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The Intergovernmental Oceanographic Commission of UNESCO and regional capacity building¹

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Introduction

This paper concentrates on the past and present interaction between the Intergovernmental Oceanographic Commission, donor organisations and developing countries in the development of regional programmes for creating and supporting marine science capabilities. The Global Ocean Observing System and Integrated Coastal Zone Management in relation to fisheries, marine pollution and climate/sea level changes require regional input which depends on South-South and North-South cooperation. The Indian Ocean with the Eastern African region, serve as an example for an ongoing process of capacity building and growing partnership in marine science. Through the Intergovernmental Oceanographic Commission, a strong and very beneficial cooperation was established, with several donors, in particular with the Swedish Agency for Research Cooperation with Developing Countries. This tripartite partnership of (a) a regional body with a regionally driven programme, (b) a global coordination mechanism in the form of the Intergovernmental Oceanographic Commission, and (c) a multi-lateral donor in the

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The Intergovernmental Oceanographic Commission (IOC) was established in 1960 by UNESCO's General Conference 'to promote marine scientific investigations and related ocean services with a view to learning more about the nature and resources of the oceans through the concerted action of its members' (UNESCO, 1968). Training, Education and Mutual Assistance (TEMA) for ocean science and services is one of the four major objectives of the IOC. A TEMA working committee was established in 1973. Over the past 25 years the activities focused on four levels by:

- Providing training to individual scientists through fellowships, seminars, workshops, training on the job, etc., and to technicians.
- Assisting in the creation of national and regional infrastructure (equipment, research vessels, institutions and organisations, libraries, data, information and communication systems).
- Initiating and supporting global and regional research projects with a strong TEMA component.
- Creating public awareness for the importance of ocean science and services for the economical development and social welfare of coastal states.

The budget and staff of the IOC is, however, far too limited to be more than a broker and catalyst in the capacity building process. The actual planning and the implementation of the TEMA related programmes

and activities rests with national governments, donor agencies, UN organisations etc. In 1980 the third session of IOC working committee for TEMA strongly recommended the establishment of a 'Comprehensive Plan for a major assistance programme to enhance the marine science capabilities of the developing countries'. The Committee noted with grave concern the ever-widening gap between the need for marine science and technology and the capability for acquiring it in developing member States. The objective of the Comprehensive Plan (IOC, 1985) was to bring about appropriate actions at national, regional, and global levels with a view to ensure that by the end of the century, the majority of coastal States would have attained a sufficient capability for undertaking marine research and ocean services. This would also allow them to resolve such issues as rational management of marine resources, protection of the marine environment and balancing multiple uses of ocean space. The following fields for assistance were identified:

- Preparation of a marine science country profile.
- Strengthening of the national marine science infrastructure.
- Strengthening of regional cooperation including regional centres and cooperative networks.

The major technical bodies of the IOC (e.g. Global Investigation of Pollution of the Marine Environment (GIPME), Integrated Global Ocean Services System; and International Oceanographic Data and Information Exchange (IODE)) were assigned the role to provide general technical guidance relative to their respective programmes. Regional bodies were requested to identify and formulate TEMA requirements and donor organisations were asked to collaborate in regional programmes. The implementation of the Comprehensive Plan over the past seventeen years was partly successful (Haq, 1995) but is far from reaching the goal set for the turn of the century. Substantial contribution from aid-giving agencies was realised directly or in support of ongoing regional programmes of the Commission and the cooperation between the IOC and other UN agencies such as the Food and Agriculture Organisation of the United Nations (FAO); International Atomic Energy Agency (IAEA); International Hydrographic Organisation (IHO); United Nations Environment Programme (UNEP); World Health Organisation (WHO), etc., has increased on TEMA-related activities.

The deliberations and results of the United Nations Conference on the Law of the Sea (UNCLOS) and United Nations Conference on Environment and Development (UNCED) as well as the expansion in socio-economic activities in coastal and marine areas have attracted growing attention of governments to the significance of marine sciences and services in the context of national development. These developments at the national and international level set the stage for increased cooperation amongst the developing countries, between the developing and the industrialised countries and for increased recognition of the importance of IOC programmes providing unique opportunity to foster scientific and technological transfer.

The major obstacle to the development of a number of regional programmes has been inadequate funding and support for training and other TEMA-related activities. While the impact of regular training in certain areas was seen in steady progress of related programmes (e.g. IODE, the IOC Group of Experts on the Global Sea-Level Observing System,

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form of the Swedish Agency for Research Co-operation with Developing Countries is in fact a model for regional development aid. The need for strong leadership of regional bodies is emphasised including a formal intersessional mechanism in the form of a bureau. © 1998 Elsevier Science Ltd. All rights reserved

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¹Panikkar Lecture II/1997. The Intergovernmental Oceanographic Commission (IOC) started a series of Panikkar lectures on its programme Training, Education and Mutual Assistance (TEMA), to be given at every IOC Assembly.

GIPME, a number of other targeted programmes tended to suffer due to a lack of focused training or to lack of continuity of these activities.

The TEMA framework Plan

Within the IOC it was realised that a new approach for cooperation in capacity building in developing countries is needed. IOC's role has to be strengthened as a broker and facilitator of projects and programmes, and as executor of demonstration projects. Regionalisation in terms of programmes and organisational structure (subcommissions regional offices, etc.) was one answer. But the budget allocations for TEMA in the IOC are very small while the Secretariat is grossly understaffed. The TEMA Group of Experts in the IOC developed in 1995 a Framework Plan for capacity building on a regional basis (IOC, 1995a, b). The planning and implementation of each regional Framework Plan consists of a number of steps involving the newly established TEMA unit of the IOC Secretariat as well as regional and national bodies.

Steps in the implementation the Framework Plan are shown in Figure 1. The most important elements within the plan are:

- The TEMA Unit develops draft recommendations, which identify the needs and requirements for capacity building in a particular region. IOC programme coordinators, programme managers and national and regional TEMA Focal Points provide input to this process.
- The Regional Subsidiary Body, working with input from all national representatives, develops a preliminary draft plan. The TEMA Group of Experts may provide advice.
- The TEMA Unit reviews the preliminary draft plan with assistance from the programme managers. It develops the final draft plan.
- The Regional Subsidiary Body finalises the plan.
- The Executive Secretary IOC approves the plan and forwards it to the TEMA Unit and Regional Subsidiary Body for implementation.

The plan should include high-priority activities, which have a reasonable chance for attracting support. It is important to maintain a realistic approach so that the plan is not viewed as a 'wish list' but instead a very honest evaluation of what is needed to develop capacity in the region to support IOC programme with a major emphasis on Integrated Coastal Zone Management (ICZM) and the Global Ocean Observing System (GOOS). Funds for implementing the Framework Plan will derive from the IOC regular budget, the IOC Trust Fund and contributions from other organisations. The Framework Plan will cover three years. The funds available will be updated as the regular budget of IOC is decided on a biennial basis. Coordination with other units of UNESCO and within the UN system as well as with regional organisations on ocean affairs should already be ensured at an early stage.

As plans are reviewed by the TEMA Unit, TEMA Focal Points, Groups of Experts, Officers, Programme Managers and Programme Coordinators, it should become obvious where major outside donations may be required, particularly for certain global programmes or activities. These should be identified and the TEMA Unit and others should pursue funding sources outside the normal planning process. Outside donors will be encouraged to review the Framework Plans as targets for funding

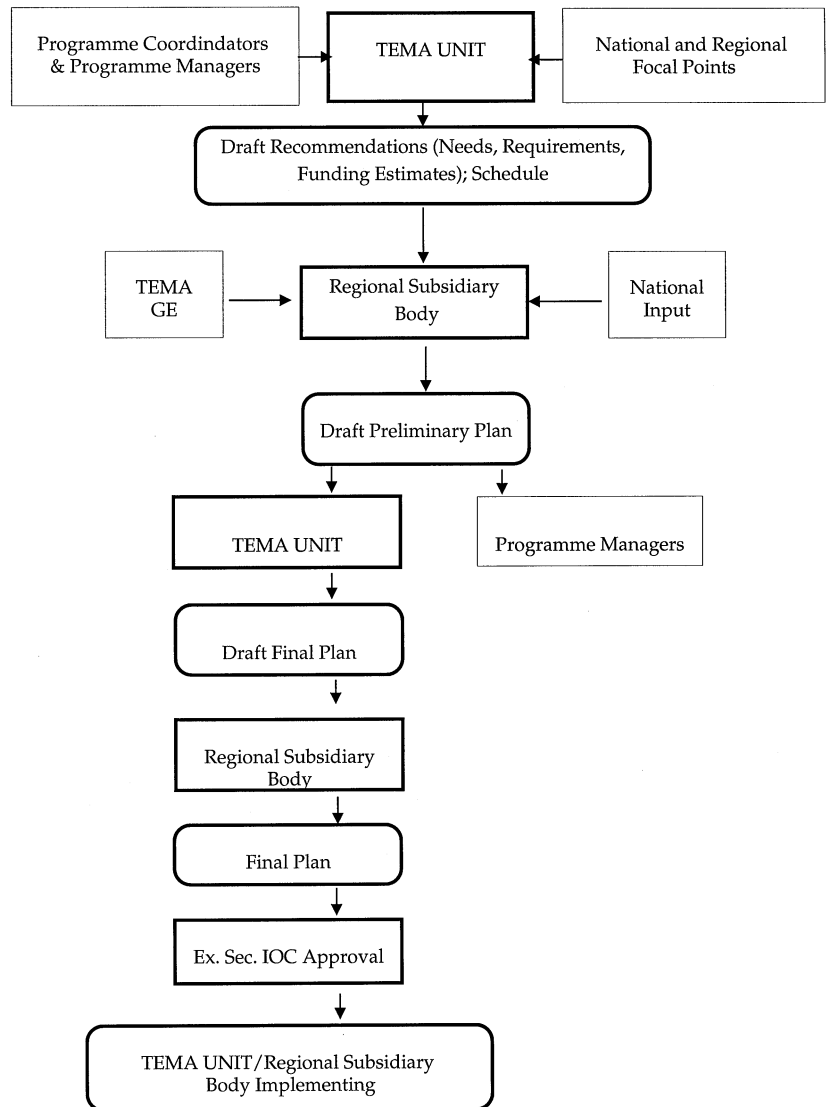


Figure 1. Steps in implementing the Framework Plan for marine capacity building.

support through the IOC. The regional design of the Framework Plans should be attractive to donors as many donors target specific regions. The TEMA Unit and regional subsidiary bodies should pro-actively use the plans when discussing capacity building requirements with potential donors. Donors should also be advised of needs in the area of infrastructure, equipment and maintenance. These are, however, areas wherein the IOC does not have the resource to assist. On the other hand, the TEMA Unit would maintain specified funds for the participation at conferences, seminars, etc., which are related to capacity building.

Project development is an integral part of capacity building. Within the TEMA Framework Plan project development requires seed funding to support individuals and the convening of small groups to identify and develop project proposals and funds are required to present draft proposals to potential funding agencies and donors. The Framework Plans have to be supported on one hand by TEMA Focal Points to be identified within each member country and on the other hand by the IOC Assembly

which should organise regular debates on TEMA issues in general and related to specific regions and programmes.

Capacity building in the Eastern African Region

The Eastern African region can be taken as an example for the development of a capacity building programme under the auspices of the IOC, national governments and donors. The problems related to the development of such a programme are:

- Lack of a national policy on marine research and of national coordination boards and indigenous professional societies.
- Lack of trained scientists and technicians as well as of equipment and its maintenance and of scientific literature and communication tools.
- Insufficient income for scientists for a full-time commitment and lack of incentives for active research.
- Insufficient monitoring of research quality and efficiency and insufficient participation in international scientific meetings.

This list of deficiencies indicates that capacity building is a process operating at interlinked levels: the micro level of human resources, the meso level of institutions and the macro level of the public environment willing to develop and support a marine science capability. Within the region the priorities for the application of marine science will vary, but they include always living resources, coastal management, climate change and marine pollution. A workshop on the Eastern Indian Ocean has demonstrated this with regard to the various modules of GOOS (Figure 2).

The IOC-SIDA/SAREC (Swedish Agency for Research Co-operation with Developing Countries) Marine Science Programme tried to resolve the problems of Eastern African marine science in a co-ordinated manner, within the framework of IOC's Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean (IOCIN-CWIO), and complementary with activities of other programmes and donors active in the region. These included the bilateral programmes Sweden–Tanzania, Sweden–Mozambique, and Belgium–Kenya, the

Module	I.R. of Iran	Republ. of Maldives	Australia	Bangladesh	Qatar	Sri Lanka	Indonesia	India	Total
Coastal	2	2	1	1	3	1	2	4	16
Living Resources	3	1	3	3	2	2	1	2	17
Climate	4	3	2	2	5	5	3	1	25
Health of the Ocean	1	4	5	4	1	3	4	5	27
Marine Services	5	5	4	5	4	4	5	3	35

Figure 2. Prioritisation of the different GOOS modules for the Indian Ocean region on a scale of 1–5 (1 highest and 5 lowest).

SAREC Regional Marine Science Programme, the East Africa programme of UNEP, etc. The IOC and SIDA/SAREC have formulated a common strategy for the development of a marine science capability in the IOCINCWIO region by linking training, education and research. The strength of the IOC-SIDA/SAREC cooperation is the partnership approach whereby each partner brings in its expertise and own network.

The IOC brings in its extensive field experience, its regional programme structures including the Regional Committee (in this case IOCINCWIO), composed of governmentally approved representatives from national institutions, and its extensive linkages and partnerships with other agencies, both UN and non-UN, and global/national programmes and projects (in this case linkages with UNEP, FAO, WMO, Belgium). SIDA/SAREC brings into the partnership its extensive bilateral and regional experience (in this case bilateral programmes with Tanzania and Mozambique, regional Eastern Africa programme), and its resources (both in terms of scientific expertise and financial resources).

In recent years, SIDA/SAREC has financed a large number of marine science activities in the region. These include meetings of Ministers of environment to discuss coastal zone management issues. Several training workshops have been arranged covering most aspects of marine science. SIDA/SAREC has also initiated a postgraduate programme leading to a MSc and a PhD in physical oceanography. This programme is run jointly by the universities of Dar Es Salaam in Tanzania, and Gothenburg in Sweden.

The specific content of a national programme supported through this umbrella programme is defined on the basis of identified needs of the country concerned. The national programmes are, or should be building blocks for the regional one. To some extent, such an identification has been done through the IOC regional bodies and through the IOC marine science country profiles. The latter are now prepared for Tanzania, Madagascar, Kenya, Comoros, and Mauritius.

The initial focus of the East Africa programme was the development of capabilities and human resources. The development of research and monitoring programmes to support management efforts should coincide with the adoption by Governments of the objectives of coastal zone management. The programme thus used the IOC intergovernmental regional subsidiary body IOCINCWIO, to establish regional priorities and needs, and to obtain national commitments for sustained participation in the programme. In this way a true partnership was built. In East Africa, since the programme's inception in 1990, a multitude of workshops, scientific symposia and other training activities have been fully or partially supported with funding from this programme. In addition, more individualised support has been provided to scientists from the region to attend various international meetings and for research in the region. An important achievement was the creation, in 1994, of the Western Indian Ocean Marine Science Association (WIOMSA), an NGO based in Zanzibar.

Apart from the Swedish contribution there are other European donors active for marine science in Eastern Africa. The Belgian Agency for Development Co-operation (BADC) through the Free University of Brussels funded from 1984 several marine science programmes (Figure 3) to Kenya through the Kenya Marine and Fisheries Research Institute (KMFRI). This is in the form of staff training, provision of equipment, and research. The project on Regional Co-operation in Scientific Information



Figure 3. Coastal research within the Kenyan–Belgium project.

Exchange in the Western Indian Ocean (RECOSCIX-WIO) has also been funded by BADC since 1991 up to 1999. This project provides scientists from the region with bibliographic search facilities and document delivery services. The libraries of the main marine science institutions were also provided with training and equipment to allow them to develop their library catalogues.

The Norwegian Agency for International Development (NORAD) has provided assistance in developing a marine science capacity especially in Mozambique. NORAD, in collaboration with FAO, also organised fish stock assessment cruises in the Western Indian Ocean using the research vessel “*Dr. Fridtjof Nansen*”. Other organisations and countries which have provided TEMA support for countries in the region include Canada, Ireland, Germany, Great Britain, the Netherlands and the United States.

Barely two years to the end of the century, it will be instructive to review how the IOCINCWIO region has fared in achieving the major elements of the Comprehensive Plan. The IOC and WIOMSA have prepared the marine science country profiles for the Western Indian Ocean countries which provide information on the current status of marine sciences and what needs to be done to address the shortfalls. More scientific expertise now exists in the region than at the launch of the Comprehensive Plan, but other than in marine biology and fisheries the region has yet to develop a critical mass of experts in marine science. Only Mozambique has an ocean going vessel which can be adapted and run as a (regional?) research vessel. In most of the countries infrastructure, including laboratory space and equipment are inadequate.

The initiation of IOCINCWIO and the launching of WIOMSA have provided both the governments and scientists from the region with fora for exchanging ideas and to plan and implement cooperative programmes. RECOSCIX-WIO has promoted linkages between scientists and institutions in the region, in addition to providing useful data and information exchange services. Nevertheless, East Africa is still far from fully realising the visions given in the Comprehensive Plan, though the region has made strides in developing capacity for marine science and technology.

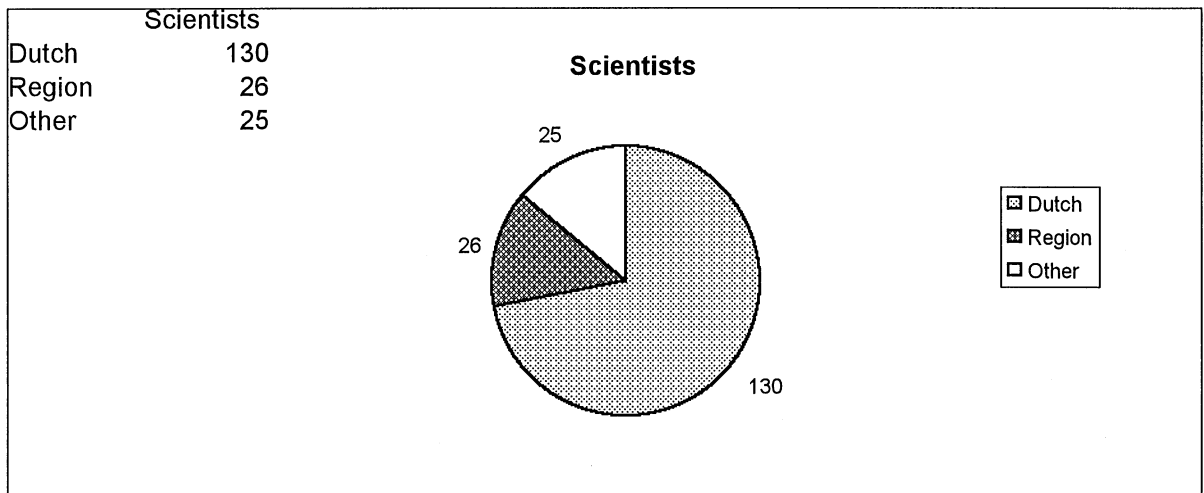


Figure 4. Participation in the Indian Ocean Expedition.

An Eastern African Partners in Science Programme

In the 1990s the Dutch carried out the Indian Ocean Programme (1990–1995) which comprised five interrelated projects, being (1) monsoons and coastal ecosystems in Kenya, (2) monsoons and pelagic systems, (3) tracing seasonal upwelling, (4) geological study of the Arabian Sea, and (5) biology of oceanic reefs. Scientists from Kenya were, through a formal partnership programme with KMFRI in Mombasa, intensively involved in the planning of the programme and its expedition (May 1992 to April 1993). The Kenyan–Dutch partnership programme was built upon existing Belgian–Kenyan coastal research, funded by the European Union and was divided into two phases. Phase 1 (1992–1995) was the ocean-going research programme which was part of the Dutch IOP; phase 2 will be a follow-up programme.

As funding from the Dutch ODA organisation was not obtained, these programmes were funded by the Dutch national science foundation. A modest pre-expedition training programme was implemented before the expedition. A training course, held in May 1992 in Mombasa was given a regional accent and attracted participants from Kenya, Tanzania and the Seychelles. This course was also supported by the Swedish Agency for Research Co-operation with Developing Countries (SAREC) and UNEP. The course included a three-day training course on-board the Dutch research vessel *Tyro*, off the Kenyan coast. The scientific programme of this research cruise was developed by Kenyan scientists. During the expedition a substantial number of scientists from Kenya as well as from Pakistan and the Seychelles, participated in the research cruises (Figure 4). After the expedition a limited number of scientists came to the Netherlands for research and training and writing joint papers. A popular book *The Third Ocean, An expedition between Asia and Africa* was published in 1994 in English and Dutch, to inform the public at large. In 1995 a CD-ROM with all expedition data was published by the Netherlands Geosciences Foundation (GOA), and donated to the partners. By this they got access to all available data of the ten months expedition in the Indian



Figure 5. Containerised laboratories near Jadini Beach hotel served as a temporary, remote, land-based laboratory for a coastal research project within the Indian Ocean Programme

Ocean. An update is planned for 1998. The use of containers as laboratories offering a large degree of flexibility, was demonstrated by placing three containers on the compound of the prestigious Jadini Beach hotel, during June–July 1992 (Figure 5).

The phase 2 programme with Kenya turned out to be rather complex to organise. It is part of a Land–Ocean Coastal Zone Interactions (LOICZ) related partnership for the Eastern African region and is also linked to the Coastal Module of GOOS. The idea is to build such a programme on existing cooperation between scientists in Eastern Africa and Europe. From the beginning donors active in the area were invited to participate in the development of this partnership. The Intergovernmental Oceanographic Commission (IOC) of UNESCO acts as a coordinator and facilitator. The feasibility of such a programme in Kenya, Tanzania, Mozambique and South Africa was explored during a mission of the IOC in November 1995. Regional workshops, organised with donor support, in Europe and Eastern Africa preceded a joint workshop in March 1997 in Mombasa, Kenya during which a five-year workplan was drafted.

The workshop was organised by GOA and KMFRI, with support of the IOC, SIDA/SAREC, UNEP, LOICZ, and the Global Change System for Analysis Research and Training. The draft regional partnership programme contributes to the Coastal Zone Module of GOOS and to the implementation activities of LOICZ. The plan builds on existing research programmes such as the GEF-Project Large Marine Ecosystem (LME) of the Somali Current and the activities of several donors active in the region. The research plan will be embedded in a partnership programme linking research with capacity building. The concept of marine science development in the region is based on strengthening (a) the national inputs within the region, (b) the cooperation amongst the countries of the region and (c) looking for northern (mainly European) partners in science. The countries of the region try to catch up on new technologies for GOOS in the

form of observation platforms, sampling equipment, information and data analysis and storage devices, communication facilities, etc. But support from outside donors is needed in terms of hardware, software and scientific and technical advice and training. The ultimate aim of the science plan is to prepare the ground for implementing and operating a Seawatch system for Eastern Africa within GOOS. Seawatch is a complete, on-line, off-the-shelf, state-of-the-art ocean monitoring and forecasting system. This is of mutual interest both to coastal zone management in the region and to science and operational oceanography in industrialised countries. At the workshop two aspects were emphasised being:

- Cooperation between regional bodies and donors must increase. Donors should contact regional bodies early on the project formulation and *vice versa*. Donor-driven projects should be avoided. The projects must have a national base so as to ensure their self-sustainability. There is a need to collect and put together the experiences obtained in different regions and donor programmes to use them as an aide to the donor community at large in formulating projects that are responsive to the recipient's needs. Donors should form consortia to develop marine sciences capabilities jointly and efficiently.
- The existing gap must be closed between fisheries people and ocean research people. The conditions of the marine environment, both from an environmental and ocean health point of view, are essential factors to be considered for fisheries management and other living resources questions. Therefore, there is a need for intersectoral projects.

Creating public awareness for the future

The IOC needs to reconsider its strategic purpose, particularly in the regional context. Where are the outputs of the various IOC activities directed to, how are they used, how do the results of a workshop get into a planning process or into a programme? The IOC should not at all compete with other organisations about projects, but rather facilitate, modify, improve and help to coordinate activities. A key question in this context is how to make decision-makers more aware about the role of research and observations; which medium to use; whom to address? Improved awareness is a must and should include information about what we are doing; about the good things and results; about impacts of these on economics and sustainable development. The role of education in schools about the ocean and the marine environment should also be brought up in this context.

In order to achieve this the IOC should go to the top, to Prime Ministers and Finance Ministers. There is a need for strong arguments, directed to key leaders. The IOC should make an information package aimed at these targets, but should avoid to talk about its problems. The dialogue with policy makers and management in general is needed to ensure long-term commitments and sustainable development of the marine environment, and to achieve a proper acknowledgement of the IOC itself.

The cooperation between donors and science lies in the benefit of identifying sustainable programmes based on national interests, including economics, in the form of an attractive science-based package. This will also attract other users and sectors. The IOC-SIDA/SAREC cooperation

is a case at hand. The scientific wings of donor agencies should be addressed with the lessons learned from the IOC-SIDA/SAREC cooperation. The IOC is expected to identify the problems, bring it to the donor, and if of interest, bring together the partners: national, institutional, donors and facilitators.

When identifying the different groups in the donor community, the IOC should single out those oriented towards research. These others should be addressed for the preparation of information packages for decision-makers. Those products can sell the issues much better than the scientists. Various tools can be developed: presentations; special courses; workshops; inter sectoral national seminars involving governments etc. The IOC needs to exchange ideas on how to produce and present concrete results to society. Perhaps we should create a scientific and technical forum at a national level. Preparation of brochures, information booklets (e.g. the tsunami series, fisheries, harmful algal blooms, marine science country profiles). Public relations should be part of missions, and the IOC must follow up these missions. Regional science seminars can be very effective with the participation of all regional bodies so as to include also the user sectors.

Essential missing elements in many of our research and environmental development efforts are linkages to economics and social-cultural aspects. This must be remedied if societies are to obtain the impact and benefits, which are inherent in the current development of our understanding of the oceans.

References

S M Haq, *Observations and experiences of selected TEMA activities during 1984–1994*, Doc. IOC-XVIII/Inf. 2, Paris, 1995.

IOC, *Marine Science and Ocean Services for Development: UNESCO/IOC Comprehensive Plan for to Major Assistance to Enhance the Marine Science*

Capabilities of Developing Countries, Doc. IOC/INF-612, Paris, 1985.

IOC, *TEMA ad hoc Strategy Meeting, Summary Report*, Paris, Doc. IOC/INF 999, Paris, 21–24 March 1995a.

IOC, *Draft TEMA Strategy in response to UNCLOS and UNCED*, Doc. IOC-XVII/2, Annex 6, Paris, 1995b.

UNESCO, *Report of the Intergovernmental Conference on Oceanographic Research*, Copenhagen, Doc. UNESCO/NS/167, Paris, 11–16 July 1968.