

REPUBLIC OF LEBANON

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)



The Rehabilitation of

MARINE RESEARCH CENTRE
(MRC)

of the

National Council for Scientific Research
(NCSR)

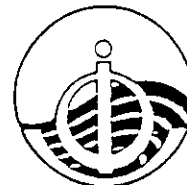
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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION



UNESCO

IOC

report on

The Rehabilitation of the

Marine Research Centre

of the

National Council for Scientific Research

Lebanon

By

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This document is the result of a UNESCO/IOC mission to Lebanon composed of Dr. Selim Morcos, Mr. David Medio with Dr. Hratch Kouyoumjian as national counterpart and co-author. The mission took place from 24 to 30 May 1992 and visited Beirut, Jouniah and Batroun. The report which is also based on results of meetings with officials of the Council for Development and Reconstruction (CDR), National Council for Scientific Research and staff of the Marine Research Centre (MRC) is a synthesis of the needs of MRC/NCSR.

The Rehabilitation of
MARINE RESEARCH CENTRE
(MRC)
of the
National Council for Scientific Research
(NCSR)
Lebanon

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The Rehabilitation of

MARINE RESEARCH CENTRE
(MRC)

of the

National Council for Scientific Research
(NCSR)

1. INTRODUCTION

The UNESCO/IOC mission to Lebanon, 24-30 May 1992, follows a request from the Lebanese National Council for Scientific Research in order to look into and assist in the rehabilitation of the Marine Research Centre of the National Council for Scientific Research (MRC/NCSR).

The mission followed-up also a request from the Minister of ^{National} Education addressed to UNESCO in order to look into marine activities in Lebanon in general, in the context of renewed interest to establish a maritime school in the partially constructed Batroun complex which could potentially house maritime as well as marine related activities in Lebanon.

Members of the mission, composed of Dr. Selim Morcos, Mr. David Medio, with Dr. Hratch Kouyoumjian as national counterpart and co-author, visited the Marine Research Centre, The Batroun site, and had extensive discussions with senior officials of the National Council for Development and Reconstruction, the National Council for Scientific Research and the staff of MRC. The mission also had discussions with representatives of French and Italian representations in Lebanon. The mission reviewed past activities of MRC, discussed and evaluated needs for rehabilitation and produced this document as a framework for a rehabilitation plan to be used by NCSR and MRC in future contacts with interested parties including UN Organizations, other governmental and non-governmental organizations as well as potential donors.

The term "Rehabilitation" used in this report follows the common usage in Lebanon, in particular the master plan of the Council for Development and Reconstruction (CDR) which is the government body officially responsible for the rehabilitation of Lebanon. The master plan of CDR comprises rehabilitation (3-5 yrs), recovery (5-8 yrs) and development phases (8 yrs).

Rehabilitation is therefore a short-term remedial plan to be followed by recovery and development phases. For this reason, the present document identifies the very essential needs after taking into consideration the priorities and limitations associated with this rehabilitation phase.

2. Historical Background

Very few studies were published on the Lebanese waters prior to the establishment of the Marine Research Centre in 1977. These were mainly due to personal initiatives and by visiting scientists. However, interest in marine sciences became more visible in the seventies and studies in this field were carried out mostly at private institutions such as the American University of Beirut and the Lebanese University. Few students worked towards advanced degrees in marine sciences, in make-shift laboratories provided by the Ministry of Agriculture in Jounieh. These studies for the most part were financed by NCSR and supported by UNESCO, UNEP and other UN Agencies, as well as the Ford Foundation. These Organizations enhanced these initiatives in marine research by providing financial support, advice and fellowships.

In 1977 the Marine Research Centre (MRC) was established by the Lebanese National Council for Scientific Research, when the critical minimum in scientifically trained manpower became available. Thus, temporary premises were acquired, a research vessel was repaired and co-ordinated studies initiated.

A UNESCO/UNDP project provided much of basic oceanographic equipment, fellowships as well as UNESCO experts in oceanographic disciplines and fish biology. The project continued to function until interrupted by the outbreak of hostilities.

Today, after many troubled years, the Centre has become a reality and an integral part of the Mediterranean Activity Centres, and as such is fully recognised by other Mediterranean Centres and by UN Agencies. On a local level, the Centre is in close collaboration with universities and other institutions involved in similar activities.

3 Personnel of MRC

Currently a team of 20 people (ANNEX I) is engaged in scientific studies and research. Senior staff engaged in full-time research consist almost exclusively of NCSR fellows who have returned back to Lebanon after having obtained higher degrees in marine sciences and related fields abroad.

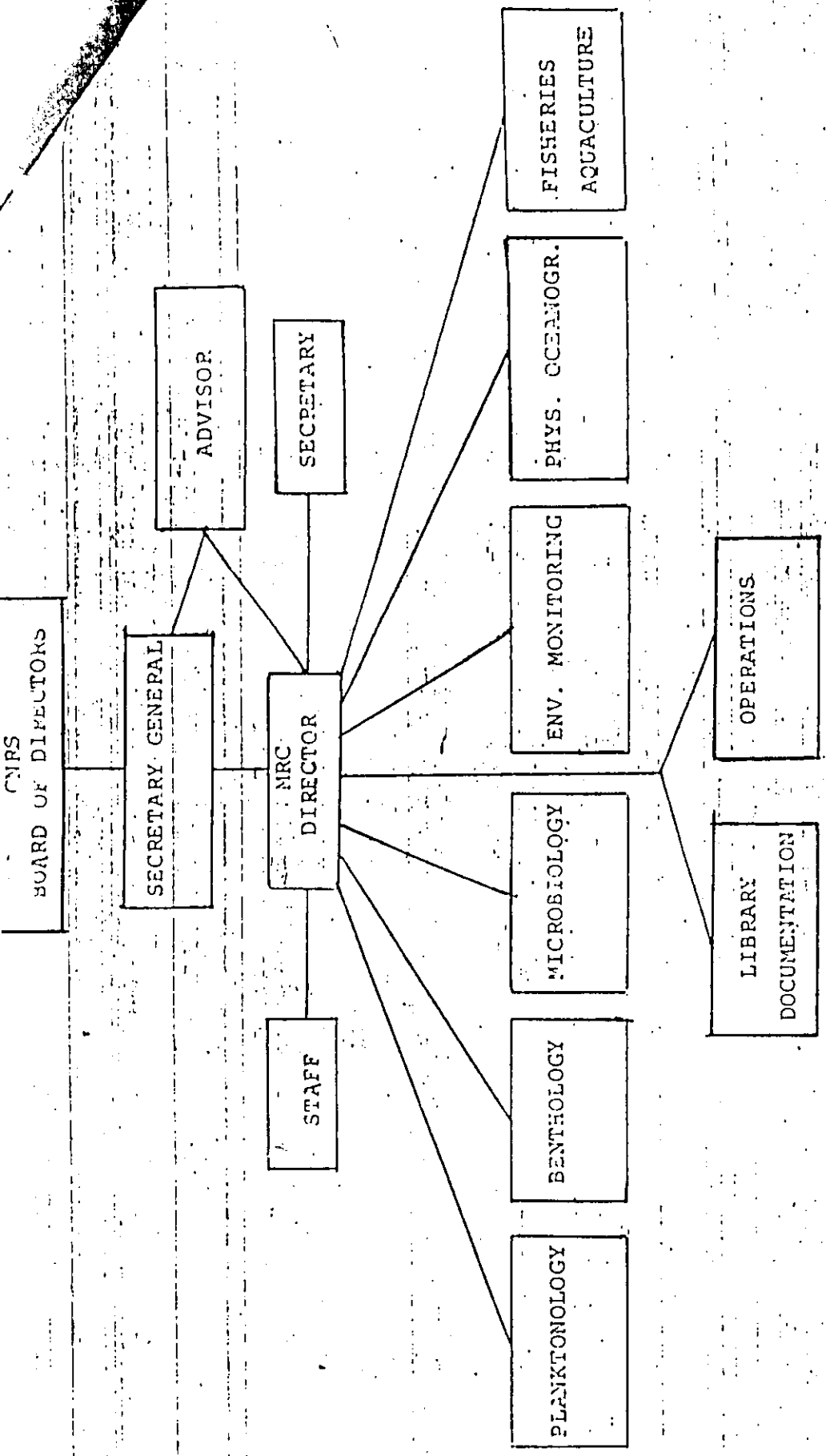
Many staff members are also engaged - part time, in University teaching, and play active roles in environment oriented activities and Mediterranean regional programmes.

Staff members have about 50 scientific publications to their credit and have also participated during the past years in numerous international meetings and conferences in different capacities as trainees, experts and advisors.

4. Organization and Budget of MRC

The Marine Research Centre is established and financed by the National Council for Scientific Research, and is an integral part of its activities in the fields of development, planning and initiation of research oriented activities. The Director of the Centre administers and co-ordinates research activities through the relevant Scientific Advisor in the Office of the Secretary-General.

Figure 1 gives the organizational chart of the Centre, which comprises six operational divisions: Planktology, Benthology, Microbiology, Environmental Monitoring, Physical Oceanography and Fisheries Aquaculture. These divisions stem from the major interests of staff. They are not rigid entities and are for



convenience only. Although there is considerable interaction between these units, each unit is encouraged to be semi-independent in order to encourage initiative and academic competition.

The budget is voted annually and for 1982 it was just over one million Lebanese Pounds (about 300,000 U.S. Dollars). About two-thirds of the overall budget goes towards salaries and the rest for research and administration. The 1992 budget, however, is only 25,000 U.S. Dollars.

5. Premises and Facilities

The present premises comprise a working area of approximately 225 square meters. The Centre occupies the first floor of a block of buildings in Jounieh, not far from the coast. The home port of the research vessel SITA III is the Naval Base at Jounieh. Unfortunately, the vessel is presently unoperational.

The Centre is equipped to undertake basic studies and research in marine sciences. ANNEX II lists all major equipment available. Additionally, the Staff enjoy the facilities of the Computer Centre and the Documentation Unit of the NCSR. During the past troubled years, the Centre had its own share of damage - windows were broken, some equipment damaged and lost, irreparable damage to the research vessel, etc.

6. Present Capabilities and Policies of MRC

It is encouraging to see that, after 16 very difficult years, the Centre continues to operate thanks mostly to the concerted efforts of the NCSR and members of the Staff, who established and supported it and gave to it continuity of purpose and objectives.

The civil war undoubtedly has left its scars, but these could all be explained if examined in relation to the situation of the country as a whole. The members of the mission were greatly impressed by the resilience and spirit of cohesion of the staff.

Lebanon, a developing country and a country emerging from civil war, has imposed its specific guidelines and priorities. Thus far, applied research has been stressed and a major emphasis has been placed in organising a scientific infrastructure and in acquiring basic expertise in this and related fields.

twelve
Current research programmes in MRC are given with some details in ANNEX III which lists 12 research projects, giving names of responsible staff members, title and summary of each project. The projects are mostly oriented towards applied aspects, emphasizing the themes of marine environment and coastal area management. Several projects deal with monitoring selected metals and chlorinated hydrocarbons in fish, nutrients in coastal waters and its bacteriological quality, floating litter along the Lebanese shore line, contingency plan against accidental oil pollution and study of local fish fillet and market survey in preparation of an aquaculture programme. On the other hand, several projects deal with oceanographic and marine biological problems closely related to living and non-living resources of the sea, such as currents, benthic population/ ichtyeplankton, phytoplankton, primary production and biomass, communities in the Lebanese coastal waters.

and dynamics of phytoplankton

eutrophication,

teen
The mission met with most of the MRC scientists engaged in the above studies, and we wish to commend the determination, ~~tolerance~~ *patience* and co-operation among its staff members against a background of difficult daily life and scarcity of equipment and scientific supplies. The continuity of this research institution over 16 very difficult years, deserves great respect. It is, on the other hand, a convincing evidence to UN Organizations and donor institutions, that even a small investment in this institution will have good return that may exceed the modest objective of "rehabilitation".

Over the years MRC staff acquired basic knowledge mainly of the Lebanese waters and shores. In addition, MRC is able, with some assistance, to provide expertise and services to Lebanon, neighbouring countries, and to enter into bilateral and regional programmes that require specific capabilities such as:

- Analysis of chlorinated hydrocarbons and PCB's in water and biological materials.

- Analysis of metals in water and biological materials.
- Microbiological and chemical analysis of water.
- Sediment studies (granulometry, porosity, permeability, etc.).
- Studies of water circulation and currents.
- Expertise in planktonology.
- Expertise in marine science technology transfer to the developing ~~world.~~ *Countries.*

This expertise is backed up by modest laboratory facilities, a specialised library and documentation in marine sciences and a small collection of local marine fauna and flora.

A major obstacle for studies in the Lebanese waters is the loss of the survey research boat. In order to continue the monitoring and research programmes, it is recommended that MRC find a temporary solution by renting small boats such as fishing vessels to collect samples and make observations, assuming of course that MRC resources are able to cover these expenses.

7. Towards a Rehabilitation Plan

As highlighted in the preceding section, the present ^{main} capabilities and policies of the Marine Research Centre, make it one of the ~~five~~ candidates in Lebanon for financial and technical assistance through bilateral or multilateral arrangements. The resistance of MRC and its staff to all negative and destructive factors over ~~16~~ ^{sixteen} years of civil war gains the admiration of many observers in the marine science community in the Mediterranean and beyond. In fact, the emergence of MRC from this crisis, and the endurance of a diverse scientific and technical staff over this long period, qualify MRC for an immediate rehabilitation effort by Lebanon and the international community. In such a healthy and motivated environment, modest investment is expected to have an exceptionally high return in terms of efficiency and quality research.

It is very important for MRC to establish its present strategy on specific priorities relevant to the needs in the Lebanese society. Introducing a viable programme insures the support of the Lebanese Government, and attracts the attention of donor institutions.

The following sections of the report give in some details, the priority areas which justify the rehabilitation of the Centre, the requirements for immediate assistance followed by a preliminary estimation of the most immediate needs that put rehabilitation efforts on the right track.

3 -
capitals

8. Justification for Assistance

MRC

The Marine Research Centre was established in 1977/78 as a direct result of national initiatives and efforts of NCSR, supported to a great extent by a UNESCO/UNDP project. Today, after many troubled years, it is an integral part of the Mediterranean activity centres and, as such, participates in relevant activities and programmes of various UN Agencies. On a local level, MRC is in close collaboration with institutes of higher learning.

sixteen

Advice and services provided by MRC over the last ~~16~~ years to Ministries (e.g. Health, Water Resources) and the National Council for Development and Reconstruction, have been invaluable in environmental management in difficult times and in the execution of various tasks as part of the national reconstruction and rehabilitation effort.

The National Council for Scientific Research has invested a great deal in order to keep MRC cohesive and stem possible brain drain. Sixteen very difficult years, however, have taken their toll and MRC has had its share of damage and destruction: the research vessel SITA III was vandalised and destroyed, current meters were lost, analytical equipment became obsolete, and there is a general breakdown in maintenance and services.

Today MRC is expected to perform various tasks which, unfortunately, it is unable to execute because of lack of funds, equipment, a survey vessel, and in

certain cases personnel and consultants. The list given hereunder describes the various activities MRC should be involved in. The list is not in any priority order, and activities described are not mutually exclusive.

8.1

§.1. MRC is unable to fill in the gaps in various fields of oceanography and supply data from Lebanese and adjacent waters in the Eastern Mediterranean region for a comprehensive knowledge of the Mediterranean basin. Data collection is hampered, and there is no adequate data acquisition or management facilities in order to fill-in this gap for the mutual benefit of the basin in general. By way of an example, MRC is unable to participate in a UNESCO/IOC organised programme for the study of the physical oceanography of the Eastern Mediterranean (POEM).

8.2

§.2.

Lebanon is a contracting party to the Mediterranean Action Plan, and as such has signed and/or ratified Protocols under which MRC is expected to perform various tasks, the most important amongst these tasks being environmental monitoring. Analytical equipment available at MRC for these tasks is now obsolete or irreparable.

8.3

§.3.

MRC with the approval and support of the Ministry of Agriculture has to rehabilitate the existing trout farm in the country, and more importantly will develop the mariculture sector. Lebanon is party to the Mediterranean Regional Aquaculture Development Programme (MEDRAP/UNDP) and has been encouraged by UNDP to start action. A national aquaculture development programme has been prepared and submitted to UNDP. Additional assistance is needed for a pilot station and for an effective training programme in general.

8.4

§.4.

The expertise and services offered by MRC within the overall activities of reconstruction and rehabilitation of Lebanon, were needed in the past and are needed now in various aspects of physical oceanography, in bathymetry, in coastal area management and in contingency planning for oil spills, etc. A fully equipped survey vessel is desperately needed for these and other activities.

Needless to say, MRC staff continue to carry on basic studies in planktonology, benthology and continue to be deeply involved with the only Lebanese scientific publication - The Lebanese Science Bulletin (ISSN 0256-7482).

9. REQUIREMENTS FOR IMMEDIATE ASSISTANCE

In the preceding section, four major activities are described. This section gives the requirements of five operational units which are necessary for these activities to be implemented. These operational units are not rigid entities and there is overlap as regards equipment, services and personnel. An equipped survey vessel and an oceanographic data management unit are needed by all units. This section together with Tables 1 and 2, gives background information and the needs of each unit in equipment and personnel.

9.1 Environmental Monitoring Unit

This unit was set up as a direct response to the activities of the Mediterranean Action Plan. Most of the equipment and some training were obtained through MAP/UNEP. The unit comprises:

- ← one coordinator
- three full-time research assistants
- one half-time research assistant

Personnel are all MRC staff. Productivity has declined and activities could not include other aspects of monitoring, e.g. air, due to lack of funds and modern equipment.

This unit needs an atomic absorption spectrophotometer, a gas chromatograph, a lyophiliser, a computer with peripherals and an independent power generator.

9.2 Aquaculture Unit

The unit was a direct response to the long-felt need for the development of the aquaculture (mariculture) sector in Lebanon. The Mediterranean Regional Aquaculture Development Programme, funded by UNDP has catalysed this activity. A national aquaculture development programme has been prepared with FAO assistance and submitted to UNDP for funding (LEB/90/004). The unit comprises the following personnel:

- ← one project co-ordinator
- ← one senior biologist
- ← one part-time planktonologist
- ← one part-time research assistant
- ← one part-time field work assistant

Effective operation will necessitate the employment by the NCSR/MRC of one aquaculture specialist, two technical staff (one electrician and one plumber) and two watchmen.

The national aquaculture development programme, with the assistance of UNDP, aims at the establishment of a national pilot station. Additional assistance for specialised equipment and training will be needed.

9.3 Chemical and Biological Oceanography Unit

The unit comprises the following staff:

- ← -- two senior biologists
- ← -- one junior biologist
- ← four research assistants (one half-time)

The unit is very active, but most of the studies are descriptive. There is an acute need for some equipment, training for the assistants and professional visits by senior staff to other regional marine centres.

Three staff members of this unit - an invertebrate specialist, a benthologist and a microbiologist - have left MRC and Lebanon definitively. It is hoped that NCSR/MRC will, in due course, fill these positions by recruiting new staff.

The needs in equipment are: STD and Oxygen probes, a salinometer (bench type), nutrient auto-analyser, water sampling bottles and other field equipment. The bench salinometer which is still in operation was acquired through UNESCO assistance over 15 years ago.

9.4 Physical Oceanography Unit

The NCSR has invested greatly in this unit both as regards equipment and personnel including consultants. The survey vessel SITA III was acquired through ^{ways} an assistance provided by the Ford Foundation and a work-plan initiated through UNESCO help in the early seventies. Unfortunately, the damage suffered by this unit is considerable: the survey vessel was vandalised and destroyed, self-recording current meters and other field equipment lost or stolen, etc. There is a desperate need for a survey vessel, current meters and a computer.

Staff comprises: | one senior assistant
 | - one field assistant
 | ← one skipper

For an effective and sustained productivity, staff needs training, and NCSR should employ one junior scientist or a senior research assistant. There is a desperate need for consultants in order to team-up with local staff and supervise implementation of activities and provide on-job training for local personnel.

9.5 Bathymetry Unit

^{in extent} The organisation of this unit is a direct response to the necessity to update or even correct the bathymetry of the coastal zones. As a result of uncontrolled development over the last ~~10~~ years, the coastal area of Lebanon suffered severe damage. Coastal erosion, land fills, proliferation of ports and marinas, uncontrolled removal of sand for construction purposes, necessitate corrective action. There is a great need for careful planning and management of the coastal zone as apart of the present rehabilitation efforts. The proposed survey vessel should be adequately equipped for this task.

Available personnel comprise:

 | ← one senior scientist
 | - one half-time assistant
 | ← one skipper

a For an effective and sustainable operation the NCSR should recruit one junior scientist. There is need for training and consultants to team up with local personnel and for on-job training.

TABLE I

IDENTIFIED NEEDS IN EQUIPMENT

1. List of Equipment

AMOUNT (USD)

ENVIRONMENTAL MONITORING UNIT

| | |
|-------------------------------------|----------------|
| Gas Chromatograph + Accessories | 60,000 |
| Atomic Absorption Spectrophotometer | 70,000 |
| + Accessories | ↙ |
| A Computer + peripherals | 20,000 |
| Lyophiliser + extra vacuum pump | 10,000 |
| Miscellaneous | 10,000 |
| | ↑ |
| | <u>170,000</u> |

AQUACULTURE UNIT see footnote

CHEMICAL AND BIOLOGICAL OCEANOGRAPHY UNIT

| | |
|---------------------------------------|----------------|
| STD + O₂ probes | 40,000 |
| Salinometer (bench type) | 30,000 |
| Nutrient auto-analyser | 40,000 |
| Sampling bottles and thermometers | 30,000 |
| Miscell. field equipment | 15,000 |
| Chemicals | 10,000 |
| | <u>165,000</u> |

PHYSICAL OCEANOGRAPHY UNIT

| | |
|-------------------------------------|---------------|
| Self-recording current meters (x 4) | 50,000 |
| Tide gauge | 15,000 |
| Computer peripherals | 20,000 |
| Data logger | 10,000 |
| | <u>95,000</u> |

BATHYMETRY UNIT

| | |
|-----------------------|--------|
| Specialised equipment | 50,000 |
|-----------------------|--------|

SERVICES

| | |
|--|---------------|
| Oceanographic Data management equipment | 25,000 |
| Information/Documentation, equipment + books | 30,000 |
| Power generator | 10,000 |
| Vehicle | 15,000 |
| | <u>80,000</u> |

TOTAL (equipment) 560,000

* NOTE

of the project (LEB/20/004)

The establishment of a national pilot station for mariculture development has been submitted to UNDP for financing. The estimated budget is about 350,000 USD. UNDP funding has not been finalized. New or additional sources of financing might be needed.

TABLE 2
 IDENTIFIED NEEDS IN TRAINING
 AND ADVISORY SERVICES

2.1 TRAINING ABROAD (STUDY GRANTS)

| UNIT | M/M |
|---|-----|
| <u>ENVIRONMENTAL MONITORING UNIT</u> | |
| Pesticide analysis (GLC) | 1 |
| Heavy metal analysis (AAS) | 1 |
| Analysis of nutrients | 1 |
| Microbiological techniques | 1 |
| <u>AQUACULTURE UNIT</u> | |
| General management | 1 |
| Fish nutrition | 1 |
| Fish pathology | 1 |
| Marketing | 1 |
| <u>CHEMICAL BIOLOGICAL OCEANOGRAPHIC UNIT</u> | |
| Primary productivity | 1 |
| Fish larvae and eggs | 1 |
| Benthology | 2 |
| Sedimentology | 1 |
| Meiofauna | 1 |
| <u>PHYSICAL OCEANOGRAPHIC UNIT</u> | |
| Field techniques | 3 |
| <u>BATHYMETRY UNIT</u> | |
| Field techniques | 3 |
| <u>SERVICES</u> | |
| Oceanographic Data Management | 1 |
| Information Management Techniques | 1 |
| | == |
| TOTAL | 22 |

Total (Training) (Subsistence and Travel USD 70,000)

2.2 ADVISORY SERVICES AND ON-JOB TRAINING (CONSULTANTS)

| | |
|-----------------------------|-----|
| | M/M |
| Physical oceanography | 6 |
| Bathymetry | 12 |
| Coastal erosion expert | 3 |
| Pesticide and metal analyst | 1 |
| | = = |
| TOTAL | 22 |

Total (Consultants) (Remuneration and travel USD 220,000)

*3rd letter
of serial*

10. Multipurpose Survey/Research Vessel

x As mentioned before, the Marine Research Centre acquired the research vessel SITA III in its early years and made good use of it in field research. A team of MRC staff and UNESCO Consultants worked intensively on the ship in the Lebanese waters, until their research cruises were interrupted by the breakout of hostilities. Later, the ship was vandalized and completely damaged.

What is required for the immediate needs of MRC in its rehabilitation phase is a small survey vessel, 30 to 40 feet long, capable of carrying out basic oceanography and fisheries research in the coastal waters of Lebanon. The following guidelines are of a general nature and are proposed after careful consideration of the local conditions and the nature of work in this part of the Mediterranean Basin.

GENERAL LAYOUT

*U.K. x Please note
x Full
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
- GRP (fiberglass) hull and structure for low maintenance. Wide bodied, length 35-40 feet.
- Insulation and ventilation for sub-tropic conditions.
- Steering position only in wheel house - including all navigational and engine controls, with preferably 360 degrees view. Large windows and preferably 2 entrance doors to wheel house.
- Superstructure positioned in front thus leaving free deck from amidship to stern.
- Small laboratory (optional) with work bench and wash basin for fresh and salt water.
- Store room preferably aft of engine room, together with small refrigerated hold.
- Gas or oil cooker and refrigerator.

- Toilet room with W.C. and wash basin.
- Life saving appliances and mooring gear, international navigational lights.

ENGINE

- Single engine about 150 KW (200 HP) preferably fresh water cooled of low r.p.m. with heavy duty hydraulic reduction gear.
- Cruising speed 9 - 10 knots.
- Engine room fan.

EQUIPMENT

- Two drum hydraulic winch with gypsies of about 2 ton capacity installed aft of wheel house. Oceanographic barrel winch could be simply fitted to the side of main winch.
- Provision for a second smaller winch (electric) and a hand winch. Gallow with block.
- *h.i.d.*
Please
clarify  Windlass electric for shallow water.
- Sliding A-frame or 2 davits stern.
- Small independent power source of about 10 Kw (15 HP).

NAVIGATION AND COMMUNICATION

- Hydraulic rudder wheel
- Compass, wind direction and speed indicator.

- Chart table.
- Radar about 50 mile range.
- × - VHF station.
- Echo sounder low and high frequency, and a side-scan sonar.
- Basic satellite position fixing equipment.

REMARKS

These are guidelines that could be altered or modified. It is preferable to get the vessel fully equipped, rather than install equipment at a later stage.

Estimated Cost

Circa USD 300,000

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

*1. Roll call
+ Capital*

11. Rehabilitation Budget and Potential Donors

Table 3 is a summary of the main components of the proposed budget for the rehabilitation phase of MRC. The requirements for equipment, training and consultants, are given for each Unit. The Summary Table gives the following estimates:

| | |
|---|-------------|
| Total for the Scientific Units (except the Aquaculture Unit) | \$845,000 |
| The Survey/Research Vessel | \$300,000 |
| | <hr/> |
| Grand Total | \$1,145,000 |

This budget is quite provisional and is devised as a starting point towards the rehabilitation of MRC. The management of MRC and CNCSR are well advised to be flexible when soliciting funds either from the Government or through bilateral or multilateral arrangements. Funding sources have different priorities and approaches. MRC should be in a position to accept reasonable offers for assistance either in money or in kind, directly or indirectly, as long as it has the capacity to integrate all these in one stream towards a balanced and healthy rehabilitation of the Centre. Emphasis should be made on building the human capabilities of the Centre by encouraging scientific exchange with foreign institutions. A significant part of the budget can be satisfied by opportunities to study abroad, especially those available under bilateral agreements. With the progress in the rehabilitation process, MRC should make a serious attempt to attract visiting scholars to gain exposure to outside experience after a long period of isolation. Lebanese funds for scientific equipment and a coastal research vessel may be difficult to accommodate within the long list of priorities facing the Lebanese Government. Outside assistance should be solicited for specific Units, and the budget is presented in small parcels to facilitate funding of specific Units such as pollution monitoring or aquaculture, etc.

TABLE (3)

BUDGET SUMMARY

| | <u>Equipment</u> | <u>Training</u> | <u>Consultant</u> | <u>Total</u> |
|---|------------------|-----------------|-------------------|------------------|
| | \$ | \$ | \$ | \$ |
| 1. Environmental Monitoring Unit | 170,000 | 14,000 | 10,000 | 194,000 |
| 2. Aquaculture Unit | — | 14,000 | — | 14,000 |
| 3. Chemical and Biological Oceanography Unit | 165,000 | 20,000 | — | 185,000 |
| 4. Physical Oceanography Unit | 90,000 | 8,000 | 60,000 | 158,000 |
| 5. Bathymetry Unit | 80,000 | 8,000 | 150,000 | 208,000 |
| 6. Oceanographic Data Management | 25,000 | 3,000 | — | 28,000 |
| 7. Information/Documentation | 30,000 | 3,000 | — | 33,000 |
| 8. Services (power Generator, Vehicle) | 25,000 | — | — | 25,000 |
| Total A Units and Services | 555,000 | 70,000 | 220,000 | 845,000 |
| Survey/Research Vessel | 300,000 | — | — | 300,000 |
| Total B (Scientific Units, Services and Research Vessel) | | | | 1,145,000 |

12. MRC NATIONAL COMMITMENT

of Lebanon
x
x
The National Council for Scientific Research established the Marine Research Centre and oversaw its development. In their meeting with the President and Secretary-General of the NCSR, the members of the mission were assured that NCSR remains committed to MRC, particularly to recruitment priorities within a global rehabilitation programme of MRC. In view of dwindling financial resources however, this commitment becomes difficult if not impossible without external assistance and support. In the initial formative years of MRC, the UNESCO/IOC played a very important role in catalysing this national commitment. After 15 years the assistance of UNESCO/IOC and other organizations becomes a necessity for the rehabilitation of MRC. The national commitment to MRC was stressed time and time again by Lebanese officials. In this respect, the UNESCO/^{IOC}mission throughout its meetings with officials and ~~representatives of~~ French and Italian representations in Lebanon noted an interest and willingness to assist NCSR/MRC either through bilateral or multilateral agreements through UNESCO/IOC. During meetings with CDR officials, ^{the}past assistance by Germany and possibilities for future help were also discussed.

13 FUTURE STRATEGY

The following issues should be taken into consideration by the NCSR and MRC management when formulating the future strategy of MRC in its rehabilitation phase.

- Upgrading the capabilities of the present staff by encouraging short term training abroad and making provisions for visiting scientists.
- Fostering academic exchange and joint research projects with Lebanese and foreign universities and learning institutions.
- Strengthening cooperation with relevant public authorities and the private sector in the fields of development and applied studies such as aquaculture.
- Maintaining the relationships with relevant UN organizations such as UNESCO/IOC, UNEP, FAO, WHO, WMO, IMO, as well as other intergovernmental and non-governmental organizations.

Furthermore, this report presents the needs of MRC for an immediate rehabilitation. A small equipped survey vessel is a major item on this list. An immediate rehabilitation of MRC will make the centre once again fully operational within the confines of existing premises.

The future development of MRC and considerable expansion of its activities, however, will necessitate a search for either additional premises or new headquarters for MRC. The NCSR has already taken steps under these lines. A plot of land has already been placed under the jurisdiction of the NCSR in Batroun as the site for the national aquaculture pilot station. There is tacit acceptance by the Ministry of Education and the Council for Development and Reconstruction to place new premises under the authority of NCSR/MRC. The following section gives background information on the Batroun complex. All these, of course, could only be justified once a rehabilitation programme is put in motion.

*باللبنانية
Computer*

184. The Option of the Batroun Complex

The Batroun site, about 40 Km north of Beirut, was developed by the Lebanese State in the early seventies, in order to accommodate various maritime activities: particularly, a technical maritime school, a public aquarium, etc. The complex, or parts of it have been placed under the jurisdiction of various Ministries or Agencies. Whereas the maritime school is the responsibility of the Ministry of Education, the remaining part of the complex is under the Ministry of Agriculture. A section of the land and office space, is now placed under the National Council for Scientific Research, for the purposes of developing a pilot aquaculture plant by the Marine Research Centre.

The complex comprises the following buildings on a site of about 65.000 m².

- a 3 floor building for teaching purposes
- an administration block
- a 5 floor accommodation block
- a public aquarium tower
- a domed planetarium

X

A considerable part of the buildings were vandalised and damaged throughout the past 16 years. The presidential decree No. 1382 of 16 June 1978 states that the Batroun complex be rehabilitated and an 'Institut Technique Supérieur des Sciences Maritimes' be created and hosted in the Batroun Complex. The overall rehabilitation of the complex is the responsibility of the National Council for Development and Reconstruction (CDR) which is the government body officially responsible for the rehabilitation of Lebanon. Its master plan comprises rehabilitation (3-5 yrs), recovery (5-8 yrs) and development phases (8 yrs). At an official meeting with CDR's vice president we were informed that some Government funds are now available for the rehabilitation of parts of the complex. Work is expected to start ⁽¹⁹⁷²⁾ this summer. At various times, authorities have approached donors for assistance in order to develop the site. The most significant assistance thus far received has been through the German Government in order to establish the maritime school.

Recently the Marine Research Centre of the NCSR has shown an interest in parts of the complex, not only in relation to the national aquaculture pilot station, but also for the purposes of moving there some of the field activities of the Centre. We agree with this approach.

The premises in Batroun would be an excellent opportunity for the centre to expand at least part of its components such as plankton, chemistry and biology laboratories, whereas the physical oceanography and cartography could continue to operate from Junieh.

In our meeting in CDR, we were assured by the Vice-President that one floor, possibly the top floor of the teaching building at Batroun would be reserved for the MRC. The recovery of the site would be undertaken as speedily as possible in collaboration with CDR personnel. We strongly recommend that the premises be developed and used for a multi-purpose interdisciplinary compound or a campus where the vicinity of various marine related activities could co-exist and collaborate without encroaching on each other's functions.

and Meanwhile, we strongly recommend that all measures and legally binding documents be undertaken by NCSR and other ministries having jurisdiction on the Batroun Complex to safeguard the independence of MRC and other entities, to stimulate co-operation among these diverse but inter-connected entities, *to* ensure the sound management of the Complex.

An issue related to the Batroun Complex is the request of the Minister of National Education conveyed to the Director-General of UNESCO during their meeting on 6 July 1971. In this meeting the Minister expressed the interest in developing a project in support of the technical education in the Centre of Maritime Sciences* which will occupy part of the Batroun Complex.

* *An information document on the*
~~* For further details see ANNEX IV~~ Centre des Sciences Maritimes ~~which~~
describes the site, the buildings and the instruments required for the Maritime Technical School (Institut Technique Supérieur des Sciences Maritimes). No information is given in this ~~Annex~~ *document on* other planned activities in the Complex such as oceanographic research or aquaculture.

A close examination of the planned activities in the Batroun Complex, shows that the issues and disciplines involved in these activities are sectorial in nature and come under the authorities of several national ministries. Similarly, technical assistance to develop the Batroun Complex as a whole requires the competence of several UN Specialized Agencies and Organizations, as shown in the following Table.

Table ⁴₃: Projected Activities in the Batroun Complex

| <u>Activities</u> | <u>Ministry</u> | <u>UN Agency</u> |
|------------------------------|--------------------------|------------------|
| 1. Maritime Technical School | Education | IMO |
| 2. Public Aquarium | Agriculture | FAO |
| 3. Marine Research Centre | NCSR (Prime Minister) | UNESCO/IOC |
| 4. Pilot Aquaculture Plant | NCSR (Prime Minister) | FAO |

5
2
Table 3 gives only the principal UN Specialized Agency having competence in a specific activity. However, each activity required the input and support of several UN Organizations. As an example, the MRC has received over the years the support and technical advice of UNESCO, IOC, UNEP, FAO, WHO, etc. Likewise, the Maritime Technical School is the main domain of the International Maritime Organization (IMO) in London. But additional assistance may be required from UNESCO in the form of advice or fellowships for a part of the technical education in the School.

Therefore, expertise and support of several UN Specialized Agencies and Organizations are required, if the Lebanese Government accords priority to this project, given the large investment already made in the site of Batroun. In such a case, it is strongly recommended that CDR requests UNDP to mobilize an inter-agency effort to develop an intersectorial project in consultation with an inter-ministerial group from the ministries having jurisdiction on parts of the Complex. It is natural that UNESCO would be willing to participate in such co-ordinated effort.

Persons contacted in Lebanon

24 to 30 May 1992

National Council for Scientific Research (NCSR)

- Dr. Moustafa SOUFI
Secretary-General
- Mr. George ROUAYHEB
Scientific Advisor
Council for Scientific Development and Reconstruction

- Dr. Botros LABAKI
Vice-President
- Mr. François ABOU-ASSI
Director of Programme
- Mrs. Rima YAKTIN

Centre of Marine research

Mission met most of the scientific and technical staff. For names and specialization, please see ANNEX I.

French Mission

Italian Mission

- Mr. Antonio RIGHETT

*Please
complete*

PERSONNEL

SENIOR STAFF

| <u>Name</u> | <u>Qualification</u> | <u>Specialization</u> |
|------------------------------|----------------------|----------------------------------|
| H.H. Kouyoumjian Director | Ph.D. -U.K. | Environ. Sci. and Aquaculture |
| M. Abboud Abi Saab | Ph.D. -France | Phytoplankton |
| N. Kabbara | Ph.D. -USSR | Oceanography |
| N. Nouayhed | Ph.D. -U.K. | Physiology and Aqua- culture |
| S. Elakris | Ph.D. -France | Zooplankton |
| A. Saad | Ph.D. -France | Parasitology |

RESEARCH ASSISTANTS

| | | |
|-------------|----------------|--------------------------------|
| R. Haber | M.Sc. -Lebanon | Ecology |
| M. Tilbian | B.Sc. -Lebanon | Heavy metals |
| J. Belian | B.Sc. -Lebanon | Microbiology |
| E. Najjar | B.Sc. -Lebanon | Pesticides |
| N. Mattar | B.Sc. -Lebanon | Benthology/chemistry |
| R. Zeidane | B.Sc. -Lebanon | Phytoplankton/zoo- plankton |
| M.T. Kassab | B.Sc. -Lebanon | Phytoplankton |
| J. Yazbek | B.Sc. -Lebanon | Water chemistry/ nutrients |

ANCILLARY STAFF

| | |
|-------------|----------------------|
| A. Haddad | Admin. Assistant |
| L. Rouayheb | Assistant Librarian |
| E. Tarek | Field work assistant |
| M. Khachan | Skipper |

COLLABORATORS AND VISITING STAFF

| | | |
|-----------|----------------|---------------|
| F. Ghorra | Doct. -France | Microbiology |
| A. Ananov | Thesis -U.S.J. | Oil pollution |
| Gh. Bitar | Ph.D. -France | Benthology |

LIST OF CAPITAL EQUIPMENT

- Gas chromatograph. Pye Unicam 204 and Varian 3700 with recorders.
- Atomic Abs. Spect. Pye Unicam SP 1900 with recorder.
- Carbon rod atomiser. Varian CRA 90.
- Spectrofluorometer. Turner 430.
- Salinometer. Beckman RS7-C.
- Spectrophotometer. Pye Unicam SP6-200 and Bausch & Lomb 88.
- Autoanalyser. Technicon with accessories.
- PH-meters, Corning Eel 109 and Gallenkamp portable.
- Balances. Sartorius 2257 and 2492.
- Centrifuge. MSE Super Minor.
- Microscopes. Wild M8, Wild M20, Wild M40, Leitz Dialux 20.
Leitz Ortholox, Carl Zeiss SMX II and Carl Zeiss
Ergaval with photomicrographic attachment. Reichert
Res. Micr.
Photomicrographic attachment for all Wild Microscopes.
- Histological equipment. Microtome, hot plates, etc.
- Microbiological equipment. Incubators, hot bath, autoclave,
filtration equipment etc.
- Drying cabinets, moisture extraction oven and furnace.
- Refrigerator, deep freeze and lighting and temp. controlled chambers
- Soxhlet extractor, Kjeldahl dist. and digest. Unit. Rotary eva-
porator.
- Distillation units. All glass and ordinary. De-ioniser.
- Sieves and sieve shaker.
- Freeze drier.
- Stock of chemicals.
- Stock of glassware.
- Apple II mini computer

Field Equipment

Plankton nets, water bottles, oceanographic thermometers, corer, grab, InterOcean S.T.O. Probe, Self recording Aanderaa current meters with decoder and other accessories, SCUBA diving gear etc.

CURRENT STUDIES

- 1 - Kouyoumjian, H., E. Najjar & M. Telbian
Monitoring of selected metals and chlorinated hydrocarbons in fish from Lebanon.

This is part of our environmental monitoring programme. Fish from various parts of Lebanon are analysed for bio-chemical parameters and various chlorinated pesticides, PCB's and metals such as lead, cadmium and mercury. Chemical analysis at times is almost impossible due to the continuous power cuts. UN guidelines are used.

- 2 - Kouyoumjian, H., J. Belian & J. Yazbek
Bacteriological coastal water quality and nutrients in Lebanese Coastal Waters.

As part of our on-going, monitoring programme, monitoring of coastal bacteriological water quality is to continue. New stations in Beirut up to Ramlet-al-baida have been added. In addition to hydrographic parameters, nutrients will also be analysed.

- 3 - Kouyoumjian, H. and N. Mattar
Study of deposition of floating litter on the Lebanese shoreline.

A new project similar to those conducted in neighbouring countries. Litter is cleared from various stations stretching from Batroun to Ramlet-al-Baida, and then the coast is periodically inspected for litter deposition. Litter will be weighed and sorted out, thus giving an indication of dynamics of deposition along our shores.

- 4 - Kouyoumjian, H. and A. Ananov
Preparation of a national oil pollution fighting contingency plan.

We are in the process of formulating a national oil fighting contingency plan according to guidelines set by IMO. We took this initiative as a result of the paralysis of other relevant public sectors. Several of our staff have now been trained in oil fighting. The work is being also submitted for an M.Sc. at the University of St. Joseph.

- 5 - Nouayhed, M. and H. Kouyoumjian
Market survey and socio-economic study for the national aquaculture programme.

This survey is in preparation for the national aquaculture project and parallel to MEDRAP. The survey will concentrate on availability of good quality fish on the market and prices they fetch.

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- 6 - Nouayhed, M. and N. Mattar

Seasonal changes in the chemical composition of local fish fillet.

This study will be an important aspect of the national aquaculture project. Study deals with body chemistry of Serenidae and Sparidae.

- 7 - Kabbara, N.

Study of coastal drift.

A new study in order to study drift. Currently drifters are being designed and tested.

- 8 - Bitar, Gh. and N. Mattar

Study of benthic populations.

Benthic studies had ceased many years ago when our benthologist left. Now this new study will continue our survey of benthic organisms, particularly those living on hard bottoms. SCUBA diving will be the main observation and collection technique.

- 9 - Lakkis, S. and R. Zeidane

L'Ichtyoplancton des eaux cotières libanaises - Structure et composition.

This is a continuous and long-term study of ichthyoplankton. The study has a direct bearing on our national aquaculture project.

- 10- Lakkis, S. and R. Zeidane

Le plancton des zones eutrophisées de la côte libanaise.

This study deals mainly with eutrophication within our coastal areas. The study follows UN guidelines.

- 11- Abboud-Abi Saab, M. and M.T. Kassab

Etude de la production primaire et de la biomasse des microorganismes planctoniques dans les eaux libanaises.

This is a long-term ongoing project. Descriptive work of phytoplankton continues, together with studies on population dynamics.

- 12- Abboud-Abi Saab, M. and M.T. Kassab

Influence des rivières saisonnières sur la dynamique des populations planctoniques. Cas typique de la côte centrale du Liban.

The study deals with the dynamic of phytoplankton communities in brackish coastal areas. The study follows UN guidelines.