Intergovernmental Oceanographic Commission (IOC)

CAPACITY-BUILDING

IOC PRINCIPLES AND STRATEGY FOR CAPACITY BUILDING

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ABSTRACT

A draft Strategy for Capacity-Building was presented to the Executive Council at its 37th Session, in June 2004. By Resolution EC-XXXVII.9, the Council instructed the IOC Executive Secretary to produce a final draft Strategy for Capacity-Building for consideration by the Assembly at its 23rd Session, based on inputs from Member States.

Following instructions of the Executive Council, a revised draft document incorporating comments from Member States, (made during the discussion at the 37th Session of the Executive Council, and through their written responses to Circular Letter no. 2119 inviting further comments) was developed and uploaded to the IOC website for further review from January 2005 on. This revised draft was discussed and further improved at the IOC Expert Workshop "Drafting an Implementation Plan for the IOC Strategy for Capacity-Building" held at UNESCO, Paris, 9–11 March 2005 (see Annex I for tabulation of various inputs). Special attention has been paid to drafting the mission and vision statement that sets the Medium Term goals for the Capacity-Building Section of IOC. These statements were the initial steps in formulating the Principles and Strategy for Capacity- Building at IOC.

The mission of the IOC Capacity-Building Section is:

"to help Member States, through international cooperative mechanisms, identify and address capacity-building needs to contribute to improved management and decision-making processes, sustainable development, and protection of the ocean and coasts"

The vision of IOC Capacity-Building is:

"to establish networks of scientists, managers and other practitioners working within regional and similar cooperative mechanisms, to create demand-driven science, enhance sustainable development and protection of the marine environment, and provide operational oceanographic services for the benefit of all humanity"

Inherent in the vision statement is the concept of 'self-directed capacity-building' that leads to autonomous development cycles. This key strategic principle is also reflected in the key funding strategy of making 'business proposals' to sponsors with clear deliverables against identified performance indicators. This in no way diminishes the responsibilities of sponsors as long-term partners in building capacity in developing regions. It asks instead for a change of strategy, from both sides of the partnership — a business-like approach to building safer lives, sustainable livelihoods, and deriving economic gains from healthy ocean and coasts. These concepts have guided the development of this strategy document.

(SC-2005/WS/23 rev.)

TABLE OF CONTENTS

IOC PRINCIPLES AND STRATEGY FOR CAPACITY BUILDING'

page

PART I

1. THE ROAD TO THE UN YEAR

In accordance with the Mission of IOC, the Capacity-building section after consultations, proposes the following long-term vision:

> "The vision of IOC capacity-building is to establish networks of scientists, managers and other practioners working within regional and other cooperative, mechanisms to create demand-driven science, enhance protection of the marine environment, and provide operational oceanographic services for the benefit of all humanity."

The Strategy for Capacity-building can be summarized as follows:

1. Capacity-building interventions will follow the *Principles of Capacity-Building*.
2. The Medium-term Strategy of IOC, and its main operating themes, will be the framework within which IOC Capacity-building initiatives will be *aligned and harmonized.*
3. On-going *Regional Projects, addressing key regional concerns*, will be primary vehicles for Capacity-building interventions.
4. Regional Project objectives will be facilitated through *Capacity-building Pilot Programmes.* Submission to funding agencies of pilot proposals, formulated by regional networks of scientists, will be facilitated by IOC regional entities in cooperation with IOC secretariat. Importance will be paid to leadership programmes for heads of organizations and team-building programmes for scientists.
5. Capacity-building Pilot Programmes will address training needs in close partnership with GOOS, JCOMM, COOP, CEOS and other organizations and programmes *on available operational products,* remote sensing data and numerical model outputs. This will form the short-term component of the Pilot programmes — the "know-how".
6. *Education and research* programmes will form the long-term components of the Capacity-building Pilot Programmes — the "know-why". In this way, products specific to regional needs can be created in future.
7. *Regional networks of scientists and stakeholders* participating in the Pilot programmes will be facilitated to nucleate a Regional Resources Hub (RRH) where they can continue working together and creating products specifically for regional communities.
8. In appreciation of differing capacities for marine scientific research between countries in a region, *country-specific programmes* will be carried out. These will pay special attention to building-up institutional and legal frameworks, mutual assistance, and transfer of technology.
9. *Partners and programmes* whose capacity-building strategies are in consonance with the IOC Principles of Capacity-building will be sought. In particular JCOMM, GOOS and COOP will form the core group for operational products.
10. *Information & Communication and Awareness Raising* at different societal levels will be important activities in support of Capacity-building at the professional levels.

11. *Funding resources* are critical to capacity-building efforts and several mechanisms will be evolved to ensure that interventions do not falter because of lack of resources.

12. *Capacity-building initiatives will be evaluated* for effectiveness and efficiency and best practices continuously distilled from such analyses.

2. INTRODUCTION

The ocean is unique in its magnitude, its contribution to the planetary life support system and its position as a global commons. This global nature of the ocean requires that all countries participate in its wise and sustainable management, and also makes it necessary to enact international agreements to protect and preserve the oceans for present and future generations. This second facet of international agreements has precedents such as the UN Convention on the Law of the Sea (UNCLOS, 1982) that can serve as a basis in tackling other global and intergovernmental issues. The first requirement — that of building capacity where required, so that all countries can participate in the wise and sustainable management of the ocean — is the focus of this document.

3. ROLE OF IOC IN CAPACITY-BUILDING

Several international resolutions identify a leadership role for the IOC as the UN focal point for Ocean Science and Ocean Services. UNCLOS recognises IOC as the competent organization in the field of marine scientific research and development and transfer of marine technology [Parts XIII and XIV of UNCLOS]. Its Statutes give the declarations from the Rio Conference, the Millennium Development Goals, and the Johannesburg Summit a legal framework and indicate the importance of building capacity in marine sciences, in the sustainable management of ocean resources, and the key role of the IOC in this endeavour.

How do we define Capacity-building?

Individuals, organizations and countries all benefit from capacity building which can be defined as:

> *"…development, fostering and support of infrastructure, resources and relationships for ocean science and related systems and services, at Member States, organizational, inter-organizational, regional and systems levels, contributing to the peaceful, socially distributed and sustainable development of our societies."*

IOC has to date responded:

- Revised its statutes in 1999 defining its permanent mission;
- Revised its mandate in 2000; and
- Restructured its Medium-Term Strategy [2004–2007] within five main themes:
  - (i) Coordinating major ocean science programmes for understanding the ocean's role in climate change and the carbon cycle, and assessment of man's impact on the oceans;

(ii) Leading the development and implementation of Global Ocean Observing System (GOOS), as part of an Integrated Global Observing Strategy (IGOS) to improve forecasting of natural phenomena, management of coastal seas & its living resources;

(iii) Building the capacity of developing countries, especially to manage and exchange marine data and information needed for sustainable development;

(iv) Intensifying support to the African Process as a follow-up to the Pan-African Conference on Sustainable Integrated Coastal Management (PACSICOM), to the effect that IOC will concentrate in Africa a significant portion of its field activities, especially in the development of marine data and information networks and integrated coastal management.

(v) Improving ocean services to Member States through the new Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM).

4. CAPACITY-BUILDING MISSION AT IOC

Building on the IOC mission statement and synthesizing the various resolutions of the Assembly, we believe that the mission of the IOC Capacity-Building Section is:

> *"to help Member States, through international cooperative mechanisms, identify and address capacity-building needs to contribute to improved management and decision-making processes, sustainable development, and protection of the ocean and coasts"*

5. PRINCIPLES OF CAPACITY-BUILDING

The growing gap between countries in their capacity to understand and use the ocean effectively and sustainably is of concern to IOC. The IOC recognizes that building capacity is a large, complex and long undertaking, and must be addressed along with partners. These partners must have the same mission and long-term goal of "sustainable" capacity-building. Some Principles are therefore needed to guide the formulation of the IOC Strategy for Capacity-Building and to be used in harmonizing its future Capacity-Building interventions and when collaborating with partners:

1. IOC Capacity-building interventions need to be imbedded in on-going regional projects that contribute directly to the larger IOC mandate:

   "to promote international cooperation on protection of the marine environment and preservation of human life and property in the ocean and coastal areas and work towards sustainable development"

2. IOC Capacity-building programmes should be structured so that groups of regional scientists define and determine their own capacity-building programmes. They will:

   - Identify areas for regional collaboration;
   - Seek partners through clear enunciation of their requirements; and

- Seek funds in a "business" mode, by delivering products of public good.

3. Capacity-building interventions should be structured to have enduring long-term impacts. This requires interventions both in "know-why" and in "know-how".

4. Interventions should target development of both research and operational capabilities.

5. IOC Capacity-building needs to be approached in a holistic manner involving as appropriate decision-makers, directors of institutes, scientists, technicians, and society.

6. Interventions must be treated as investments. Appropriate contact must therefore be maintained with participants. Strategic partners, collaborating institutions, key decision makers, sponsors/funding organizations, and thought leaders in relevant scientific disciplines are also important elements in capacity-building and active contact needs to be maintained with all of them.

7. IOC capacity-building interventions must optimise limited resources and reduce/eliminate duplication and overlap. This will include liaising closely with other agencies that also provide capacity-building services, to improve coordination and increase efficiency. IOC will also ensure that it applies Best Practices in Capacity-Building to every intervention that it sponsors.

8. A majority of capacity-building initiatives will focus on developing regions.

9. IOC Capacity-Building Strategy will be focused and address prioritised needs of Member States within the regional/global framework. [The implication of this principle is that with limited resources, IOC capacity-building cannot and should not address every need].

6. STRATEGY FOR CAPACITY-BUILDING

Before we outline a strategy we need to define a vision to which the Strategy is directed. Therefore in accordance with the Mission of IOC, the Capacity-building section after consultations, proposes the following long-term vision:

We can now outline a Strategy to serve as the basis for developing an implementation plan.

"The vision of IOC capacity-building is to establish networks of scientists, managers and other practioners working within regional and other cooperative, mechanisms to create demand-driven science, enhance protection of the marine environment, and provide operational oceanographic services for the benefit of all humanity"

1. *Principles of Capacity-building* enunciated earlier will guide IOC in its collaborative initiatives, since IOC can organize only a small fraction of needed interventions, and must necessarily work with partners.

2. *Alignment and harmonization* of capacity-building initiatives will be along IOC Main Themes. IOC has through Training, Education and Mutual Assistance [TEMA], developed three well-recognised and effective initiatives. These are:

- Training-Through-Research (TTR) Programme;
- IODE — Information and Ocean Data Exchange Programme; and
- Harmful Algal Bloom (HAB) Programme.

These and other capacity-building interventions conducted by the main themes of IOC will be better aligned with the Principles of Capacity-building.

3. *Regional projects addressing key regional concerns* will be the primary vehicles for regional capacity building. The key step will be to identify one or more regional projects [including regional programmes of UN agencies], which the IOC regional entities [sub-commissions and project offices] would be best placed to do.

   Such regional entities provide an efficient and targeted route to identify, organize, and follow-up capacity-building needs of each region within the context of the governance structure of the IOC.

   These entities can also interact with regional groups who wish to present their programmes to the IOC Assembly following relevant Rules of Procedure. Such presentations will encourage inter-regional collaboration and exchange of best practices.

4. *Capacity-Building Pilot Programmes* would follow the identification of suitable regional projects. IOC will arrange:

   - Leadership–innovation programmes for heads of academia and research organizations;
   - team building programmes for groups of project scientists; and
   - facilitators to assist in drafting Capacity-building Pilot proposals for external funding. Proposals should address objectives of the regional projects and be:
     - structured to create capabilities (short-term training and longer term education/research programmes);
     - formulated as 'Business' proposals aligned to *Principles of Capacity-building.*

5. *Available operational products,* remote sensing data and numerical model outputs will be targeted in the first phase in close partnership with GOOS, JCOMM, COOP, CEOS and other organizations. This forms the 'know-how' part of capacity-building.

6. *Education and research* programmes are acknowledged to create long-term impacts. Capacity-building must be tackled at this 'know-why' scale to become "sustainable". IOC schemes, present and proposed, should be used when needed.

   <u>Distance education and international courses</u>

   - Ocean Teacher Internet model for self-learning, and HAB training Programme;
   - International governance training programmes of International Ocean Institute; and

- Regional institute dedicated to marine sciences. Such an institute needs to be created, based either on the UNU, Tokyo or ICTP, Trieste.

UNESCO-IOC Chairs

- Chairs can promote synergy between research institutes, operational centres and industries. Additional Chairs could be developed based on a critical assessment.
- Chairs can mentor young doctoral students and use UNESCO's Partnership and Fellowship programmes, and IOC Innovative Coastal Research Scheme.

Research Initiatives

- Inviting Eminent Visiting Researchers. These will spend sabbatical time pursuing research in a region. [This scheme is presently under construction].
- Open Ocean TTR opportunities. Further opportunistic replications for TTR such as the first Asian TTR on-board the RV *Marion Dufresne*, must be sought.
- Coastal Ocean TTR opportunities. Present TTR must be replicated into a Coastal TTR model-training students in traditional science-at-sea techniques.

Travel and Study Grants

These will continue supporting the concept of mobility, albeit within more defined programme areas of the Capacity-Building Pilot programmes.

7. *Regional Networks of scientists and other practitioners* creating demand-driven science and operational products is stated to be the long-term vision. As regional networks raise their capabilities they will better be able to meet new responsibilities. This will require creation of new facilities, housed in centres real or virtual, that we call Regional Resources Hubs [RRH].

- Real-time satellite data and high-end computational power will be important facilities in these RRHs which should be accessible to local scientists, attract expatriate regional scientists, and showcase ocean science capability to deliver products of tangible worth.
- RRHs should be structured to be financially autonomous, and benefit from GOOS experiences and relevant elements of operational centres.
- RRHs should also catalyse interactions between universities and research institutes.

In this way, capacity-building would enable creation of cutting-edge operational products and also support innovative research.

8. *Country-specific programmes* are necessary since most decision-making in ocean sciences and management takes place at the national level. Collaboration is most active between countries of comparable capacity, and reducing disparities will go a long way in improving regional collaboration. Some initiatives to improve capacity are:

Capacity-building through projects of national importance

Capacity-building programmes often lack sustainability, for a variety of reasons including low national priority, lack of long-term governmental commitment, and limited support when funding levels decrease. Externally funded projects where:

- A national concern defined by recipient government is being addressed;
- Government is the implementing agency, with decision power at all levels;
- Government commits financial resources for the continuation of the programme;
- Expertise for continuation of project needs to be built up within the country; are projects through which IOC can assist marine scientists to actively participate.

University-research institute-industry partnerships

These sectors create educated manpower, new knowledge, and wealth, and in partnership are best suited to successfully address marine issues of national relevance. IOC will facilitate such partnerships through its regional offices, and IOC Chairs, by engaging with heads of organizations in innovative leadership programmes. IOC will foster awareness of the advantages of partnerships in solving national issues, whilst simultaneously strengthening institutional structures.

Mutual Assistance and Technology Transfer

Within the context of Agenda 21, technology transfer needs to increase significantly. This must be addressed in ways that benefit both users and manufacturers, enrolling instrumentation manufacturers and marine information service providers as active partners in transfer of technology. Countries will be encouraged to acquire low-cost technologies and partner in emerging technologies that need testing in a variety of oceanographic conditions. The work of the IOC Group of Experts on the Law of the Sea (IOC/ABE-LOS) must be widely advertised to assist countries improve their legal frameworks in dealing with ocean matters and international concerns, especially in marine scientific research and marine technology.

9. *Partners and programmes* are critical elements in the Strategy for Capacity-building, without which the IOC will be unable to respond to the mandate of its Member States.

Partners

A rich and diverse source of expertise exists in the many sectors of UNESCO and in-house linkages should be the first step in searching for capacity-building partners. Numerous other institutional, international and intergovernmental partners can complement IOC capacity-building efforts, help it conduct more efficient programmes, and assist it address a range of associated needs outside the domain of competence of IOC.

- WMO runs a Voluntary Cooperation Programme (VCP) initially focused on implementing World Weather Watch (WWW), and providing participating countries with clear benefits. An IOC VCP programme could similarly focus initially on the implementation of GOOS.
- JCOMM (Joint Technical Commission for Oceanography and Marine Meteorology) was created by WMO and IOC to better harmonize their activities and reduce administrative and bureaucratic hindrances to their cooperation.

- JCOMM and GOOS have merged their capacity-building programmes and IOC bears a natural responsibility in coordinating and collaborating with this joint activity.
- UNEP-GRID, Arendal is undertaking Continental Shelf Delineation that calls for IOC participation through IODE. This represents an opportunity for significant capacity-building activities.
- Other UN bodies, notably UNDP, UNEP, ITSU and ISDR have components of IOC interest such as executing agency status for GEF projects, Regional Seas programme, and risk reduction against marine hazards, respectively.
- GOOS Regional Alliances (GRA) are regional entities, established with support of Member States, and natural partners in regionally conducting IOC Capacity-building interventions for operational products.
- Committee on Earth Observing System (CEOS) has a programme on establishing access to real-time satellite data for developing regions. Regional Resources Hubs need high-speed data links and will depend on CEOS/UNDP for their needs.
- Group on Earth Observations (GEO) is an emerging process in which IOC is actively participating. GEO has identified capacity-building as an essential element in the Global Earth Observation System of Systems [GEOSS] making it a natural partner as the Principles of Capacity-Building of IOC and those of GEOSS are similar in many respects.
- International Human Dimension Programme (IHDP) is an international, interdisciplinary, non-governmental science programme dedicated to promoting and coordinating research. Its aims are to describe, analyse and understand the human dimensions of global environmental change. Its programme is designed around its three main objectives of research, capacity building and networking.

Besides the above, partnerships with non-governmental organizations will be sought, as they inject new ideas, competence and energy. NGOs also create new constituencies, and promote new approaches.

<u>Programmes</u>

- GODAE and related projects (e.g. the European Mercator) are Pilot Projects for data assimilation into operational oceanographic models and products. GODAE has received expressions of interests in educating scientists in the use of new data, products, and model outputs and predictions, including applications to coastal regions. Important avenues exist for collaboration in capacity-building and in initiating cooperative pilot projects.

- Global Marine Assessment (GMA) Programme, still in its initial stages of definition, could be the next major programme requiring active participation of Member States, and become a vehicle through which future capacity-building activities can be channeled.

10. *Information, Communication and Awareness Raising* are important activities in fostering a climate for capacity-building. A website with information on IOC capacity-building programmes, and information on items of interest to the community, will

used to catalyze and facilitate regional networks. The website will also serve as a virtual office for IOC regional entities to exchange information, ideas, and best practices.

Awareness Raising is an important aspect in sustainable capacity-building from life-saving information through risk reduction from marine hazards, to maintaining sustainable livelihoods, to gaining economic benefits from oceanic resources.

- Awareness in ocean matters must be raised in policy/decision-makers, professionals, coastal communities, students and society at large, as it creates the environment to support capacity-building efforts at the professional level.
- Raising awareness within the decision-making establishment is critical for IOC efforts in interfacing science with society. Thus the use of relatively simple, computationally inexpensive models, that allow country/regional specialists use local data to run scenarios before decision-taking, will strengthen the case to political leaders of the importance for capacity-building activities.
- Policy makers should be invited to concluding sessions of IOC-sponsored global and regional workshops, to hear summaries of deliberations and be informed of issues of importance and products that are directly useful to the policy making process.
- Creating community awareness of the variety of products available to address regional/national needs and ways to access these products is an initial and important step in 'sustainable' capacity-building. The next steps build capacities to effectively use these products. The last steps are to make widely known, to all levels of society, the additional benefits that accrue from contributing to ocean data, products and services.
- Student awareness can interest bright minds to take up a career in science. It starts at school with enthusiastic teachers who have access to interesting teaching material. Local science museums, aquaria and the media can also play important roles in this process. The IOC will seek ways to partner such organizations in order to raise the level of awareness in the student community. UNESCO runs several imaginative school-level educational programmes and Capacity-building will use these in-house capabilities for awareness raising and basic knowledge of the ocean.

11. *Funding Resources* are critical to implementation and three modes of raising funds for Capacity-building activities are proposed.

- Primary Funding Strategy: Regional scientists drafting Capacity-Building Pilot proposals to build capacity for important regional projects that address regional concerns. Facilitators will be provided to help them formulate proposals that seek funds in a "Business" mode with clear public-good products identified as deliverables, performance indicators and timelines. It will be aimed at sponsors and collaborators and be pitched to leave better regional capacity than before the project start. Contact should always be maintained with the primary sponsor while building new bilateral relationships with other sponsors.
- In-country funding and industrial funding Strategies: IOC will work with regional scientists to identify products and services important for decision-

makers, and through these demonstrate to national governments the importance of in-country support to capacity-building.

- Funding from industrial and commercial sources will also be sought, when compatible with the societal and environmental goals of UNESCO and its IOC. Organizations that attract such funds are able to offer their industrial sponsors the advantage of tax-deductions based on their contributions. UNESCO cannot presently offer this facility and a study has to be initiated to develop these concepts further, defining methods that will be in-line with in-house auditing procedures.
- IOC Trust Funds: This avenue can be used to fund special Capacity-building projects, not in the mode of a 'central funding agency' but to respond in those cases where the most effective response is from a central point before it can become regional. IOC needs adequate resources to follow opportunities that occur between sessions, allowing prompt responses and visibility and to maintain leadership in ocean matters.
- The possibilities of diversifying funding sources for capacity building activities beyond traditional donor States will be actively explored using the experiences of GOOS and JCOMM. IOC can further enhance its fund-raising effectiveness by enrolling persons of eminence, influential scientists and decision-makers to suggest innovative means of financial support.

12. *Performance Indicators in evaluating Capacity-Building initiatives* will be an integral part of capacity-building interventions. In line with GOOS and JCOMM Capacity-building reports, this Strategy proposes evaluations to strengthen learning and performance of project participants and provide information to sponsors, government bodies, and general public about the results and effectiveness of projects. Evaluations are also necessary to present a persuasive case to funding agencies.

The Results-Based Management methodology adopted by UNESCO is a process where each project is required to have a hierarchy of objectives or intended goals that taken together produce higher order objectives. This requires that action-goals, together with clear purpose-statements and the definition of anticipated results, be spelt out and agreed to at the commencement of each cycle. Through this process, results can be quantified and the effectiveness of the Capacity-building initiatives can be gauged.

IOC Capacity-building evaluation methodology must go beyond evaluating Capacity-Building interventions that it conducts itself, since IOC Capacity-Building section has the further responsibility of harmonizing capacity-building activities of other Main Lines of Action of IOC. Additionally it must also evaluate the effectiveness of joint Capacity-Building ventures with its partners. Accordingly, its evaluation frame needs to have a broad remit. A consultancy on *Best Practices of Capacity-building in IOC* has after considering various aspects arrived at a three-tier mechanism to assess Capacity-building.

At the highest level, the performance indicators would be overarching and would provide an indication of the collective IOC capacity-building performance. Primary performance indicators should address IOC management level on the following issues:

- Identification and prioritisation of capacity-building needs.
- Regional alignment especially through continued extra-budgetary support.

- Strategic Plan for Capacity-building approved by Assembly.
- An Implementation and Business Plan for Capacity-building.
- Programme delivery through periodic evaluations and feedback.
- Resources growth indicating commitment to the Capacity-building process.
- Strategic Relationships support to Capacity-building programmes and interventions.

The second tier of performance indicators would be at the regional level. Primary performance indicators should address regional entities on the following issues:

- Identification and prioritisation of capacity-building needs and consequences of not meeting these.
- Implementation and Business Plan approved by Assembly.
- Programme/project/intervention delivery based on objectives, milestones and performance indicators and comprehensive feedback.
- Cost/resource control.
- Development of products in response to specific needs of regional members.
- Cost-benefit analysis investment and impact.
- Current database on participants and programme activities
- Capture and Dissemination of Learning.

The third tier of performance indicators would be at the operational project/intervention level. Primary performance indicators should address project leaders on the following issues:

- Clearly defined Project/Activity plans are approved.
- Capture and publication of outputs/results.
- Technology/Capacity Transfer evaluation reports.
- Participant/beneficiary audit and evaluation from each participant on process, content and service orientation of key role players involved in the intervention.

It is conceivable that all the above performance indicators may be met without actually having a meaningful and sustainable impact. Therefore there is serious merit in considering whether an additional performance indicator, which focuses on the protection and health of the ocean and coastal zones, should be included. In the final analysis, directly or indirectly, all IOC capacity building programs/interventions should contribute to the improved protection and health of the ocean and coastal zones. Therefore whilst capacity building is not the only influencing variable, there should be a causal relationship between the health of the ocean and coastal zones and IOC capacity building programs/interventions. A strategic performance indicator of this nature should at least be included at the most senior level within IOC.

7. CONCLUSION

In conclusion, and to again focus on the purpose of this Principles and Strategy for Capacity-building document, the long-term vision is presented again:

> "The vision of IOC capacity-building is to establish networks of scientists, managers and other practioners working within regional and other cooperative, mechanisms to create demand-driven science, enhance protection of the marine environment, and provide operational oceanographic services for the benefit of all humanity"

PART II

1. INTRODUCTION

1.1 The ocean and the need for Capacity-Building

The ocean is unique in its magnitude, its contribution to the planetary life support system and its position as a global commons. This global nature of the ocean requires that all countries participate in its wise and sustainable management, and also makes it necessary to enact international agreements to protect and preserve the oceans for present and future generations. This second facet of international agreements has precedents such as the UN Convention on the Law of the Sea (UNCLOS, 1982) that can serve as a basis in tackling other global intergovernmental issues. Building capacity where requested, so that all countries can participate in the wise and sustainable management of the ocean, is also reflected in the IOC mission.

2. ROLE OF CAPACITY-BUILDING AT IOC

2.1 Role for IOC in Capacity-Building

Several international resolutions identify a leadership role for the IOC in ocean matters, two of these are:

- ✓ IOC as the UN focal point for Ocean Sciences and Ocean Services is recognized by UNCLOS as the competent organization in the field of marine scientific research and development, and transfer of marine technology [Parts XIII and XIV of UNCLOS].

- ✓ UNCLOS Statutes give the declarations from the Rio Conference, the Millennium Development Goals, and the Johannesburg conference a legal framework and indicate the importance of building capacity in marine sciences, and in the sustainable management of ocean resources, and highlight the key role of the IOC in this endeavour.

These declarations bestow a unique advantage on IOC, giving it great responsibility and an authority that can be judiciously used in implementing the directives and meeting the needs of its constituency. It is within this framework that the Strategy for Capacity-Building has been developed.

It is important to define the Capacity-Building that IOC wishes to engage in. We consider that individuals, organizations and governments all benefit from capacity-building (Annex II) which we define as:

> *"development, fostering and support of infrastructure, resources and relationships for ocean science and related systems and services, at Member States, organizational, inter-organizational, regional and systems levels, contributing to the peaceful and sustainable development of our societies."*

2.2 Response of IOC to its Capacity-Building mandate

In response to the Capacity-Building responsibilities assigned to it by these international declarations, IOC has to date:

- Revised its statutes in 1999 defining its permanent mission to be:

> *"to promote international cooperation and coordinate programmes in research, services and capacity-building, in order to learn more about the nature and resources of the ocean and coastal areas and to apply that knowledge for the improvement of management, sustainable development, the protection of the marine environment, and the decision-making processes of its Member States." (Article 2.1)*

- Revised its mandate in 2000 requiring that:

> *"UNESCO and its Member States must seize the opportunity to build on their initial investment in the scientific study of the oceans in the second half of the twentieth century, to provide the urgently needed global leadership in the development of operational oceanographic services for the benefit of all humanity through the twenty-first century."*

- Restructured its medium-term strategy [2004–2007] within the following five main themes:

1. Coordinating major ocean science programmes for understanding the ocean's role in climate change and the carbon cycle, and assessment of man's impact on the oceans;
2. Leading the development and implementation of Global Ocean Observing System (GOOS), as part of an Integrated Global Observing Strategy (IGOS) to improve forecasting of natural phenomena, management of coastal seas & its living resources;
3. Building the capacity of developing countries, especially to manage and exchange marine data and information needed for sustainable development;
4. Intensifying support to the African Process as a follow-up to the Pan-African Conference on Sustainable Integrated Coastal Management (PACSICOM), to the effect that IOC will concentrate in Africa a significant portion of its field activities, especially in the development of marine data and information networks and integrated coastal management.
5. Improving ocean services to Member States through the new Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology.

2.3 Actions following from IOC response to Capacity-Building

The Medium-Term Strategy identifies Capacity-Building as a cross cutting activity across the Main Themes of IOC. Accordingly, these activities will be planned through the regions and pay special attention to the build-up of institutional and legal frameworks in support of marine science and ocean services.

Present capacity-building activities will continue, and new ones will be initiated to provide an informed and responsible response to climate, coastal and open ocean issues, reflecting Member State priorities. Regional competence to deliver products and modelling advice useful to stakeholders will also be enhanced. Areas in which IOC will focus its capacity-building efforts are protection of the marine environment, disaster mitigation, coastal management, fair and sustainable use of resources, climate change, Law of the Sea, and preservation of biodiversity. The IOC will also provide inputs for building legislative capacity, where requested, for the sustainable and fair use of the ocean including in matters relating to bioactive molecules for pharmaceutical and industrial applications.

Considering the mandates that IOC has received and the actions that naturally flow from them, we can proceed to define a mission statement for Capacity-Building at IOC.

3. CAPACITY-BUILDING MISSION AT IOC

3.1 Defining a Mission Statement for IOC Capacity-Building

Building on the IOC mission statement and synthesizing the various resolutions of the Assembly on Capacity-Building, we believe the appropriate mission of the IOC Capacity-Building Section is:

> *"to help Member States, through international cooperative mechanisms, identify and address capacity-building needs to contribute to improved management and decision-making processes, sustainable development, and protection of the ocean and coasts".*

That IOC has been fulfilling this mission can be seen from its actions in:

- ✓ Encouraging international collaboration between Member States by promoting mutual assistance in the field of Marine Scientific Research (Article 242 & 244 of UNCLOS) and Transfer of Marine Technology (Article 275 of UNCLOS).

- ✓ Reminding Member States of commitments made at the "1992 Rio Declaration on Environment and Development" (Principle 9); in Chapter 17 and 37 of "Agenda 21"; and in Principle 18 of the 2002 "Johannesburg Political Declaration".

- ✓ Driving the implementation of the above principles by making the case to Member States to put into practice legal provisions, and thereby realize the benefits from mutual assistance among States.

- ✓ Supporting the advisory Group of Experts on the Law of the Sea (IOC/ABE-LOS) that assists Member States to implement Parts XIII and XIV of UNCLOS and represents the core IOC activity in the Law of the Sea.

3.2 Benefits accruing from supporting Capacity-Building

Building capacity in countries produces several benefits:

(i) Several long-term initiatives in the area of Marine Scientific Research in developing regions are returning benefits to sponsors - the Harmful Algal Bloom Programme is a good example demonstrating this aspect.

- Improved observation and basic research of the Ocean is a direct outcome of building the capacity of Member States to more effectively participate in research programmes, and in the exchange of scientific information

- A well-designed capacity-building and TEMA strategy also provides a substantial opportunity for IOC to grow in stature and recognition worldwide.

- The dissemination of knowledge and fostering the efficient, fair and sustainable use of ocean resources brings about socio-economic benefits by which IOC contributes to the larger UN millennium goal of reducing poverty.

- The development of regional collaboration in the management of ocean resources can contribute to prevention of conflicts.

IOC capacity-building initiatives will play a key role in helping Member States create and maintain a national enabling environment for generating new knowledge-products and services. These will support science-based decision-making and public awareness in countries for sustainable development and a healthy marine environment.

The capacity-building mission requires more resources and competencies than IOC possesses, and partnerships are necessary if all-round Capacity-Building is to be achieved. We therefore enunciate some Principles of Capacity-Building to help us collaborate effectively with our partners.

4. PRINCIPLES OF CAPACITY-BUILDING

The growing gap between countries in their capacity to understand and use the ocean effectively and sustainably is of concern to IOC. The IOC recognizes that building capacity is a large, complex and long undertaking, and must be addressed along with partners. These partners must have the same mission and long-term goal of "sustainable" capacity-building. Some Principles are therefore needed to guide the formulation of the IOC Strategy for Capacity-Building and to be used in harmonizing its future Capacity-Building interventions and when collaborating with partners. These are:

(ii) IOC Capacity-Building interventions need to be imbedded in on-going regional projects that contribute directly to the larger IOC mandate:

"to promote international cooperation on protection of the marine environment and preservation of human life and property in the ocean and coastal areas and work towards sustainable development"

- IOC Capacity-Building programmes should be structured based on proposals drafted by regional scientists who define and determine their own capacity-building programmes. The proposals should:
  - ✓ Identify areas for regional collaboration;
  - ✓ Seek partners through clear enunciation of their requirements; and
  - ✓ Seek funds in a "business" mode, by delivering products of public good.

- Capacity-building interventions should be structured to have enduring long-term impacts. This requires interventions both in "know why" and in "know how".

- Interventions should target development of both research and operational capabilities.
- Capacity-building at IOC needs to be approached in a holistic manner involving as appropriate decision-makers, directors of institutes, scientists, technicians, and civil society.
- Interventions must be treated as investments. Active contact should be maintained with participants. Strategic partners, collaborating institutions, key decision makers, sponsors/funding organizations, and thought leaders in relevant scientific disciplines are also important elements in Capacity-Building and active contact needs to be maintained with all of them.
- IOC Capacity-building interventions must optimise limited resources and reduce/eliminate duplication and overlap. This requires liaising closely with other agencies that also provide Capacity-Building services, to improve coordination and increase efficiency. IOC will also ensure that it applies Best Practices in Capacity-Building to every intervention that it sponsors.
- A majority of Capacity-building initiatives will focus on developing regions.
- IOC Capacity-building Strategy will be focused and address prioritised needs of Member Countries within the regional/global framework. (The implication of this principle is that with limited resources, IOC Capacity-building cannot and should not address every need).
- We now identify IOC Capacity-Building programmes, partners and regional entities that can be used in the Strategy for Capacity-Building.

5. IOC PROGRAMMES, PARTNERS AND REGIONAL ENTITIES

5.1 Capacity-Building Programmes of IOC

IOC has evolved with time and changed the focus of its programmes to remain relevant in a rapidly changing world. Capacity-Building through Training, Education and Mutual Assistance [TEMA], has evolved three well-recognized and effective initiatives in line with the Principles of Capacity-Building. These are:

Training Through Research

The IOC has been coordinating a Training-Through-Research Programme for the last 13 years. Approximately 550 scientists and students have participated in research cruises that bring together young and experienced marine scientists on a sophisticated research vessel to work on significant scientific problems addressing emerging global issues. Large number of publications in peer-reviewed journals has resulted. The TTR Programme has focused on the North Atlantic and more recently on the Mediterranean. It is now being studied for replication in other regions, and a pilot is being implemented in SE Asia/Australia in July 2005.

IODE - Ocean Data and Information Network for Africa - ODINAFRICA

ODINAFRICA III is the latest in a series of Ocean Data and Information Exchange programmes that has over 4 decades built a community of Data & Information Managers. The present project goes beyond just data management and provides a framework for operational oceanography projects of GOOS-Africa and GLOSS. The ODIN concept has also been

applied in the Caribbean (ODINCARSA), and is being replicated in other regions. It is well-referenced in the GOOS and JCOMM Capacity-Building plans, and its Ocean Teacher programme will prove useful in the distance learning efforts in other areas of Capacity-Building.

Harmful Algal Bloom (HAB) Taxonomy Programme

Over 12 years the IOC has helped to build capacity in Member States pertaining to harmful algae, and produced reference materials and documentation. It has organised 35 HAB training courses, workshops and 500 individual training opportunities in the identification of potentially harmful algae and related topics. The strategy has been short-term training courses supported by complementary activities and long-term follow-up. The programme builds on past successes, and is replicating the concept in other regions. Benefits are now accruing to both sponsors and recipients through the preservation and creation of taxonomic skills.

Further information on these initiatives is given in Annex III. In addition to these long-term programmes the IOC supports workshops in operational products, research and education programmes, and travel and study grants for young scientists from developing regions.

Training and Operational products

Training programmes that have given IOC visibility include those of the International Oceanographic Data & Information Exchange (IODE), and Global Sea-level Observing System (GLOSS). Further information on GLOSS is given in Annex III. Training/fellowship programmes sponsored by IOC are by the International Ocean Colour Coordination Group (IOCCG) and through IOC-SCOR-POGO Fellowships. Each of these has been operating for some years, creating an active scientific/operational community.

IOC has also been associated with training in the use of models, analysis of remotely sensed data, and creation of operational products – a recent example being two workshops on the Global Data Assimilation Experiment (GODAE) Pilot Programme. Such Pilot programmes are training operational oceanographers and modellers in the use of new real-time data sets and assimilation methodologies to create real-time products for operational uses. These efforts are at the cutting edge of marine operational science, and have been held for users from both industrialized and developing nations.

Research and Education

Important assets of the IOC are the UNESCO Chairs in Oceanography and Marine Sciences established at a number of universities in geographically distributed regions. These positions have enabled the Chairs to leverage collaborations, and establish specialist education and training programmes. Two notable examples have been annual International Summer Schools in Remote Sensing, and successful annual negotiations for the use of a sophisticated research vessel for education and training programmes at sea.

Travel and Study Grants

The IOC has traditionally allocated a small portion of its budget to encourage mobility of researchers in the form of travel and research grants to young researchers. The travel grants are awarded in open competition to applicants (6 to 8 every 6 months) who have been invited

to present original research work at recognized international conferences. The study grants financially support 1 or 2 graduate students, for short periods, in the early years of their research careers.

5.2 Partners and partner programmes

The IOC does not work alone on ocean science and related programmes, including those dedicated to Capacity-Building. There are numerous institutional, international and intergovernmental partners that complement IOC capacity-building efforts. Through such partnerships, more efficient programmes are conducted that are tailored to address a range of needs not limited to the domain of competence of the IOC. Organisations within the UN system are important entities to consider as our first partners.

Intra-UN collaboration

UNESCO, the parent organization of IOC, is largely devoted to capacity-building in various domains. This makes cooperation and coordination much easier with other UN agencies, notably United Nations Development Program (UNDP), United Nations Environmental Program (UNEP), International Strategy for Disaster Reduction (ISDR), and World Meteorological Organization (WMO), which co-sponsors the World Climate Research Program (WCRP).

The IOC and WMO are good examples of complementary partners. They have created a Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) to better harmonize their activities and reduce administrative and bureaucratic hindrances to their cooperation. JCOMM has drawn up a Framework of Activities, (Annex IV), which has many similarities with the Capacity-Building strategy proposed here. Furthermore JCOMM and GOOS have merged their capacity-building panels and IOC bears a natural responsibility in coordinating and collaborating in their joint activities.

Besides the UN organizations, the GOOS Regional Alliances (GRAs) are important regional entities, established with support of IOC Member States, and are natural partners in regionally conducting IOC Capacity-building interventions for operational products.

5.3 Regional entities of IOC

IOC regional sub-commissions, project offices and committees, formed with the approval of the Assembly and according to the wishes of the regions, are vehicles through which the differing needs of each region are addressed within the context of the governance structure of the IOC and its Rules of Procedure. Such regional entities provide an efficient and targeted route for Capacity-Building, an important consideration given that the ocean is a powerful medium of interconnection and many marine-based issues are regional in nature (examples demonstrating this interconnectedness are extreme events and disasters such as tsunamis, cyclones and storm surges, as well as climate variability such as monsoons and El Niño; fisheries resources too are affected by regional-scale phenomena).

Such issues, best addressed with a coordinated regional response (and in cooperation with the entities such as the GRAs), also provide an incentive for cooperation between neighbouring nations. By fostering regional collaboration in marine sciences and management of resources, IOC plays an important role within UNESCO and also within the UN mandate of conflict prevention.

The strategy must therefore have region-specific elements responding to regional needs. Furthermore, since different countries within a region may have different activity levels, structures and capabilities, these needs will have to be addressed accordingly.

6. VISION AND STRATEGY FOR CAPACITY-BUILDING

The existing elements for a Strategy have been described. Next we need to define a long-term vision for which to develop a strategy. Therefore, in accordance with the Mission of IOC, the Capacity-Building section proposes the following long-term vision:

> *"to establish network of scientists, managers and other practitioners working with regional and similar cooperative mechanisms, to create demand-driven science, enhance sustainable development and protection of the marine environment, and provide operational oceanographic services for the benefit of all humanity"*

The Strategy for Capacity-Building can be summarized as follows:

(iii) Capacity-Building interventions need to adhere to the *Principles of Capacity-Building*.

(iv) The Medium-term Strategy of IOC and its main operating themes will be the framework within which IOC Capacity-Building initiatives will be *aligned and harmonized*.

(v) On-going *regional projects, addressing key regional concerns,* will be primary vehicles for Capacity-Building interventions.

(vi) Regional Project objectives will be facilitated through *Capacity-Building Pilot Programmes*. Submission to funding agencies of pilot proposals, formulated by regional networks of scientists, will be facilitated by IOC regional entities in cooperation with IOC secretariat. Importance will also be paid to leadership programmes for heads of organizations and team-building programmes for scientists.

(vii) Capacity-Building Pilot Programmes will address training needs in close partnership with GOOS, JCOMM, COOP, CEOS and other organizations and programmes on *available operational products* including remote sensing data and numerical model outputs. This will form the short-term component of the Pilot programmes - the "know how".

(viii) *Education and research programmes* will form the long-term components of the Capacity-Building Pilot Programmes – the "know-why". In this way, products specific to regional needs can be created in the future.

(ix) *Regional networks of scientists* and stakeholders participating in the Pilot programmes will be facilitated to nucleate a Regional Resources Hub where they can continue working together and creating products specifically for regional communities.

(x) In appreciation of the differing capacities for marine scientific research between countries in a region, *country-specific programmes* will be carried

out. These will pay special attention to building-up institutional and legal frameworks, mutual assistance, and transfer of technology.

(xi) *Partners and programmes* whose capacity-building strategies are in consonance with the IOC Principles of Capacity-Building will be sought. In particular JCOMM, GOOS and COOP will form the core group for operational products.

(xii) *Information & Communication and Awareness Raising* at different societal levels will be important activities in support of Capacity-Building at the professional levels.

(xiii) *Funding resources* are critical to Capacity-Building efforts and several mechanisms must be evolved to ensure that interventions do not falter because of lack of resources.

(xiv) *Capacity-Building initiatives will be evaluated* for effectiveness and efficiency and best practices continuously distilled from such analyses.

7. IMPLEMENTING THE STRATEGY FOR CAPACITY-BUILDING

The steps outlined above in the Strategy for Capacity-Building are elaborated in this section.

7.1 Principles of Capacity-Building

Since IOC can organise only a small fraction of needed interventions, it must necessarily work with partners. The principles enunciated earlier will guide IOC in its collaborative initiatives.

7.2 Harmonizing Capacity-Building initiatives

The three long-term Capacity-Building initiatives highlighted earlier will be encouraged to further enhance their excellent initiatives in line with the Principles of Capacity-Building, and replicate them where suitable to other regions. Similarly, all collaborative interventions with IOC partners will be harmonized and aligned along IOC's Main Themes.

7.3 Identifying Regional Projects that address Regional Concerns

Regional entities are the primary vehicles for regional capacity-building, and through these entities the needs of the region for capacity-building will be known. The key strategic step will be to identify one or more major on-going Regional Projects that address priority regional concerns. The regional entities of IOC [sub-commissions, regional and project offices] are best placed to carry out this identification. Regional programmes of UN agencies need also be considered when selecting a representative regional project, and they will in consequence become our natural partners. Regional groups can also approach the regional IOC offices if they wish to present programmes of the region to the IOC Assembly following the relevant Rules of Procedure.

7.4 Formulating Capacity-Building Pilot Programmes for Regional Projects

After identifying one or more major regional projects that address regional concerns, the next step would be to arrange:

- ✓ leadership-innovation programmes for heads of academia and research organizations;
- ✓ team building programmes for groups of project scientists; and
- ✓ facilitators to assist in drafting a Capacity-Building Pilot programme for external funding.

The Pilot programme should address capacity-building needs of the identified regional projects, and accordingly should be:

(xv) Structured to create capabilities (both through short-term training programmes and longer term education and research programmes) to better meet the objectives of the major regional project.

(xvi) Formulated for funding with the help of facilitators, as a 'Business' proposal in-line with the Principles of Capacity-Building.

(xvii) Addressed to training needs on available operational products including remote sensing data and numerical model outputs, in the first phase. This training can be coordinated by the regional GOOS offices where they exist.

Such pilot programmes would be important steps towards 'self-determined' Capacity-Building.

7.5 Education and Research in Capacity-Building Pilot Programme

The strategy proposes an emphasis on education and research acknowledging its longer-term impact. Capacity-building must be tackled at this 'know-why' scale to become "sustainable". Augmentation of present IOC schemes is described below, and should be used when needed.

<u>Distance education and International courses</u>

(xviii) The best practices from the Ocean Teacher Internet model for self-learning and the HAB training programme need to be merged and used for general Capacity-Building needs.

(xix) The international governance training programmes of IOI should be used where needed.

(xx) Creation of a regional institute dedicated to marine sciences, whose operating mode could be inspired by United Nations University, Tokyo or ICTP, Trieste, must be explored.

<u>UNESCO-IOC Chairs</u>

(xxi) Some IOC Chairs organize specialist international courses to meet special needs. Their successes should be examined for possible replication. These

Chairs must be consistently funded and synergy promoted between research institutes, operational centres and industries. Opportunities for South-South cooperation must be fostered where possible.

(xxii) A study should be completed of the impact of these Chairs and on that basis options for identifying additional Chairs should be developed. Guidelines for IOC Chairs must specify the way that Chairs will work in Capacity-Building Pilot Programmes with IOC regional offices.

(xxiii) IOC Chairs must also be involved in all stages of IOC's new Innovative Coastal Research Scheme that encourages young research students to examine innovative solutions to local coastal problems.

Research Initiatives

(xxiv) An IOC Eminent Visiting Researchers Scheme is under consideration where eminent oceanographers spend sabbatical time pursuing research in a regional institute with direct association of the director, vice-chancellor, and scientists in the region.

(xxv) The first Asian TTR on-board the RV *Marion Dufresne*, will be taking place in July 2005. More opportunistic replication for short training programmes must be sought.

(xxvi) Since there is an abiding interest from the regions in coastal issues, the TTR programme should be examined for replication into a successful Coastal TTR model. This +will allow calibration and validation of satellite data and presents an opportunity to train and educate students in traditional science-at-sea techniques.

Travel and Study Grants

Travel and Study grants will continue but will be focused to augment the long-term TEMA schemes in the region, while still supporting the concept of mobility, albeit within more defined programme areas.

7.6 Regional Networks creating Operational Products

(xxvii) As regional networks raise their capabilities to deal with local issues, open ocean processes, better tackled on a regional scale, will become important. IOC regional offices can assist regional organizations to meet new responsibilities when seeking funds for the creation of new facilities.

(xxviii) These facilities should have access to real time satellite data and high-end computational power. These centres (referred here as Regional Resource Hubs) should be accessible to scientists in the region, and be a showcase for the advancement of marine and coastal science demonstrating the capability of ocean science to deliver products of tangible worth demanded by their regional communities.

(xxix) It is expected that these Regional Resource Hubs would attract scientists who have left the region to return, at least for short 'sabbatical' periods.

(xxx) The Hubs would be structured to be financially autonomous, and benefit from GOOS experiences.

(xxxi) The Hubs could also disseminate partly processed data products with lower bandwidth requirements, to catalyse the interaction of universities and other research facilities in the area.

(xxxii) IOC will seek ways to promote and develop south-south cooperation in a manner that spreads regional endogenous knowledge amongst its Member States, particularly in developing countries.

In this way, capacity-building would establish an environment for creating cutting edge operational products and supporting research, rather than just sharing and dissemination of existing knowledge.

7.7 Country-specific programmes to build Capacity in Marine Sciences

The work with regions has been given priority. Recognising however that most decision-making in ocean sciences and management is made at the national level, activities to improve institutional and governance capabilities in countries and reduce imbalance in capabilities are accordingly included. Furthermore, considering that collaboration is most active between countries of comparable capacity, reducing disparities will go a long way in improving regional collaboration.

For nations that do not have a long history of investing in marine sciences, Capacity-Building needs to be initiated with issues for which there are clear benefits in the short-term. Coastal areas have this potential - of immediately demonstrating to decision-makers the potential benefits of investing in ocean sciences since it is the most productive marine area, and also the site of most human activities. Climate change and other issues of global or basin scale (e.g. Monsoons, El Nino) may impact societies through their influence on agriculture, food and water resources, and addressing these issues is also an essential part of Capacity-Building efforts proposed here. Thus while recognizing that the open ocean is an integral part of coastal zone processes, the strategy proposes a greater thrust to coastal development programmes in certain nations based on their requirements. In this venture, full advantage needs to be taken of the experience and knowledge developed by the Coastal Ocean Observations Module of GOOS (e.g. GOOS report no. 125).

<u>Capacity-Building through projects of national importance: Coastal Management</u>

Capacity-building programmes have often lacked sustainability, for a variety of reasons including low national priority, lack of long-term governmental commitment, and limited support when funding levels decrease. In this context and in accord with Principles for Capacity-Building it is proposed to seek collaboration in nationally supported and externally funded projects that satisfy the following criteria:

(xxxiii) Answers a need defined by recipient government and has received external funding

(xxxiv) Recipient government is an implementing agency, with real power on decisions at all levels.

(xxxv) Recipient government commits financial resources for the continuation of the programme.

(xxxvi) Necessary expertise for continuation of the project needs to be built up within the country.

GEF and regional development bank projects are types that meet the above criteria. On request, IOC will carry out necessary interventions to equip local marine science groups to actively participate in such projects along with external consultants.

University-research institute-industry partnerships

These sectors are collectively responsible for creating educated manpower, new knowledge, and wealth, and in partnership are best suited to successfully address a wide range of marine issues of national relevance. The IOC will seek ways to facilitate such partnerships through its regional offices, UNESCO-IOC Chairs, and directors of research institutes. IOC will engage with heads of organizations in innovative leadership programmes that will foster awareness of the possibilities and potential benefits of partnership in contributing solutions to national issues.

Mutual Assistance and Technology Transfer

Within the context of Agenda 21, technology transfer of marine instrumentation for developing countries needs to increase significantly. This must be addressed in ways that benefit both users and manufacturers, enrolling instrumentation manufacturers and marine information service providers as active partners in the transfer of technology. Countries in the regions will be encouraged to consider the acquisition of low-cost technologies that have proved reliable and accurate in the field. It is appropriate that developing regions are also partners in emerging technologies, as emerging technologies can be more thoroughly tested in a variety of oceanographic conditions before commercial marketing, thus benefiting both designers and potential customers.

7.8 Working with Partners and Programmes

Intra-UN partnerships were mentioned earlier. These will be developed to take maximum advantage of complementary skills where these add efficiency and effectiveness to capacity-building efforts. Partnerships with non-governmental organizations will be further strengthened, as they can inject new ideas, competence, and energy, create new constituencies, and promote new approaches. A partial list of entities and the capacity-building partnerships that can be jointly conducted are given here, and a further non-exhaustive list given in Annex V:

- ✓ **WMO** runs a Voluntary Cooperation Program (VCP) initially focused on implementing the World Weather Watch (WWW), and providing participating countries with clear benefits. An IOC VCP program could similarly focus initially on the implementation of GOOS.

- ✓ **UNEP-GRID**, Arendal is undertaking Continental Shelf Delineation that calls for IOC participation through IODE. This represents an opportunity for significant Capacity-Building activities beyond data management - to tasks associated with the delineation of the legal continental shelf.

- ✓ **Other UN bodies**, notably UNDP, UNEP, ITSU and ISDR have components of IOC interest such as executing agency status for GEF projects, Regional Seas program, and risk reduction against marine hazards, respectively.

- ✓ **GOOS Regional Alliances** (GRA) are regional entities, established with support of Member States, and are natural partners, that we must rely upon, to conduct Capacity-Building interventions for operational products within the region.

- ✓ **Committee on Earth Observing System** (CEOS) has a programme on establishing access to real-time satellite data for developing regions. Regional Resources Hubs need high-speed data links and will depend on CEOS/UNDP for their needs.

- ✓ **Group on Earth Observations** is an emerging activity, in which IOC is actively participating. GEO has identified capacity-building as one of 5 essential elements in the task of setting up a GEO System of Systems [GEOSS], with education as a basic requirement for long-term Capacity-Building.

- ✓ **International Human Dimension Program** (IHDP) is an international, interdisciplinary, non-governmental science programme dedicated to promoting and coordinating research. Its aims are to describe, analyse and understand the human dimensions of global environmental change. Its programme is designed around its three main objectives of research, capacity-building and networking. Such a partner would be especially important in programmes relating to the management of the coastal zone.

- ✓ **GODAE** and related projects (e.g. the European Mercator) are Pilot Programmes that need to be promoted for operational oceanographic models and products. These projects are of particular value in raising awareness in many countries on the benefits of marine sciences. GODAE has received expressions of interests in educating scientists in the use and exploitation of new data, products, and model outputs and predictions, including their application in coastal regions. There is potential for fruitful collaboration in capacity-building activities that is clearly worth exploring, and the possibilities and indications for initiating cooperative pilot projects need to be investigated.

- ✓ **Global Marine Assessment** (GMA) programme, still in its initial stages of definition, could become the next major programme requiring major participation of Member States, and could become a vehicle like GOOS, through which future capacity-building activities can be channelled.

7.9 Information & Communication, and Awareness Raising

Information and Communication

One of the first tasks in a focused strategy will be the creation of a website that will collate information on capacity-building associated with IOC programmes. The site will have information on items of interest to the community, and be used as the means of creating the

regional networks that are called for in the Strategic Vision. The site should also serve as a virtual office for IOC regional entities to exchange information, ideas, and best practices.

Awareness Raising

(xxxvii) Creating awareness is an important aspect in sustainable capacity-building. Awareness raising could range from:

(a) life-saving information on storm surges, floods, tsunamis and atmospheric disturbances;

(b) maintaining sustainable livelihoods; and

(c) gaining economic benefits from oceanic resources.

A general level of societal awareness of the ocean will create a positive environment and provide national support for capacity-building efforts at the professional level. Therefore the capacity-building needs of policy/decision-makers, professionals, coastal communities, and students must be addressed.

- Raising awareness within the decision-making establishment is critical for IOC efforts in interfacing science with society. Thus:

  (a) The use of relatively simple, computationally inexpensive models, that allow local data to be used for playing out scenarios before taking decisions, will strengthen the case to political leaders for capacity-building activities.

  (b) Global and regional activities of the IOC will be used to increase the visibility and credibility of national experts, who would then become excellent advocates of the necessity and benefits of marine sciences for their country.

  (c) Policy makers should be invited to concluding sessions of IOC-sponsored global and regional workshops, to hear summaries of deliberations and be informed of issues of importance and products that are directly useful to the policy making process.

- An important awareness-raising element is creating community awareness of the variety of operational GOOS-type products available to address regional or national needs, and ways of accessing these products. The next step would be to address building capacities to effectively use these products, followed by making widely known, to all levels of society, the additional benefits that accrue from contributing to ocean data, products and services.

- Students awareness is the intervention that can interest bright minds to take up a career in science. It starts at school with enthusiastic teachers who have access to interesting teaching material. UNESCO runs several imaginative school level educational programmes and Capacity-Building must use these in-house capabilities for awareness raising and also basic knowledge of the ocean.

- Local science museums, aquaria and the media (documentary makers, such as the National Geographic, are leaders in this respect) can also play important roles in this process. The IOC will seek ways to partner with such organizations in order to raise the level of awareness in the community.

8. RESOURCES AND EVALUATION OF CAPACITY-BUILDING INITIATIVES

8.1 Funding Resources

Three different modes of raising funds for Capacity-Building activities are proposed. The first two are related to funding for projects and are led by the region/country, whilst the third is a central fund for quick responses.

Primary Funding Strategy

The Capacity-Building Strategy proposes drafting Pilot Programme proposals to build capacity for important regional projects that address regional concerns. Facilitators will be provided to help regional scientists formulate such capacity-building proposals, that seek funds in a 'business mode' from sponsoring/funding agencies, and identify public-good quality products as deliverables with specific time lines. Sponsors need to appreciate that capacity-building is a long-haul exercise, and that regions can enter the 'sustainability loop' by being accountable for quality products delivered within agreed time frames and to accepted performance standards. Contact should always be maintained with the primary donor while trying to build new bilateral relationships with other sponsors.

This forms the primary funding strategy – where regions take policy and funding decisions to build their capacity. From its side, IOC will:

- ✓ *make available its resources in terms of expertise, networking, and intergovernmental skills;*
- ✓ *catalyse, coordinate, and facilitate proposal writing, submission to funding agencies, and follow-up; and*
- ✓ *assist in monitoring pilot programmes to ensure timely delivery of project deliverables.*
- ✓ *In the long-term, IOC Capacity-Building Section will maintain active contact by following each regional pilot project with assessment, feedback and follow-up studies on the effectiveness of the entire intervention.*

In-country funding and industrial funding Strategies

IOC will work with regional scientists to identify products and services important for decision-makers. IOC will use its networks and its regional entities to raise awareness among decision-makers of the countries in a region, about locally developed products and the local scientific capacities that created them. In this manner, regional collaboration will be used as an example to demonstrate the benefits of supporting capacity-building efforts and thus encourage in-country financial contribution for its further development.

IOC will work in developing regional capacity to partner fisheries, transportation, tourism and insurance industries. Structured correctly, such partnerships can be a win-win situation allowing:

- ✓ *industries to become more efficient;*
- ✓ *scientific communities to improve their efficiency in meeting customer needs for 'sustainable products'; and*

✓ *the environment to improve through its sustainable use.*

Funding from industrial and commercial sources will also be sought, when compatible with the societal and environmental goals of UNESCO and its IOC. Many examples exist of industries sponsoring non-governmental and not-for-profit organisations in ventures such as capacity-building, care for the environment, and awareness programmes. Organisations that attract such funds are able to offer their industrial sponsors the advantage of tax-deductions based on their contributions. Most inter-governmental organisations however do not have the appropriate financial or administrative structures or mechanisms to attract such commercial funds. The IOC needs to initiate a study that develops these concepts further – defining methodologies that will be in line with in-house financial auditing procedures. It is estimated that such a structural change will attract a great deal of industrial interest and give the IOC much needed financial autonomy.

IOC Trust Funds

The IOC Trust Funds are a possibility for funding special Capacity-Building projects, at least in the initial stages. This is not in the mode of a "central funding agency" but to respond in those cases where the only logical response is from a "central" point, before it can become regional. IOC needs the back up of adequate resources to follow opportunities and react to those situations that occur between sessions. This will ensure prompt responses and visibility allowing IOC to maintain leadership in ocean matters.

The possibilities of diversifying funding sources for capacity-building activities beyond traditional 'donor' states will be actively explored. IOC will emulate the best examples of the GRA/GOOS/JCOMM in this endeavour, and work with these and other partners to augment the IOC Trust Funds with contributions from governments, individuals, organizations, and industries. In order to increase effectiveness of programme implementation and execution, IOC would decentralize to its field offices, the budget and allocated funds for capacity-building interventions.

The IOC can further enhance its effectiveness by enrolling persons of eminence, influential scientists, scientific managers, sponsors and decision makers in an informal Friends of IOC programme. This informal group could assist the Executive Secretary in furthering the mission of the IOC through advisories, useful contacts, and philanthropic contributions.

8.2 Evaluation of Capacity-Building Initiatives

Project evaluation is an integral part of development co-operation in capacity-building. Evaluations strengthen learning and performance of project participants and provide information to the general public and government bodies about the results and effectiveness of these projects. The GOOS and JCOMM Capacity-Building Panels [JCOMM Meeting Report No. 14; GOOS Report No. 69], emphasize that without performance measures we would not be able to estimate the usefulness of interventions and would have no basis in improving future capacity-building activities. This would also make it difficult to present a persuasive case for capacity-building activities to funding agencies. We mention below the UNESCO evaluation programme, as well as an evaluation methodology for IOC capacity-building interventions. Details of the performance indicators are given in the Implementation Plan document with its accompanying consultancy report on 'Guidelines on Best Practices in Capacity-Building'.

UNESCO Results-Based Management methodology

UNESCO conducts a rigorous Results-Based-Management programme where each Main Line of Action is required to have a hierarchy of objectives or intended goals that taken together produce higher order objectives. At each level, interventions must be gauged against performance indicators (quantitative where possible) to gauge the relative success and effectiveness of interventions. This requires that action-goals, together with clear purpose-statements and the definition of anticipated results are spelt out and agreed to at the commencement of each cycle. Through this process, results need to be quantified and the effectiveness of the Capacity-Building initiative gauged.

IOC Capacity-Building Evaluation methodology

Beyond evaluating Capacity-Building interventions that it conducts itself, the IOC Capacity-Building section has the further responsibility for harmonizing the Capacity-Building activities of the other Main Lines of Action of IOC. It must also evaluate the effectiveness of joint Capacity-Building ventures with its partners. This means that the evaluation frame for capacity-building needs to incorporate, and suitably modify the UNESCO RBM methodology.

The Guidelines on Best Practices in Capacity-Building consultancy having taken all the above points into consideration arrived at a three-tier mechanism to assess Capacity-Building. These are summarised below.

At the highest level, the performance indicators would be overarching and provide an indication of the collective IOC capacity-building performance. Primary performance indicators should address the following:

- ✓ *Identification and prioritisation of regional* Capacity-Building needs in the short, medium and long-term.

- ✓ *Regional alignment secured* on an ongoing basis and ultimately, by Member States during Assembly meetings and through continued extra-budgetary support.

- ✓ *Strategic Plan* for Capacity-building approved by IOC Assembly and used to direct all IOC Capacity-Building activities including the formulation of an Implementation Plan.

- ✓ *Implementation Plan for* Capacity-building which includes milestones, accountabilities, timings, performance indicators and resource requirements.

- ✓ *Programme Delivery* met as seen through periodic evaluations and feedback from Member States, regional governing bodies, programme leaders and participants.

- ✓ *Resources* growth in real terms by a minimum of 5% per annum from extra-budgetary sources indicating commitment to the Capacity-Building process. Resources properly accounted for and utilised in accordance with approved UNESCO policies and procedures.

- ✓ *Strategic* partners, collaborators and funding agencies recognise, acknowledge and continue to support IOC because of the impact and delivery of sustainable benefits flowing from IOC's Capacity-Building programmes and interventions.

The second tier of performance indicators would be at the regional bodies'/CGCB level. Primary performance indicators should address the following:

- ✓ *Identification and prioritisation of Capacity-Building needs with regional consultations with needs and benefits quantified and where possible, consequences that may emerge should these needs not be met;*

- ✓ *Implementation Plan is approved by the Assembly following broad-based consultation with the Member States; the plan is consistent with the Capacity-Building Principles and is used to guide and review progress within the region.*

- ✓ *Programme/project/intervention delivery where objectives, milestones and performance indicators as set out in the Implementation Plan are met as evidenced by periodic evaluations and comprehensive feedback.*

- ✓ *Cost/resource control where investments for the region are monitored and sound governance is applied to effectively manage/control costs and resources;*

- ✓ *Development of products in response to specific needs of member states in regions, as these are reflective of their scientific capabilities.*

- ✓ *Cost-benefit analysis to evaluate the relationship between investment and impact. Review outcomes are reported to IOC and corrective actions taken where variances from approved plans have occurred.*

- ✓ *Current and reliable database where information concerning participants and programme activities are captured in an information system.*

- ✓ *Capture and Dissemination of Learning to capture, test and validate the most important lessons/ insights being generated during IOC capacity building activities and easily available to Member States.*

The third tier of performance indicators would be at the operational project/intervention level. Primary performance indicators should address the following:

- ✓ *Project/Activity plans are approved with clear objectives, performance indicators, benefit statements, action steps/key milestones, deadlines and resource requirements, and guide each capacity-building intervention.*

- ✓ *Capture and Publication of outputs/results that include evaluation of each intervention by the project leader and evaluated by regional body.*

- ✓ *Technology/Capacity Transfer evaluation reports that clearly indicate the extent of technology transfer and capacity built as a consequence of the intervention.*

- ✓ *Participant/beneficiary Audit and Evaluation from each participant on process, content and service orientation of key role players involved in the intervention. These evaluations are reviewed by the regional governing body/programme leader.*

In addition to the above, the following "Check-list" will be used in assessing interventions at the operational project level:

For effective evaluation of training workshops:

- ✓ Course material, immediate outputs from trainees and trainers, and feedback on teaching effectiveness and setbacks during the session, (as obtained through questionnaires).

✓ Secondary impacts of training courses on (for example) educational curricula, job market (economy), and decision-making.

The performance indicators will include adherence to project/programme/activity plan, level of capture, degree of capacity transfer, participant/beneficiary audit, improvement in the quality of work (data collection/analysis/publication of output or results), and an evaluation and reassessment of CB needs and priorities.

For operational training:

✓ Degree of involvement by local government as seen in scholarships for training, new services, improvements in quality control of data, usage of operational products, and

✓ Improvements in infrastructure.

For effective evaluation and monitoring of Capacity-Building projects:

✓ Extent of progress towards capacity-building initiatives seen from the work plans implemented by host country;

✓ Extent of State-level comprehensive programmes achieved as a result of capacity-building and the State's success in pulling together diverse stakeholders for planning;

- ✓ Role of the State in developing and implementing a common vision for comprehensive Capacity-Building programmes.

Capacity-Building performance indicators will at this stage address the project/programme capacity-building needs, implementation plans, cost/resource control, cost benefit analysis and capture, and dissemination of learning.

9. CONCLUSIONS

The IOC has been building capacity in its Member States from the time of its founding. Training-Education-Mutual Assistance, TEMA, has been a long-term effort started when capacity-building did not receive the attention that it presently does. The efforts of innumerable gifted and dedicated scientists found expression through many channels in building the capacity of colleagues in developing regions. Bilateral programmes, international cruises, advise during the establishment of institutes in developing regions, and publishing reference manuals are just some of the capacity-building efforts that IOC, through its network of scientists, has engaged in.

This tradition continues today through the several long-haul programmes described earlier. They represent the best of IOC efforts in capacity-building. However the vastness of the task means that we are building capacity to understand and protect ocean resources slower than we are destroying those same resources. We therefore need to harmonise our efforts, and work with like-minded partners in this endeavour, we need a vision, and we need a strategy. The long-term vision that we proposed for the IOC Capacity-Building Section is:

"to establish networks of scientists, managers and other practitioners working with regional and similar cooperative mechanisms, to create demand-driven science, enhance sustainable development and protection of the marine environment, and provide operational oceanographic services for the benefit of all humanity"

Inherent in the vision statement is the concept of 'self-directed capacity-building' that leads to autonomous development cycles. This key strategic principle is also reflected in the key funding strategy of making 'business proposals' to sponsors with clear deliverables against identified performance indicators. This in no way diminishes the responsibilities of sponsors as long-term partners in building capacity in developing regions. It asks instead for a change of strategy, from both sides of the partnership – a business-like approach to building safe lives, sustainable livelihoods, and obtaining economic gains from healthy ocean and coasts. These concepts have guided the development of this strategy document.

ANNEX I

DEVELOPING THE IOC CAPACITY-BUILDING FRAMEWORK

The Strategy framework document has been substantially developed since its first draft presentation and debate at the 37th Executive Council in June 2004. The actions taken by the secretariat include:

1. Executive Sec. Circular letter 2119 sent to Member States asking for their inputs.
2. Draft document loaded on Discussion Forum website for comments and suggestions.
3. Discussion of document at the Experts Workshop to draft the Implementation Plan, held at Paris, 9–11 March 2005.

This finalised draft incorporates the suggestions from Member States, regional subsidiary bodies, the Consultative Group on Capacity-Building, and from JCOMM, GSC and GOOS.

Countries and Organisations	**Recorded comments during 37th Executive Council meeting**	**Responses to Circular letter No 2119**	**Experts Workshop to draft an Implementation Plan for Capacity-Building, Paris, 9–11 March 2005**
IOC MEMBER COUNTRIES			
Australia	√	√	
Belgium	√		√
Brazil	√	√	
Canada	√	√	
Cuba	√	√	√
Finland	√		
Germany	√		√
Ghana	√	√	√
India	√	√	
Indonesia	√		√
Iran	√		√
Italy	√		√
Kenya	√		√
Madagascar			√
Mexico			√
Norway	√	√	√
Portugal	√		√
Peru		√	√
Philippines	√	√	
Tunisia	√	√	
Turkey	√	√	√
UK	√	√	
USA	√	√	√

Countries and Organizations	Recorded comments during 37th Executive Council meeting	Responses to Circular letter No 2119	Experts Workshop to draft an Implementation Plan for Capacity-Building, Paris, 9–11 March 2005
IOC REGIONS			
BSRC			√
IOCARIBE	√		√
IOCEA	√		√
IOCINDIO	√		√
IOCWIO			√
WESTPAC	√		√
SPONSORS, OBSERVERS and IOC PROGRAMMES			
NOAA, NOS, US			√
Belgium			√
IOI, Malta	√		√
NIVA, Norway			√
JCOMM	√		√
IOC GOOS Programme			√
GOOS Perth Office			√
PIGOOS			√
IOC HAB Programme			√
IOC TTR Programme			√
IOC IODE Programme			√

IOC Circular Letter No. 2119 IOC/PB/ED
(English only) Paris, 26 July 2004

To : IOC Member States

cc. : Chairman and Vice-chairmen of the IOC
Permanent Delegates/Observer Missions to UNESCO of IOC Member States
Chairmen and Vice-Chairmen of Major IOC Subsidiary Bodies (Scientific, Technical and Regional)

Subject: Capacity-Building: Following up on the 37th Session of the Executive Council (EC)

The recently concluded 37th Executive Council meeting, gave strong support for IOC to proactively address critical emerging issues such as the Global Marine Assessment and the Global Earth Observing System of Systems (GMA and GEOSS respectively). It should become increasingly evident to all, that the better informed we are, the richer our debates will become during the EC and the Assembly. In this context, I shall endeavour to continue briefing through Circular Letters when necessary. My colleagues and I shall welcome answering your queries and provide briefings whenever you need us to do so.

This Circular Letter addresses the specific issue of Capacity Building. I refer you to the following documentation from the EC.

1. Draft Report, Working Paper, and Resolution relating to Agenda Item 4.7.1;
2. Draft Report, Working Paper, and Resolution relating to Agenda Item 4.7.2;
3. Draft Report, Working Paper, and Resolution relating to Agenda Item 5.1

Resolution EC-XXXVII.9 refers to the production of a final draft Strategy for Capacity-Building document for consideration at the 23rd Assembly, based on:

i. comments received from Member States at the 37th Session of the EC;
ii. further comments to be requested of Member States through a Circular Letter soliciting inputs to the draft Strategy by 30th November 2004.

We encourage your active participation in this consultation on Capacity Building since it is one of the key areas that give IOC its visibility. It is our goal that the Strategy that finally emerges will be one that includes as many synergistically supporting points of view as possible. Whilst formulating your inputs to this process, I request you to specifically consider Agenda Item 5.1 where the different Main Lines of Action are all structured to additively build to achieve the overall goal of the IOC, forming the superset of the Strategy for Capacity-Building. Agenda Item 4.7.2 also merits consideration as it forms a sub-set of the Strategy for Capacity-Building in Remote Sensing.

The documents referred to will all be available on the IOC Website before by the end of July. Please do keep in mind **November 2004 as the cut-off date for sending your**

inputs. Ehrlich Desa [e.desa@unesco.org] will be glad to work with you and clarify any points that need further elucidation.

The next step will be to convene an Experts Workshop to draft an Implementation Plan during the first quarter of 2005, and a parallel activity on assessing the impact of earlier Capacity-Building activities, both of which are being supported with US funding.

The Capacity-Building activity more than most other areas, binds us – the 129 Member States of the IOC – into a team striving for parity in our capability to administer our ocean space, and I am sure that with your inputs we will ensure that the Strategy for Capacity-Building reflects this "inclusive" nature.

Yours sincerely,

Patricio Bernal
ADG UNESCO
Executive Secretary, IOC

ANNEX II

THE CHOICE OF THE DEFINITION OF "CAPACITY- BUILDING" IN THE REVISED STRATEGY DOCUMENT FOR THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION OF UNESCO

Several modifications to the definition of capacity-building were suggested by Member States in their comments on the previous draft of the strategy document. The definition proposed was: "the sharing of knowledge, information and technology allowing our societies to grow and develop in a sustainable manner". The purpose of this note is to present the reasons for the final choice of the definition proposed in this revised strategy document.

GENERAL DEFINITIONS OF CAPACITY-BUILDING

Capacity-building (CB) is a term that is now being used in many fields. For the choice of a particular wording for a definition, it may be useful to consider IOC's CB efforts in this general context.

The mixed results obtained in international cooperation and development with direct aid distribution, beginning in the early 90s, caused many agencies involved in international cooperation and development to shift their focus onto the building of capacity as a more efficient means to contribute to sustainable development. These agencies have similar definitions of capacity-building, but the various wording emphasize different aspects of this process.

For instance, a broad vision presented by the World Bank in relation to CB is to *"spur the knowledge revolution in developing countries to be a global catalyst for creating, sharing, and applying the cutting-edge knowledge necessary for poverty reduction and economic development"*.[1]

The Swedish International Development Authority (SIDA) provides a definition that is both brief and general, while conveying the main idea: *"capacity development is a matter of developing the capacity to identify and solve problems. It can be used at different levels and includes everything from individual training programmes to extensive changes in health care in a country"*[2]

Neither the United Nations nor UNESCO appears to provide a single definition of CB that encompasses all the CB activities that these agencies are undertaking in various fields. An excellent and fairly extensive discussion of this subject is available in M. E. Hilderbrand' report, "Capacity-building for poverty reduction: reflections on evaluations of UN system efforts"[3]. For the purpose of this note it is sufficient to cite one definition of CB from this report, seen as contributing to *"strengthening capability within developing countries to take on development challenges on their own, rather than the external agencies' doing the*

[1] Léautier, F.A., Vice-President, the World Bank Institute. Available online from http://web.worldbank.org/
[2] "*What is capacity development*", available from the Swedish International Development Authority website, at http://www.sida.se/Sida/jsp/polopoly.jsp?d=4069&a=28276
[3] Hilderbrand, Mary E., 2002: Capacity-building for poverty reduction: reflections on evaluations of UN system efforts. Available online from UN website at http://www.un.org/esa/coordination/ReptMHild.pdf

operational work themselves and thereby perpetuating dependence on external resources and expertise".

Definitions of capacity-building in the context of marine sciences

We now present comments from member states pertaining to the definition of CB, and other definitions of CB in the field of marine sciences.

The following definition was proposed by Australia: *"Capacity-Building within IOC is the development, fostering and support of infrastructure, resources and relationships for ocean science and related systems and services, at individual, organizational, inter-organizational, regional and systems levels"*[4].

The United States stressed the importance of considering IOC CB in relation to GOOS CB, and within the context of four main themes[5]:

- *to develop, promote and facilitate international oceanographic research programmes to improve our understanding of critical global and regional ocean processes and their relationship to the sustainable development and stewardship of ocean resources;*
- *to ensure effective planning, establishment and co-ordination of an operational global ocean observing system to provide the information needed for oceanic and atmospheric forecasting, for ocean and coastal zone management by coastal nations and for global environmental change research;*
- *to provide the international leadership for education and training programmes and technical assistance essential to systematic observations of the global ocean and its coastal zone and related research; and*
- *to ensure that ocean data and information obtained through research, observation, and monitoring are efficiently handled and made widely available.*

The vision presented in the JCOMM capacity-building strategy document is included below for completeness ([6]):

> *"It will be the vision of the JCOMM Capacity-Building Programme to understand the needs of its Member States and to address the deficiencies of the operational observing and information system wherever they may be. This shall be done through the dedication and mutual cooperation of all countries, through the development of partnerships, through the collective focus of effort and assistance on the identification and solution of problems in ability and capacity and under the guidance of a global plan for JCOMM."*

In the document on the strategy for CB of the IOC, as proposed at the 37th session of the Executive Council, CB is defined as:

> *"the sharing of knowledge, information and technology allowing our societies to grow and develop in a sustainable manner".*

[4] Smith, Neville, 2004: Personal communication to Ehrlich Desa
[5] Patterson, A., NOS, NOAA, 2004: Personal communication to Ehrlich Desa. Definition of IOC capacity-building in GOOS report number 69
[6] JCOMM capacity-building strategy, 2000

Proposed revised definition

The revised definition of CB proposed below attempts to take into account the comments provided by member countries representatives. As pointed out by Australia, CB for IOC is more than just sharing of knowledge. The definition we propose below clarifies this aspect.

The revised definition also aims at placing IOC's CB within the UN's goals of poverty reduction, disaster mitigation and sustainable development, and UNESCO's goals of contributing to international peace and cooperation.

It was attempted to keep this definition as brief as possible while satisfying the above criteria. While it is acknowledged that there remains arbitrariness in the choice of this particular wording, it is believed the revised version better reflects the overall IOC mandate and takes into account inputs from member states.

We define the Capacity-building that IOC wishes to engage as the:

> *"development, fostering and support of infrastructure, resources and relationships for ocean science and related systems and services, at Member States, organizational, inter-organizational, regional and systems levels, contributing to the peaceful and sustainable development of our societies."*

ANNEX III

DETAILS OF IOC LONG-TERM CAPACITY-BUILDING PROGRAMMES

The key lessons learnt from successful IOC programmes are summarized below. They are in general agreement with the Principles of Capacity-Building of which they provide a concrete illustration. Thus, they:

- ✓ Ensure that training is in line with the priorities of recipient institutes;
- ✓ Approach Capacity-Building interventions with the appropriate mix of 'tools'. Capacity grows during a long-term process and must be catered for. New technologies, where possible, have their own impact;
- ✓ Distil essential elements of success for replication in other regions;
- ✓ Training programmes need follow-up to keep participants up-to-date. They are also the constituency that benefit from periodic up-dates, and multiple visible uses for their training.
- ✓ Research programmes need a challenge, mentoring, and peer-acceptable products such [publications, participatory skills].
- ✓ Cooperative projects are most successful when both sides gain.
- ✓ Target critical numbers of trained manpower in a topic and within a geographic area.
- ✓ Ensure adequate follow-up and monitoring of the effectiveness of the training.

The programmes are described in more detail below.

Training Through Research Programme

In operation since 1990, the Training-through-Research (TTR) programme puts together the advantages of the formal training of undergraduate and postgraduate students and young scientists with the experiences gained in advanced research. Its main operational field is marine geology and geophysics combined in interdisciplinary way with studies in benthic biology and physical oceanography.

The TTR programme is managed by the Executive Committee and its Scientific Committee is responsible for formulating research tasks and targeting the TTR cruises. The annual TTR cycle of activities includes:

- preparation of a cruise by the Executive and Scientific Committees;
- the TTR cruise, with (when possible) a mid-cruise workshop and/or field excursion(s) for the participants and invited scientists;
- preliminary data processing, preparation and publication of scientific reports;
- a post-cruise conference to present and discuss the results of on-going analysis and interpretation of data, and to co-ordinate with other regional studies; and
- preparation of scientific publications.

In the period 1991-2004, fourteen major TTR cruises were conducted in the Mediterranean and Black Sea and in the northeastern Atlantic. Nine post-cruise conferences were held in:

Moscow (1993, 1996 and 2001), Amsterdam (1994 and 1997), Cardiff (1995), Gent (1998), Southampton (1999), Granada (2000). A number of other field exercises (including smaller cruises), group and individual training activities, and presentation and publication of the research results were carried out.

About 500 scientists and students have taken part in the cruises. They hailed from some 25 countries mostly scattered around the North Atlantic, Black Sea and Mediterranean regions, but some were from other regions (Latin America, Middle East, and Southeast Asia). TTR is open for co-operation to all those interested in break-through research and gaining new experience through training in multi-disciplinary science.

Activities

The main TTR work area is the deep-water part of continental margins. TTR uses large, well-equipped, marine geosciences research ships to do both leading edge research and provide training to young geoscientists. Five out of ten cruises in Mediterranean and Black Seas were carried out on board RV *Gelendzhik* and more recent work in the northeast Atlantic was carried out on board RV *Professor Logachev*, both ships belonging to the Ministry of Natural Resources of the Russian Federation.

The funding is ensured by preparing first-rate scientific proposals and making full use of the wide range of advanced equipment and the high standard of technical support provided on the ships. Long-term funds have come from the European Science Foundation and from the Intergovernmental Oceanographic Commission of UNESCO. Some of funding has come from sources that appreciate the fundamental science being done, some has been for hydrocarbon exploration and environmental studies in areas of projected offshore drilling, and some has been to support TTR training role.

Research

Since 1991, TTR has been actively involved into multi-disciplinary deep-sea geosciences studies. Apart from cruises, the research includes data processing in leading universities and laboratories of countries involved. The results of this work has appeared in more than 50 refereed papers in scientific journals including special issues of Marine Geology (#132, 1996) and Geo-Marine Letters (#18, 1998) and in nine comprehensive cruise reports published by UNESCO and its Intergovernmental Oceanographic Commission.

More information on this programme can be found at http://ioc.unesco.org/ttr/geninfo.html

ODINAFRICA Programme

The Ocean Data and Information Network for Africa (ODINAFRICA) brings together marine institutions from twenty-five Member States of the Intergovernmental Oceanographic Commission of UNESCO from Africa (Algeria, Angola, Benin, Cameroon, Comoros, Congo, Cote d'Ivoire, Egypt, Gabon, Ghana, Guinea, Kenya, Madagascar, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, Seychelles, South Africa, United Republic of Tanzania, Togo, and Tunisia).

The earlier phases of ODINAFRICA enabled the participating member states to get access to data available in other data centres worldwide, develop skills for manipulation of data and

preparation of data and information products, and develop infrastructure for archival, analysis and dissemination of the data and information products.

The goal of the current phase of ODINAFRICA will be to improve the management of coastal and marine resources and the environment in participating countries by: enhancing data flows into the national oceanographic data and information centres in the participating countries, strengthening the capacity of these centres to analyse and interpret the data so as to develop products required for integrated management of the coastal areas of Africa, and increase the delivery of services to end users.

The focus will be on preparing data and information products to enable the Member States to address the key issues identified in the African Process: (i) coastal erosion, (ii) management of key ecosystems and habitats, (iii) pollution, (iv) sustainable use of living resources, and (v) tourism. The government of Flanders, Belgium has provided US$2.5 million to support the implementation of ODINAFRICA-III. The following thematic work packages will be implemented to achieve the objectives of ODINAFRICA-III:

Coastal Ocean Observing System (GOOS) will focus on upgrading and expanding African network for *in-situ* measurements and monitoring of ocean variables (e.g. sea-level, temperature, salinity, currents, winds, etc), provision of near real-time observations of ocean variables, and building adequate capacity for collection, analysis and management of sea-state variables. About 15 tide stations will be installed or up-graded and some of them equipped with sensors for other meteorological and oceanographic parameters.

Data and Information Management will focus on: further development and strengthening of National Oceanographic Data Centres (NODC) to manage data streams from the coastal ocean observing network; upgrading infrastructure in the NODCs (including internet access and computer systems); integrating biogeography and hydrological data steams into NODC systems; building capacity for data and information managers for new National Oceanographic and Data Centres established as part of this project; and rescue of historical data (especially sea level data).

Product Development and end user communication and information delivery will focus on identification of end users of marine/coastal data/information products and their requirements, identification and development of set of core products to be prepared by each NODC, development of Regional and National Marine Atlases, improvement of atmospheric and oceanic monitoring databases, promotion and dissemination of outputs of the project to all stakeholders, and assessment of the impacts of products on the end-user.

More information on this programme can be found at http://ioc.unesco.org/odinafrica

Harmful Algal Bloom Programme

In view of the global interest in the problems of harmful phytoplankton, and the associated mass mortality of marine organisms, public health problems, and economic impacts expressed through various recommendations of major IOC scientific and regional subsidiary bodies the Sixteenth Session of the IOC Assembly, Paris March 1991, adopted Resolution XVI-4 concerning the formation of an Ad hoc **Intergovernmental Panel on Harmful Algal Blooms (IPHAB)**. The Panel was requested to identify resources for a sufficiently broad programme to solve some of the real problems caused by harmful algae.

The programme consists of three main elements: scientific, operational, and educational elements. Many IOC member States have confirmed the importance and urgency to adequately address HAB problem. The overall goal of the HAB Programme is:

> "to foster the effective management of, and scientific research on, harmful algal blooms in order to understand their causes, predict their occurrences, and mitigate their effects".

Elements and goals of the HAB Programme
Scientific programme elements

- Ecology and Oceanography: To understand the population dynamics of harmful algae.
- Taxonomy and Genetics: To establish the taxonomy and genetics of the causative organisms at the appropriate levels.
- Toxicology and Toxin Chemistry: To determine the physiological and biochemical mechanisms responsible for toxin production and accumulation, and to evaluate the effect of phycotoxins on living organisms.

Operational programme elements

- Resource Protection: To develop and improve methods to minimize the environmental and economic consequences of harmful algae.
- Monitoring: To promote and facilitate the development and implementation of appropriate monitoring programmes.
- Public Health and Seafood Safety: To protect public health and ensure seafood quality.

Educational programme elements

- Information Network: to develop, encourage and maintain the flow of information, technology and expertise to scientists, administrators and the general public
- Training and capacity-building: to promote and facilitate the development and implementation of appropriate training programmes in order to distribute the necessary knowledge and expertise on a global basis.

More information on this programme can be found at http://www.ioc.unesco.org/hab

Global Sea Level Observing System

In the mid-1980s, the IOC established the Global Sea Level Observing System (GLOSS). GLOSS was to improve the quantity and quality of sea level data provided to the data bank of the Permanent Service for Mean Sea Level (PSMSL, Liverpool, UK), and thereby, data for input to studies of long-term sea level change. It would also provide the key data needed for international research programmes, such as the World Ocean Circulation Experiment (WOCE) and later, the Climate Variability and Predictability Programme (CLIVAR), and the climate and coastal modules of the Global Ocean Observing System (GOOS).

GLOSS has developed into an international coordination mechanism for global high quality sea level observation together with important elements for (i) global data archiving facilities with QC of data; (ii) QC- and tidal prediction software; (iii) training courses on analysis and

uses of sea level observations; (iv) technical expert visits; (v) technical manuals and training material; (vi) special workshops on technical issues (i.e. How to operate a gauge in harsh ocean environments; new technical developments in sea and land level observations); (vii) provision of gauges; (viii) assistance with development of proposals for upgrade of tide gauge hardware.

Today GLOSS serves a multitude of users. Data from GLOSS designated stations are used by scientific researchers in oceanography, geophysics, coastal engineering, and climate change. For example, most researchers now accept that there is a threat to the coastal environment and infrastructure from sea level rise and GLOSS is required to monitor such level changes. GLOSS data are used extensively by the satellite altimetry community for calibration and joint analyses, and for the validation of operational numerical models. Some GLOSS station data are used in real time by port offices to enable safe navigation or assimilated into storm surge models and many GLOSS stations in the Pacific currently provide data to the Pacific Tsunami Warning Centre. Through recent participation in GODAE, it is anticipated that the use of GLOSS real-time data for data assimilation will increase.

Capacity Building activities

GLOSS activities now include a large number of regional projects and products, and a range of international training courses and materials. The Implementation Plan 1997 provides a review of activities.

Training on 'How to Operate a Tide Gauge' is available as part of the IOC Manuals available from the PSMSL training page, and a manual on 'How to Operate GPS at Gauge Sites' is planned. The present manuals are also available in CDROM form from the PSMSL.

Training courses and workshops on sea level measurement and interpretation have been held at least annually since 1983 covering tide gauge installation, maintenance and operation; data reduction of sea level observations; geodetic fixing of tide gauge benchmarks; uses of sea level data in scientific analysis and practical coastal applications; and data exchange. Since 1993, the emphasis has been given to the training in computer-based data analysis within HOTS (Hands On Training Sessions), and to the application of the results to studies of regional and local processes and for practical purposes.

Training courses/workshops have been held in the United Kingdom (annually 1983-1990 and 1997), China (1984), France (1990), Brazil (1993), India (1995), Argentina (1996), UK (1997), South Africa (1998), Brazil (1999), Saudi Arabia (2000), Chile (2003) and Malaysia (2004).

More information about the GLOSS programme is available at:
http://www.pol.ac.uk/psmsl/programmes/gloss.info.html

More information on PSMSL & GLOSS training material is available at:
http://www.pol.ac.uk/psmsl/training/

ANNEX IV

FRAMEWORK OF ACTIVITIES OF THE PROPOSED MERGED JCOMM/GOOS CAPACITY-BUILDING PANEL

The Joint JCOMM/GOOS CB panel will take a distinct regional approach, following JCOMM and I-GOOS, thereby enabling developing countries to participate in, benefit from and contribute to GOOS.

The Joint Panel will aim to:

1. *Raise abilities to participate in and benefit from GOOS*, for example through fundraising for resources, guiding infrastructure development, improving communication capabilities and encouraging mutual assistance.

2. *Facilitate the creation of baseline networks in critical areas*, for example through organising regional workshops, establishing registers of needs, priorities, and assets, coordinating support for regional partnerships and assessing effectiveness.

3. *Facilitate the creation of regional networks,* applying the ODIN (Ocean Data and Information Network) strategy, providing equipment, training and operational support in an integrated framework linking observations, data/information management and product/service development.

4. *Develop and maintain the scientific and technical capacity required for the implementation of GOOS,* for example through facilitating education and training across key action areas**,** technology transfer such as tool boxes and start-up packs, the design of pilot projects and the establishment of regional activity centres.

5. *Raise understanding and awareness of the value of observations and their benefits,* for example through communications and media liaison, electronic and hard-copy manuals and handbooks, outreach to educational establishments, lobbying policymakers, and recognising cultural and language diversity.

The key action areas for this framework of activities are:

- Infrastructure development
- Remote sensing capabilities
- *In situ* observations
- Models and forecasting systems
- Data and information management, exchange and delivery
- Product/service development

ANNEX V

LIST OF IOC PARTNERS IN CAPACITY-BUILDING

United Nations Organizations

UN Division for Ocean Affairs and the Law of the Sea (UN/DOALOS)
UN Oceans - members
United Nations Convention on the Law of the Sea (UNCLOS)
United Nations Environment Programme (UNEP)
UNEP-GRID Arendal
World Meteorological Organization (WMO)
United Nations University (UNU)
International Strategy for Disaster Reduction (ISDR)
United Nations Industrial Development Organisation (UNIDO)
Food and Agriculture Organization (FAO)
International Atomic Energy Agency (IAEA)

Other International Governmental Organizations (IGOs)

World Bank
Global Environment Facility (GEF), World Bank, UNEP, UNDP
South Pacific Applied Geoscience Commission (SOPAC)
IOC Sub-Commissions and Regional Committees: IOCARIBE, WESTPAC, IOCWIO, IOCEA, IOCINDIO, ODINAFRICA, ODINCARSA,
Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM)
Committee on Space Research (COSPAR)
Pan Ocean Remote Sensing Conference Association (PORSEC)
Global Ocean Data Assimilation Experiment (GODAE)
Committee on Earth Observing Satellites (CEOS)

Non-Governmental Organizations

Partnership for Observation of the Global Ocean (POGO)
Global Forum on Oceans, Coasts, and Islands
International Council for Science (ICSU)
Scientific Committee on Ocean Research (SCOR)
International Ocean Institute (IOC)

Others

Scripps Institute of Oceanography (US)
IFREMER (France)
Southampton Proudman Lab (UK)
Network of UNESCO and UNI-TWIN Chairs
UNESCO network Institutes, Centres and Field Offices
Committee on Earth Observation Satellites
Committee on Space Research
Scientific Committee on Oceanic Research
NAUSICAA (France)
Australian Bureau of Meteorology (BOM)

ANNEX VI

BACKGROUND MATERIAL REFERENCES

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ANNEX VII

LIST OF ACRONYMS

ABE-LOS	Advisory Body of Experts on Law of the Sea [IOC of UNESCO: IOC/]
APN	Asia Pacific Network
CGCB	Consultative Group on Capacity-Building
CEOS	Committee on Earth Observation Satellites
COOP	Coastal Ocean Observations Panel
COSPAR	Committee on Space Research
ESA	European Space Agency
GEF	Global Environmental Facility
GEOSS	Group on Earth Observations System of Systems
GIS	Geographical Information System
GLOSS	Global Sea-Level Observing System
GMA	Global Marine Assessment
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GRA	GOOS Regional Alliance
GRID	Global Resource Information Database
HAB	Harmful Algal Bloom
ICSU	International Council for Science
ICTP	International Centre for Theoretical Physics
IGOS	Integrated Global Observing Strategy
IHDP	International Human Dimension Programme
IHO	International Hydrographic Organization
IOC	Intergovernmental Oceanographic Commission of UNESCO
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCCG	International Ocean Colour Coordination Group
IODE	International Ocean Data and information Exchange
IOI	International Ocean Institute
ISA	International Seabed Authority
ISDR	International Strategy for Disaster Reduction
ICG/ITSU	International Coordination Group for the Tsunami Warning System in the Pacific (IOC)
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
NGO	Non-Governmental Organizations
ODIN	Ocean Data and Information Network
ODINAFRICA	Ocean Data and Information Network for Africa
ODINCARSA	Ocean Data and Information Network for Caribbean and South America
PACSICOM	Pan-African Conference on Sustainable Integrated Coastal Management
POGO	Partnership for Observation of the Global Oceans
RBM	Results Based Management
SCOR	Scientific Committee on Oceanic Research
TEMA	Training, Education, and Mutual Assistance
TTR	Training Through Research
UN	United Nations

UNCLOS	United Nations Convention on Law of the Sea
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNU	United Nations University
VCP	Voluntary Cooperation Programme
WAPMERR	World Agency of Planetary Monitoring and Earthquake Risk Reduction
WCRP	World Climate Research Programme
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development
WWW	World Weather Watch