UNDERSTANDING OCEANS

INDIAN OCEAN CRISIS MANAGEMENT THROUGH OCEANOGRAPHY

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Importance and relevance of oceans keep increasing every day due to land based resource scarcity, growing population rate and reduction of land mass due to rise in sea levels. Despite technological advances, 95 percent of the oceans remains unexplored. With more than 60 percent of the world's population living within 100 km from the coast, and with 13 out of 15 largest cities predicted to be located near oceans by the turn of the millennium, academics, professionals, and scientists have turned their central attention towards understanding oceans. The enormous ocean resources, slightly discovered and mostly hidden, are of immeasurable value in the future, given the excess utilization of land-based resources.

Over the past few decades, techniques and theories have been developed as an attempt to understand oceans a little better. Yet, the potential and scope of ocean studies remain wide. With increased understanding and findings, study of oceans has become more specific and categorized, one of which is Operational Oceanography.

Operational Oceanography

In layman terms, oceanography is the study of marine or ocean sciences. Operational Oceanography, a derivative of this vast subject area, aims to provide sustained and accurate marine measures, analyses, predictions and assessments which are used to advance marine policies and activities including national security and marine environment. The European Component of the Global Ocean Observing System (EuroGOOS) defines OO as the activity of systematic and long-term routine measurements of the seas, oceans and atmosphere, and their rapid interpretation and dissemination.

As such, OO is capable of producing accurate now-casts, hind-casts, re-analyses and future forecasts of the ocean including state of the living resources, covering global-to-coastal marine environments and ecosystems through rapid transmission of observational data. These observational data, generated by means of mathematical forecasting models can foretell early warnings of adverse weather changes, electronic charts, prime routes for ships, ocean currents and even the productivity. Being a fairly new concept, OO has managed to provide accurate and valuable real time data on marine and coastal environment, marine resources, marine safety and climate and seasonal forecasting.

In order to deliver successful and accurate forecasts, there must be enough ocean observations available with super computer facilities and models to decipher and disseminate the data. As a result of such, the OO facilities were limited and applied by financially and technically competent nations, such as the USA. In other developing nations, most OOs are run either by national weather centres or by coordinated partnerships between government and various research organisations.

Operational Oceanography in the military

The US Navy has pioneered in OO having incorporated them in its military strategies since Cold war. In Italy, OO has been used to define its marine strategy directive related to ecosystem sub-regions. As a result, sea surface temperature seasonal data, chlorophyll climatology data and trends along with wind coastal upwelling indices are obtained which helps determine the environmental impact at a given location and time. The EU project 'Mediterranean Ocean Forecasting System: Toward Environmental Predictions' (MFSTEP) composed of a real time observing system with satellite and in-situ elements, a numerical ocean forecasting system at the basin scale, biochemical models for algal biomass forecasting and a product dissemination system. These products were used to determine oil spill drift and dispersion, sediment transport and fish stock assessments which determine the operational value for the stakeholders.

Monitoring disasters

The Indian Ocean Region over the past half a decade has faced many unpredicted natural disasters in the form of earthquakes, cyclones and flooding resulting in the death of hundreds of thousands of individuals. Given the proximity of South Asian and South East Asian states to the Indian Ocean, a better understanding of the ocean currents, salinity, wind and sea level could have reduced the damage caused. Lack of effective OO centres resulted in the enhanced damage to both property and human lives. However, some efforts have been taken by East and South East Asia to incorporate OO.

In 2005, the first Ocean Operational system was implemented in the Indonesian archipelago with the collaboration of Indonesia and European Institutes. The system provides information for sustainable use of marine resources, improved management of the sea with high business impact for both public and commercial operators. It further capitalizes on their capabilities in fisheries, environmental policies and human activities in the marine environment. The Chinese Global Operational Oceanography Forecasting System (CGOFS) includes both ocean circulation and ocean wave models providing 3D predictions on marine temperature, salinity, currents, sea levels and ocean waves.

On the contrary to improvements in East and South East Asia, South Asia is still behind in understanding OO. In 2004, the enormous damages caused by the tsunami would have been avoided if the regional countries were equipped to monitor the ocean dynamics. Vast number of deaths and damages incurred by natural disasters over the last decade could have been curtailed, had there been accurate and reliable data on the environmental changes.

Today, India is the only country in South Asia to take an OO initiative. Following a proposal made in June 2010, in December 2017 Prime Minister Narendra Modi approved the establishment of an International Training Centre for Operational Oceanography as a Category 2 Centre (C2C) of UNESCO in Hyderabad. The centre would be mainly used as a capacity building centre for Indian Ocean Rim countries, bordering African countries as well as small island states. The establishment of the UNESCO C2C in India will provide a unique opportunity for India to emerge as a leading country in the Indian Ocean, drawing in cooperation and improved engagement with its neighbours.

While the centre is of immense value to the region, it further gives a strategic edge over to India with its newly acquired role as a lead in regional marine science. Nevertheless, this is a progressive step taken towards scientific research in the region to help governments with achieving sustainable development goals as well as overcoming natural hazards.

Importance of Operational Oceanography to Sri Lanka

Given the immense untapped ocean resources around Sri Lanka and being situated at the centre of major sea lanes of communication, it is of utmost importance that the island is aware and conscious of the ocean around it. The ocean tetra-tonics, wind movements, salinity and the pH levels, not only help monitor movement of vessels, observe the wave and plate movements, but at the same time, give a thorough report of how ocean resources are to be governed.

It further helps in oceanic meteorology and weather forecasting which is critical to the region.

Situated at the southernmost point of the Indian Ocean, the sustainable management of marine resources is of prime importance to Sri Lanka. Blue Economy and Ocean Resource Management are main components of country's Blue-Green vision 2030, which requires an advanced understanding of OO for successful implementation. This requires reformed knowledge and application of oceanography through which, necessary scientific data can be deduced to make informed policy decisions.

However, the development of OO in the country is hindered by various factors. Despite the availability of the technical expertise in the subject, lack of technology and the interest retract the relevant actors from taking significant steps to develop oceanic studies. The country has not understood the importance and need to engage in ocean centric education which poses a greater challenge to the island. Relevant research, hands on experiments and practical experience is not sought, and at the same time active engagement in the area has further reduced, mostly due to lack of awareness and understanding.

Operational Oceanography in Asia remains at a basic level despite efforts from India, Indonesia and a few other countries like China and Korea. In order to obtain better results and better technical expertise in the area, countries must exhibit both personal and scientific interest in the area, keen interest and need on the part of the government to implement better ocean centric policies and a collective determination for sustainable ocean usage, all of which is not possible due to lack of consciousness. It is therefore, appropriate time that Sri Lanka as an island nation pursues necessary and needful steps towards advancing ocean centric policies and implementing oceanography in a larger scale to obtain a strategic advantage in the region and beyond.

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