvement of the constitution, MARGS and operational arrangement are very welcome.

ANNEX V

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ANNEX VII

LIST OF DOCUMENTS [1]

Document Code	Title
IOCINCWIO-III/1.rev.1	Revised Agenda
IOCINCWIO-III/2	Annotated Provisional Agenda
IOCINCWIO-III/3	Summary Report
IOCINCWIO-III/4 prov.	Provisional List of Documents
IOCINCWIO-III/5 prov.	Provisional List of Participants
IOCINCWIO-III/6	Report of the Secretary on Intersessional Activities
IOCINCWIO-III/7	Chapter 17 of UNCED Agenda 21: Protection of the Oceans, All Kinds of Seas Including Enclosed and Semi-enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of their Living Resources.

[1] This list is for reference only. No stocks of these documents are maintained, except for the Summary Report.

ANNEX VIII

LIST OF ACRONYMS

ACP	Africa, Caribbean, Pacific
ASFA	Aquatic Sciences & Fisheries Abstracts (FAO-IOC-UN)
ASFIS	Aquatic Sciences & Fisheries Information Services
BREDA	Bureau Regional d'Education pour l'Afrique
BSH	Bundesamt fur Seeschiffahrt und Hydrographie (Germany)
CCCO	Joint SCOR-IOC Committee on Climatic Changes & the Ocean
CEC	Commission of European Communities
CEPPOL	Marine Pollution Assessment & Control Programme for the Wider Caribbean (IOC-UNEP)
CIDA	Canadian International Development Agency
CNRO	Centre National des Recherches Océanographiques
COMAR	UNESCO Major Inter-regional Project on Research & Training Leading to the Integrated Management of Coastal Systems
COMARAF	UNESCO Major Inter-regional Project on Research & Training Leading to the Integrated Management of Coastal Systems in Africa
CTD	Conductivity, Temperature, Depth
EC	European Community
EEC	European Economic Community
EEZ	Exclusive Economic Zone
FAO	Food & Agriculture Organization of the United Nations
FCCC	Framework Convention on Climate Change
GCNSMS	Global Coastal and Near-Shore Monitoring System
GCOS	Global Climate Observing System
GEF	Global Environmental Facility
GESAMP	Group of Experts on Scientific Aspects of Marine Pollution
GIPME	Global Investigation of Pollution in the Marine Environment (IOC)
GOOS	Global Ocean Observing System (IOC)
IAEA	International Atomic Energy Agency
IBCWIO	International Bathymetric Chart of the Western Indian Ocean (CGOM)
ICSPRO	Intersecretariat Committee on Scientific Programmes Relating to Oceanography
ICSU	International Council of Scientific Unions
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer (France)
IMO	International Maritime Organization
INAHINA	Instituto Nacional d'Hidrografia e Navigaçao (Mozambique)

IOC	Intergovernmental Oceanographic Commission
IOCEA	IOC Regional Committee for the Central Eastern Atlantic
IOCINCWIO	IOC Regional Committee for the Co-operative Investigations in the North & Central Western Indian Ocean
IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IODE	International Oceanographic Data & Information Exchange
IOE	Indian Ocean Expedition
IOI	International Ocean Institute (Malta)
IOMAC	Indian Ocean Marine Affairs Co-operation
IOTC	Indian Ocean Tuna Commission
IPCC	Intergovernmental Panel on Climate Change (UNEP-WMO)
IPTP	Indo-Pacific Tuna Management Programme
IUCN	International Union for the Conservation of Nature & Natural Resources
JGOFS	Joint Global Ocean Flux Study (SCOR-IOC)
KMFRI	Kenya Marine & Fisheries Research Institute
LME	Large Marine Ecosystems
MARGS	Marine Research Grant Scheme
MARINF	Marine Information Document (IOC-MRI)
MARPOL	Marine Pollution
MARPOLMON	Marine Pollution Monitoring System (IOC)
MIM	Marine Information Management
MRI	Marine Related Issues (IOC)
MSCP	Marine Science Country Profiles
MSIRI	Mauritius Sugar Industry Research Institute
NGO	Non-Governmental Organization
NOAA	National Oceanic Atmospheric Administration (USA)
NORAD	Norwegian Agency for International Development
OCA/PAC	Ocean & Coastal Areas, Programme Activities Centre
ORSTOM	Office de la Recherche Scientifique et Technique Outre Mer (France)
OSLR	Ocean Sciences for Living Resources
OSNLR	Ocean Sciences for Non-Living Resources
PROMAR	Promotion of the Marine Sciences
RECOSCIX-WIO	Regional Co-operation in Scientific Information Exchange in the Western Indian Ocean Region
ROSTA	UNESCO Regional Office of Science & Technology for Africa (Kenya)
SAREC	Swedish Agency for Research Co-operation with Developing Countries
SCOR	Scientific Committee on Oceanic Resaerch
STD	Salinity, Temperature, Depth
TEMA	Training, Education & Mutual Assistance in Marine Sciences (IOC)
TOGA	Tropical Oceans & Global Atmosphere
TREDMAR	Training & Education In Marine Sciences
UNCED	United Nations Conference on Environment & Development (1992)

UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States of America International Development
UV	Ultra Violet
VLIR	Flemish Inter-university Council (Belgium)
WCRP	World Climate Research Programme
WIOMSA	Western Indian Ocean Marine Science Association
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment (WCRP)
XBT	Expendable Bathy Thermography