

OCEAN RESEARCH IN INDIA

3.2. QASIM

National Institute of Oceanography
Panaji, Goa
INDIA

Ocean research has been given a high priority in India and it includes both fundamental and applied research. The main purpose of formulating an ocean policy in the country is to make an effective use of the sea for our economic, social and recreational needs and to foster international collaboration in certain fields of our activity. Besides the National Institute of Oceanography (NIO), which is a premier institution in the country for researches in oceanography, marine research is carried out in several Universities and Fisheries Institutes. The present account largely includes the programme of work carried out by the NIO.

The NIO was established in 1966. It is located in Panaji, Goa and is housed in its own building, specially designed and constructed for the purpose. It has a total strength of 280 staff members at its headquarters and two Regional Centres in Bombay and Cochin. It has three medium and small-sized boats and six vehicles. The main research vessel of the Institute is at present undergoing modifications and will be ready for operation in March 1975. It is 67.97 metres in length and provides accommodation for 18 scientists on board. It is equipped for practically all types of oceanographic work.

The Institute has the following six divisions :

- (1) Physical Oceanography Division,
- (2) Chemical Oceanography Division,
- (3) Biological Oceanography Division,
- (4) Geological and Geophysical Oceanography Division,
- (5) Instrumentation and Ocean Engineering Division,
- (6) The Indian National Oceanographic Data Centre.

Each Division has several sections and undertakes a wide variety of research projects. The main features of the programmes are as follows :

PHYSICAL OCEANOGRAPHY PROGRAMME

The projects in this field include land-sea interaction and nearshore circulation with application to coastal zone management. In these projects, studies are conducted on beach erosion, concentration of heavy mineral deposits along some parts of the coastline, sedimentation in harbours and estuaries, formation of sand bars and sand spits across the river mouths and their impact on navigation.

The other projects in Physical Oceanography are on energy exchange between the sea and the atmosphere and shore protection through utilisation of wave energy. The project on marine meteorology deals with the study of monsoon and its influence on oceanic processes.

CHEMICAL OCEANOGRAPHY PROGRAMME

In this field, research projects have been designed to study the fertility of the sea (nutrient distribution in water and sediments), enrichment processes, effect of monsoon and land runoff on the fertility of both Arabian Sea and Bay of Bengal and the utilisation of marine chemicals from sea water, seaweeds and bottom sediments.

BIOLOGICAL OCEANOGRAPHY PROGRAMME

India has a coastline of more than 5,000 kilometers which is being utilized for the exploitation of living resources (fish, crustaceans and mollusca). The management of fishery resources comes within the scope of Central Marine Fisheries Research Institute under the Indian Council of Agricultural Research. At present the total marine fish production in India is about 1.2 million tonnes, which largely comes from the continental shelf. Nearly 12,000 mechanised boats and 100,000 non-mechanised boats are engaged in fishing along both west and east coasts. During the next five years (Fifth Five year Plan), considerable development is likely to occur in the field of aquaculture for generating extra food resources. Aquaculture or sea farming will not only be utilized in the coastal waters but would also be extended to low-lying ar-backwaters, estuaries and mangrove swamps covering an area of thousands of hectares.

Other projects on biological oceanography include measurement of primary productivity of coastal and offshore waters, qualitative and quantitative analysis of zooplankton and determination of the rates of energy flow from one trophic level to the other.

GEOLOGICAL AND GEOPHYSICAL OCEANOGRAPHY PROGRAMME

The projects in this field are on bottom topography and bottom sediments with a view to finding mineral resources including fossil fuel such as oil and natural gas. The western continental shelf and slope covers an area of 400,000 sq. km. This is roughly half of the total area of continental shelf and slope of the country. At present almost the entire offshore mineral production of the country such as calcareous sand, shell deposits, bauxite and ilmenite comes from the west coast. Large thickness of sediments and proximity to the oil producing field in the Cambay region have made this region for offshore oil to be most promising. This has now been confirmed by the recent oil strike at the Bombay High. The project on mineral exploration aims at a reconnaissance survey of the entire west coast at first and a detailed exploration to be carried out in promising areas later on.

INSTRUMENTATION AND OCEAN ENGINEERING PROGRAMME

Design and development of oceanographic instruments (mechanical and electronic) according to varied needs of the country, form a part of the programme in this area.

Instrumentation includes indigenous development of salinometer, current meter, STD system and teletelemetry systems. Other projects in this field are on service and maintenance facilities, calibration and testing facilities and the development of marine sensors and simulation techniques. The programme in ocean engineering includes development of underwater technology and experimental submarines.

THE INDIAN NATIONAL OCEANOGRAPHIC DATA CENTRE

The institutional programme in this field includes acquisition, processing, evaluation and management of oceanographic data and informations related to the Indian Ocean. The main objective of this programme is to develop within the country a service facility pertaining to physical, chemical, geological and biological data and to coordinate with the World Data Centres at Washington and Moscow on the informations related to the Indian Ocean.

PROGRAMME ON PROTECTION OF MARINE ENVIRONMENT

The main objective of this programme is to design and implement a system, based on accepted principles, for the protection of marine environment. The work includes the development of overall methodology, organizational and management structures, measurement techniques and data handling system for the actual pollution monitoring and living resources assessment in different areas of the Indian Ocean. The thrust on pollution monitoring programme will be on "Priority pollutants". The living resources assessment programme will be directed primarily at monitoring changes in stocks of commercial fish and changes in the food chain.

INTERNATIONAL COLLABORATION

The most prominent body in oceanography on the international scene is the Intergovernmental Oceanographic Commission (IOC). It is a world governmental body, founded in 1961, and has more than seventy member states. Its principle function is to promote and coordinate the study of oceanography throughout the world. India has been a member of IOC since its very inception and delegates from India have been participating in its meetings fairly regularly. The other international agencies which have considerable interest in ocean research are SCOR, UNESCO, WMO, FAO, UNEP, etc...

The long-term benefits of oceanography are so important and large that whether the countries are developing or developed, international collaboration in marine sciences is absolutely essential to solve the varied problems and to avail the benefits of the sea. Recognising the need for international support, the IIO hopes to collaborate with as many agencies as possible so as to be of use for the development of ocean research in the world.