

OF PLANNING AND PROGRAMME IMPLEMENTATION (SHRI RAM NAIK): (a) to (d) Fifty-five small hydro power plants of an aggregate capacity of 222.43 MW have so far been sanctioned and an amount of Rs. 138.57 crores disbursed by IREDA, for these projects. Seventeen small hydro power plants of an aggregate capacity of 34.38 MW have been commissioned and these plants are estimated to generate about 36 MU of electricity annually. Remaining projects are scheduled for commissioning during 1998 and 1999.

Power from Ocean

4065. SHRI VAYALAR RAVI: Will the PRIME MINISTER be pleased to state:

(a) whether Government have made any study to produce power from Ocean;

(b) whether any such project was initiated in Tamil Nadu with U.S. collaboration; and

(c) if so, the details and the present status of the project?

THE MINISTER OF STATE IN THE MINISTRY OF RAILWAYS AND THE MINISTER OF STATE IN THE MINISTRY OF PARLIAMENTARY AFFAIRS AND THE MINISTER OF STATE IN THE MINISTRY OF PLANNING AND PROGRAMME IMPLEMENTATION (SHRI RAM NAIK): (a) Yes, Sir. The Ministry has supported feasibility studies in selected sites for producing power from ocean through ocean thermal energy conversion and tidal energy.

(b) and (c) A Memorandum of Understanding (MOU) was signed on 24.1.1994 between Sea Solar Power, Inc. of USA and Tamil Nadu Electricity Board/Tamil Nadu Energy Development Agency regarding 100 MW ocean thermal power project at the Off-shore of Kulasekarapattinam in Tamil Nadu. The proposal was for the establishment, operation and maintenance of the proposed project estimated to cost around US \$ 250 million for the supply, erection and commissioning of 100 MW floating type ocean thermal energy conversion sea power plant. However, Tamil Nadu Electricity Board informed this Ministry in 1997 that the MOU stands cancelled, as decided by the Government

of Tamil Nadu, as the project was not cost effective.

Ocean development studies

4066. SHRI VAYALAR RAVI: Will the PRIME MINISTER be pleased to state:

(a) whether Government have taken further initiative for Ocean development studies; and

(b) what are the new areas of research and the details thereof?

THE MINISTER OF STATE IN THE MINISTRY OF PERSONNEL PUBLIC GRIEVANCES AND PENSIONS AND THE MINISTER OF STATE IN THE MINISTRY OF FINANCE (SHRI R. JANARTHANAM): (a) Yes, Sir.

(b) Some of the major new areas of research proposed to be pursued during the 9th Five Year Plan period are as under :—

- * Development and demonstration of shallow bed mining system upto 500m depth off Indian coast, as the first step towards mining of Polymetallic Nodules, under a joint technology development project with external assistance and generation of a detailed technical report for development of technologies and hardware for mining of nodules from 6000 m. depth.
- * Commissioning of a continuous metal extraction pilot plant as a joint project with M/s Hindustan Zinc Ltd for 4-metal recovery process of PMN with a capacity of 500 kg per day and generation of process data for future commercial plant capable of processing 1.5 million tons of nodules per year.
- * Design and techno-economic viability study for a commercial metallurgical plant.
- * Development of a new power module to improve efficiency of wave energy conversion incorporating impulse turbine with movable guide blades and a common shaft single turbine connected to the variable speed induction generator and testing it at the Wave Energy plant at Vizhinjam.
- * Establishment of one MW pilot technology demonstration Ocean

Thermal Energy Conversion plant using the temperature differential between the surface sea water and the bottom sea water into electric power.

- * Design and development of a upgraded version of Remotely Operated Vehicle for deep sea bed mining technology development.
- * Design and development of marine acoustic instrumentation such as sub-bottom profiler, under-water positioning system, Remotely Operated Seak Skimmer platform, etc.
- * Establishment of Geomagnetism, Optical and Aeronomy Laboratory for conducting studies on atmospheric sciences in Antarctica.
- * Application of remote sensing for geo-exploration and survey, ocean and lake sediment coring, Sub-surface geophysical investigations in Antarctica under the Earth Sciences discipline.
- * Environment Impact Assessment studies for conservation and management of Antarctic environment.
- * Assessment of Marine Living Resources beyond 70 m depth in the Indian EEZ and ecological co-relation.
- * Developing and demonstrating viable technologies for enhancement of Marine Living Resources.
- * Development of a herbal drug for Antidiabetic and continuing the multi-institutional project on 'Drug from the Sea' to develop traditional and modern drugs.
- * Research and development in Satellite Coastal Oceanography and Ocean Modelling and Dynamics to generate validated operational data products and their dissemination for application in ports, shipping, fisheries, meteorology, oil and natural gas exploration, environment and management, etc.
- * Development of models of ocean-state for forecast on wave; currents; storm surges; sea level monitoring and Land-Ocean interaction in

the Coastal Zone; Climate variability, etc.

- * Development of Geographic Information System (GIS) on sources of pollution.
- * Determination of use classification of coastal waters, GIS based information system for ecologically sensitive areas, preparation of Model Integrated Coastal and Marine Area Management Plan, determination of Waste Load Allocation and development of guidelines for Environment Impact Assessment studies, under an Integrated Coastal and Marine Area Management Programme.
- * Reconnaissance geophysical surveys, heatflow data, water column studies and seabed sampling, for identification of nature, chemistry and frequency of the hydrothermal discharges in Andaman Bark Arc Basin.
- * Study of the geomorphology, sea bed configuration and collection and analysis of core samples from various spots of the Bengal and Nicobar Fan.
- * Establishment of Ocean Science & Technology Cells in selected universities in different fields of Marine Science & Technology; upgradation of R&D facilities in universities and Centres of Learning for pursuing research in Ocean Science and human resource development.
- * Survey of the Indian EEZ and beyond to collect data for delineation of the outer limits of continental shelf upto 350 nautical miles for claiming additional areas for exploration and exploitation of the Marine Resources as per the provision of the Convention on the Law of the Sea.

केन्द्रीय जांच ब्यूरो द्वारा प्रश्नावली भेजा जाना

4067. चौधरी हरमोहन सिंह यादव: क्या प्रधान मंत्री यह बताने की कृपा करेंगे कि:

(क) क्या केन्द्रीय जांच ब्यूरो किसी मामले में संदिग्ध व्यक्तियों से वास्तव में पूछताछ करने की बजाय प्रश्नावली जारी करता है;