

**GOVERNMENT OF INDIA
OCEAN DEVELOPMENT
LOK SABHA**

UNSTARRED QUESTION NO:1287
ANSWERED ON:07.12.1999
OCEAN DEVELOPMENT PROGRAMMES
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Will the Minister of OCEAN DEVELOPMENT be pleased to state:

- (a) whether some proposal pertaining to Ocean Development Programme are under the consideration of the Government;
- (b) if so, the details thereof and the estimate cost of these projects, separately;
- (c) the total expenditure incurred by the Government on Ocean Development during the last three years, yearwise; and
- (d) the measures being taken to exploit huge resources lying in the ocean basin?

Answer

MINISTER FOR OCEAN DEVELOPMENT (DR. MURLI MANOHAR JOSHI)

- (a) At present there are no proposals under consideration of the Government.
- (b) Does not arise.
- (c) The expenditure incurred by the Department of Ocean Development on ocean development programmes during last three years, yearwise, is as under:

(Rs. In crore)

Details	1996-97	1997-98	1998-99
Plan	44.99	83.96	87.58
Non-Plan	19.38	16.83	19.03
TOTAL	64.37	100.79	106.61

- (d) Some of the important measures being taken to exploit the resources from the ocean basin include:

The Polymetallic Nodules Programme is one of the major R & D efforts towards the exploration of the marine non-living resources for the socio-economic benefit of the society. The Polymetallic Nodule programme, a multi-disciplinary and multi-institutional programme being implemented by the Government, is a futuristic long-term project of national importance aimed at development of relevant technologies to demonstrate the capabilities to exploit the manganese nodules from a depth of about 6,000 metre in the Central Indian Ocean Basin (CIOB) mine site. During the last 15 years systematic grid sampling and surveys were taken up in a phased manner in the Indian mine site at Central Indian Ocean Basin with definite objectives. The vast data thus acquired provided new insights on the topography of the basin and the resource potential. Based on these surveys, the resource potential, its abundance and quality was estimated. Further, it is planned to carry out close grid surveys at 5 km X 5 km and deep-tow photography in selected areas to improve the estimates on resource potential and demarcate the mine site and mining tracks. An underwater mining system with a capacity of 100 tonnes/day with a remotely operable crawler based collector module, a bucket-in-pipe based lifting module and control module with required instrumentation designed and fabricated by Central Mechanical Engineering Research Institute (CMERI), Durgapur and tested in shallow water on shore basin. New designs and development efforts were initiated to demonstrate the technology in Indian waters. In 1996, India reoriented its Polymetallic nodule development programme to establish the technologies in a phased manner with the initial efforts to demonstrate shallow bed mining technology in Indian seas upto 500 metres depth. Successful development of this mining technology could find applications in the exploration of sulphides, phosphorites, placer deposits and other seabed minerals in the Exclusive Economic Zone of India. India has formulated a joint developmental programme on seabed mining technology with the participation of the National Institute of Ocean Technology (NIOT), Chennai and the University of

Siegen, Germany. In the initial phase of the shallow bed mining technology development, the crawler available at the University of Siegen has been modified with a cutting system, a manipulator, pumping system and other accessories for demonstrating the shallow bed mining technology in Indian seas upto 500 metre depth. The required infrastructure in India is established at NIOT to integrate, to check out, to test and evaluate the performance of the crawler and its sub-systems and to demonstrate the shallow bed mining technology. Simultaneously, a detailed engineering report is being prepared jointly by the two institutes for the development of deep sea mining module capable of operating upto 6000 metre depth. By integrating such mining modules, a mining complex of optimum size can be established depending upon the needs of the future large scale operations. Considering the immense applications of the Remotely Operable Vehicle (ROV)/ Submersibles to underwater programmes in addition to sea bed mining, studies are initiated to define a submersible capable of operation upto 6000 metres for scientific research, underwater inspection and photography, maintenance and repair of the subsystems of the deep sea mining module, search and recovery of object, etc. As a supportive activity of mining technology development programme, a joint collaborative programme between DOD/NIOT and the Russian Academy of Sciences for design, development and testing of an unmanned submersible for operation upto 6000 metre water depth has been initiated. Copper, nickel, cobalt and manganese are the major metals of interest from the polymetallic nodules. In late 1995, considering the advantage in economics and the status of recovery of the metals from the nodules, the extractive metallurgy programme was reoriented to recover compounds of manganese also and go in for 4 metal recovery. In early 1997, the results of the batch scale process development were reviewed and decided to develop the sulphur-di-oxide ammoniacal leaching process further in a continuously operating pilot plant with a capacity to process 500 kg. dry nodules per day and continuously for 40 days. RRL, Bhubaneswar, Bhaba Atomic Research Centre (BARC), Mumbai and Hindustan Zinc Limited, Udaipur have developed the process parameters for the extraction of copper, nickel, and cobalt. Engineers India Limited, has designed the pilot plant to extract the metals. This continuously operating pilot plant is being established at M/S Hindustan Zinc Limited at Udaipur. About 100 tonnes of the nodules shall be processed in five batches to optimise the process parameters and to generate required data on process parameters for designing large scale commercial plants. With these data and other available information a detailed techno-economic feasibility analysis shall be carried out for future commercial operations which will guide the future plans on technology development and the magnitude of operations. In order to assess the impacts of large scale deep seabed mining activity on the marine environment a long term Environmental Impact Assessment study has been undertaken.