

*NATIONAL INSTITUTE OF  
OCEANOGRAPHY AND FISHERIES,*

*NIOF, EGYPT*

*Presentation prepared*

*By*

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## **PREFACE:**

Technology has become not only a necessity for socioeconomic development but also a prerequisite of countries' national security. The reason behind this is that technology is based on a combination of both science and application; employing the innovative knowledge in numerous disciplines. This has allowed various nations to redouble their potentials to produce food and energy and realize a decisive superiority in controlling the cost of production and ensuring its quality. It also minimized environmental hazards and shortened the necessary period for progress, besides creating a new economy characterized by vitality and accelerating growth.

**(From the address of President Mubark)**

# **INTRODUCTION:**

· This brief paper represents an overview of the Institute functions and activities. I hope it will provide at least an initial insight which support our endeavors for synergistic cooperation within our scientific plan, as well as collaboration and viable joint work with as many local, foreign and international organizations as we can reach.

· Historically, the National Institute of Oceanography and Fisheries, Egypt, (NIOF), was reestablished in accordance with the presidential decree number 436 of 1983 and 102 of the year 1998. According to these presidential decrees, the institute is affiliated directly to the Minister of State for Scientific Research.

· In fact the institute has started its research activities in the fields of Oceanography and Fisheries long time before the above said presidential decrees under different titles and structures, NIOF started at the twentieth through three main bodies which were:

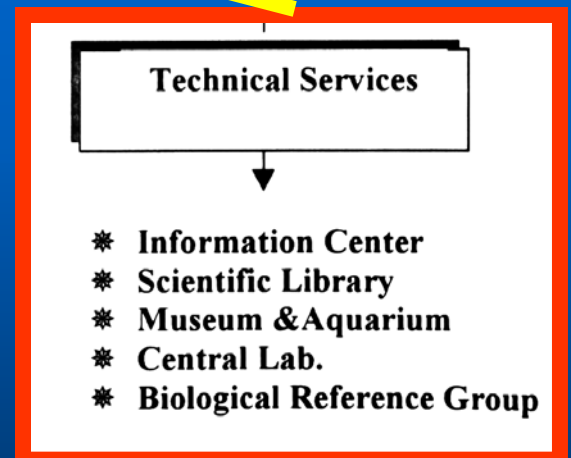
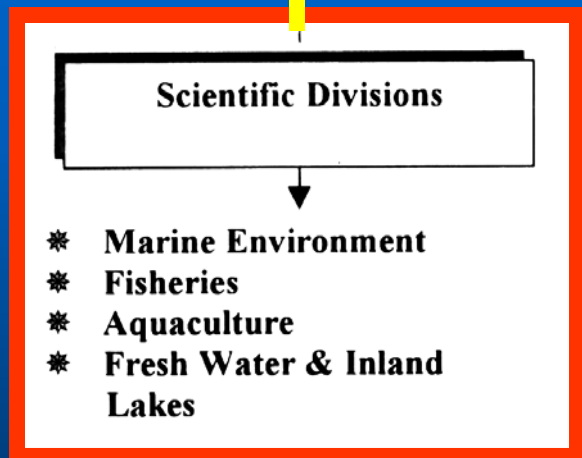
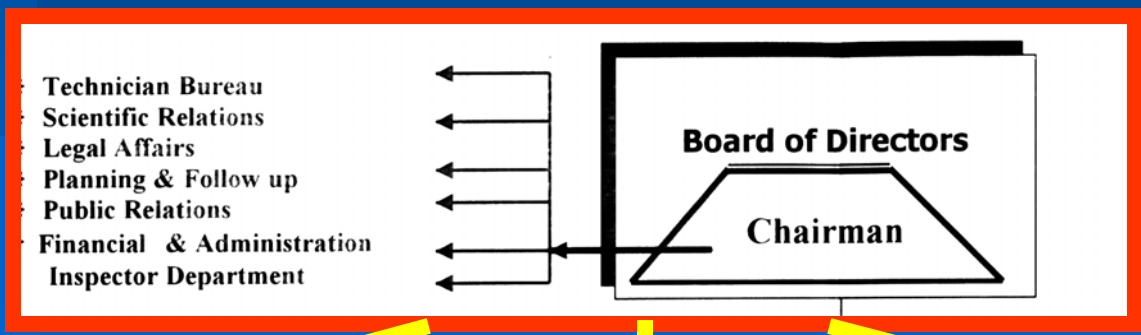
- (A) Alexandria Institute of Hydrobiology established in 1927, which was at that time affiliated to the Ministry of Agriculture.
- (B) Research Marine station for living organisms at Hurgada that belonged to Fouad El-Awal University and was established in 1931. Which is now Cairo University.

\* These two bodies were merged together in 1962 consisting the Institute of Oceanography and Fisheries (IOF).

\* In 1967 another body was established under the name of Inland Water and Aquaculture Branch at Barrage.

\* Later early in seventieths the last body of the institute was established under the name of Gulfs of Suez and Aqaba branch.

# NIOF CURRENT STRUCTURE



**The following main objectives are the main interest during the ongoing years hopping to give us more power for further steps to put our institute on the due level regionally and internationally:**

- (A) Be committed to specific scientific research plan, which aims to cover food production, environment and pollution control, coastal protection, and tourism.**
- (B) Strengthening our scientific relation with local and foreign similar institutions.**
- (C) Encouraging the young scientists to achieve participation in the ongoing research activities.**
- (D) Activate the participation of all of the workers of the institute in decision-making.**

## *CONTEXT OF THE PRESENT PAPER:*

- *\*Information about the National Institute of Oceanography and Fisheries, Egypt (NIOF).*
- *\*Field and Research and Studies of the Scientific Divisions.*
- *\*Scientific and Technical Services.*
- *\*Main Expertise.*
- *\*Working Individuals.*
- *\*Linking to other Local Organizations.*
- *\*Publications.*
- *\*Major Achievements.*
- *\*Future Plan.*

# **BACKGROUND:**

*The goals of the NIOF were designated in the Presidential decree No. 436 of the year 1986 as follows:*

**To maintain, protect and promote the different water bodies and their natural resources. Also to increase fish stock. To achieve these goals, the Institute has the following procedures:**

- 1) To propose measures for the protection of aquatic environment.
- 2) To organize, conduct and supervise research programs on better management for aquatic resources. These programs include fisheries studies, fresh water aquaculture, and mariculture and seafood technology.
- 3) To train and offer advice at different levels for personnel and bodies involved in aquatic resources and aquatic environment.
- 4) To follow up world progress in the fields of interest to the Institute and to transfer, develop and adopt new technologies necessary for better management of the aquatic resources.
- 5) To represent Egypt in different regional and international scientific organizations concerned.
- 6) To suggest and prepare draft and by-laws for the protection of aquatic environment and fishermen societies.
- 7) To provide the different fields of activities of the institute with the needed scientific and technical stag.
- 8) To accept international scientific scholarships and to encourage research in the different fields of research.
- 9) To encourage public awareness about the role of the institute and its scientific and technical activities.

# **STRUCTURE OF NIOF:**

## **(I) NIOF consists of four main branches which are:**

*(a) Mediterranean Branch, Kayet Bay, Alexandria, Egypt. It lies on the Mediterranean coast of Alexandria.*

*Affiliated to this branch a number of applied research stations in Mataria, Max and Baltim.*

*(b) Suez and Aqaba Branch, Ataka area, Suez. It lies on the western bank of the Gulf of Suez.*

*(c) Red Sea Branch, Hurgada. It lies on Red Sea Coast of Hurgada.*

*(d) Inland water and Aquaculture Branch. It lies at Cairo Head Quarter of the Institute*

*(e) Six research stations are affiliated to this branch namely; Aswan, Shkshook, Wadi-Elrayan, Barrage, El-Serw*

## **(II) Also affiliated directly to the president of the institute:**

*(i) Oceanographic Data Centre.*

*(ii) Marine Reference Collection.*

*(iii) NIOF owns two research vessels R/V Salsabil and R/V Yarmouk.*



# Mediterranean Sea



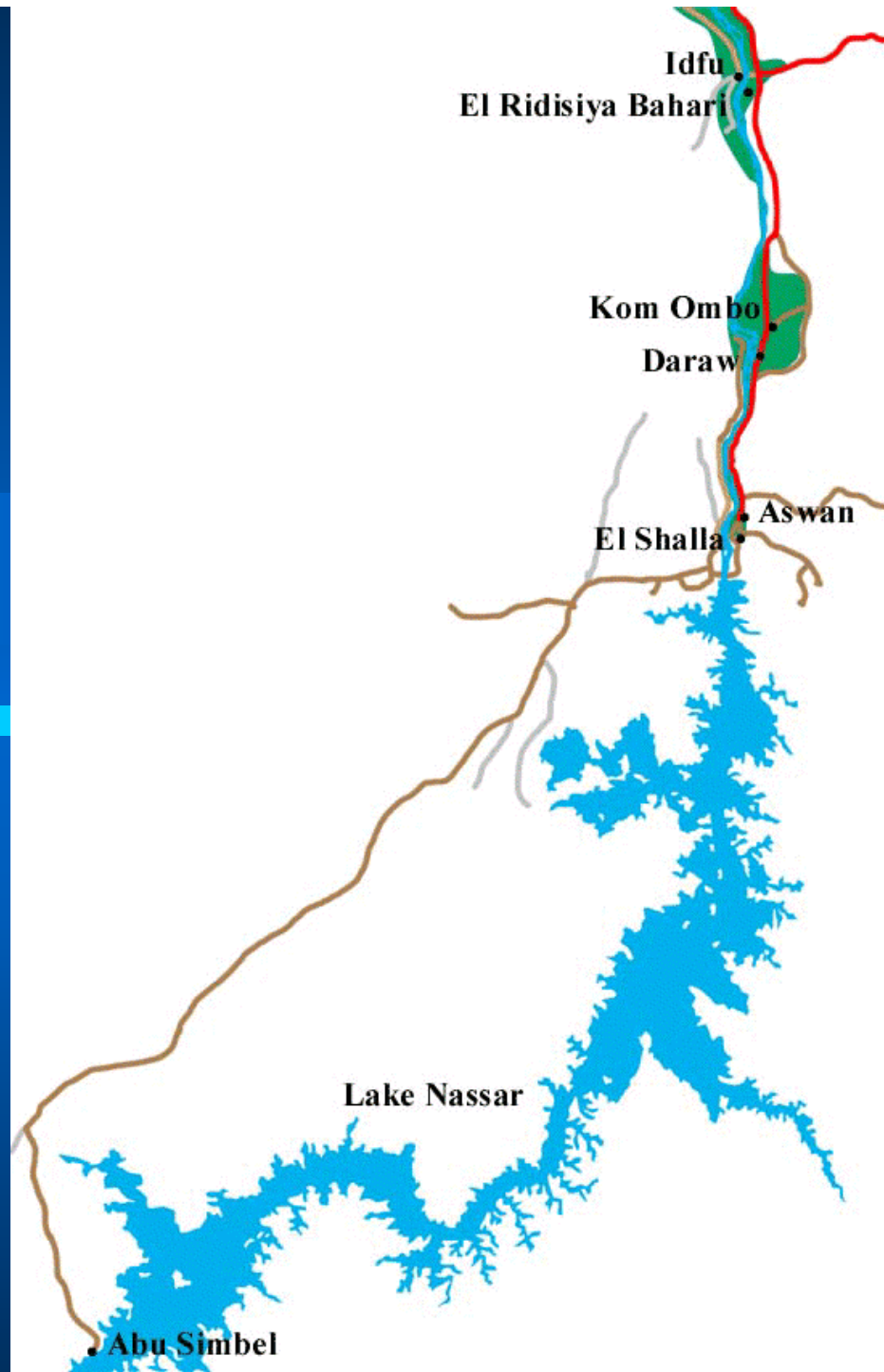














*(III) The aforesaid presidential decrees state that the institute is composed of four research divisions each consists of a number of labs as follows:*

### *1-Marine Environnent Division:*

- i) Marine Chemistry Lab.*
- ii) Marine Pollution Lab.*
- iii) Marine Geology Lab.*
- iv) Marine Geophysics Lab.*
- v) Physical Oceanography Lab.*
- vi) Hydrobiology Lab.*
- vii) Microbiology Lab.*
- viii) Shore Processing Lab.*

### *3- Aquaculture Division:*

- i) Artificial Fish Spawning Lab.*
- ii) Nutrition and Reering Lab.*
- iii) Fish Diseases Lab.*

### *2- Fisheries Division:*

- i) Fishery Biology Lab.*
- ii) Fish Statistics and Economy Lab.*
- iii) Fishing Gear and methods Lab.*
- iv) Population Dynamic Lab.*
- v) Fish Technology Lab.*

### *4-Fresh Water and Inland Lakes Division:*

- i) Chemistry and Pollution Lab.*
- ii) Aquatic organisms Lab.*
- iii) Physics and Geology Lab.*
- iv) Microbiology Lab.*

## **FIELDS OF RESEARCH AND STUDIES OF THE SCIENTIFIC DIVISIONS:**

### **I- Marine Environment Division:**

- 1- Geological and Geophysical marine survey of the coastal and offshore areas.
- 2- Hydrographical survey of the Egyptian waters of Mediterranean and Red Seas.
- 3- Monitoring survey for Chemical, Pollution, and Geological analysis of seawater and sea bottom.
- 4- Exploration for the coastal resources depending on geological, geophysical, chemical and biological studies.
- 5- Feasibility studies of marine coastal buildings. Like tourist villages, platforms and ports...etc. including protection from marine currents, sea erosion, sedimentation, sea level changes and waves ... etc.
- 6- Application of Geographic Information System (GIS) in marine and coastal survey.
- 7- Application of Remote Sensing Techniques in marine surveys.
- 8- Development of marine antifouling paints resisting for corrosion and friend-like environment, in favor of maritime transport.
- 9- Ground water exploration in the coastal region in favor of the infrastructure of coastal engineering projects.
- 10-Feasibility studies for economic importance marine plants like biological dyes, B-carotene and agar- agar.... etc.
- 11-Study of Paleo-environmental and Paleo-ecological conditions.
- 12-Projects of Marine Environmental Impacts like cleanup of jellyfish and starfish.... etc.
- 13-Biodiversity of hydro-biological marine life, phytoplankton, zooplankton, benthos ...etc.
- 14-Ecological and Environmental Impact Assessments of Coastal and Near Shore projects in favor of the application of Law No. 4 of 1996 for the protection of Environment.
- 15-Feasibility studies for economic importance of small-scale industry like Microbiological industries, and Algae as food for fishes...etc.
- 16-Reuse, Recycling and treatment of the industrial and civil waste products.



## *II- Fisheries Division:*

- 1- Estimate the fish stock of the water bodies with traditional methods, remote sensing techniques and sonic waves.*
- 2- Exploration of new fishing areas in deep water.*
- 3- Development of present fishing gears and methods.*
- 4- Development of the fishing laws.*
- 5- Fish biology research.*
- 6- Rehabilitation of fishing grounds.*
- 7- Study of fish migration to and from Mediterranean and Red seas.*

## *III- Rearing and Aquaculture Division:*

- 1- Artificial spawning of valuable marine and fish water fish for seed production.*
- 2- Establishment of invertebrate hatcheries for artificial spawning of crustacea and molluscs.*
- 3- Production of new species of aquarium fishes.*
- 4- Production of new, non-traditional supplementary food staff for marine, fresh-water fish larvae and adult.*
- 5- Establishment and management of marine and fresh-water fish farms.*
- 6- Establishment, designing and management of fish cages for rearing marine and fresh-water fishes.*

## *IV- Fresh-Water and Inland – Lakes Division:*

- 1- Assessment of primary production of inland waters and lakes.*
- 2- Chemical and biological survey of the inland waters*
- 3- Pollution effects on fresh water fauna and flora*
- 4- Environmental rehabilitation through feasibility studies along the fresh- water bodies.*

### *MAIN EXPERTISE:*

- Means of combating pollution of aquatic environment from different sources (land-based, ships ...etc.)*
- Conservation of the marine environment and its living and non-living resources through legitimate use.*
- Development of aquaculture techniques.*
- Fisheries management, fishing gears and fishing methods development.*
- Coastal management.*
- Jellyfish combat.*
- Survey the sites of the living marine wealth.*
- Reuse of wastewater in irrigation and aquaculture.*
- Legal aspects in aquatic environment, fishermen societies, and fish catch.*
- Maintain coral reefs.*

## **SCIENTIFIC AND TECHNICAL SERVICES:**

- *Defining and delineation of the fishing gear and fishing methods for appropriate catch.*
- *Appropriate collection and handling systems for marine fish fry.*
- *Successful rearing of fish fry.*
- *Construction of shrimp farms and seed supply.*
- *Artificial spawning of valuable marine fish (sea bass and sea bream).*
- *Surveying polluted areas and defining of types pollutants.*
- *Assessing pollution hazards come out from ship accidents.*
- *Setting technical specifications for marine ports and platforms.*
- *Defining, delineation, and identification of coral reefs, conservation, and development.*
- *Environmental Impact assessments (EIA) Physical, chemical, geological and biological; of coastal and marine projects.*
- *Methods of sewerage and agro drainage combat.*
- *Decontaminating seafood from pollutants.*
- *Advising and consultation for fish culturists.*
- *Offering the practical and cheap technology of sewerage treatment.*
- *Cheap techniques of jellyfish combat*

# THE WORKING INDIVIDUALS:

The total number of workers in the Institute is 1476, from them:

* Research staff	393	* Specialist	405
* Technicians	159	* Skill Labors	164
* Service Assistants	81	* Administratives	270

• The following table shows the distribution of these numbers between the said branches:

Kind of work	Total	Distribution				
		Med	.SuezRed	SeaInland	waterHead	Quarter
High ranks Research staff	4					4
and their assistants	393	243	48	7	95	-
Specialists	405	195	21	22	91	76
Administratives	270	73	26	16	43	112
Technicians	159	69	16	12	42	20
Skill labors	164	54	16	22	67	5
Service assistants	81	22	11	9	29	10
<b>Total</b>	<b>1476</b>	<b>656</b>	<b>138</b>	<b>88</b>	<b>367</b>	<b>227</b>

# *PUBLICATIONS:*

*The institute publishes the Bulletin of (NIOF) in English; it is exchanged and linked with other local organizations:*

- Fish resources Development Organization, Ministry of Agriculture.*
- Environmental Affairs Agency, Ministry of State for Environment.*
- Ministry of Tourism.*
- National Research Centre, Ministry of State for Scientific Research.*
- Petroleum Research Institute.*
- National Research Centre for Water, Ministry of Water Resources.*
- Coastal Protection Research Institute, Ministry of Water Resources*
- Ministry of Development and Urbanization.*
- National Institute for Planning.*
- Fishermen National Societies.*

## MAJOR ACHIEVEMENTS:

### First: Research on the Increase of Good Production:

- *Study on reproduction and rearing of various species.*
- *Induce spawning and reproduction of marine shrimp.*
- *Assessment of fish stock in various water bodies and development of fishing methods and gears.*
- *Fish rearing in underground water in Upper Egypt & Fish rearing in cages.*
- *Application of genetics in evolving, developing, and controlling of aquatic organisms.*
- *Application of remote sensing technology and information system in detection of fisheries.*
- *Study on fish fodder from non-used natural residues.*
- *Fisheries development of Lake Nasser, Lake Bardawil and Lake Manzalah.*
- *Fisheries development in Shalateen and Halayeb, south east of Egypt, on the Red Sea.*
- *Deep-water fisheries.*
- *Fisheries development of the Gulf of Suez.*
- *Study on possibility of using brine seawater in the culture of certain plants.*
- *Food chain in the Mediterranean.*
- *Seafood safety.*
- *Environmental study on Lake Qarun for conservation purposes as proper environment for fish production.*
- *Culture and production of zooplankton and phytoplankton as fish feed in fish farms.*

## *Second: Research on the Shore Protection and Coastal Environment and Realization of Sustainable Development:*

- *Studies on environments of water covered areas (lakes-rivers-seas), from chemical, physical, geological, biological, and statistical aspects.*
- *Control of jellyfish, at Portsaid sea shore.*
- *Environmental impact assessment of the new valley canal, Toshka.*
- *Assessment of environmental damages due to ship accidents at the national water of Egypt, (south Gulf of Aqaba).*
- *Undertaking studies on the assessment of living and non-living natural resources in the waters of the exclusive economic zone of Egypt, (EEZ).*
- *Study on the pollutants of aquatic environment due to the discharge of sewerage, agro drainage or industrial wastes, and their impact on the population dynamic.*
- *Monitoring of oil pollutants in the Egyptian regional waters and impacts of pollution consequences on marine organisms.*
- *The protection of aquatic environment legislations, fishing laws and suggestion of necessary amendments.*
- *Assessment of environmental variables and development of fish resources of Lake Nasser.*
- *Preparation of environmental sensitivity maps of Egyptian coasts.*
- *Extraction of bioactive materials for use in drug industry.*

### *Third: Research for the purpose of Tourism:*

- Development of Aquaria and Museums in Alexandria and Hurghada.*
- Study on destructive consequences of touristic activities on coral reefs and strategy of conservation and development.*
- Survey and identification of areas suitable for marina yachting construction, Taba, Sharm El-Sheikh, Hurghada, ...etc.*
- Land and Sea survey for touristic villages along Red Sea coast.*

### *Fourth: Research on National Projects:*

- Development of Sinai (increase of fish production amendment of fish yield structure).*
- Environmental Impact Assessment of the New Valley Canal-Toshka and survey of depth scale in front of the proposed pump station to be at sea level.*
- Evaluation and development of Lake Nasser (study the phenomenon of the crocodiles spread in the lake), its effect of fish production, and the corresponding socioeconomic risks on fishermen.*
- Study of fish stock and environmental qualities ( identification of water quality) at the new area pumped to Sheikh Zayed Canal.*
- Evaluation and development of fisheries at Shelateen and Halayeb.*
- Assessment of environmental damages and reporting for judgment among ship accidents at the national waters.*
- Development of Lake Manzalah fisheries, pollution survey, effect of drainage policy on the future of the lake and environmental impact on fish production; applying GIS technology.*



## *Fifth: Services Rendered to others:*

*Providing concerned bodies (Governorates and fish resources companies) in Egypt with expertise, consultants and results of studies conducted by NIOF.*

- Providing ponds culturists with fish fries reared in NIOF research stations and instructions for fish rearing.*
- Participation of NIOF researchers in teaching subjects of fish resources and oceanography in Egyptian, Arab and African Universities.*
- Holding training courses in different specialized fields for NIOF staff to upgrade their efficiency and scientific levels. Training courses are also organized in various specializations for Arab Scholars.*
- Contribution in dissemination of scientific culture in NIOF's activities through broadcast, TV and science magazines...etc, to raise the public awareness.*
- Completion of Adabia Port development for ship anchorage at night.*
- Mapping of marine lighthouses sites on the Egyptian coasts.*
- Erection of onshore platform at Sadat Port, south of Suez city.*
- Study the impact of oil exploration in Suez Gulf area.*

## *Sixth: Foreign Scientific Relation:*

*It represents an effective contribution to promote scientific research activities and support our infrastructure equipments and materials. The following examples represent some of the active roles*

# FOREIGN SCIENTIFIC COOPERATION:

## A) Marine Technology Program for the Middle East:

*This program started in the year 1980 and continued in phases each for three years and ended in the year 1997. It included several projects in each phase as follows:*

### 1) The first and second phase projects:

- *Tilapia*
- *Fish nutrition*
- *Intensive fish culture*
- *Controlled reproduction*
- *Coastal studies*
- *Lake Manzala*
- *Biological productivity in the eastern Mediterranean*

### 2) The third phase:

- *Seafood toxin*
- *Water reuse*
- *Lake Borollos*
- *Management and development of Lake Qarun*

### 4) The Fourth phase:

- *Tropho-dynamics of southeastern Mediterranean*
- *Seafood safety, Fish decontamination, technological and health implications.*
- *Lake Ecosystems*

### 3) The third extended phase:

- *Brackish water fishes*
- *Spawning of gray mullet*
- *Circulation of the Levantine*

## **B) Red Sea Program:**

- *This program is going on in cooperation with Bremen University in Germany and funded from the Ministry of Education & Technology Researches (BMF) in Germany.*
- *Each of the followings takes part in the program:*
  - # National Institute of Oceanography & Fisheries (NIOF), Egypt.*
  - # Bremen Marine Environment Centre (Germany).*
  - # Inter University Institute (IUI) Eilat, Israel.*
  - # Palestinian Consultant Group (PCG) (Palestine).*
  - # Marine Research Station – Aqaba (Jordan).*

## **C) Damage of Coral Reef due to Recreational Activities**

- *Restoration strategy for reef conservation and development. The participant countries in this study are Israel and Netherlands. This study is funded by the international cooperation with developing countries.*
- *The Egyptian and the German researchers succeeded to isolate two kinds of genes from the coral, which can be applied in modern biotechnology for the protection of environment and identification of areas enriched with reefs liable to extinction. This will help to identify the reasons and consequently lead to solutions. Some of these results may probably be used for the treatment of some diseases.*

## **D) Culture of gray mullet**

## **E) Food Production in Freshwater ecosystems:**

*Whole Lake experiments in fisheries development and water quality improvement of Wadi El-Rayan Lake.*

## **F) Biological Treatment of Marine Pollutants by Activated, Laminated**

**Microbial Communities**

# **FUTURE SCIENTIFIC PLAN 1998-2002:**

*The Future Scientific plan of the institute has been built on the following main elements:*

- (A) Food production and development of aquatic resources.*
- (B) Aquatic environment and combating pollution.*
- (C) Strengthening the infrastructure of the NIO.*
- (D) Research plan for the operation of research vessels Salsabil and Yarmouk.*

## *(A) Food production and development of aquatic resources.*

### *1- Natural Fisheries:*

*Conducting a survey on fishing areas by the two research vessels for the exploration of new fishing areas in order to alleviate burden on the present fishing grounds, which became exhausted through over fishing.*

### *2- Aquaculture:*

*It is a mean for making up for the shortage and insufficiency of the catchments as expansion opportunities in such field are available. In view of the increase of population, which is expected to reach about 120 million inhabitants by the year 2017, it becomes a must to increase fish production. Areas of fish farms, currently exploited, are estimated at about 100000 feddans representing 2% of the total available water resources.*

*In this context the plan tends to:*

- = Establish marine fish hatcheries.*
- = Develop the integrated aquaculture system, particularly with ducks.*
- = Generalize aquaculture system in rice fields.*
- = Utilize intensive aquaculture in floating netlike cages.*
- = Establish hatcheries for shrimps.*

### *3- Development of Lake Nasser and study of Environmental changes:*

*In the field of environment, the plan is keen that studies of fishing activities should include environmental aspects to identify sources and kinds of pollution and means of control and means of mitigation.*

## **(B) Aquatic Environment and combating pollution:**

*A number of studies in this field is going to be carried on hand in hand with the studies of fisheries in order to determine sources of pollutants and the best means of combating and conservation.*

## **(C) Strengthening the Infrastructure of the NIOF:**

*To develop potentialities of the personnel and increase their skills.*

### **In the field of building and fish farms the plan tends to:**

- Renewal of the main Building of Alexandria branch,(Its costs is about LE 2.0 million)*
- Develop and convert Max station into a productive farm due to its large area and appropriate situation, which is about 38 feddans.*
- Fix the area of each basin of the Barrage farm by 1.5 feddans.*
- Establish a group of hatcheries in Alexandria, Barrage, Suez, and Serow.*
- Start implementing a program for food production from Rayan Valley Lakes.*
- Renovate and develop the museum and aquarium in Alexandria and Hurghada.*

## **(D) Research plan for the operation of research vessels,**

**Salsabil and Yarmouk : This plan comprises three main parts**

- 1- Hydrographic, chemical, pollution, and hydrobiological researches related to Egyptian waters.*
- 2-Geological and Geophysical researches related to the study of marine sediments and shallow recent structures.*
- 3- Fisheries research related to the study of fish gatherings and study of fish stock in the area.*

***THANK YOU ALL***