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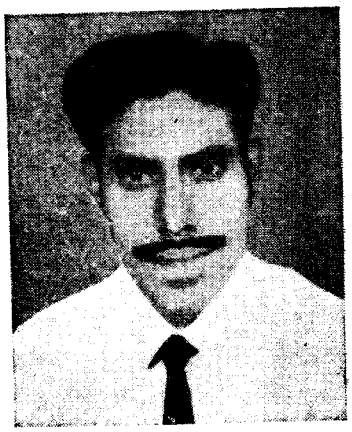
The Resources of the Ocean with Special Reference to the Indian Ocean



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Today as ever, the ocean is full of riddles and mysteries. It is quite logical that the exploration of the near ocean has actualy started at the same time as that of the exploration of distant space.

In many countries the number of research ships is increasing, new types of research craft being developed including submarines and bathyscaps, entirely new exploration methods have appeared. Why this hightened attention towards the ocean? Principally because of the possibilities to draw on the vrried resources of the ocean? The ocean is an-inexhauttible source of food, minerals, chemicals and power. It may be used for medical and health building purposes. The ocean is a source of potable and indusirial waters. Desalting of sea water will permit not only to solve the fresh water problem but also to tap the chemical resources of the ocean which run into staggering figures.

The estimated resources of the ocean should last tens and even hundreds of thousands of years, since they are incomparably richer than all the deposits known on land. As for as the power resources of the ocean are concerned they are virtually inexhaustible. The energy resources of all rivers total 850,000,000 KW, while the energy of the tides is estimated at 1000,000,000 KW. Further more,the source of this energy—the Cosmic mutual attration forces in the earth-moon-sun system, does not grow weaker with time. Enormous resources of energy are contained in sea waves and in the temperature drop between the upper warm and the lower cold layers of the ocean waters. However the possibility of practical utilisation of these sources of energy has not been tested and for the time being the problem is still in the stage of schematic projects. The by-products are processed into animal feed, fertilisers and industrial raw materials.

The ocean serves man in many other ways as well; as the most important factor shaping climate and weather, as a carrier of Sea-borne trade, as a health building factor. It all explains the complex nature and the diversity of the problems of ocenographical science. The Indian ocean was practically unexplored some ten years ago. According to some scientists we know less

about the bottom relief of the Indian ocean than about the Moon surface. In this connection as well as in the interests of developing countries on the Indian ocean, a special organisation was set up about eight years ago and such expeditions are continuing till now. The Indian oceanographer Shri D. Lal devoted his reports to large scale physical process in the ocean. On the basis of the information about the distribution of certain 'Long Life' radioactive isotopes in the ocean he calculated the characteristics of the mixing of waters in the ocean. This process is highly important for providing the variable marine organisms with nutritive substances. In this way the physics of the sea borders on the biology and is related to questions which have a bearing on sea fishing industry. The problem of the ocean and atmosphere was a sizeable contribution to improving the methods of weather forecasts and establishing the hydrological conditions of the sea.

In recent years Soviet scientists have done quite a lot to develop underwater research facilities to promote an all round investigation of the ocean. The cruises of the research submarine, "severyanta" have been fruitful. The submarine submerged under water using a variety of air mixtures. Several types of hydrostats and submarine glinders including the "Attanta-1" which was tested in the Batlic Sea, have been developed. Special photo equipment, T. V. and other devices have also been developed.

India with her perennial problem of population explosion, must look not to her land for salvation but to the sea whose resources are legion. Nowhere else can such huge quantities of excellent food be obtained with so little effort, as from the waters especially from the oceans which cover 71% of the surface of the globe. With an area of 139,295,000 squire miles containing 331,000.000 cubic miles of water, the world's oceans provide the highest store house of human food that nature in her bounty has conferred on us. The food production from the oceans can be aptly called 'harvest without sowing'. In fact one of the most promising international scientific developments has been the exploration of the last frontier on the planet, the world's oceans, to solve humanity's eternal problem : hunger. It is estimated that the oceans contain about 80% of the world's animal life. The exploitation unfolds a vista of immense possibilities to feed the millions. According to some experts, the oceans can supply enough animal protein to satisfy the needs of a world population six times as large as now. Thus, scientific exploitation of the sea and proper utilisation of the aquatic products provide the ultimate answer to the food problems. Seafoods are an all purpose protein food containing 22 amino acids commonly found in the animal protein food and good proportions of the 8 regarded as essential to human health. Generally all animal proteins have a higher Biological value than plant proteins. Thus, only animal protein can supply man with the whole complex of essential amino acids essential to sustain health.

Fish is one of the most important resources of the waters and it is the cheapest and best source of the animal protein containing all the essential amino acids. The target of the animal protein could there-fore be effectively and economically met by an increase in fish supplies.

India has a large coastline of 5,500 kms. and a continental self of 281,600 sq.

kms. offering considerable scope for establishment of successful fisheries. The continental shelf on the West Coast is narrow in the South but broadens towards the north of Bombay. The shelf on the east coast is narrow, except off the mouths of the Ganges. The wadge bank forms part of the shelf in the extreme south. The Bay of Bengal and the Arabian Sea abound in fishing grounds. Gulfs and Bays all along the coast and a large number of Islands with their mangrove swamps and coral reefs are rich sources of marine life.

Many of the World's great Fisheries are found along the paths of ocean currents that plough the ocean by creating circulation that penetrates to the ocean bottom and cause an upwelling of water, rich in nutrient salts. The Indian waters are a meeting place of 4 ocean currents.

1. The south west monsoon drift
2. The north east monsoon drift
3. The Indian counter current
4. The north equatorial current

The other permanent currents of the Indian ocean are the Equatorial counter current, South Equatorial current, Mozambique, Agulhas and Somalia currents which wash the east coast of Africa. The confluence of the ocean currents near India keeps her poised on a thresh-old of copious supplies of sea-foods.

Sunlight plays a role of dual importance in aquatic life. It is an essential element of the life of fish and other marine animals. Response of marine plants to light, their propagation and growth, develop euphotic zones in which phytoplankton and planktonic algae flourish. This is Nature's fish food. The other prominent role of sunlight is on the fertilization and maturity of fish eggs. India situated in a location that extends from the hottest tropical regions upwards, possesses waters that are bathed in sunlight.

More than 1800, distinct species of fish are known to exist in Indian waters. Of these 500 species classified in 16 groups can be considered the commercially important edible fishes. In fishing, depth zone areas are divided into inshore waters which extend upto a pressure range of 2 atmospheres (i.e.) 2066 grams pressure per square centimeter that stretches upto 10 fathoms; offshore waters which extend upto a pressure range of 6 atmospheres (i. e.) 6,198 grams pressure per square centimetre that stretches upto 30 fathoms; and deep sea which represents depth from 30 fathoms beyond. Fertile fishing grounds abound in the Indian Ocean. The Indian waters possess 14 rich and fecund fishing grounds. Their systamatic exploitation will yield very rewarding results. India's annual fish production is little more than one million tonnes. According to the estimate of the National Institute of Oceanography the present yield from Indian ocean fisheries can be increased to at least 10 million tonnes in the next few years and is capbale of a ten fold increase towards the close of the century.

The significant achievements of Indo-Norwegian Project in regard to exploratory fishing are the discoveries of new fishing grounds (a) the location of large fishing grounds of Kalva in the 45–50 fathoms line. (b) the location of the synagris fishing grounds off Alleppey-Cochin in the 25–40 fathoms range. (c) the location of the potential deep water prawns and lobsters in the 150–200 fathoms range off Quilon-Alleppey region. (d) the shrimp beds off Quilon-Kayankulam region and

the Cannanore Pazhayangadi region. (e) the development of the purse seine fishing for cat fish in the Gulf of Mannar, (f) the location of prawn beds off Mandapam in the Gulf of Mannar. It is worth noting that practically all the afore mentioned new grounds are deep sea fishing grounds for prawns in deep waters beyond 30 fathom line. Per Sandven remarks (1959) that in the Arabian Sea out side the Malabar coast are found some of the richest prawn grounds in the world. In terms of value and development the sea based shrimp fisheries of India occupy a significant position. About 100,000 tonnes of shrimp are captured every year by Indian fisher men. The Indian seafood industry has registered an impressive growth in exports at an average annual growth rateof 14.9% as against the rise of world exports of seafood of 8.2%. India's annual earning from export of seafoods can touch Rs. 822.61 million by 1978–79. This will be in addition to the current export earnings which will aggregate to a total annual earning of Rs. 1,272.61 million by 1978–79. Besides shrimps, India can export in substantial quantities other marine products like Lobster, mackerel. Sardine, Tuna, Bombay Duck. Eel, Crab, Oyster, Mussels, froglegs, fish meal, fish maws, sharkfins and seaweeds.

Most countries in the world have been paying special attention to the development of their fisheries. As a result, the World production of aquatic products, which was just 21.1 million tonnes in 1950 had more than doubled to 52.4 million tonnes in 1965. Biologists have estimated that the seas of the world could sustain an annual catch of between 400 and 500 million tonnes of fish. It may be mentioned here that the resources of the Indian ocean have just begun to be exploited and these at present account for only about two million tonnes of the world's production. It is clear that the food in the sea is plenty and varied. It is left to the ingenuity and adaptability of man to make use of these immense resources which nature in her bounty has conferred on us.

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