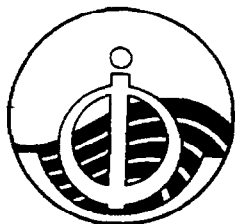


Intergovernmental Oceanographic Commission
Reports of Governing and major Subsidiary Bodies



**IOC Regional Committee for the
Central Indian Ocean**

Third Session
Tehran, Islamic Republic of Iran
21-23 February 2000

UNESCO

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1. OPENING

The Third Session of the IOC Regional Committee for the Central Indian Ocean (IOCINDIO-III) was called to order at the Iranian National Center for Conferences, in Tehran, Islamic Republic of Iran on 21 February 2000. After the traditional prayer and national anthem of Islamic Republic Iran, the floor was given to Prof. H. Zomorrodian, President of the Iranian National Center for Oceanography.

The IOCINDIO Chairman, Dr. Muthunayagam, the Executive Secretary IOC, Dr. P. Bernal, the Honourable Dr. Moin, Minister for Culture and Higher Education of the Islamic Republic of Iran, successively addressed the session; their opening addresses are presented in Annex III.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

The Chairman recalled that the provisional Agenda had been circulated to Member States through IOC Circular Letter 1633 of 15 November 1999. He invited comments from the floor. The Vice Chairman proposed that International Oceanographic Data Exchange be discussed under Item 4. The Technical Secretary suggested that Ocean Mapping issues also be included under the same item. The Chairman recommended to delete an item dealing with "Cooperation with other organizations" as it is already covered under item 5. **The Regional Committee agreed** with the changes and adopted the Agenda as given in Annex I.

2.2 CONDUCT OF SESSION, TIME TABLE AND DOCUMENTATION

The Technical Secretary reviewed the List of Documents (Document IOCINDIO-III/4) and the provisional Timetable of the Session (Document IOCINDIO-III/1 add.prov). He recalled that the Regional Committee is expected to work in plenary. The time schedule should lead the Regional Committee to a concluding afternoon session on 23 February.

The Regional Committee agreed not to designate a Rapporteur of the session taking into account the presence of few IOC staff. The Chairman requested those who introduce agenda items for discussion to provide inputs to the Summary Report through the Technical Secretary. The Vice Chairman provided the participants with information on local arrangements.

The Chairman drew the attention of the Delegates that an *Ad Hoc* Sessional Drafting Group should be established on Programme and Budget. The Regional Committee appointed the representative of Pakistan as Chairman of this Group. India, Islamic Republic of Iran, Sri Lanka expressed their wish to participate in the sessional group. The Chairman requested the Technical Secretary to assist the Group. Other countries were invited to join.

3. REPORT OF THE CHAIRMAN ON INTERSESSIONAL ACTIVITIES

The Chairman presented a summary of the main inter-sessional activities conducted by the Regional Committee (Document IOCINDIO-III/6). He made special references to his participation at IOC Governing Bodies meetings and presented Resolutions adopted there relevant to the Committee's activities.

He highlighted three groups of actions to which special attention was given during the inter-sessional period: organization of regional workshops, implementation of sub-regional workshops, and organization of the third session of IOCINDIO. He emphasized that because of lack of resources not all planned activities were implemented.

He then presented an extensive list of IOC activities which have been organized within the region as a contribution to the IOC technical and scientific programmes. The summary of them is presented in Annex VI

The Chairman informed the Regional Committee of his participation at the IOC Assembly and of the discussions taking place relevant to IOCINDIO activities. Resolution XX-16 was accepted and the progress achieved by the Regional Committee was appreciated. Drawbacks were identified and guidance was given to him, the Vice Chairman and the Member States of the region for facilitating the implementation of IOCINDIO-II decisions.

The Regional Committee expressed its satisfaction with the actions taken by the Chairman in supporting the implementation of IOCINDIO-II recommendations, thanked the IOC Assembly for the guidance provided and decided to consider in detail the progress achieved under relevant agenda items.

The Regional Committee acknowledged the efforts made within the region to improve cooperation between oceanographic and meteorological communities in response to the decisions of IOC and WMO Governing Bodies and called on Member States to continue these efforts at the national and regional level in order to avoid duplication of activities and to use available resources in the most effective way.

The Regional Committee appreciated the creation of the IOC Perth Office and considered that as an example to follow in bringing resources of meteorological and oceanographic agencies closer.

The Regional Committee noted with concern that only very few Member States submitted national reports to the session. The Regional Committee noted the importance of national reports for increasing awareness of national activities within the region as well as for the entire international community. The Member States were requested to submit to the Technical Secretary by 30th March their national reports in electronic format to be included as an annex to the Summary Report.

The Regional Committee requested the Technical Secretary to develop instructions on the format of the national reports to be submitted to IOC and send them together with the invitation letter of the next IOCINDIO session.

4. IN-DEPTH DISCUSSION ON IMPLEMENTATION OF THE PROGRAMMES ADOPTED BY IOCINDIO-II

4.1 SEA LEVEL NETWORK

In accordance with the Resolution XIX-19 of IOC Assembly, the office of the Chairman IOCINDIO formulated a project proposal for the establishment of a network of about 40 tide gauges in the region, based on the inputs obtained at the second Session of IOCINDIO. The report was circulated in September 1997 among the Member States

requesting for comments and their willingness to participate in the proposal. The Chairman GLOSS was also consulted. It was expected to seek the financial assistance from international funding agencies for implementation of the project. The five following countries responded : Islamic Republic of Iran, Iraq, Sri Lanka, Bangladesh and India. A revised project proposal on sea level network was prepared considering the participation of the five countries and was circulated among them in September 1998. The Member Countries were requested to confirm their commitments of local fund and infrastructural support for implementation of the project. There was response only from Islamic Republic of Iran and India.

Mr. B. N. Krishnamurthy of India presented the proposal on sea level network. The proposal was discussed by the Regional Committee in depth. The Committee appreciated the efforts of the office of the Chairman IOCINDIO in formulating and pursuing the proposal with Member States.

The Regional Committee observed that one of the reasons for inadequate response from Member States is due to lack of identified focal points in the Member States.

The Regional Committee recommended that the proposal should be pursued and that the project may be implemented even if one or two countries are interested and with the resources available within the region. That would be an example to encourage other Member Countries to follow.

The Regional Committee recommended to report the progress achieved to IOCINDIO-IV.

4.2 STORM SURGE PROGRAMME

Dr. B. N. Krishnamurthy from India as a representative of the country which hosted the IOCINDIO workshop on Storm Surges (20-21 October 1999, New Delhi, India) provided information on the results of the Workshop. He pointed out that the Workshop was divided into four sessions covering the presentation by Member States on existing storm surges forecast systems, presentations by experts on modeling using finite differences and finite element approaches, on-hand demonstration of storm surge and tidal models, and adoption of conclusions and recommendations. The Workshop recommended enhancing the infrastructure in the member countries for collection of data on meteorological, oceanographic and hydrological parameters. The Workshop also recommended the development of the state of the art cyclone and storm surge forecast models.

The Regional Committee congratulated the organizers of the Workshop for the successful meeting and endorsed the Workshop recommendations.

The Regional Committee invited IOCINDIO Member States to provide necessary resources for accomplishing activities recommended by the Workshop.

Speaking in his capacity as the Pre-Project Manager, Dr. Krishnamurthy referred the Regional Committee to the progress achieved in the implementation of the project proposal on storm surge disaster reduction in the northern part of the Indian Ocean. He informed the Regional Committee of the meeting held in New Delhi, India, from 22-26 October 1999, at which representatives of eight Member States took part. The meeting formulated the plan of action for the pre-project period which contained, *inter alia*, the appeal to the Member States to continue their efforts to get clearance and funding from all concerned authorities of their governments for the implementation of the project.

Dr. B. N. Krishnamurthy reported then on the progress achieved by him in taking up activities as authorised by the regional meeting. He presented responses from some international funding agencies whom he approached seeking their interest in funding the regional project. In conclusion he invited Member States concerned to take actions following the plan of action of the October meeting.

The Regional Committee congratulated the Project leader, Pre-Project manager and the Secretariat on the progress achieved and expressed its strong support to the project considering it as the main regional activity in mitigating natural disasters and preventing their effects.

The Regional Committee endorsed the need for consolidating efforts at the national and regional levels for providing support to the project. In this regard the **Regional Committee adopted** Recommendation IOCINDIO-III.2 as presented in Annex II.

4.3 CLIMATE STUDIES

The Chairman invited Member States to comment on their activities contributing to the implementation of the GOOS Climate Module and on other activities related to climate studies. A few Member States provided brief comments:

The Delegate of India reported on India's Climate Research Program which is a counterpart to the World Climate Research Program. The program encompasses five projects including sea-level measurements, the completed JGOFS project, LOICZ Carbon Flux Studies, INDOEX which focuses on clouds and the inter-tropical convergence zone and BOBMEX, a time series study of monsoons.

The Delegate of Pakistan referred to the work of the inter-ministerial committee on Global Warming and Sea-level Rise. It conducts a project in the North Arabian Sea with 62 observing stations for obtaining data and information on chemistry, biology, physical oceanography and meteorology. It also conducts research cruises to study monsoons and impacts on ocean productivity.

The Delegate of the Islamic Republic of Iran reported on a network of tide gauges in the northern coastal area of the Persian Gulf which is in operation since 1990. He stressed the need for information from other Member States about their observing stations in the Persian Gulf and Sea of Oman and emphasized a need to facilitate the exchange of data.

The Delegate of Bangladesh reported that the Department of Meteorology and the Bangladesh Water Development Branch are involved in the measurement of temperature and rainfall. Bangladesh Inland Water Transport Authority (BIWTA) also collects water level data in the northern part of the Bay of Bengal.

Mr. William Erb, the Director of the IOC Regional Office in Perth reported on a Workshop on Sustained Observations of Climate in the Indian Ocean planned for November 13-15, 2000. The Workshop is being organized as a follow-up to a recommendation made at the Working Meeting on Indian Ocean in Perth held in September 1999. Delegates invited from Indian Ocean countries will receive IOC support. Other meetings taking place in Perth in November include:

Indian Ocean Climate Initiative Workshop	9-10 November
TAO Implementation Panel Meeting	16-17 November
Workshop on southern Ocean Observations	16-18 November

Mr. Erb also reported on the ARGO Project which will deploy 3,000 profiling floats, globally, to support climate studies. Cooperation from Indian Ocean countries is desirable to support deployment of floats. The data will contribute to a better understanding of the Indian Ocean Dipole and monsoon events, which will directly benefit Indian Ocean countries. India has expressed interest in contributing profiling floats for the project.

4.4 COASTAL STUDIES INCLUDING COASTAL MARINE POLLUTION

Dr. Raj Murthy, Chairman of the Regional Workshop on Integrated Coastal Area Management, including Marine Pollution, held in Tehran, Islamic Republic of Iran (19-21 February 2000) presented the recommendations of the Workshop. The Workshop was attended by experts from Bangladesh, Canada, India, Islamic Republic of Iran, Kuwait, Qatar, Sri Lanka, and Thailand as well as representatives from IOC, IOMAC, and ROPME.

The Workshop recommended that as a first step a broad regional strategic ICAM action plan should be formulated and invited IOC, through the Regional Committee to take steps for its formulation by organizing a regional meeting of experts. The Workshop also recommended the necessity of designing specific demonstration projects (for example on coastal megacities, and the vulnerability of the Persian Gulf to oil pollution) with a view to develop methodology in the ICAM process, taking advantage of emerging new science and technology (including ICAM tools and techniques).

The Regional Committee endorsed the recommendations of the Workshop as presented in Annex VII of the Summary Report.

The Regional Committee also recommended that the regional meeting on Strategic ICAM Action Plan should be organized by IOC, in consultation with the ROPME Secretariat and held within a year, preferably in one of the Member States of ROPME.

The Regional Committee suggested that IOC provide technical assistance for the preparation of the Strategic ICAM Action Plan and that IOC and ROPME support the participation of experts from the IOCINDIO region.

The ROPME Representative informed the Regional Committee that his organisation has produced regional guidelines on Integrated Coastal Area Management which could be disseminated in the region and used in the regional strategy meeting. He also expressed the willingness to cooperate with IOC in this field. ROPME would be ready to support some joint ICAM related activities with IOC, and in particular a pilot study on a ICAM demonstration project in one of the Member States of ROPME.

The Regional Committee took note of the kind offer made by ROPME, and instructed the Secretariat to follow it up.

The Chairman of the Workshop also reported on the Training Programme on Modelling and Monitoring of Coastal Marine Processes (MAMCOMP), sponsored by IOC, which last took place in November 1999, in New Delhi, India. The Course has been running successfully for the last five years, having trained around 100 participants in the field of coastal sciences related to ICAM. He also informed the Regional Committee of the initiative

of India to organize an International Symposium on ICAM for Coastal Cities, 20-22 November 2000 in Chennai, as a follow up of the IOC-SOA Hangzhou Workshop which took place in September 1999. This event will be also co-organized by the National Ocean Institute of Technology/DOD, and Ocean Engineering Centre. The International Ocean Institute (IOI) in Malta and its regional office in India have already expressed willingness to support this event.

The Regional Committee congratulated Dr. R. Murthy (Canada) and Prof. P. Sinha (India) for their work in co-organizing the MAMCOMP programme, and invited them to share the benefits of such programme to the other countries of the region, especially to countries of the ROPME Sea Area.

The Regional Committee endorsed the proposal of organizing a Symposium on Coastal Cities for the region, and recommended that this event be supported by IOC. **The Regional Committee invited** ROPME to support the participation of ROPME Member States in the next MAMCOMP Training Course and the Symposium on ICAM on Coastal Cities.

4.5 MARINE LIVING RESOURCES AND CORAL REEF PROGRAMMES

The Delegate of India informed the Regional Committee that the IOC-HAB Centre and the regional training course suggested at IOCINDIO-II were not implemented due to a lack of financial support. However India initiated activities on HAB and marine taxonomy as part of their on-going activities on Marine Living Resources.

Occurrence of algal blooms are common phenomena along the Indian coasts and incidents of human mortality due to algal toxins have been reported. The objectives of the on-going projects are : i) identification of toxic phytoplankton, ii) study of physico-chemical factors affecting their growth and distribution, iii) assessment of their toxic influence on marine organisms, iv) modelling for the prediction and detection of HAB, v) prediction of the threshold limits of the blooms to understand the extent of environmental hazards.

The Delegate of Pakistan informed the Regional Committee on national activities in this field, and in particular on algal taxonomy and monitoring of algal bloom occurrences along the coast of Pakistan.

The Representative of ROPME stated that a major fish mortality affected the region last year. He communicated that a regional meeting on HAB will take place from 6-9 March 2000 in Kuwait with a view to conclude a plan of action on marine mortality for the region. IOC has been invited to participate.

The Regional Committee recommended that Member States forward their proposals for the establishment of a Regional Centre for the Study of HAB to the Technical Secretary within a period of six months.

The Regional Committee also recommended the organization of a HAB Training Course to be implemented during the intersessional period.

The Technical Secretary informed the Regional Committee about the development of the Global Coral Reef Monitoring Network (GCRMN) in the Indian Ocean. Two regional nodes already exist, one based in Sri Lanka (covering India, Maldives, and Sri Lanka), and a second one based in Mauritius covering the island states of the Western Indian Ocean. No node exists in the Gulf area yet. He called upon Member States to prepare national reports on

the state of coral reefs in view of the preparation of the 'Status of Coral Reef of the World' report which will be published this year. He invited Member States to contact the GCRMN Coordinator, Dr. C. Wilkinson as soon as possible, in case financial or technical support was needed for the preparation of the national reports.

The Representative of ROPME informed the Regional Committee on the results of the Workshop on Coral Bleaching in the Arabian region which took place in Riyadh, 6-9 February 2000. The meeting endorsed the need for expanded monitoring capacity in the region and recommended the formation of a Node for the Red Sea region at a location that has the capacity to support the training and data management.

Mr. Erb identified a project proposal submitted by Dr. Russel Reichert, Director of AIMS in Townsville, Australia, in September 1999. It proposed a coral reef study and monitoring of reefs in the Indian Ocean and addressed coral reef bleaching and reef regeneration techniques. Cooperation from institutes in the region is being sought and Member States should contact the IOC Regional Office in Perth for additional information.

The Delegate of the Islamic Republic of Iran informed the Regional Committee that in Iran around 15 islands presenting coral reef covers were located in the Persian Gulf. He stressed that they were poorly studied and invited other countries of the region to cooperate with INCO in developing monitoring of these coral reefs.

The Regional Committee endorsed the proposal that the GCRMN should look at the possibility of including the Islamic Republic of Iran within the South Asia regional node, or within the emerging regional initiative led by PERSGA and ROPME in the Persian Gulf.

4.6 SUB-REGIONAL WORKSHOP ON OIL SPILL MONITORING

The Representative of ROPME reported on the Regional Workshop on Oil Spill Trajectory Modeling, which took place in Bahrain, 15-17 February 1998. The workshop was co-sponsored by IOC, ROPME/MEMAC and NOAA. He reported also on the follow-up activities towards the adoption of the NOAA Trajectory Model to suit the requirements of the ROPME region. He explained the measures taken in upgrading the GIS and Remote Sensing capabilities of ROPME and in developing a digital electronic bathymetry chart as well as the preparation of habitat mapping and hyperspectral characteristics of the coastal area natural formations and anthropogenic influences. To this effect, he informed the Committee that the digital charts in two scales have been developed and sent to NOAA, available data for species in the ROPME Sea Area coded, wind data of the region collected, and the high resolution spectrometry is in the final calibration phase.

The **Regional Committee** acknowledged the efforts of the ROPME/MEMAC Secretariat in meeting the needs of the Member States in oil spill trajectory modelling.

The **Regional Committee** further urged all concerned Member States to provide data and information to support the regional efforts.

The **Regional Committee** further recommended that IOC cooperate with ROPME/MEMAC in the organization of the Regional Workshop on the Final Version of the Trajectory Modeling.

4.7 PARTICIPATION IN GOOS

Mr. William Erb presented a summary of the GOOS program and recent developments in the Indian Ocean region. Document IOCINDIO-III/11 provided the basis for this presentation and was available as a meeting document.

The Regional Committee noted that only few countries in the Indian Ocean region have national GOOS programmes but this is expanding. There exists in the region, already, elements of the GOOS Initial Observing System. The proposed Storm Surge Disaster Reduction Project, when funded, will provide a major focal point for GOOS in the region, as well as globally.

The Delegate of India described several national GOOS related activities it conducts, including projects involving moored buoys, XBT's, current meter arrays, satellites and modeling.

The Delegate of the Islamic Republic of Iran and the Representative of ROPME pointed out the problem of data sharing in the region and the need for additional monitoring systems and networks.

A discussion on the scope of the coastal module ensued with Dr. Bernal explaining the parameters of coastal GOOS. Problems related to vandalism associated with offshore buoys and instruments were discussed. It was explained that IOC is giving attention to this problem.

Capacity building was identified by several Member States as an important need in the region. The IOC Perth Regional Office offered its assistance to develop GOOS capacity building to respond to the needs of IOCINDIO Member States. It will also seek to identify, in general, regional activities that will support the development of GOOS in the Indian Ocean.

4.8 INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE

Dr. I. Oliounine, Deputy Executive Secretary IOC reported on a wide range of the activities relevant to oceanographic data and information exchange and management implemented in the region during the intersessional period such as training courses held in India and the Islamic Republic of Iran in 1997 and 1998, missions to Pakistan and the countries of the Persian Gulf area in 1997, development in 1999 by the WDC-B, MGG with IOC support of a CD-Rom containing geological, geophysical and OSNLR data from the Indian Ocean and others.

He stressed the need to strengthen or establish ocean data management national and regional infrastructures that ultimately would contribute to different IOC activities in the region as well as to meeting national needs in science, research and technology.

Dr. I. Oliounine referred the participants to a proposal submitted to the UNESCO Regional Office in the Arab States of the Gulf, in Doha, Qatar "to establish a regional data and information center which will include besides the Arab Gulf universities the local and regional environmental research agencies. The center which is planned as a part of an inter-university network in the Arab Gulf Region is proposed to be hosted by the deanship of scientific research of the Sultan Qaboos University". It was also envisaged that the Center be located in Oman due to the need to include data of the interaction of the Indian Ocean/ the Arabian Sea/Strait of Hormoz/ to that of the Persian Gulf.

He reminded the participants of the IODE rules for selection and nomination of RNODC's and of the conclusions of the IOC/ROPME mission to the State of Kuwait, the Kingdom of Saudi Arabia, the State of Bahrain, the United Arab Emirates and the Sultanate of Oman which took place from 15 March – 2 April 1997. One of the conclusions of the mission was a need for a regional center which will be a regional node for oceanographic data collection and exchange in the region. At the same time the mission expressed a view that a regional center whenever and wherever established should have facilities necessary for an effective response to the regional needs, objectives and tasks. The mission also strongly recommended that while establishing a center, existing internationally agreed data collection, processing and exchange rules and procedures as well as the data policy of the IOC/IODE system should be strictly followed for the benefits of all Member States of the region.

The Delegates of Pakistan and the Islamic Republic of Iran provided information on national activities in the IODE area and thanked the Executive Secretary of IOC for his support in training and strengthening national data and information management facilities.

The Delegate of Pakistan thanked the Secretariat for sending the IOC mission to Pakistan, on the development of an information and data gathering system in support of integrated coastal zone management for coastal Pakistan. The recommendations of the mission are under consideration for implementation.

The Regional Committee expressed satisfaction with the progress made in capacity building related to data and information management. However the Committee stressed an urgent need for enhancing national capabilities and strengthening the IODE infrastructure in the region.

The Regional Committee noted that there is still not enough knowledge on the IODE system in the region and proposed that the IOC and ROPME Secretariats with the support of the Iranian NODC and RNODC for the Indian Ocean in Goa, India, spare no effort in increasing awareness of the benefits of participation in the system. The added value of exchanging data freely was emphasized. A joint plan of actions should be developed on improving the IODE activities in the region and its implementation reported to IOCINDIO-IV.

The Regional Committee accepted the provisions of the IOC/ROPME mission to the Persian Gulf on strengthening national facilities and recommended that the compilation of information and data on coastal and marine areas from all national sources be implemented.

The Regional Committee acknowledged with thanks the readiness of the Islamic Republic of Iran to provide advice and support to the Member states of the Persian Gulf in establishing national data and information management infrastructures and in training the personnel on bilateral or regional basis.

The Regional Committee noted the interest of the Iranian Oceanographic Data Center to become a Regional Oceanographic Data Center for the Persian Gulf area with a focus on marine pollution monitoring data (RNODC for the Persian Gulf). The Committee emphasized the importance to follow strictly to the IODE rules and procedures in selection and nomination of RNODC's as they are presented in the IOC Manual No.9 Annex II published in 1991.

Noting the plans of establishing a regional oceanographic data center in Oman, **the Regional Committee recommended** the Executive Secretary IOC jointly with the Executive

Secretary of ROPME and the Director of UNESCO Regional Office in the Arab States of the Gulf to organize consultations with Oman to discuss the Proposal and make an assessment of data management facilities of the Sultan Qaboos University of Oman. It was stressed that wide consultations with the Member States of the region should be arranged prior to any final decisions for the establishment of a regional RNODC for the Persian Gulf area is taken.

4.9 OCEAN MAPPING

The Technical Secretary introduced this item by referring to the IOC Assembly Resolution XX-5 on Ocean Mapping which “invites Member States (ii) to assist developing countries, at their request, in the exploration and protection of their Exclusive Economic Zone (EEZs) in providing technical assistance or assisting in the production of large scale bathymetric charts for areas of particular interest such as the coastal zones and nearshore shelf areas; (iii) to give increased support on TEMA and capacity building in Ocean Mapping in national and regional programmes”.

Member States were requested to express their wish to prepare such detailed maps and obtain related TEMA support by contacting the Chairman of the Consultative Group on Ocean Mapping (CGOM), Dr. G. Giermann.

The Regional Committee thanked the Chairman of CGOM, and **invited** Member States to forward their requests on ocean mapping activities to him.

5. CO-OPERATION WITHIN THE REGION AND WITH OTHER REGIONAL BODIES OF IOC

The Vice Chairman, Prof. Zomorrodian presented this item recalling that one of the most important objectives of the IOCINDIO Regional Committee is the cooperation with other regional and international marine-oriented organizations.

The many Member States of the Regional Committee and the vast expanse of the marine area, makes it necessary, in most cases, to define and implement the programs and projects of the Regional Committee for the Central Indian Ocean, in the form of sub-regional projects. On the other hand, dividing the projects into sub-projects that can be implemented by only a few countries decreases the scientific capabilities of implementing them. In order to maximise the success of regional projects, it is necessary for the Committee and other regional bodies of IOC to maintain close co-operation.

Improved co-operation within the region and with other regional bodies of the IOC will result in:

- i) Strengthening the human and financial resources and facilities of the projects currently being implemented;
- ii) Utilizing common resources in implementing projects;
- iii) Exchanging technologies and experiences between different countries;
- iv) Constant linkages between the Regional Committees of IOC;
- v) Decreasing international tensions within a framework of scientific cooperation.

In the Central Indian Ocean region, priority is given to following regional organizations :

- i) Regional Organization for the Protection of the Marine Environment (ROPME);
- ii) Indian Ocean Marine Affairs Co-operation (IOMAC);
- iii) Regional Organization for the Preservation of the Environment of the Red Sea and Gulf of

Aden (PERSGA).

Prof. Zomorrodian stressed that the cooperation of the Regional Committee for the Central Indian Ocean with other regional programmes of the IOC in the region such as IOCINCWIO and WESTPAC is of special importance. An important point in regional co-operation is the attempt to avoid overlapping of activities, which does not only interrupt the progress, but brings projects to a standstill.

The Representative of IOMAC re-affirmed the interest in ICAM as indicated at the preceding IOCINDIO-ICAM Workshop. He invited IOC to participate in IOMAC-ESCAP ICAM planned projects under the ESCAP work programme for the Great and Little Basses region and Weligama Bay in Sri Lanka. IOC was also invited to join IOMAC in reporting to a similar need for the Maldives. He also drew the attention of the Regional Committee to the need for specialized training programmes as well as the resumption of the IOMAC integrated ocean management training programmes to which IOC could contribute as well as to the production of a compendium of marine space information for coastal states of the Indian Ocean region to which IOMAC is also committed. IOC could also help in facilitating the participation of Member States in planned oceanographic cruises in the region, by working closely with IOMAC. IOMAC welcomed closer on-going cooperation with the IOC, through the provision of technical back-stopping in responding to national needs in the region through project formulation and capacity building. Finally, he informed the Regional Committee that the Third Indian Ocean Conference-IOMAC III was also planned and that IOC inputs would be welcomed.

Mr. William Erb, as Director of the IOC Perth Regional Office, offered to fully cooperate with IOCINDIO in the development of GOOS. He explained the genesis of the office and the partnership of IOC and the Government of West Australia in establishing it. The Office is staffed by one person now, but expects that over time it will be expanded by secondments, perhaps from the Indian Ocean region. The Office has a responsibility to work with the South Pacific region, Southern Ocean, coastal Australia and the Indian Ocean. Therefore its activities will require the creation of partnership with countries and institutions since the Office's resources (funds and manpower) will not allow it to operate as a "funding source". It will work with partners to identify and contact funding agencies and potential donors of GOOS activities in all regions.

The ROPME Representative emphasized the need to increase the working relationship between his organization and IOC, and in particular through the implementation of joint activities. To this effect, the following ROPME planned activities which were presented to the Regional Committee for information and consideration of possible areas of cooperation :

- i) Open Sea Cruise on physical, chemical, and biological oceanography of the ROPME Sea Area (planned for Summer 2000),
- ii) Water exchange study through the Strait of Hormuz,
- iii) River basin management programme for Shatt Al-Arab, focusing on the river and coastal zone interaction,
- iv) regional action programme for monitoring of coral reefs in the ROPME and PERSGA Regions,
- v) Workshop on technical guidelines for environmentally sound management of marine sources of pollution, and
- vi) Training course on oceanographic data management.

The Technical Secretary reacted positively to the intervention of ROPME, and IOMAC and invited their representatives to discuss cooperative activities.

The Regional Committee noted with appreciation the kind offers of ROPME and IOMAC and invited the Secretariat to build stronger links with this two organizations as well as with

other IOC sub-regional bodies. **The Regional Committee noted** with interest the proposal to undertake a feasibility study on a real time forecasting system in the Persian Gulf with the following objectives: i) operational use for the prediction of extreme climatic events and ii) for combating accidental spills and transboundary movement of marine pollution.

The Vice Chairman then continued his report, referring to Resolution XX-16 presented at the 20th IOC Assembly. In this Resolution, a request was made to the Executive Secretary to consult with Member States with regards to the establishment of an IOCINDIO Regional Support Office. This proposal was made by the distinguished delegate of India, but as the other Representatives of the region were not present at the Paris Session, the proposal was deferred to the IOCINDIO-III Session in Tehran.

The Regional Committee was requested to express its opinion on the establishment of the IOCINDIO Regional Support Office.

The Delegate of India reaffirmed his offer to host such an office for a three year period and to provide support to the Chairman regardless of his location in the region, and also brought to the attention of the Regional Committee that similar arrangements exists in other IOC regions.

The Delegate of Pakistan expressed his concern with the fact that it would create logistical difficulties if the Chairman and Office were not located in the same country.

The Executive Secretary IOC informed the Regional Committee that the issue of regional policy will be discussed at the next session of the Executive Council. He emphasized the importance of implementing activities at the regional level without stretching the Secretariat beyond its capacity. He welcomed the proposal for establishing this kind of mechanisms and stressed that the project support office if established, should be flexible, dynamic, committed to attract external funds, and should be on a fixed term basis.

The Regional Committee discussed the matter in detail and decided that it was too early to establish a Regional Office for IOCINDIO at the present time.

The Regional Committee recommended to address the matter again at the next meeting of the Regional Committee.

The Regional Committee recommended that in order to improve communication within the region, the Technical Secretary will circulate an electronic newsletter in consultation with the Chairman, to inform about the state of implementation of the regional workplan.

6. CONTRIBUTION OF IOCINDIO COUNTRIES TO IYO

The Technical Secretary reported on the implementation of the IYO programme as it was accepted by the Nineteenth Session of the IOC Assembly. He referred to the various activities organized by Member States, governmental and non-governmental organizations and the IOC Secretariat in promoting global concerns on ocean use. He also informed the Regional Committee about the decision of the Twentieth Session of the IOC Assembly relevant to the issue and of plans for IYO follow-up activities.

Member State were invited to inform the Session about their participation in the IYO

and on the plans to contribute to the realization of the plan of follow-up activities.

The Delegate of Pakistan informed the Regional Committee of the actions taken during the 1998, which included seminars, media events, signing of the Ocean Charter. He also announced that his country will organize an International Conference on Trace Metal Contaminants in the Marine Environment, in January 2001.

The Delegate of India informed the Regional Committee that India organized in 1998 several events including: cruises, production of stamps, workshops, signing of ocean charters, and has prepared a document on national activities, which was available for information.

The Representative of ROPME informed the Regional Committee that ROPME has published the First State of the Marine Environment Report, and the Manual of Oceanographic Observations and Pollutant Analyses Methods (MOOPAM) during the IYO. ROPME also organised the First International Environmental Technology Exhibition during April 1998. The ROPME Secretariat and MEMAC are further planning to organize the Second International Environmental Technology Exhibition in April 2000, and the Second Conference and Exhibition on the Protection of the Marine Environment and Contingency Planning in the Middle East in September 2000, as a follow-up to the activities carried out during IYO.

The Delegate of the Islamic Republic of Iran informed the Regional Committee that his country organized workshops involving decision-makers, and issued a series of IYO stamps. Beach Clean up campaigns also took place, with the involvement of schools, local communities and universities, as well as the publication of the first issue of the Journal of Oceanography.

The Delegate of Bangladesh informed the Regional Committee that his country contributed to the 1998 IYO by organizing programmes which included public lectures on El Nino, and sea-level rise, and special publications. A short course on oceanography is planned to be organized at the end of the year.

The Delegate of Sri Lanka recalled that his country organized a workshop on oceanographic studies in Sri Lanka, produced articles on oceanography, and broadcasted oceanographic research films.

The Regional Committee expressed its support to the Assembly resolution and acknowledgement of the progress achieved.

7. PRIORITIES FOR REGIONAL CAPACITY BUILDING ACTIVITIES

7.1 DEVELOPMENT OF IOC CAPACITY BUILDING STRATEGIES

The Vice Chairman presented a summary report on relevant issues concerning regional capacity building and the priorities as well. The report concluded:

- a) As most of the countries in the IOCINDIO region are developing countries, the issue of education and capacity building mechanisms in the region is vital and needs special consideration;
- b) Despite the vast development over the past few decades of the IOC/TEMA program, capacity building in developing countries is still facing numerous problems.

- c) Short-term training courses and workshops should be strengthened by long term activities to satisfy fully the need of Member States.

In view of the fact that the programmes of the courses and workshops do not take into account fully scientific and technical needs of developing countries, and due to the lack of coordination between educational and capacity building programs and regional needs, **the Regional Committee agreed** that new mechanisms must be sought for the regional capacity building based on particular conditions of developing countries in the region.

7.2 USAGE OF NEW TRAINING TECHNOLOGIES IN THE REGION; PROBLEMS AND MEANS TO SOLVE THEM

The IOC Deputy Executive Secretary informed the Committee of the mechanisms, principles and tools of the IOC/TEMA Programme and presented some data on the TEMA activities in the region. In 1999, twelve countries of IOCINDIO received support within the TEMA Programme with the total number of trainees – 29. For comparison during the period 1984 –1994 the number of experts who received training within on-going programmes of IOC, was for the IOCINDIO region 188. He then focused on new approaches for achieving the goals in education and training such as computer-aided learning, distance teaching and networking and called on the Committee to try finding answers to a number of questions:

- a) What new occupational areas in marine research, protection and exploitation can be foreseen in the region as developing in the new millenium?
- b) What key knowledge in marine research, ocean data and information collection and management will be required and how will they differ from today?
- c) What major problems the region is facing in the marine science and monitoring fields?
- d) What education, training and techniques towards solving these problems are required? Will distance learning help to solve the problem?
- e) What will be the main obstacles in applying educational and training methods and new ones particularly in the region and what is needed to overcome them?
- f) What should be the balance between the training of local communities and the calling on outside expertise in order to address the problems faced?
- g) What type of assistance is expected from IOC and what assistance to supporting regional capacity building efforts can be provided by countries of the region, and regional and other international bodies?

The Regional Committee thanked the speaker and decided on a number of actions which should be urgently implemented in order to meet effectively the needs of the region in capacity building.

The Regional Committee recommended that the TEMA Coordinator within IOC will initiate an assessment of capacity building activities conducted in the IOCINDIO region during 1996-2000. This report will be evaluated and commented by the IOCINDIO officers and TEMA focal points in the Member States of IOCINDIO.

The Regional Committee urged the Member States of the region to identify TEMA focal points, key capacity building experts and centers of excellency.

The Regional Committee called on the Member States to participate actively in effort of IOC to identify needs of countries of IOC in different types of TEMA activities and respond to the IOC request to provide necessary information.

The Regional Committee decided to establish an *ad hoc* regional group on capacity building without any financial implication for IOC. This group will develop a capacity building plan for IOCINDIO using the strategies and framework contained in Document IOC/TEMA-CB-II/3. The *ad hoc* group will assist in identifying regional priorities and needs and will start the work immediately.

The Regional Committee requested the Chairman of the *ad hoc* group, Dr. Partovian of the Islamic Republic of Iran, with the assistance of the IOC Perth Office to propose an interim status report by June 2000 and present it to the IOCINDIO Chairman during the IOC Executive Council planned for 20-30 June 2000. If possible the next meeting of the *ad hoc* group will take place during the Executive Council.

8. PROGRAMME AND BUDGET OF THE REGIONAL COMMITTEE FOR 2000-2002

8.1 IDENTIFICATION OF SCIENTIFIC PROGRAMME PRIORITIES

The Chairman of the *ad hoc* intersessional group on programme and budget of the Committee for 2000-2002 presented the report of the group containing a draft Recommendation on the programme and budget. The report and Recommendation were written taking into account discussions and agreements achieved under earlier agenda items of the session.

The Regional Committee noted the group's report and discussed and commented on the draft Recommendation. The Committee adopted the Recommendation IOCINDIO-III.1 as presented in Annex II.

8.2 IDENTIFICATION OF RESOURCES

The Chairman of the Committee informed Member States of the decisions taken by the IOC Assembly at its 20th Session (29 June-9 July 1999, Paris, France) on the Programme and Budget for IOC for 2000-2001 with special emphasis on funds allocated for regional activities implementation.

The Technical Secretary for the Session informed of the decisions taken by the UNESCO General Conference at its 30th Session (26 October to 18 November 1999, Paris, France) on the UNESCO Programme and Budget for 2000-2002 and of the new budgetary policy of UNESCO.

The Regional Committee proposed the budget for the implementation of activities presented in the Recommendations adopted under Agenda Item 8.1. Member States and representatives of international organizations were invited to provide advice in the ways of raising additional funds for the IOCINDIO programme implementation.

The Regional Committee recommended that a maximum number of Member States of the region and regional bodies concerned should actively participate in the IOC Assembly, and contribute to the discussion, in order to give strong support to the regional programme.

9. ELECTION OF OFFICERS

The Technical Secretary reminded the Committee of existing procedures for the election of officers of the IOC main subsidiary bodies based on new statutes of IOC and on the IOC Manual Part I, 1989.

The Regional Committee expressed its satisfaction with the work achieved by the present Chairman and Vice Chairman. Taking into account that they served only one intersessional period and that there was no other applications for the positions, **the Regional Committee elected** them by acclamation for the next intersessional period.

The Regional Committee stressed the need for clear definition of the responsibilities of the Vice Chairman and recommended that the Vice Chairman should take the responsibility of assisting the Chairman in TEMA and capacity building activities.

10. DATE AND PLACE OF IOCINDIO-IV

The Chairman invited proposals. The Delegate of Sri Lanka proposed to host the fourth session of the Committee in the period December 2002-January 2003.

The Regional Committee expressed its thanks for this offer. In order to reduce implementation costs, the Committee proposed to hold a Training course on HAB or Coral Reef, back to back with the 4th Session of the Regional Committee.

The Regional Committee requested the Executive Secretary IOC to send a letter to the IOC focal point in Sri Lanka in order to start planning the arrangements.

The Technical Secretary was invited to contact the focal points of the region, so as to ensure that they are still operational, and when necessary request Member States to appoint a new focal point. A revised list should be sent to all Members of the Regional Committee.

11. ADOPTION OF REPORT, RECOMMENDATIONS AND CLOSURE

The Regional Committee adopted a draft summary report and the recommendations. **The Regional Committee thanked** the Government of the Islamic Republic of Iran for its excellent arrangements, and in particular Prof. H Zomorrodian, and the INCO staff for the quality of the hospitality and services they provided during the Session.

The Chairman closed the Session at 15.00pm. on 23 February 2000.

ANNEX I

AGENDA

- 1. OPENING**
- 2. ADMINISTRATIVE ARRANGEMENTS**
 - 2.1 ADOPTION OF THE AGENDA
 - 2.2 CONDUCT OF SESSION, TIME TABLE & DOCUMENTATION
- 3. REPORT OF THE CHAIRMAN ON INTERSESSIONAL ACTIVITIES**
- 4. IN-DEPTH DISCUSSION ON IMPLEMENTATION OF THE PROGRAMMES ADOPTED BY IOCINDIO-II**
 - 4.1 SEA-LEVEL NETWORK
 - 4.2 STORM SURGE PROGRAMME
 - 4.3 CLIMATE STUDIES
 - 4.4 COASTAL STUDIES INCLUDING COASTAL MARINE POLLUTION
 - 4.5 MARINE LIVING RESOURCES AND CORAL REEF PROGRAMME
 - 4.6 SUB-REGIONAL WORKSHOP ON OIL SPILL MONITORING
 - 4.7 PARTICIPATION IN GOOS
 - 4.8 INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE
 - 4.9 OCEAN MAPPING
- 5. CO-OPERATION WITHIN THE REGION AND WITH OTHER REGIONAL BODIES OF IOC**
- 6. CONTRIBUTION OF IOCINDIO COUNTRIES TO IYO**
- 7. PRIORITIES FOR REGIONAL CAPACITY BUILDING ACTIVITIES**
 - 7.1 DEVELOPMENT OF IOC CAPACITY BUILDING STRATEGIES
 - 7.2 USAGE OF NEW TRAINING TECHNOLOGIES IN THE REGION; PROBLEMS AND MEANS TO SOLVE THEM
- 8. PROGRAMME AND BUDGET OF THE REGIONAL COMMITTEE FOR 2000-2002**
 - 8.1 IDENTIFICATION OF SCIENTIFIC PROGRAMME PRIORITIES
 - 8.2 IDENTIFICATION OF RESOURCES
- 9. ELECTION OF OFFICERS**
- 10. DATE AND PLACE OF IOCINDIO-IV**
- 11. ADOPTION OF REPORT AND RECOMMENDATIONS, CLOSURE**

ANNEX II

RECOMMENDATIONS IOCINDIO-III.1

Programme of Work and Budget Estimate for 2000-2002

The Regional Committee for the Central Indian Ocean,

Having reviewed the implementation of its programme agreed at the Second Session,

Having considered the proposals on the IOCINDIO programme activities for the next intersessional period made during the Session;

Taking into account available funds as contained in the Approved Programme and Budget of IOC for 2000-2001;

Noting the need for continuing commitments by Member States of the region in providing extrabudgetary funds for programme implementation;

Decides to adopt the Programme of Work for the Committee over the period 2000-2002 as indicated in the Table annexed to this Recommendation,

Urges Member States of the region to participate in, and support the implementation of the regional cooperation programme to the best of their interest and capabilities.

Activities	Action and objectives	Date and Place	Estimated Budget (US\$)	Participation	Remarks
<u>I. Sea Level Network</u> Training Course on GLOSS	Training in use of modern instruments To achieve uniformity in data acquisition in the IOCINDIO Network	2000-2001	Maximum \$30,000	All countries	Approved by IOC Assembly Resolution XX-16
<u>II. Integrated Coastal Area Management</u>					
1) Preparation of Strategic ICAM Action Plan (SAP)	To hire a consultant to collect information and inputs from Member States and other resources with a view to provide a regional synthesis on ICAM and prepare a draft proposal.	2000	\$10,000	All countries	
2) Regional Meeting on SAP	To discuss and approve SAP and identify pilot projects	2001	\$15,000	Interested countries	
3) MAMCOMP Training Course and Symposium on Coastal Cities and ICAM	To support participants to attend the MAMCOMP course and coastal cities Symposium	2000	\$25,000	Interested countries	
4) ESCAP Bay Programme, Sri Lanka	To provide technical assistance for a planning meeting, in collaboration with IOMAC	2000-2001	\$5,000	Sri Lanka	

Activities	Action and objectives	Date and Place	Estimated Budget (US\$)	Participation	Remarks
II. Marine Living Resources					
1) Training Course on HAB Taxonomy	Training regional scientists in HAB identification and taxonomy	2001	\$20,000	Interested countries	Approved by IOCINDIO-II
2) Coral Reef Monitoring Course/Workshop	Training in monitoring techniques	2000-2001 Persian Gulf	\$15,000 GCRMN, ROPME		Approved by IOCINDIO-II
III. Marine Pollution					
1) Workshop on Oil Spill Trajectory Modeling	To adapt and finalise the NOAA Model in collaboration with ROPME	2000 Persian Gulf	US\$ 5,000 (IOC)	Interested countries	
2) Forecasting for marine pollution in the Persian Gulf	To support a resource person to undertake a Feasibility Study	2000 Persian Gulf	US\$5,000	Interested Member States	
IV. TEMA					
IOCINDIO Intersessional Meeting of Ad Hoc Group on TEMA	Meeting of a group of experts	2000 June, Paris Prior to the 33 rd EC	\$5,000		
V. IOCINDIO-IV					
	Meeting of the regional committee	2003	\$30,000	All Member States	
TOTAL REQUESTED		2000-2003	\$ 165,000		

RECOMMENDATION IOCINDIO-III.2
Storm surge project

The IOC Regional Committee,

Noting the conclusions of the IOC-WMO Regional Meeting on Storm Surges in the Northern Indian Ocean and the progress achieved in the implementations of its decisions,

Emphasizing that the availability of external financial support is crucial for the implementation of the regional project

Reaffirming that IOC should continue its support to project

Urging Member States concerned to contribute to the project implementation within the context of government policies

Recommends the following steps be implemented urgently:

- a) Each Member State interested in the implementation of the project, through the Heads of National Weather Service and the National Ocean Service, unless a Member State identifies another agencies as more suitable for their needs, will submit to their Ministry of Finance or another appropriate agency, a letter recommending that the Storm Surge proposal be given a high national priority. Appended to the letter will be a copy of the project proposal. This should be done in a coordinated way to ensure that all requests of participating Member States reach the identified funding agencies at approximately the same time.
- b) The letter from the Ministry of Finance or another appropriate agency, with the Appendix will be submitted to the World Bank and other funding agencies...
- c) The letter submitted to the funding agencies by each member state will explicitly identify the intention of the Member State to fully cooperate with all other Member States identified in the project proposal in accordance with the protocols identified therein. The letter should emphasize the readiness to provide required national contributions.
- d) The IOC Regional Office in Perth will work with the pre-project manager to identify appropriate funding agencies to whom the proposal should be sent.
- e) The IOC Secretariat in Paris will draft a letter of endorsement for a joint signature by IOC, IHP (UNESCO) and WMO. This letter will be sent to the funding agencies to demonstrate support for the project and to express the intention of the UN agencies to work fully with the countries involved to ensure success.

Urges the Executive Secretary IOC to bring this recommendation to the IOC and IOCINDIO focal points in the countries concerned and to the Heads of WMO, and IHP of UNESCO.

ANNEX III

WELCOME ADDRESSES

A. Address by the Honorable Minister of Culture and Higher Education of the Islamic Republic of Iran, Dr. Moin

In the name of God, the Compassionate and Merciful,

I congratulate all the participants and contributors for holding the IOC Committee for Northern and Central Indian Ocean Session in Iran as a splendid and superb activity of the Intergovernmental Oceanographic Commission (IOCINDIO) and value the presence of the dear guests; the Executive Secretary of the Intergovernmental Oceanographic Commission (IOC), the Regional Marine Organizations, the President of the Regional Committee, the Representative of UNESCO in Iran, the Representatives of ROMPE and IOMAC and the Esteemed Professors and Researchers at the Third Session.

Water is the basic element of an individual's life and social existence. "Because of water all things exist", therefore, whatever relates to this living phenomenon, in itself is a broad base of positive favoring and on going actions, must do activity, or deserving the new investigation on national, regional and international horizon.

In Quran, our holy book, water referred to as the source of living and creation and is one of the most significant signs of God, includes providing the means to get man's fair share and control of the nature.

Therefore, any subject that somehow involves water, is superior to financial and its tangible dimensions. It is not limited to a person, a society, a generation a territory or even a region. Demands looking to the past, present and future and needs attention to spiritual and financial responsibility.

When this issue, enters into boundaries of the science and research, acquires double importance and urgency. Water, Environment, water and future societies, water and future political geography of countries, water and cultural communications, water and new technologies and tens of other subjects needing challenge, mutual scientific collaborations so based on their foundation a new order takes place.

We are at the beginning of a new millennium, this force all of us to have a new look at our surrounding world to use our present resources efficiently. Knowledge, research and technology are joined chains that can be used to broaden the natural capacities and improve the standards of living for human and societies. Naturally to enter into such a broad view, we can and must improve using the available national, regional and international resources. About 2/3 of the earth surface is covered by water, the vast resources that are hidden in Lakes and Oceans and the direct effect that they have on living conditions of the people of the coast is obvious to everyone. Oceans at times played the most important role in creation and development of civilizations. At some other times they were transformed to exhortative roads to force the imperialistic policies of the strong countries over poor countries. But today it can be a path and basin of co-operations between developing countries.

Indian Ocean is a good example of this powerful capacity. This unit of immense water and its common several coastal civilizations, is the main communication road of very reach economic oil producing (Persian Gulf) to all over the world. It contains enormous

living and other resource. Perhaps it is the same reason this place attracts world economic, military and political powers enforcing their authoritarian policies.

Despite having basic resources for development, most countries of Indian Ocean region, are still not well equipped for development, even most of their population are below poverty level. For this reason, this rich water resources is mostly used by developed countries and the role and share of the regional countries are very minute.

- Technological advances in using the Ocean resources, specially technologies relating to deep waters and also inaccessibility of the region countries to these technologies, practically has caused a great difficulty to use this God-given water resources for most region countries.

Cautiously looking towards future, it is obvious that further development of the region specially, the coastal countries are subject to efficient use of this vast Ocean resources.

Co-operation between region countries is one of the most important necessities in this new process. In a world, that majority of big countries, leaning towards regional uniformity, developed European countries, despite excellent scientific and economic capabilities, see that their future survival is an unavoidable necessity in common cooperation, uniformity of the region countries.

Due to the importance of “water” in international relations, cooperation of Indian Ocean region countries can be a first step towards development of the region and increasing the scientific and economic capability.

Mutual programs toward increasing the level of knowledge and awareness, training specialist and the use of Ocean resources are important priorities of the region.

In this position, human and social goals, increasing the efficiency and knowledge level, development and economic boom of the region, should surpass the difference of opinion and taking political sides.

To respond to this obligation, We must treat as important, the role of Committee’s and the Regional and Global Marine Commissions in increasing the level of knowledge and capabilities of the region.

We shouldn’t believe that in using the Ocean Resources, if a country has access to advanced tools and new industries, do not need the cooperation of developing countries.

Today more than any other day we continuously need a broad level of marine information, data, understanding Ocean Science and producing Databases. The above requirements are in the hands of cooperation of all nations, specially in sensitive regions like Indian Ocean. Therefore lack of knowledge and awareness of coastal countries especially in the field of Oceanography and high technology, distorts the global cooperation derange the available resources.

Therefore the program of capacity building and increasing the efficiency of the less advanced countries by itself, is one of the important Oceanography issues in solving the Oceanographic problems at regional and global level. Capacity building of these countries can improve their national and regional development and consequently conclude to a broad

cooperation in using the Lakes and Ocean resources. Of course the basic role in scientific and economic capacity building is the responsibility of the countries of the region.

Adequate knowledge of the officials and policy makers of the region countries from significance of the Oceans and their resources, and their strategic role of economic, politic and social point of view, can conclude improving the national infrastructure program of each country on Marine Science Technology. This by itself is a main basin in capacity building of these countries.

Obviously, more advance countries of the region must also help the less developed countries in the framework of comprehensive regional programs for example: IOCINDIO framework. And pull the global programs towards the regional policies in such a way that appropriation of available financial resources of global institute, coincides with suggestion of useful programs of the region.

I think it is appropriate to point to the new horizon that has opened global and regional cooperation:

Dialogue of civilization that was suggested by the honorable President of the Islamic Republic of Iran, Mr. Khatami at the United Nation, and the global embarrassment of this proposal, can be a new expanse for regional cooperation. Year 2000, the “International Year of Dialogue Civilization” and the civilization of Indian Ocean region countries has been blend together from long time ago.

Mutual cultural and social effects of these countries on each other’s social infrastructure, can perceived as a turning point in regional cooperation specially in political, economical and social cooperation.

On issues relating to Lakes and Oceans, specially coastal issues and coordination of their management which is totally depends on the economic and social conditions of any region countries

Cultural coordination of these countries and comparable views in social issues can conclude to comprehensive managerial policies.

Present special regional solutions concerning the Coastal Issues and Environmental, by itself will be a role model to other marine regions. On the other hand, cultural similarity of these countries, can help the educational and scientific cooperation and present applied solution to improve the general and special knowledge and cultural level on common issues, including Marine issues and pave the way for doing needed regional marine projects.

On the other hand making an effective policy for IOCINDIO, cooperation of member States in the framework this strategy and full support of IOC from IOCINDIO program, can make this regional committee, correlated with other regional committee’s of IOC. Unfortunately the information I have, IOCINDIO Committee comparing to other IOC regional committees such as west Indian Ocean Committee, Caribbean Marine Committee and Westpac Committee, is suffering many limitation. During past years, financial backing of IOC from this committee is very small in comparison to other regional IOC committee. and even has reached zero during some periods. This indicates existence of some sort of injustice in regional budget distributions. I hope this is eliminated in the new round of

regional activities. Of course we should remember the need for a serious and effective cooperation of members.

The fact that this regional committee has overcome its dormancy from July 1998 (first session in Islamabad) until November 1996 (second session in Goa, India) meaning close to eight year, certainly is a weakness that I hope seriously catch the attention of all regional member.

The new IOC Executive Secretary definitely will have this point in mind on his appreciation and Tehran Session with the help of God improves IOCINDIO programs and UNESCO and IOC.

Tehran session with the help of God would be a vanguard towards advancement of IOCINDIO programs and serious backing of UNESCO and IOC will be the agenda for this committee also, IOCINDIO Member States with the consideration of these historic necessities and effectively participating to the programs of Committee and also national support in reaching its goals, and giving constructive suggestion, towards regional Marine Development, will play major role in advancement the of region.

I think I need to thank the IOC and UNESCO for their support in holding this Session of Nation Center of Oceanography (Dr. Zomorroddian and his colleagues) who practically has carried the responsibility of this Conference and sincerely thank the Ministry of Foreign Affairs - Center for Studies for their kind execution of this Conference.

At the end with official Inauguration of IOCINDIO in Tehran, wishing a success in the session and I hope the dear guests will spent a memorable time in our Islamic country and have a good memory of this area its cultural people. Thank you for your care.

B. Address by Dr. A. E. Muthunayagam, Chairman, IOCINDIO

Your Excellency Dr. Moin, Hon'ble Minister for Culture and Higher Education, Government of Islamic Republic of Iran and President of the Iranian National Commission for UNESCO, your excellency Dr. Ncorian, Vice Minister, Islamic Republic of Iran, Dr. Patricio Bernal, Executive Secretary-IOC, Prof. Zomorroddian, President, Iranian National Centre for Oceanography and Vice Chairman, IOOCINDIO, distinguished delegates from the member states of IOCINDIO and other regional organisations, distinguished guests, ladies and gentlemen.

It is a great honour and privilege for me to be in this city and Chair the session of IOCINDIO. On behalf of IOCINDIO and myself, I thank the Government of Islamic Republic of Iran for hosting the third session of IOCINDIO. I also thank Prof. Zomorroddian and his colleagues for making all local arrangements for organising the IOCINDIO session and the regional workshop on Integrated Coastal Area Management including Marine Pollution during the last two days. My thanks are also due to Dr. Bernal, Executive Secretary IOC, Dr. Oliounine, Deputy Executive Secretary IOC and Mr. Julian Barbieri, Programme Specialists, IOC who made this regional meeting possible. I also join Prof. Zomorroddian in welcoming all of you to this function.

We, in this region, celebrated 1998 as the International year of the Ocean along with all other nations of the globe. This is indeed in recognition of the importance of the Ocean, the marine environment and their resources for sustaining life and sustainable development

in our planet earth. This has created an awareness of the potential and uses of the ocean among all sections of the society which includes children in the schools and universities, academic and research institutions, public, administrators and policy makers in the Government. Under such a favourable global environment for promoting and supporting the plans and programmes in the ocean sector, several nations of the globe are directing their efforts towards the development and use of ocean science and technology for the exploration and sustained utilisation of our vast marine resources for the socio-economic benefit of our society. The IOCINDIO session will have to address how the member states of IOCINDIO want to focus their efforts in the ocean sector for the well being of the society.

The IOCINDIO member states cover a wide range. This heterogeneous group covers coastal states from Oman to Australia. Our requirements, priorities, challenge and opportunities also widely vary. Hence, we may have to consider formulating sub regional programmes and seeking the support from IOC and donors for specific actions. We are all aware that the recently finalised project on storm surge in the Northern Part of Indian Ocean sponsored by IOC, WMO, IHP of UNESCO and the successful regional component of GCRMN supported by UK are examples of such sub regional programmes.

We all recognise that ocean covers about 71% of the global surface and provides challenge and opportunities varying in nature. They have local specific national and regional significance. We recognise that programmes and plans formulated at the global level can succeed only if implemented at national level with the regional assistance and cooperation. Hence, we have to have national focus and national organisations with linkages with regional bodies. For Integrated development of the region, institutions and management systems at national and regional level are essential.

IOCINDIO is a regional body of IOC with about 127 member states. IOC is now celebrating its fortieth year. In the recent part IOC is increasingly defining programmes with policy shaping and issues oriented approach. The stress is towards capacity building for the use of the scientific knowledge gained over the years towards socio-economic benefit. Operational Oceanography and Coastal Zones are areas of major thrust. We have to address how we contribute to and benefit from the programmes of IOC. If we pool our resources, cooperate and put our efforts unitedly we will have programmes of benefit to the region and we could contribute to the aims and objectives of IOC.

ANNEX IV

LIST OF WORKING DOCUMENTS

Document Code	Title
WORKING DOCUMENTS	
IOCINDIO-III/1 prov.	Provisional Agenda
IOCINDIO-III/1 Add. prov.	Provisional Time Table
IOCINDIO-III/2 prov.rev	Annotated Provisional Agenda
IOCINDIO-III/3	Draft Summary Report (prepared during the Session)
IOCINDIO-III/4 prov.	Provisional List of Documents
IOCINDIO-III/5 prov.	Provisional List of Participants
IOCINDIO-III/6	Report of the Chairman on Intersessional activities
IOCINDIO-III/7	GLOSS Development in the IOCINDIO region
IOCINDIO-III/8	Recommendations of the IOCINDIO Regional Workshop and Regional Meeting on Storm Surges
IOCINDIO-III/9	Executive Summary of the IOCINDIO Workshop on ICAM and Marine Pollution
IOCINDIO-III/10	GCRMN Development in the IOCINDIO region
IOCINDIO-III/11	GOOS and the Indian Ocean region
IOCINDIO-III/12	Proposal for the establishment of an IOCINDIO programme support office.
IOCINDIO-III/13	Capacity building strategies in the IOCINDIO region
IOCINDIO-III/14	New training technologies in marine sciences
IOCINDIO-III/15	Recommendations of Regional Workshop on Oil Spills

ANNEX V
LIST OF PARTICIPANTS

I. Representatives of Member States

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ANNEX VI

REPORT OF INTERSESSIONAL ACTIVITIES

Based on the recommendation of the XIX Session of the IOC Assembly in July 1997 and the second session of IOCINDIO in Goa in November 1996, the following activities are coordinated by the IOCINDIO-Delhi Office.

1. Regional Workshop on Trajectory Modelling on Oil Spills

A Regional Workshop on Trajectory Modelling on Oil Spills, organized by Marine Emergency Mutual Aid Centre (MEMAC), Behrain, was sponsored by IOC and National Oceanic and Atmospheric Administration (NOAA) of USA. The Workshop was held in Behrain in February 1998. From the IOCINDIO region, three participants one each from Indonesia, Iran and India participated and benefitted from the Workshop. The participants had hands on experience on models predicting the trajectory (movement) of oil spills.

2. Regional Workshop on Tropical Ocean & Climate

A Regional workshop on Tropical Ocean and Climate was organised at Bangalore in India during November 1998. The objective of the Bangalore Workshop was to discuss issues relating to Tropical Ocean & Climate, particularly of Central Indian Ocean. The Workshop was sponsored by IOC and jointly hosted by the Department of Ocean Development, Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore. The workshop was also dedicated to the International Year of the Ocean, 1998. The delegations from Australia, Bangladesh, Iran, Oman, Sri Lanka, Thailand and India participated in the Workshop. Experts on the subject from USA & Australia delivered special lectures. The workshop has identified a number of areas for the cooperation in the climate research. Some of the recommendations of the workshop are:

- Consolidation of data available from different national institutions
- Setting up of the state-of-the-art observing systems.
- Carrying out of three seasons surveys (pre-monsoon, monsoon and post-monsoon) in the Arabian Sea, Gulf of Oman and Bay of Bengal.
- Human resources development, and
- Collaboration between the research and educational institutions of IOCINDIO countries.

3. Tide Gauge Network

As per the recommendation of IOCINDIO-II the regional network of tide gauges is to be established in the IOCINDIO region. The IOCINDIO office at Delhi prepared a proposal in consultation with the National Institute of Oceanography in Goa for setting up such a network. The proposal envisaged setting up of 40 tide gauges in the region. The data generated would be useful for research on climate changes, ocean circulation, etc. Out of the 18 countries consulted, Bangladesh, Iran, Iraq and Sri Lanka have responded. Accordingly, a

modified proposal covering these countries has been prepared and circulated to the interested countries. The IOCINDIO office at Delhi is presently in consultation with these countries for its recommendation.

4. Global Coral Reef Monitoring Network (GCRMN)

Apart from the fascinating beauty of corals, they are considered as treasure house of knowledge of seas. Realizing the importance of the coral reefs, IOC joined UNEP and IUCN to establish GCRMN in 1995. GCRMN is a partnership of people, governments agencies and institutions, whose objectives is to assess the status and trends of coral reef. There are six networks covering the Regions, viz., Pacific, East Asia, South Asia, Middle East, Western Indian Ocean-Eastern Africa and Carribean – Eastern Tropical Americas.

The South Asia network consists of India, Maldives and Sri Lanka and funded by UK. The goals of South Asia network is to establish sustainable monitoring programmes within each country. The network has organised three Workshops and a training course.

The network has also commissioned four pilot reef monitoring exercises through the following organisations:

1. National Institute of Oceanography, India, Reefs at Kadmat Island;
2. Madurai-Kamaraj University, India, Reefs in the Gulf of Mannar;
3. Marine Research Station, Maldives, Selected Maldives Reefs;
4. Colombo University, Sri Lanka, Selected Sri Lanka Reefs.

Through the Workshops, training and monitoring exercises about 170 participants in the region got the exposure to the technique of data collection. An independent review of the network, has recommended its continuation.

In view of these activities, the Sub-regional Workshop on Coral Reef Monitoring recommended by the XIX Session of IOC Assembly was not taken up.

5. WMO/ESCAP Panel on Tropical Cyclones

IOCINDIO office, on behalf of IOC, participated in the 26th Session of WMO/ESCAP panel on Tropical Cyclones held in Male, Maldives, from 2nd to 8th March 1999. The IOC representative highlighted the importance and need for establishing capabilities in the region for improved forecasting of cyclones and storm surges and measures for mitigating the damages. He further referred to the proposed project sponsored by WMO, IHP and IOC for developing and setting up of a reliable storm surge prediction system supported by Oceanographic, Meteorological and Communication components in the region. He stressed the need for very close cooperation between ocean and met sectors in the region.

6. Ocean Science in IOCINDIO Region

As per the request of IOC to prepare a Synthesis Assessment of Ocean Science concerning IOCINDIO region, IOCINDIO office in consultation with the Member States prepared and submitted to IOC a report titled "Assessment and Analysis of the State of Ocean Science in Member States of IOCINDIO region". The report was mainly based on input from Australia, Bangladesh, Islamic Republic of Iran and India was also recommended to IOC for contributions towards further regional synthesis.

This report has highlighted the following:

“Indian Ocean as a water body suffers from inadequacy of high level of understanding of the oceanographic processes. There are huge gaps in data availability. Basic scale studies with the collaboration, cooperation and contribution from the Indian Ocean RIM countries are a necessity. Country-wise development in the region are quite promising. Some countries have even attained global dimensions in oceanographic pursuits. The cooperation in the region needs to be intensified to bring the other countries to a suitable level in the oceanographic science and services. The topmost priority of the area is for capacity building both manpower and infrastructure. Marine Pollution, Coastal Zone Management, Storm Surge Studies, Climate Research are some of the priority areas in the region. Many countries in the region also need the financial support from the developed countries for the capacity building”.

7. Intergovernmental Meeting of Ministers on South Asian Seas Programme at Islamabad, Pakistan on 26th March 1999.

At the request of Executive Secretary, IOC, Chairman-IOCINDIO represented in the first Inter-Governmental Meeting of Ministers on South Asian Seas Programme on 26th March 1999 at Islamabad, Pakistan. The Chairman, IOCINDIO, made a brief presentation on IOC and the regional programmes, the activities of IOCINDIO having relevance to the Member States of the South Asian Seas Region which included the ongoing initiatives for establishing a regional tide gauge network, the proposed regional tropical Cyclone and Storm Surge project and IOCINDIO regional workshops.

8. MAMCOMP Training Course

The majority of personnel responsible for coastal zone management and environmental impact analysis are drawn mainly from traditional fields of physical, biological and engineering sciences. Many of them are not exposed to specialised training in problems of coastal marine waters, natural and man made hazards and marine policy issues which are of major concern in most developing countries.

With a view to understand the problems of coastal marine environment, coastal hazards as well as integrated coastal management and to develop scientifically trained manpower, the Indian Institute of Technology, Delhi organised a comprehensive training programme on Integrated Coastal Management (MAMCOMP) with the active support of IOC, in November 1999.

The MAMCOMP training programme is meant for scientists/engineers, research workers, policy makers/managers of the government/non-governmental agencies who are involved in the issues related to coastal marine problems. It was attended by 20 participants from India, representing 17 Faculties.

ANNEX VII

EXECUTIVE SUMMARY AND RECOMMENDATIONS OF THE REGIONAL WORKSHOP ON INTEGRATED COASTAL AREA MANAGEMENT, INCLUDING MARINE POLLUTION - 19-20 FEBRUARY 2000, TEHRAN, R.I. OF IRAN

The Regional Workshop on Integrated Coastal Area Management, including Marine Pollution, was held in Tehran from 19-20 February 2000, just prior to the IOCINDIO-III Session. The workshop was attended by experts from Bangladesh, Canada, India, I.R. of Iran, Kuwait, Qatar, Sri Lanka, and Thailand as well as representatives from IOC, IOMAC, and ROPME. Dr. R. Murthy and Dr. S. Sheikholeslami were elected as co-chairmen for the meeting. Following key lectures on the topics of ICAM and Marine Pollution, and presentation of country reports, a round table discussion took place.

Based on the discussions of the experts, **the participants recognized** that as a first step a broad strategic ICAM action plan should be formulated taking into consideration the most important developmental activities and associated marine pollution issues affecting the region; for e.g. the Persian Gulf is the tanker route for more than 50% of the world energy transportation, this inevitably exposes the Gulf marine environment to oil pollution problems as well as the rest of region through transboundary processes ; the IOCINDIO region is also experiencing large scale urbanization growth to the detriment of the marine and coastal environment; large scale industrialization in the near future will also create pressures on the coastal zone. These types of anthropogenic activities threaten marine resources and the human communities depending on these resources.

Thus a broad strategic long-term ICAM action plan is the starting point for the region. **The participants invited** IOC, through its IOCINDIO Regional Committee to take steps for the formulation of a regional strategic ICAM plan by organizing a regional meeting of experts. With this in mind, **the participants recommended** that national coordinating mechanisms for ICAM should be promoted with a view to develop a national action plan in each country within the region.

The participants invited IOC, through its IOCINDIO Regional Committee to take steps for the formulation of a regional strategic ICAM plan by organizing a regional meeting of experts.

Within the context of the strategic action plan mentioned above, **the participants also recommended** the necessity of designing specific demonstration projects (for example on coastal megacities, and the vulnerability of the Persian Gulf to oil pollution) with a view to develop methodology in the ICAM process, taking advantage of emerging new science and technology (including ICAM tools and techniques). The demonstration projects should also aim at sensitizing policy makers towards the ICAM concept, feasibility, and benefits to be derived at the national level by all the stakeholders through the sustainable use and management of coastal and marine resources. Towards the success of this activity, IOC and other regional organization such as ROPME, and UN specialised agencies, **are invited to provide** assistance in terms of project planning, technology transfer, training and capacity building, as well as donor assistance.

The participants recommended that, following the formulation of the regional strategic ICAM plan, the IOCINDIO Officers and Member States will take the appropriate steps for the preparation of a draft proposal for the demonstration projects and report to the next session of the Regional Committee.

ANNEX VIII

LIST OF IOCINDIO MEMBER STATES

AUSTRALIA	PAKISTAN
BANGLADESH	QATAR
CANADA	RUSSIA FEDERATION
FRANCE	SAUDI ARABIA
GERMANY	SRI LANKA
INDIA	SULTANAT D'OMAN
INDONESIA	THAILAND
ISLAMIC REPUBLIC OF IRAN	THE NETHERLANDS
IRAK	TURKEY
KENYA	UNITED ARAB EMIRATES
KUWEIT	UNITED KINGDOM
MALAYSIA	UNITED STATES OF AMERICA
MALDIVES	YEMEN
MYANMAR	
MAURITIUS	

ANNEX IX

LIST OF ACRONYMS

AIMS	Australian Institute of Marine Sciences
ARGO	Array for Real-time Geostrophic Oceanography (CLIVAR-GODAE)
BOBMEX	Bay of Bengal Monsoon experiments
CGOM	IOC Consultative Group on Ocean Mapping
EEZ	Exclusive Economic Zone
NGCRM	Global Coral Reef Monitoring Network
GIS	Geographical Information System
GLOSS	Global Sea-Level Observing System
GOOS	Global Ocean Observing System
HAB	Harmful Algae Bloom
ICAM	Integrated Coastal Area Management
IHP	International Hydrological Programme (of UNESCO)
INCO	Iranian National Center for Oceanography
INDOEX	Indian Ocean Experiment
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCINCWIO	IOC Committee for the Cooperative Investigation of the Western Indian Ocean
IOCINDIO	IOC Committee for the Central Indian Ocean
IODE	International Oceanographic Data and Information Exchange
IOMAC	Indian Ocean Marine Affairs Co-operation
IUCN	World Conservation Union
IYO	International Year of the Ocean
JGOFS	Joint Global Ocean Flux Study
OSNLR	Ocean science in Relation to Non-Living Resources
LOICZ	Land-Ocean Interaction in the Coastal Zone Programme (of IGBP)
MAMCOMP	Modelling and Monitoring of Coastal Marine Processes Project
MEMAC	Marine Emergency Mutual Aid Center
MGG	Marine Geology and Geophysics data
MOOPAM	Manual of Oceanographic Observations and Pollutant Analyses Methods
NODC	National Oceanographic Data Center
NOAA	National Oceanic and Atmospheric Administration
PERSGA	Regional Organization for the Preservation of the Environment of the Red Sea and Gulf of Aden
RNODC	Responsible Oceanographic Data Center
ROPME	Regional Organization for the Protection of the Marine Environment
SAP	Strategic Action Plan
SOA	State Oceanic Administration of China
TEMA	Training, Education and Mutual Assistance programme
WDC-B	World Data Center B
WESTPAC	IOC Regional Sub-Commission for the Western Pacific
WMO	World Meteorological Organization
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Science and Culture Organization
XBT	Expendable Bathythermograph