

Technology Development in Mining for Mineral by NIOT

National Institute of Ocean Sciences (NIOT), Ministry of Earth Sciences, Government of India is working for technology development in deep-sea mining of minerals from soft sea level at a depth of 5000 to 6000 meters. As the first stage of development, NIOT has designed and developed a prototype shallow bed mining system capable of working up to a depth of 500 meters.

The system has been demonstrated at a depth of 512 meters off the Malvan coast. An artificial nodule laying system was designed, developed and successfully tested by ESSO-NIOT at a water depth of 517 m.

The remotely operable submersible ROSUB was developed in collaboration with the Bureau of Experimental Design of Moschological Engineering (EDBOE), Moscow. The ROSUB 6000 was deployed in the area allotted to India by the UN in the central Indian Ocean basin. The design depth qualification test of the ROSUB 6000 was completed at a depth of 5289 meters.

The soil testing device was developed and successfully tested at a 5200 m water depth to achieve detailed geotechnical properties of the mining area in the Central Indian Ocean Basin (CIOB).



Mining system



Remotely operated Submersible



Soil tester

The mining of deep sea minerals is expected to alter the state of the environment in the marine ecosystem. Environmental studies were conducted for the mining of deep-sea minerals to evaluate the potential impacts of deep-sea mining to fulfill one of the country's obligations as a Pioneer Investor under the United Nations Law of the Sea.

To study the effects of sediment re-suspension and rehabilitation, environmental parameters were monitored by testing and collection of samples in reference areas for the Benthic disturbance experiment. The results of surveillance cruises have indicated that the **tenth** conditions are steadily moving towards restoration and the effects of disturbances are being closed.

In addition, mineral-related organisms and other environmental parameters were also assessed. Studies conducted so far have helped to understand the basic conditions and environmental variability of various environmental parameters associated with deep-sea minerals.

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