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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

(of Unesco)

Working Committee for Training, Education and Mutual Assistance in the marine sciences (TEMA)

Third Session, Buenos Aires, Argentina, 21-26 April 1980

SUMMARY OF PROJECT PROPOSALS ON MARINE SCIENCE AND RELATED ASPECTS FOR EXTRABUDGETARY FUNDING

This document contains short summaries of proposals aimed at strengthening infrastructure in marine science and technology in developing Member States and also to assist them in participating in the programmes of the Commission. The projects are expected to contribute to other co-operative activities including marine research network at sub-regional and inter-regional levles. The proposals are presented in brief outline, giving objectives, background and status which are based on recommendations adopted by various workshops and subsidiary bodies of the Commission. The document is intended for receiving guidance from the Working Committee for TEMA on the approach and strategy for implementing those projects in future. The Committee is also requested to make appropriate recommendation for these projects to be funded under UNDP and/or Interim Fund created by UNCSTD. Detailed porjects, if approved, will be developed for final submission to funding agencies as soon as the assessment of the needs of the Member States for each project is made.

(SC-80/CONF.210/COL.9)

INTRODUCTION

1. This document contains short summaries of project proposals for strengthening national capabilities of Member States in the field of marine science and associated aspects and to facilitate their participation in the programme of the Commission, or in those being promoted by the Division of Marine Sciences of Unesco.

2. The proposals formulated by the IOC Secretariat took into account the general guidance received from the governing and subsidiary bodies of the Commission, recommendations of regional co-operative programmes and workshops, as well as other appropriate sources of advice including consultation with Member States participating within the framework of TEMA. The proposals being submitted by the IOC Secretariat are at different levels of development. Some are of a preliminary and indicative nature (e.g. on CINCWIO) while others (e.g. on WESTPAC, IOCARIBE, Pollution Studies in the South-west Pacific and Information and data exchange as part of the "El Niño" programmes) are in the process of being developed and a few others (e.g. the Investigation of "El Niño" and "Tsunami Warning System in the Pacific"), which are based on well-defined operational scientific plans, have either reached the stage of submission or are already under active negotiation with funding agencies such as UNDP. Also included are the projects promoted by the Division of Marine Sciences which have already been funded for preparatory phases and have been approved in principle, e.g. "Regional Project for Research and Training of Coastal Ecosystems of Latin America and the Caribbean and its Relation with Offshore Waters", "Training and Research Pilot Programme on the Mangrove Ecosystem of Asia and Oceanica" and "Development of Marine Science and Technology in Africa".

3. The proposals summarized in this document are relevant to projects of a regional nature which contemplate, beside supporting activities and services of common interest, training, education including components aimed at developing and strengthening national institutions engaged in marine research and education and other infrastructure support.

The Committe, on the basis of information provided in this document, as well as other pertinent information available, in other documents, and the objectives defined for the future activities in training, education and mutual assistance in the marine sciences, is invited to define the general elements of strategy for the promotion and implementation of projects to be executed by Unesco or other ICSPRO agencies, alone or jointly, as appropriate, and for which the Commission could provide the forum for consultations among the States concerned and the donor agencies, as well as for co-ordination and follow up.

INTERIM FUND (UNCSTD) - CONSOLIDATION OF SUGGESTED PROJECTS

Unit IOC

IOC Project I

Tentative title Sub-regional project on the monitoring and exchange of information on marine pollution in the South-west Atlantic

Objective; country(ies) Promote regional co-operation in marine pollution research and monitoring between Argentina, Brazil and Uruguay.

National ☐
Sub-regional ☒
Regional ☐
Interregional ☐

Brief justification and/or background and/or reference to connected activities

An IOC International Workshop on Marine Pollution in the South-west Atlantic will be held in Montevideo 28 April - 2 May 1980; it would provide a basis for the planning of the proposed project. This project would fall within the IOC's Global Investigations of Pollution in the Marine Environment (GIPME).

Nature of project activities envisaged; project components

Studies of sources, pathways and distribution of marine pollutants; effects on living resources and amenities.

Possible involvement of Unesco and of other parties

-UNESCO: IOC Working Committee for GIPEM; GIPME Group of Experts on Methods, Standards and and Intercalibration

-National institutions: As nominated by Member States of the region

-Regional inst. or orgs.:

-NGOs or other:

Budget estimate, or order of magnitude of funds required from:

Interim Fund $700,000 ; other sources (specify)

Total duration (estimate) 5 yr **Preparatory period, if any** 2 yr **Implementation** 3 yr

Status of preparation

Nil

Focal point in country(ies)

Cap. de Fragata José Luis Buscaglia (Argentina)
Comandante Hugo Bernardi Jr. (Brazil)
Cap. de Fragata Hugo Lluberas (Uruguay)

Possible follow up (a project, if activity described above is only preparatory)

Establishment of a quasi-permanent marine pollution monitoring system in the region.

Other information not covered above

INTERIM FUND (UNCSTD) - CONSOLIDATION OF SUGGESTED PROJECTS

Unit IOC

IOC Project II

Tentative title Tsunami Warning System in the Pacific (ITSU)

Objective; country(ies) To enable the system to detect tsunamis within one hour allowing early warnings

- National ☐
- Sub-regional ☐
- Regional ☒
- Interregional ☐

Brief justification and/or background and/or reference to connected activities

Connected to the activities of the IOC International Co-ordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU)

Nature of project activities envisaged; project components

- Establishment of sufficiently dense network of automated tide gauges
- Improvement of the communication system
- Training of personnel
- Maintenance of the system

Possible involvement of Unesco and of other parties

-UNESCO: IOC through ICG/ITSU

-National institutions: Several institutions in ICG/ITSU Member States

-Regional inst. or orgs.:

-NGOs or other:

Budget estimate, or order of magnitude of funds required from:

Interim Fund $ 3 millions ; other sources (specify)

Total duration (estimate) Preparatory period, if any Implementation 3 yrs.

Status of preparation

Matter will be elaborated at 7th ICG/ITSU session, in Chile, March 1980

Focal point in country(ies)

IOC/ITSU contact points

Possible follow up (a project, if activity described above is only preparatory)

The improved warning system will continue to be handled by the Pacific Tsunami Warning Center in Honolulu

Other information not covered above

INTERIM FUND (UNCSTD) - CONSOLIDATION OF SUGGESTED PROJECTS

Unit IOC
IOC Project III

Tentative title Information and Data Exchange System for Regional and Extra-regional Co-operation in the Investigation of the phenomenon "El Niño"

Objective; country(ies) To develop appropriate infrastructure and human resources so that a regional information and data exchange system can be established to strengthen and co-ordinate the dissemination of multidisciplinary scientific, technical and economic information related to the understanding, forecasting and assessment of "El Niño" events (Chile, Colombia, Ecuador and Peru)

National ☐
Sub-regional ☐
Regional ☒
Interregional ☐

Brief justification and/or background and/or reference to connected activities

Understanding of the phenomenon "El Niño" is essential to the development of regional fisheries and to climatic forecasting, both of which have considerable impact on the local economies. In view of the diverse disciplines involved and the large number of institutions (many outside the region) where data and information are stored, a concerted effort in information management is mandatory to the success of the basic research endeavour which is being strongly supported by the countries concerned

Nature of project activities envisaged; project components

- Establishment within each co-operating research institute of a data and information component, which together will form a regional network.
- Formulation of specialized personnel through regional seminars and training abroad in marine science information centres.
- Provision of equipment and specialized literature services, including purchase of books, documentation materials, computerized literature searches, etc.
- Expert advice, through joint IOC-FAO-UN(OETB) panel of experts on ASFIS (Aquatic Sciences and Fisheries Information System), to ensure compatibility with international information concepts and co-ordination with PGI.

Possible involvement of Unesco and of other parties

-UNESCO: through IOC and PGI

-National institutions: Yes

-Regional inst. or orgs.: Yes, Comisión Permanente del Pacífico Sur

-NGOs or other: Yes, especially FAO, WMO and UN (OETB)

Budget estimate, or order of magnitude of funds required from:

Interim Fund $ 1.4 million ; other sources (specify) IOC Trust Fund

Total duration (estimate) 3 yr. **Preparatory period, if any** **Implementation** 1980-82

Status of preparation

Detailed plan would be responsibility of ASFIS survey team as first phase of project

Focal point in country(ies)

CONA: Chile
IMARPE: Peru
INOCAR: Ecuador
CCO: Colombia

Possible follow up (a project, if activity described above is only preparatory)

Other information not covered above

This proposal was strongly endorsed by the IOC Assembly in its eleventh session (15 October - 3 November 1979). This programme has strong socio-economic implications.

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INTERIM FUND (UNCSTD) - CONSOLIDATION OF SUGGESTED PROJECTS

Unit IOC
IOC Project IV

Tentative title WESTPAC (IOC) Ocean Science Programmes of the Western Pacific

Objective; country(ies) The objective is to strengthen the marine sciences and technology infrastructure and activities in the Western Pacific region. Particular emphasize to be given to increase the role of the developing countries, such as those of ASEAN, therein.

National ☐
Sub-regional ☐
Regional ☒
Interregional ☐

Brief justification and/or background and/or reference to connected activities
Increasing populations along the relatively long coast lines of the countries in the Western Pacific are indicative for the stronger demands upon the marine and coastal environment and related resources in the region. Their transnational character calls for a coherent regional approach with respect to research, management, and protective activities. Priorities in this respect were adopted during the first session of the IOC Working Group for the Western Pacific, held at Tokyo in February 1979.

Nature of project activities envisaged; project components The initial programme of WESTPAC activities concern: developing a marine pollution research and monitoring programme using commercially exploited shellfish as determinants; coastal transport of pollutants; developing an overall monitoring programme for the Western Pacific; marine geoscience problems of the Northwest Pacific; and geology, geophysics and mineral resources of the South Pacific. Training, education and mutual assistance (TEMA) will form a significant component in all these activities. For programme co-ordination two full-time professionals are required to work with the elected WESTPAC Chairman and Technical correspondents.

Possible involvement of Unesco and of other parties

-UNESCO: Executing Agency through its Intergovernmental Oceanographic Commission (IOC)

-National institutions: Marine Research Institutes; University Faculties; Hydrography and Geology Departments;

-Regional inst. or orgs.: Indo-Pacific Fisheries Council of FAO; CCOP/SOPAC of ESCAP; UNEP Regional Seas Activity Center;

-NGOs or other: Association of South Asian Nations (ASEAN)

Budget estimate, or order of magnitude of funds required from:
US 1,600,000
Interim Fund (US$400,000 per year) ; other sources (specify) shiptime; scientists' staff time; laboratory and training facilities from participating countries (US $ 3 million)

Total duration (estimate) 4 yrs. **Preparatory period, if any** **Implementation** 1980-84

Status of preparation
Identified projects resulted from the fourth CSK Symposium; the WESTPAC Workshop and the first WESTPAC session (Tokyo, February 1979). Final preparations will be done by two Task Teams, and during three workshops, two of which will be held at Tokyo in March and one at Noumea in October 1980.

Focal point in country(ies)
National Committees on Oceanography

Possible follow up (a project, if activity described above is only preparatory)
The presently described projects from the initial WESTPAC programme as identified by the participating countries. Progress will be evaluated by the second session of WESTPAC schedule for the first half of 1981. Follow-up will likewise be discussed at that meeting as well as during subsequent WESTPAC sessions.

Other information not covered above
Ideally the two full-time professionals should be located in the region, and preferably at Jakarta to allow continuous close consultation with the Chairman of WESTPAC, and to profit from the long-standing involvement of the Unesco Regional Office for Science and Technology in marine sciences and technology development activities in the region.

INTERIM FUND (UNCSTD) - CONSOLIDATION OF SUGGESTED PROJECTS

Unit IOC

IOC Project V

Tentative title Marine Scientific Programmes in support of Fisheries Projects in the Caribbean

Objective; country(ies)

More proper development and management of certain fisheries in the Caribbean

National ☐
Sub-regional ☐
Regional ☒
Interregional ☐

Brief justification and/or background and/or reference to connected activities

Connected to the activities of the IOC Association for the Caribbean and Adjacent Regions (IOCARIBE)

Nature of project activities envisaged; project components

- Research in support of the "pot fishery" in the Lesser Antilles
- Central American Spiny Lobster study

Possible involvement of Unesco and of other parties

-UNESCO: through IOCARIBE

-National institutions: Several institutions in IOCARIBE Member States

-Regional inst. or orgs.:

-NGOs or other:

Budget estimate, or order of magnitude of funds required from:

Interim Fund US $ 1.2 million ; other sources (specify)

Total duration (estimate) Preparatory period, if any Implementation 3 yers.

Status of preparation

Some preparatory work has already been carried out within IOCARIBE

Focal point in country(ies)

IOCARIBE National Associates

Possible follow up (a project, if activity described above is only preparatory)

Permanent supervision through IOCARIBE

Other information not covered above

INTERIM FUND (UNCSTD) - CONSOLIDATION OF SUGGESTED PROJECTS

UNIT IOC
IOC Project VI

Tentative title Regional project on Co-operative Investigations in Oceanography and Living Resources in the North and Central Western Indian Ocean Region (CINCWIO)

Objective; country(ies) To develop and strengthen infrastructure and manpower in marine sciences and technology of the countries participating in the programme: Kenya, Madagascar, Mauritius, Seychelles, Somalia, Tanzania, and la Réunion (France)

National ☐
Sub-regional ☐
Regional ☒
Interregional ☐

Brief justification and/or background and/or reference to connected activities

There is evidence that variations in the temporal concentrations and spatial distribution of the living resources (especially fish) in the area may be influenced by variations in the circulation and upwelling processes. At the request of the countries of the region, by resolution VIII-16, IOC convened a scientific workshop (Nairobi, Kenya, 25 March - 2 April 1976) which drew up a programme of research, the greater part of which was adopted by the countries of the region in a meeting in Nairobi, 5-9 March 1979. At its eleventh session, the IOC Assembly by res. XI-9 approved the adopted programme.

Nature of project activities envisaged; project components In support of fisheries development and management in the area, the project will focus on: support to ensure running and maintenance of available research vessels; support in equipping present marine science laboratories and libraries; strengthening of marine science teaching capabilities of national universities up to M.Sc. level; regular monitoring of important oceanographic and biomass parameters during fishing cruises; assistance in establishing Regional Oceanographic Support Centre to provide facilities for regional comparative analysis of data, repair and inter-calibration of equipment, regional training of technicians, regional data centre/reference library and/or marine museum.

Possible involvement of Unesco and of other parties

-UNESCO: Through Intergovernmental Oceanographic Commission

-National institutions: Marine Science and Fisheries Institutions/Organizations in participating countries

-Regional inst. or orgs.: Regional Oceanographic Support Centre, as soon as this is established

-NGOs or other: There is a possibility that countries outside the region may participate in the project.

Budget estimate, or order of magnitude of funds required from:

Interim Fund	Over $2 million; actual amount to be stipulated later; other sources (specify)	From national sources of participating countries

Total duration (estimate) 1980-84 — **Preparatory period, if any** — **Implementation**

Status of preparation Subject to the working condition of available research vessels in the region, the countries already collect some oceanographic and biomass/recruitment data during their fish stock assessment cruises; by res. XI-9, IOC decided to from a Technical Advisory Group and a Programme Group for the programme, which are being constitututed, to provide scientific advice, and guidance on co-ordination of the programme at the regional level.

Focal point in country(ies) Mombasa (Kenya), Nosy be (Madagascar), Port Louis (Mauritius), Mahe (Seychelles), Mogadiscio (Somalia), Zanzibar (Tanzania), la Réunion.

Possible follow up (a project, if activity described above is only preparatory)

Subject to posting of a marine science expert to ROSTA, (Nairobi, Kenya), the programme will be co-ordinated through him by the Programme Group with the scientific advice of the relevant IOC Advisory Bodies.

Other information not covered above

REGIONAL PROJECT FOR RESEARCH AND TRAINING OF COASTAL ECOSYSTEMS OF LATIN AMERICA AND THE CARIBBEAN AND ITS RELATIONS WITH OFF-SHORE WATERS

This proposal has grown out of, and is intended to form part and be the following-up of the Unesco Major Regional Projects and sponsored activities on the coastal zones of the various regions of the world, including emphasis on coastal lagoons, estuaries, deltas, coral reefs and wetlands, as well as mangroves, and the relations with off-shore waters. Although the project concerns both South America and the Caribbean, each of the sub-regions will be identified in the project, owing to their national and socio-economic characteristics, including differences in existing research and management infrastructure.

I. Objectives

To establish a co-operative framework for training and postgraduate research in view of increasing the number and the level of qualification of the scientists concerned with the study of the various systems of the coastal zone environment, its relations with off-shore waters, and related resources.

In the meantime, to establish the basis for the formulation, training of administrators and implementation of sound and effective management with a view to maximize sustained economic benefits from the coastal and off-shore environment. The project foresees the establishment of a consolidated network of training and research programmes and projects on the coastal zone and off-shore waters in the Central and Latin American regions.

1. Make available a synthesis of the state of knowledge and guidelines for future research on the distribution, structure and functioning of the coastal zone and off-shore environments, resources potential and human impact and utilization. (From Unesco programme for the study and development of the coastal zone and off-shore waters, in collaboration with the International Scientific Community).

2. Enquiry about the status of advancement of marine and coastal sciences in Latin and Central America.

3. Create a regional infrastructure, as a basic mechanism for the planning and implementation of a regional co-operation towards the improving of the post-graduate training and research in the coastal zone and off-shore environment.

4. Formulate and implement an integrated programme of training on the multidisciplinary aspects of the coastal zone and off-shore environment from a broad descriptive and ecological approach to a gradually more specialized post-graduate research activity, with support of handbooks and guidelines for future scientific research and management policies, produced or currently prepared by Unesco, in particular concerning the mangrove, coastal lagoons, estuaries and coral reefs environment.

5. Organize seminars and workshops on specialized subjects with a view to defining research and training priorities, to enlarge the audience at the regional level, and to promote reflexion with a view to improve the training and research programmes in the light of the requirements for research and management policies of the participating countries.

6. Promote public information on the characteristics, values, damages, alternative utilization, protection measures, etc. concerning the coastal zone environments and its relations to off-shore waters.

II. Background

The coastal zone is born of the intermingling of the sea and the water from the land mass.

The term "estuary", "delta", "lagoons," and "wetlands" are generally used to designate littoral infilling formations which owe their originality to very specific hydrodynamic sedimentation conditions. These areas provide "non renewable" resources, such as sand, gravel, heavy minerals, peat, diatomites and oil, and "renewable" live resources.

Natural ecological systems sheltered by coastal laggons, deltas and estuaries, such as marshes, brackish and hypersaline pools and tropical mangrove, are among the most productive ecosystems of the biosphere. Their vulnerability, however, is on a part with their potential. They are particularly vulnerable to over-exploitation of their resources, which alters the balance of the ecosystems, and exposed to the aggressive pollution of urban, industrial and agricultural wastes, and similar. Lagoons, deltas, estuaries and their marshes and mangroves are subject to constant natural changes. Where human action adds to and combines with the phenomena inherent in the natural variability of the habitat, the outcome may be beneficial in some instances, catastrophic in others, but it is almost always unpredictable, since the factors involved are not understood in sufficient depth.

Projects for safeguarding and developing these unique coastal systems are prompted by awareness of the urgency of the problem. They must take account of threats of the biological equilibrium and, more specifically, of the following three fundamental acts:

1. The vulnerability of the environment to attacks originating in the activities of societies that are already industrialized or in the process of industrialization.

2. The utility of coastal environment for the harmonious development and continuance of human groups.

3. The uninterrupted and rapid growth of the elements forming an "aggressive mass".

The research and training activities of the scientific project under discussion will benefit from regular inputs from the following working groups:

SCOR*/Unesco WG 46 on "river inputs in the ocean systems"

SCOR/Unesco WG 57 on "coastal and estuarine regimes"

SCOR/Unesco WG 60 on "mangrove ecosystems"

SCOR/IABO**/Unesco WG 65 on "coastal off-shore ecosystems relationships".

Consultative Committee on the Coastal Zone of Unesco (D.M.S.)

These Working Groups started out defining the conceptual framework for integrated research and reaching programmes, and have gone on to highlight the strong points and shortcoming of the current state of knowledge in a series of specialized reports and manuals. Among these the following review-books can be cited:

"Biogeochemistry of estuarine sediments" (Proceedings of a Unesco/SCOR Workshop, Unesco, Paris, 1978).

"Coastal lagoon survey" (Unesco, in press).

"Coastal lagoons research: present and future I (guidelines) and II (proceedings) (Unesco/IABO Seminar, Unesco, Paris, in press).

"Methodological Handbook on Mangroves" (Unesco, Paris, in preparation).

"Bibliography on mangroves" (Unesco, Paris, in press).

"Coastal lagoon survey. Results of a world-wide enquiry made by the SCOR/Unesco Advisory Panel on Coastal Lagoons" (1976-1978/Unesco Paris, in press).

III. Status

The project is under preparation in Unesco for submission to the countries of the region.

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* SCOR: Scientific Committee on Oceanic Research.

** IABO: International Association of Biological Oceanography.

UNESCO'S DIVISION OF MARINE SCIENCE REGIONAL PROGRAMME FOR THE STUDY AND DEVELOPMENT OF THE COASTAL ZONE

Unesco/UNDP Project on:

Training and Research Pilot Programme on the Mangrove Ecosystem of Asia and Oceania

This project constitutes an integrated interdisciplinary regional training and research programme on the mangrove ecosystem for Asia and Oceania.

I. Objective

To study and provide training on the nature and functioning of the mangrove ecosystems and to formulate sound and effective management schemes with a view to maximize sustained economic benefits from these systems. This will consist of:

1. Prepare a synthesis of the state of knowledge on the types, structure and functioning of the mangrove ecosystems and their relationship to the coastal regime. (Currently undertaken by Unesco in co-operation with the International Scientific Community).

2. Undertake regular surveys and inventories of the typology, size, distribution and state of preservation or deterioration of the mangrove areas.

3. Identify scientific topics of prior importance for the understanding of the mangrove ecosystems and formulate detailed research projects for implementation combined with introductory and postgraduate training. In particular:

   a) make an integrated ecological study of the mangrove ecosystem and its different compartments as they relate to each other. Being an open system, make an evaluation of the material and energy imported and exported.

   b) For the different types of mangrove environments, study the factors responsible for the ground substratum and water levels influencing the salt balance, in particular:

      - the geology, geomorphology and sedimentation processes as related to the erosion and accretion.

      - the water regime, including the freshwater run-off and tidal flooding, as well as the climatic conditions.

   c) Study of the productivity of the mangrove ecosystem, including nutrients imported and organic material exported; study of the decomposition of the organic material, including through detrital-based food webs as food supply for juveniles and adults of species with life cycles inshore or extending into offshore waters.

   d) Ecophysiological study of the mechanism of adaptation of plant and animal species to the mangrove environmental conditions.

4. Survey, compile and exchange data on the human and economic resources of the mangrove environment and on the impact of human activities on the mangrove ecosystem, and formulate managerial policies to guide and control the socio-economic implantation and utilization. In particular:

   a) Assess the size and movement of human populations living in and of populations depending on the mangrove enviornment. Domestic and commercial economies of the mangrove zone.

   b) Make qualitative and quantitative appraisal of human-induced stress of the mangrove ecosystem, including exploitation of timber, charcoal, firewood, reclamation for sifh pond, aquaculture and industrial settlements, and pollution from urban wastes, industries and agricultural plans. Potential or observed effect on human health of major modifications introduced in the mangrove environment by human practices from inside or outside the environment.

   c) Establish guidelines for management plans for mangrove environment, considering possible alternative and multiple uses.

   d) Socio-economic and ecological functions of the mangrove environment. Managerial policies and practices in mangrove environment.

   e) Public information on mangrove ecosystem, and mangrove environment resources and managerial policies.

II. Background Information

The mangrove ecosystem, a dominant flora and fauna association on the tropical sheltered and estuarine shores, covers a major portion of the world's tropical and sub-tropical coastline. Mangrove forests reach their maximum development in Southeast Asia and in the Indo-Western Pacific region.

People of Southeast Asia have depended on mangrove trees for many purposes such as firewood, charcoal, timber, protection against tidal bores or cyclones, etc. The significance of the mangrove infishery production has also been recognized. Rapidly increasing population has led to the extensive clearing of such areas for industrial and urban expansion and agriculture, to extensive logging for charcoal production and firewood, to pollution or excessive siltation from agricultural or industrial activities upstream, and to destruction from tin mining. The potential of mangrove areas for aquaculture is gaining attention in Asia and Southeast Asia owing to the increasing demand for protein food sources and the declining yield of marine fisheries. Therefore, understanding of mangrove ecosystem is necessary for the best management so that the optimum economic values can be obtained on a long term basis without destroying ecosystems.

Mangroves are highly productive and they help to maintain the productivity of the nearshore ecosystem. Many major productive fishing grounds are adjacent to large mangrove swamps. The organisms that support these fisheries spend part of their lifecycles in the mangrove areas.

In January 1976, the 2nd Thai National Seminar on Mangrove Ecology was organized at the Phuket Marine Biological Centre (PMBC) by the National Research Council of Thailand with the support of Unesco and the Department of Fisheries and the Royal Forest Department of Thailand, to review needs and to recommend appropriate measures for developing a programme of research and management of the resources

of the mangrove ecosystem. The meeting included representatives and observers from Bangladesh, India, Malaysia, Papua New Guinea, Thailand, Michigan State Universiyt and Unesco Division of Marine Sciences. It was immediately followed by a meeting of the SCOR/Unesco ad hoc Advisory Panel on mangrove ecology, also at PMBC, to advise on a world-wise basis on guidelines for a detailed analysis of the scientific knowledge, gaps and priorities of the mangrove ecosystem research including managerial aspects. A SCOR/Unesco Working Group working on mangrove ecology was then established, with the terms of reference:

1. Produce a general scientific framework for mangrove ecosystem studies including research on structure, geographic range, and ecosystem dynamics.

1. To identify the subject content of a methodological handbook such as it would be required to carry out the programme identified in (1) above.

In December 1978, Unesco organized the Regional Seminar on Human Uses of Mangrove Environment and its management implications, in Dacca, Bangladesh. Among the recommendations, was the creation of a National Mangrove Committee (NATMANCOM) in these countries when it does not exist already.

III. Status

The Project will be implemented during the period 1980–1983. It will formally start with the first meeting of the National Mangrove Committees (NATMANCOMs) of the Region to be held in conjunction with the Asian Symposium on Mangrove Environment organized by Unesco, through its Regular Programme in Kuala Lumpur, 25–28 August 25–28 August 1980.

This project forms part of the Unesco Division of Marine Sciences Major Programme for the study and development of the coastal zone, including mangroves, coastal lagoons, estuaries, coral reefs, nearsline/offshore ecosystem relationships.

ECA/Unesco Project on Development of Marine Science and Technology in Africa

UNDP Project: RAF/78/024/A/01/51

INTRODUCTION

A. Development Objective

1. To enhance the capability of existing marine science institutions through the development of a regional and sub-regional programme of research and training in marine science and technology, with due regard being paid to the development of marine environmental services, shipping, coastal area development and the protection of marine environment.

2. To develop the ability of African countries in understanding and making use of their marine resources through regional and sub-regional co-operation based on active exchange in scientific and policy matters, and a continuous mechanism of contacts among scientists and decision-makers in African member states.

B. Immediate Objective

1. An up-to-date inventory of human resources, infrastructures and facilities, as well as national policies, on-going and planned programmes in marine science and technology available in East and West Africa, as a result of field missions to the following countries:

East: Sudan, Djibouti, Ethiopia, Somalia, Kenya, Tanzania, Mozambique, Madagascar and the Indian Ocean Islands.

West: Morocco, Mauritania, Senegal, the Gambia, Sierra Leone, Guinea-Bissau, Guinea, Gabon, Equatorial Guinea, Cape Verde, Sao Tome and Principe, Liberia, Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon, Congo, Zaire, Angola and Namibia.

2. A definition of the areas of priority of immediate concern to African countries in the fields of marine science and technology and marine environment as well as a comprehensive plan for the determination of a basis for a regional programme in this field, as a result of a marine science and technology workshop followed by an Intergovernmental Meeting.

3. In addition to achieving the long-term objective en enabling African countries to develop scientific and technological capabilities for the exploration and the exploitation of marine resources as well as for non-resources oriented activities such as shipping, coastal area development and the protection of the marine environment, the project is also exptected to:

(a) Assist in the process towards complementarity in co-operation and development;

(b) Promote technical co-operation between Africa and the other developing regions, which is one of the global economic goals established by the governing authorities of the United Nations Development Programme.

The project was conceived as the first activity to be jointly executed by ECA and Unesco under the co-operative arrangement programme recently worked out and signed by the two UN organization.

D. Activities

Description	Location	Time
1. A project co-ordinator will be appointed to assist in implementing the various stages of the Preparatory Assistance Phase of the project and eventually participate in one or two of the missions planned.	Addis Ababa	January 1980
2. A Working Group of African marine specialists as well as a few from other developing regions will be convened jointly by ECA and Unesco with the participation of UNEP, WMO and FAO to define the terms of reference, including the format of the mission report of the missions, as outlined in the immediate objective of this project document.	Addis Ababa	5-9 May 1980
3. A joint ECA/Unesco composed of three teams of African marine specialists assisted by ECA and Unesco Staff or consultants will make an up-to-date inventory of human resources, facilities available, and conduct discussions with government officials and marine specialists in African countries interested in Marine Science and submit a report.	Countries listed under immediate objectives	May-August 1980
4. A Marine Science and Technology Workshop jointly convened by ECA/Unesco with the participation of all interested UN bodies and other Agencies will discuss the outcome of the mission and advise on areas of priority and propose a detailed work plan for a second phase project to be executed jointly by ECA/Unesco.	Addis Ababa	January 1981
5. An intergovernmental meeting to which all interested UN bodies and other agencies will be invited will be requested to endorese the second phase project and its workplan and discuss further steps required to develop the interest of the African nations in exploration and rational exploitation of marine resources.	Addis Ababa	February 1981