

Department of Ocean Development

Statement of Outlays and Outcomes/Targets: Annual Plan 2005-06

(Rs. in crores)

Sl. No	Name of the Scheme/ Programme	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantifiable Deliverables (On quarterly Basis)	Processes/ Timelines of the approvals	Remarks/ Risk factors
1.	Polar Science	<ul style="list-style-type: none"> <li>• Planning, co-ordination &amp; execution of the XXV Indian Scientific Expedition to Antarctica.</li> <li>• Continuation of research programs at NCAOR in the realms of Paleoclimatology, Polar Remote Sensing, Southern Ocean Oceanography and Antarctic limnology.</li> <li>• Structural strengthening of Maitri and augmentation of waste water system.</li> <li>• Revamping the summer huts and establishment of temporary field huts in the Gruber Mountains.</li> <li>• Continuation of work towards the establishment of the second permanent Indian Base in the Larsemann Ranges.</li> <li>• Initiation of shallow ice-core drilling in Antarctica.</li> <li>• Establishment of lab. Infrastructure at NCAOR for</li> </ul>	41.00	<p><b>Quarter I:</b> Calling for research proposals, Initiation of action for procurement of items for the forthcoming expedition, Continuation of in-house R&amp; D programs at National Centre for Antarctic and Ocean Research (NCAOR)</p> <p><b>Quarter II:</b> Selection of the Expedition Team, Medical Inspection, Acclimatization training of the team, procurement of expedition materials, finalisation of chartering of the ship and helicopters, action for the establishment of lab. Infrastructure at NCAOR</p> <p><b>Quarter III:</b> Shipment of expedition materials to Cape Town, briefing of the team, and launching of the expedition from Goa and Cape Town during December.</p>		The exact dates of launching and return of the expedition are subject to the sea conditions

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		Environmental, micropaleontological, geochemical and Polar Remote sensing studies.		<i>Quarter IV:</i> Establishment of summer camp and initiation of research activities in Antarctica (Dec-Jan), initiation of work of structural strengthening of Maitri, revamping of the summer huts, initiation of work at the new Indian Antarctic site, continuation of research work at NCAOR, initiation of shallow ice-core drilling; the summer team with the earlier winter-over team to depart from Antarctica during mid-late March 2006.		
2.	Polymetallic Nodules Programme	<ul style="list-style-type: none"> <li>• To finalise first generation mine site</li> <li>• To study Environmental Impact of mining</li> <li>• To develop mining system in phases for exploitation of nodules.</li> <li>• To develop technologies for extracting metals from the nodules</li> </ul>	22.00	50% of close grid survey in the selected blocks  Testing of crawler at depth of upto 500 m water depth  Development of Remotely operated Vehicle for 6000 m  Testing of the ROV at 2500 m before testing at 6000 m water depth. Setting of Ferro-silico manganese pilot plant for extracting alloy from the nodules.		R&D endeavour of this nature the deliverables are indicated only on yearly basis

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3	Ocean Observation and Information System (OOIS)	<ul style="list-style-type: none"> <li>• Development of INCOIS Campus and construction of Building and establish and operate IT Infrastructure</li> <li>• Establish and operate Ocean Information Bank, Ocean Portal and Web-based Services</li> <li>• Provide Potential Fishing Zone Advisories in a mission mode and make it part of the value chain of the Fishing community</li> <li>• Provide experimental Ocean State Forecast</li> <li>• To develop algorithms and model for retrieving met-ocean parameters from Indian Ocean Remote Sensing Satellites (Oceansat series) and foreign Satellites</li> <li>• Improve Ocean State Forecast</li> <li>• Argo Profiling Floats: Deploy 150 Argo profiling Floats,</li> <li>• Develop Data assimilation System for enhancing Ocean and Climate predictability, Indigenous development of Argo floats</li> </ul>	17.00	<p><b>Quarter –I</b></p> <p>Deployment of 10 Argo Floats and generation of Value added products on INCOIS website</p> <p>Publishing of data from 536 Argo floats on INCOIS web-site.</p> <p>Conducting studies on the upper ocean response during the active and break periods of Indian Summer Monsoon.</p> <p><b>Quarter-II</b></p> <p>Install Electronic Display Board at Nagapattinam, Tamilnadu.</p> <p>Procurement and deploy 10 Argo Floats.</p> <p><b>Quarter-III<sup>1</sup></b></p> <p>Completion of Satellite Data Acquisition and Processing System, Data Storage and Peripherals.</p> <p>Install Electronic Display Board and conduct PFZ User interaction workshop at</p>		

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		<ul style="list-style-type: none"> <li>Periodically deployment of Drifting buoys, Current Meter Arrays, Expendable Bathythermographs, Tide Gauges and Sea Truth Campaigns</li> </ul>		<p>Veraval</p> <p>Retrieval and redeployment of Current Meter Mooring Arrays in the Indian Ocean.</p> <p><b>Quarter-IV</b></p> <p>Deploy 10 Argo Floats</p> <p>Operationalise Data warehousing and mining facility.</p> <p>Initiate Web computing and decision support system. Implementation of Delayed Mode Quality Control for the Argo floats data.</p>		
4.	Marine Research & Technology Development (MRTD)		25.00			
4(a)	Integrated Coastal and Marine Area Management	Determination of safe limits for heavy metals, pesticides and oil for marine animals using modern bioassay techniques		<p><b>Quarter I</b></p> <p>Completion of toxicity determination in estuarine clam and estuarine fish for mercury</p>		Sea roughness and loss of field equipment

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		<p>To understand the processes responsible for closure of mouth of Vellar estuary and the negative impact of training jetties constructed at Netravathi river to prevent accretion and development of proper management solutions</p> <p>To understand the processes involved in biogeochemical changes in estuarine environment</p> <p>To understand processes responsible for shoreline changes and develop remedial measures through mathematical modelling</p>		<p><b>Quarter II</b> Completion of sediment transport model for Vellar estuary and test the model against interventions like training jetties, geosynthetic tubes used to prevent accretion</p> <p><b>Quarter III</b> Development of hydrodynamic and water quality model to understand the dynamics of nutrients and relationship between nutrient changes and phytoplankton population</p> <p><b>Quarter IV</b> Completion of the modelling exercises in Ennore and Kerala coast (stretch-I) to delineate process responsible for shoreline changes and development of Shoreline Management Plans</p>		
4(b)	Development of potential drugs from ocean	<ul style="list-style-type: none"> <li>• Systematic collection, identification of 30 marine organisms and exploring the presence of potential active compound by extraction.</li> <li>• Conducting regulatory pharmacology and toxicology of 2 extracts.</li> </ul>		<p><b><u>Quarter-I (April – June)</u></b></p> <p>Chronic toxicity of antidyslipidemic compound (PFO) in monkeys</p> <p>Dose titration and development of CDR-134-F-194 and CDR-267-F018 antidiabetic cum antidyslipidemic drug</p>		<p>(i) Depending availability of material and animals</p> <p>(ii) Subject to timely approval of MOEF</p>

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		<ul style="list-style-type: none"> <li>Initiation of Clinical Trial for anti-hyperlipidemic anti-diabetic compound.</li> </ul>		<p>Regulatory pharmacology studies of CDR-134-F194 and CDR-267-F018</p> <p>Safety toxicity studies of CDR-134-F194 and CDR-267-F018</p>		R&D endeavour of this nature the deliverables are indicated only on yearly basis
4(c)	Coastal Monitoring and Prediction System	Assessment of the health of coastal waters including islands of India		<p><b>Quarter – I</b></p> <p>Conducting intercalibration exercises for data quality</p> <p><b>Quarter – II</b></p> <p>Updating microbial strains in Repository for reference facilities</p> <p><b>Quarter – III</b></p> <p>Updating GIS data base on marine pollution</p> <p><b>Quarter – IV</b></p> <p>Modelling of sediment transportation in Tapi Estuary</p>		
4(d)	Centre for Marine Living Resources (CMLRE)	<ul style="list-style-type: none"> <li>To corelate fishery with its environment and develop hind cast/forecast models to explain short term / long term trends in the</li> </ul>		Completion of Nearshore Environment & current data off Kerala coast for pre-monsoon and environment & productivity of the Arabian Sea for Summer Monsoon 2005		R&D endeavour of this nature the deliverables

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		<p>fishery.</p> <ul style="list-style-type: none"> <li>• Exploration and exploitation of (i) deep-sea fishery resources (ii) non-conventional resources (myctophids of DSL) and (iii) resources of the Southern Ocean.</li> <li>• To develop bench mark data on marine benthos of the Indian EEZ and update it periodically.</li> <li>• Monitoring and surveillance of Harmful algal blooms in the Indian EEZ</li> <li>• Technology development for utilisation of Marine Living Resources</li> </ul> <p>Promote basic R &amp; D on living resources</p> <ul style="list-style-type: none"> <li>• Setting up of FORV Data &amp; referral centre.</li> </ul>		<p>Preparation of atlas on the biocomposition and &amp; distribution patterns of nektons in the Deep Scatering Layer of the Indian EEZ</p> <p>Finalising of an atlas on Fishery resources in the Indian EEZ</p> <p>Completion of Fishery Oceanographic bulletins for 2002-03, 2003-04 and 2004-05</p>		are indicated only on yearly basis
4(e)	Marine Research and Capacity Building (MRCB)	<ul style="list-style-type: none"> <li>• To support basic science, applied research, technology development and other projects in the field of marine sciences and technology through the nine Ocean Science and Technology Cells</li> <li>• Upgradation of select OSTCs into</li> </ul>		<ul style="list-style-type: none"> <li>• Development of technologies, products/ applications, patents, papers published, Ph.Ds awarded, etc.</li> <li>• Submission of final reports reviewed by the Management Board in respect of completed projects</li> <li>• Upgraded OSTC in Marine Biology,</li> </ul>		

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		<p>Centre of Excellence</p> <ul style="list-style-type: none"> <li>• Provide fellowships to meritorious students at educational institutions and research organizations for research in ocean science &amp; technology, which adds to the skilled manpower base in the field of marine sciences</li> </ul>		<p>Annamalai University into DOD Centre of Excellence</p> <p><b>Quarter 1</b> Funding support for 1 ongoing and 4 completed programmes</p> <p><b>Quarter 2</b> Funding support for 30 ongoing projects and 6 new programmes</p> <p><b>Quarter 3</b> Funding support for 7 ongoing projects and 3 new programmes</p> <p><b>Quarter 4</b> Funding support for 7 ongoing projects and 3 new programmes</p>		
5.	National Institute of Ocean Technology (NIOT)	<ul style="list-style-type: none"> <li>• Demonstration of 1 MW OTEC power plant</li> <li>• Establishment and augmentation of fresh water generation from 1.0 lakh (lakh liter per day ) LPD to 2 lakh LPD</li> <li>• Lobster fattening and larval rearing:</li> <li>• Mudcrab fattening and larval rearing</li> </ul>	42.00	<p>Approval of RCE is awaited</p> <p><b>Quarter-1</b> Commissioning of a Low Temperature Desalination Plant (LTTD) of 1 lakh liter per day (LPD) at Kavaratti</p> <p>Establishment of new recirculatory system for completing the larval life cycle of spiny lobsters</p> <p><b>Quarter-2</b></p>		



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		<ul style="list-style-type: none"> <li>Transfer of technology for fattening of mudcrab in A&amp;N islands – Identification of beneficiaries and dissemination of crab farming / fattening technology:</li> </ul>		<p>Augmentation of existing LTTD plant capacity to 2.0 lakh LPD</p> <p>Scaling up of sand lobster seed production &amp; completion of larval life cycle of spiny lobsters</p> <p>Identification of beneficiaries in Middle and South Andaman</p> <p><b>Quarter-3</b> Scaling up of sand lobster seed production to a commercial level &amp; completion of spiny lobster larval cycle.</p> <p>Training and dissemination of the technology to selected beneficiaries at Middle and South Andaman. Creation of demonstration ponds at ANCOST campus</p> <p><b>Quarter –4</b> Design review and realization of hardware for 10 MLD Completion of spiny lobster larval cycle.</p>		
6.	Coastal Research Vessel (CRV)	To continuously operate and maintain and manage the two coastal research vessels Sagar Purvi & Paschimi for	5.00	Post monsoon and pre monsoon surveys for COMAPS using Sagar Purvi in the West Coast and Sagar Paschimi in the East by		

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		implementation of the COMAPS & ICMAM programmes of DOD and also provide a service to other agencies for surveys and data collection.		Institutes: NIO –MumbaiNIO- GoaCESS & RRL TrivandrumCAS- Annamalai & RRL Bhubaneshwar and also for programmes of ICMAM, NIOT and various other consultancy work.		
7	Delineation of Outer Limits of Continental Shelf (CLCS)	<ul style="list-style-type: none"> <li>• Completion of the data interpretation and Documentation of India's claims for an extended legal continental shelf</li> <li>• Completion of geophysical data banking facilities at NCAOR</li> </ul>	1.00	<p><b>Quarter I:</b> Completion of seismic, gravity and magnetic data interpretation.</p> <p><b>Quarter II:</b> Initiation of documentation of the initial scientific results</p> <p><b>Quarter III:</b> Finalization of all maps, charts and submission to the Department.</p> <p><b>Quarter IV:</b> Completion of documentation work and geodatabanking at NCAOR</p>		

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8.	Comprehensive Swath Bathymetric Survey of Indian EEZ (NIOT, NIO & NCAOR)	<ul style="list-style-type: none"> <li>To carry out the swath bathymetric survey of entire EEZ and preparation of detailed report</li> </ul>	24.00	4 cruises of 10 days each for survey upto 500 m depth. Completion of 3 cruises of survey beyond 500 m water depth.	Completed	Subject to timely Defence Clearance R&D endeavour of this nature the deliverables are indicated only on yearly basis
9.	Gas-hydrate Exploration & Technology Development for Exploitation (NIOT, NIO & NGRI)	<ul style="list-style-type: none"> <li>To explore and assess the potential of Gas Hydrates</li> <li>To develop technologies for sampling the gas hydrate</li> </ul>	30.00	<p>Detailed geophysical survey of selected sites</p> <p>Submersible with various sensor would be developed and tested upto 2500 m depth.</p> <p>Commencement of development of automatic coring system</p>		This is a R&D endeavour. The quantifiable quarterly deliverables may not be possible to indicate
10	Acquisition of new Research	<ul style="list-style-type: none"> <li>To build a new multipurpose vessel for technology services and</li> </ul>	80.00	<b>Quarter I- to Quarter IV</b>	RCE under process	

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	Vessels by NIOT	demonstration. A new vessel to cater to the ongoing and the new mission mode programs during the X and the XI Plan period will be constructed and operated.		Finalization of Tender documents  Obtaining necessary clearances for construction		
11	Geo-physical Study of Laxmi Basin	<ul style="list-style-type: none"> <li>Finalisation of the report on geophysical studies of Laxmi Basin.</li> </ul>	1.00	<p><b>Quarter I:</b> Completion of seismic, gravity and magnetic data interpretation.</p> <p><b>Quarter II:</b> Initiation of documentation of the scientific results</p> <p><b>Quarter III:</b> Finalization of all maps and charts on the basis of interpretation of various data.</p> <p><b>Quarter IV:</b> Finalization of the Report and submission to the Department.</p>		This is an R&D endeavour it would be possible to indicate the deliverables on yearly basis.
12	Ocean Moored Data Buoy Network – (National Data Buoy Programme of 9 <sup>th</sup> Plan)	<ul style="list-style-type: none"> <li>To increase the buoy network from 12 to 40 nos. to collect real time meteorological and oceanographic parameters in Indian seas so as to improve the weather prediction, early cyclone warning, to improve the climate predictive capability, satellite data validation, to support</li> </ul>	25.00	<p><b>Quarter 1</b> To maintain 20 buoys network in the Indian seas.</p> <p><b>Quarter 2</b> To maintain 20 buoys network in the Indian seas.</p>		

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		<p>Port and offshore sector developments and ocean related research activities.</p> <ul style="list-style-type: none"> <li>• To support national, regional and international programmes relating to Ocean Sciences and Technology by providing real-time and archived data and related information.</li> <li>• To provide real time data programme relating to prediction of movement of cyclone and consequent storm surges that are devastating in nature.</li> <li>• To participate in the GOOS (Global Ocean Observing System) of IOC (Inter governmental Oceanographic Commission) of UNESCO.</li> <li>• To indigenise production of data buoys.</li> <li>• Construction of Buoy Tender cum Research Vessel is under process to support data buoys deployment and maintenance activities.</li> </ul>		<p><b>Quarter 3</b> To increase the buoy network by 25 nos.</p> <p><b>Quarter 4</b> To increase the buoy network by 30 nos.</p> <p><b>Quarter 1 to quarter3:</b> Construction of vessel at M/s. Hindustan Shipyards.</p> <p><b>Quarter-3</b> Ship delivery is expected in December '05</p>		

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13	Oceanogenic Disaster: Tsunami and Stormsurges	<ul style="list-style-type: none"> <li>To realize an operational National Early Warning System for Tsunami and Storm Surges within the next 2<sup>1/2</sup> years,</li> <li>To set up the National Early Warning Centre in Hyderabad located at DOD's Indian National Centre for Ocean Information Services (INCOIS) for operation on a 24x7 basis</li> <li>To institute a mechanism to sustain the System to generate and issue 'warning' and watch' advisories, as the responsible national agency.</li> </ul>	20.00	<p><b>Quarter 1</b> Finalizing the project document and obtaining the approval of the EFC Completion of post tsunami project report</p> <p><b>Quarter 2</b> Seeking the approval of CCEA Interim Tsunami Warning Centre was set up and the Centre is operationally receiving tsunami watch and advisories from Pacific Tsunami Warning Centre and Japan Meteorological Agency on 24x7 basis.</p> <p><b>Quarter 3</b> Issuing the Administrative Order Commission V -SAT Connectivity.</p> <p><b>Quarter 4</b> Initiation of the project work</p>		
14	Information Technology	<ul style="list-style-type: none"> <li>IT induction and implementation of e-governance, augmentation of IT infrastructure at DOD Headquarters, and augmentation of IT facilities at its attached offices, autonomous bodies under it.</li> <li>Timely dissemination of the information about of technologies, news and research abstracts for the scientific staff in the Department,</li> </ul>	7.00	<p><b>Quarter I to Quarter-IV</b></p> <p>Implementation of E-governance activities</p> <p>Induction of web-servers, data base server, and file management server</p> <p>E-library, centralized UPS for additional power requirement for attached offices and autonomous bodies</p>		

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		its attached offices and autonomous bodies under it. • Hosting of Departmental activities, new activities, tender notice, tender document, ocean awards, ocean quiz, etc, on DOD Website and their periodic updation.				
	<b>Total</b>		<b>340.00</b>			