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(Results-Framework Document)

for

Ministry of Earth Sciences

(2012-2013)

Section 1:
Vision, Mission, Objectives and Functions

Vision

To excel in knowledge and technology enterprise for the earth system science realm towards socio-economic benefit of the Indian sub-continent and in the Indian Ocean region

Mission

- Provide scientific and technical support for both academic and applied research in Earth System sciences as a whole comprising the atmosphere, hydrosphere, cryosphere and the geosphere, with particular reference to the Indian sub-continent and the surrounding oceans as well as the Polar Regions.
- Provide the Nation with the best possible services in forecasting the monsoons and other weather/climate parameters, ocean state including early warnings to natural disasters like storm surge, earthquakes, tsunamis and other phenomena through well integrated programs.
- Support science, conduct research survey and develop technology for exploration and exploitation of ocean resources (living and non-living), ensuring their sustainable utilization

Objective

1	To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast
2	To provide a wide range of ocean information advisories including fishery information
3	To improve the understanding of Polar Science and its implications for climate change
4	To developing technology for harnessing marine resources
5	To conduct survey for assessing non-living resources
6	To asses coastal marine productivity and Marine Ecosystems
7	To improve understanding of Climate Change Science
8	To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.
9	To promote basic research including Capacity building in the Earth System Science
10	To promote awareness and educate the public by extending support to seminars, symposia, conferences and conduct workshops with stakeholders
11	To develop a national Geographical Information System
12	To conduct research in Seismology and Geoscience

Functions

Section 2:
Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
[1] To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	21.00	[1.1] Integrated Agro Advisory Services	[1.1.1] Number of Districts covered by Agro Advisory	number	3.15	575	570	560	555	500
			[1.1.2] Grameen Krishi Mausam Seva	Number	2.10	3500000	3400000	3300000	3200000	3100000
		[1.2] Improve Operational Weather Services	[1.2.1] Augmentation of High Performance Computing System as part of Monsoon Mission	number	3.36	160	150	140	130	120
			[1.2.2] Strengthen of Observational Network(AWS, ARGs)	number	4.20	1100	1075	1050	1025	1000
			[1.2.3] Quality of Research Publications	number	3.15	100	90	80	75	70
			[1.2.4] Application of higher resolution Global Numerical Models	Horizontal resolution (km)	1.26	22	23	24	25	25
			[1.2.5] Completion of Admission process of the first batch of ten students for the advanced training program in Earth System Sciences & Climate	number	1.68	25	20	13	11	9
			[1.2.6] Research Publications for operational forecast	number	2.10	95	80	65	60	55

Section 2:
Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
[2] To provide a wide range of ocean information advisories including fishery information	10.00	[2.1] Strengthening of Ocean Observational network	[2.1.1] Number of deployments	number	3.00	270	265	260	255	250
		[2.2] Potential Fishing Zone Advisory & Ocean State Forecast Services	[2.2.1] Potential Fishing Zone Advosory	number	3.00	130	120	115	100	90
		[2.3] Ocean State Forecast Services	[2.3.1] Ocean State Forecast	number	3.00	328	310	300	290	275
		[2.4] To acquire Ocean Research Vessels	[2.4.1] Preparation of DPR & EFC	Date	1.00	15/02/2013	28/02/2013	10/03/2013	20/03/2013	31/03/2013
[3] To improve the understanding of Polar Science and its implications for climate change	12.00	[3.1] Planning, Coordination and implementation of Indian Antarctic Program	[3.1.1] Launching of 32nd Expedition	Date	2.40	20/11/2012	01/12/2012	15/12/2012	31/12/2012	15/01/2013
			[3.1.2] Completion of targeted scientific and logistics task	%	1.00	80	70	60	55	50
			[3.1.3] Initiation of PhaseII constructive-stage activities of the 3rd station	Date	1.20	30/11/2012	17/12/2012	18/12/2012	31/12/2012	15/01/2013
		[3.2] Planning, Coordination and implementation of Scientific Expeditions to the Arctic	[3.2.1] Launching of the summer (S) and winter (W) phases of study in the Arctic region	Date	1.20	25/06/2012	10/07/2012	15/07/2012	20/07/2012	25/07/2012
			[3.2.2] completion of targeted scientific and logistics activites at Ny-Alesund for the year	Date	1.00	24/04/2013	31/03/2013	05/04/2012	15/04/2012	20/05/2012
		[3.3] Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	[3.3.1] Launching of Southern Ocean Expedition (2012-13)	Date	2.00	15/01/2013	25/01/2013	05/02/2013	10/02/2013	15/02/2013

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Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
			[3.3.2] completion of analytical work of data collected during the previous expedition and submission of report.	Date	1.00	31/12/2012	31/10/2012	15/11/2012	30/11/2012	15/12/2012
		[3.4] In-house R&D projects in the fields of cryospheric studies, polar remote sensing, paleoclimatology,polar biology and environmental studies	[3.4.1] Completion of targeted field data collection and analytical work and submission of reports	%	1.20	100	90	80	70	60
			[3.4.2] Publication of Results in peer reviewed journals	Number	1.00	15	12	10	8	5
[4] To developing technology for harnessing marine resources	12.00	[4.1] Development of Underwater Collector & Crushing Systems for manganese nodule mining and testing in shallow waters	[4.1.1] Completion of Deep-sea Trials of Subsystems	Date	4.80	31/01/2013	15/02/2013	28/02/2013	15/03/2013	31/03/2013
			[4.1.2] Demonstration of suction pile in field	Date	2.88	16/12/2012	31/12/2012	15/01/2013	31/01/2013	15/02/2013
		[4.2] Technology Development for Gas Hydrates – Development of Autonomous coring system and sea trials	[4.2.1] Sea trials of Autonomous Coring System (ACS) more than 100 m	Date	4.32	31/08/2012	31/10/2012	31/12/2012	31/01/2013	31/03/2013
[5] To conduct survey for assessing non-living resources	6.00	[5.1] Survey, exploration for Polymetallic Nodules, Cobalt crust, hydrothermal sulphides ,gas hydrates,and topographic survey of Exclusive Economic Zone	[5.1.1] Deployment of Research Vessel	sq. km	3.00	25000	20800	16000	14400	11200

Section 2:
Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
		[5.2] Geological and Tectonic Evolution of the Northern Indian Ocean and activities related to Integrated Ocean Drilling Program (IODP)	[5.2.1] Completion og Data Analysis pertaing to the Laccadive offsore region: data collecction from the forearc region of Andamans and field studies of Barren and Narcodam islands:	Date	2.00	01/02/2013	30/09/2012	31/10/2012	01/01/2013	15/02/2013
		[5.3] Creation of Marine Geophysical Data Centre at NCAOR - Design of a structured RDBMS capable of archiving & retrieving marine geophysical data	[5.3.1] Revision and submission of the Scientific Proposal to IODP based on the comments from the reviewers; Participation of Indian Scientists in IODP cruise	Date	1.00	31/03/2013	15/11/2012	30/11/2012	15/12/2013	15/01/2013
[6] To asses coastal marine productivity and Marine Ecosystems	4.00	[6.1] Integration and analysis of field data, Simulation of models, validation of results and preparation of Shoreline management plan	[6.1.1] Finalization of Shoreline Management Plan for Gopalpur coast	Date	2.00	15/02/2013	01/01/2013	15/01/2013	01/02/2013	01/03/2013
		[6.2] Establishment of Indian Ocean biogeographical Information System (IndOBIS)	[6.2.1] No. of records.	number	2.00	6000	4000	3000	2000	1000
[7] To improve understanding of Climate Change Science	5.00	[7.1] To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	[7.1.1] Regional Climate Model Projections	number	1.50	2045	2035	2025	2020	2015

Section 2:
Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
			[7.1.2] Cumulative Impact Factor of the Research Papers	number	2.50	20	21	15	10	10
		[7.2] To acquire airborne platforms for studying montoring upper air parameters	[7.2.1] Finalisation DPR and circulation of EFC to seek the approval	Date	1.00	15/12/2012	31/12/2012	31/01/2013	28/02/2013	31/03/2013
[8] To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.	5.00	[8.1] Issues of Earthquake bulletin with minimum time lag after the earth quake on sea-bed	[8.1.1] Number of EQ bulletins issued within 12 minutes after the earthquake(%)	percentage	2.00	100	98	95	85	75
		[8.2] Issue of Tsunami Warning with minimum time lag after the earth quake on sea-bed	[8.2.1] Number of Tsunami Bulletins issued within 30 minutes after the earthquake(%)	percentage	2.00	100	98	95	85	75
		[8.3] Issue of Tsunami warning with minimum time leg after the earth quake on sea-bed	[8.3.1] Accuracy of warning(%)	percentage	1.00	77	70	60	55	50
[9] To promote basic research including Capacity building in the Earth System Science	4.00	[9.1] To strengthen capacity development and promote research outside the ministry	[9.1.1] Supporting research and academic programmes in Earth System Science	Number of Projects	4.00	110	100	90	80	70
		[9.2] To set training centres in the field of Operational Oceanography, Meteorology	[9.2.1] Finalisation of EFC and Circulation for appraisal	Date	0.00	01/11/2012	01/12/2012	01/01/2013	01/02/2013	01/03/2013
[10] To promote awareness and educate the public by extending support to seminars, symposia, conferences and conduct workshops with stakeholders	2.00	[10.1] Conducting user oriented workshops with key stakeholder to promote awareness	[10.1.1] Conducting user oriented workshops with key stakeholder to promote awareness	Number	1.00	15	12	10	8	6

Section 2:
Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
		[10.2] Support seminar/symposium/conference in the field of earth sciences	[10.2.1] Support seminar/symposium/ conference in the field of earth sciences	Number	1.00	50	40	30	25	20
[11] To develop a national Geographical Information System	1.00	[11.1] To establish a centre for development of National GIS	[11.1.1] Preparation of DPR and EFC	Date	1.00	01/01/2013	15/01/2013	30/01/2013	15/02/2013	28/02/2013
[12] To conduct research in Seismology and Geoscience	3.00	[12.1] To setup a National Centre for Seismology	[12.1.1] Obtain the approval and launch of the programe of NCS	Date	1.50	31/10/2012	30/11/2012	31/12/2012	31/01/2013	28/02/2013
		[12.2] To conduct front ranking research of solid earth process for understanding seismic process	[12.2.1] Preparation of DPR and circulation EFC for Deep Sea borewell at Koyana	Date	1.50	15/09/2012	15/11/2012	15/12/2012	15/01/2013	15/02/2013
* Efficient Functioning of the RFD System	3.00	Timely submission of Draft for Approval	On-time submission	Date	2.0	05/03/2012	06/03/2012	07/03/2012	08/03/2012	09/03/2012
		Timely submission of Results	On- time submission	Date	1.0	01/05/2012	03/05/2012	04/05/2012	05/05/2012	06/05/2012
* Administrative Reforms	6.00	Implement mitigating strategies for reducing potential risk of corruption	% of implementation	%	2.0	100	95	90	85	80
		Implement ISO 9001 as per the approved action plan	Area of operations covered	%	2.0	100	95	90	85	80
		Identify, design and implement major innovations	Implementation of identified innovations	Date	2.0	05/03/2013	06/03/2013	07/03/2013	08/03/2013	09/03/2013
* Improving Internal Efficiency / responsiveness / service delivery of Ministry / Department	4.00	Implementation of Sevottam	Independent Audit of Implementation of Citizen's Charter	%	2.0	100	95	90	85	80
			Independent Audit of implementation of public grievance redressal system	%	2.0	100	95	90	85	80

* Mandatory Objective(s)

Section 2:
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Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
* Ensuring compliance to the Financial Accountability Framework	2.00	Timely submission of ATNs on Audit paras of C&AG	Percentage of ATNs submitted within due date (4 months) from date of presentation of Report to Parliament by CAG during the year.	%	0.5	100	90	80	70	60
		Timely submission of ATRs to the PAC Sectt. on PAC Reports.	Percentage of ATRS submitted within due date (6 months) from date of presentation of Report to Parliament by PAC during the year.	%	0.5	100	90	80	70	60
		Early disposal of pending ATNs on Audit Paras of C&AG Reports presented to Parliament before 31.3.2012.	Percentage of outstanding ATNs disposed off during the year.	%	0.5	100	90	80	70	60
		Early disposal of pending ATRs on PAC Reports presented to Parliament before 31.3.2012	Percentage of outstanding ATRS disposed off during the year.	%	0.5	100	90	80	70	60

* Mandatory Objective(s)

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value FY 10/11	Actual Value FY 11/12	Target Value FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15
[1] To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	[1.1] Integrated Agro Advisory Services	[1.1.1] Number of Districts covered by Agro Advisory	number	549	550	575	600	613
		[1.1.2] Grameen Krishi Mausam Seva	Number	1200000	3000000	3500000	4500000	5500000
	[1.2] Improve Operational Weather Services	[1.2.1] Augmentation of High Performance Computing System as part of Monsoon Mission	number	1	4	160	200	240
		[1.2.2] Strengthen of Observational Network(AWS, ARGs)	number	839	1000	1100	1200	1300
		[1.2.3] Quality of Research Publications	number	170	90	100	120	150
		[1.2.4] Application of higher resolution Global Numerical Models	Horizontal resolution (km)	25	23	22	21	20
		[1.2.5] Completion of Admission process of the first batch of ten students for the advanced training program in Earth System Sciences & Climate	number	10	20	25	30	35
		[1.2.6] Research Publications for operational forecast	number	92	94	95	98	105
[2] To provide a wide range of ocean information advisories including fishery information	[2.1] Strengthening of Ocean Observational network	[2.1.1] Number of deployments	number	234	250	270	290	320

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value FY 10/11	Actual Value FY 11/12	Target Value FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15
	[2.2] Potential Fishing Zone Advisory & Ocean State Forecast Services	[2.2.1] Potential Fishing Zone Advosory	number	72	140	130	150	160
	[2.3] Ocean State Forecast Services	[2.3.1] Ocean State Forecast	number	365	365	328	320	350
	[2.4] To acquire Ocean Research Vessels	[2.4.1] Preparation of DPR & EFC	Date	01/12/2012	15/01/2013	15/02/2013	--	--
[3] To improve the understanding of Polar Science and its implications for climate change	[3.1] Planning, Coordination and implementation of Indian Antarctic Program	[3.1.1] Launching of 32nd Expedition	Date	17/12/2011	20/11/2011	20/11/2012	20/11/2013	20/11/2014
		[3.1.2] Completion of targeted scientific and logistics task	%	100	90	80	70	60
		[3.1.3] Initiation of PhaseII constructive-stage activities of the 3rd station	Date	30/11/2012	--	30/11/2012	--	--
	[3.2] Planning, Coordination and implementation of Scientific Expeditions to the Arctic	[3.2.1] Launching of the summer (S) and winter (W) phases of study in the Arctic region	Date	100	100	25/06/2012	15/06/2013	15/06/2014
		[3.2.2] completion of targeted scientific and logistics activites at Ny-Alesund for the year	Date	24/03/2011	28/04/2012	24/04/2013	24/04/2014	24/04/2015
	[3.3] Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	[3.3.1] Launching of Southern Ocean Expedition (2012-13)	Date	100	100	15/01/2013	15/01/2014	15/01/2015

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value FY 10/11	Actual Value FY 11/12	Target Value FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15
		[3.3.2] completion of analytical work of data collected during the previous expedition and submission of report.	Date	31/12/2010	31/12/2011	31/12/2012	31/12/2013	31/12/2014
	[3.4] In-house R&D projects in the fields of cryospheric studies, polar remote sensing, paleoclimatology,polar biology and environmental studies	[3.4.1] Completion of targeted field data collection and analytical work and submission of reports	%	95	100	100	100	--
		[3.4.2] Publication of Results in peer reviewed journals	Number	48	18	15	20	30
[4] To developing technology for harnessing marine resources	[4.1] Development of Underwater Collector & Crushing Systems for manganese nodule mining and testing in shallow waters	[4.1.1] Completion of Deep-sea Trials of Subsystems	Date	80	15/12/2011	15/01/2012	--	--
		[4.1.2] Demonstration of suction pile in field	Date	--	--	16/12/2012	--	--
	[4.2] Technology Development for Gas Hydrates – Development of Autonomous coring system and sea trials	[4.2.1] Sea trials of Autonomous Coring System (ACS) more than 100 m	Date	--	30/11/2011	31/10/2012	--	--
[5] To conduct survey for assessing non-living resources	[5.1] Survey, exploration for Polymetallic Nodules, Cobalt crust, hydrothermal sulphides ,gas hydrates,and topographic survey of	[5.1.1] Deployment of Research Vessel	sq. km	172	25000	15000	20000	30000

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value FY 10/11	Actual Value FY 11/12	Target Value FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15
	Exclusive Economic Zone							
	[5.2] Geological and Tectonic Evolution of the Northern Indian Ocean and activities related to Integrated Ocean Drilling Program (IODP)	[5.2.1] Completion og Data Analysis pertaing to the Laccadive offsore region: data collecction from the forearc region of Andamans and field studies of Barren and Narcodam islands:	Date	31/03/2010	01/01/2012	01/02/2013	01/02/2014	01/02/2015
	[5.3] Creation of Marine Geophysical Data Centre at NCAOR - Design of a structured RDBMS capable of archiving & retrieving marine geophysical data	[5.3.1] Revision and submission of the Scientific Proposal to IODP based on the comments from the reviewers; Participation of Indian Scientists in IODP cruise	Date	30/03/2011	31400	31/03/2013	31/03/2014	31/03/2015
[6] To asses coastal marine productivity and Marine Ecosystems	[6.1] Integration and analysis of field data, Simulation of models, validation of results and preparation of Shoreline management plan	[6.1.1] Finalization of Shoreline Management Plan for Gopalpur coast	Date	15/02/2011	31/01/2012	01/01/2013	--	--
	[6.2] Establishment of Indian Ocean biogeographical Information System (IndOBIS)	[6.2.1] No. of records.	number	100	5000	6000	7000	8000
[7] To improve understanding of Climate Change Science	[7.1] To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	[7.1.1] Regional Climate Model Projections	number	24	2030	2045	2075	2095

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value FY 10/11	Actual Value FY 11/12	Target Value FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15
		[7.1.2] Cumulative Impact Factor of the Research Papers	number	15	--	20	30	40
	[7.2] To acquire airborne platforms for studying montoring upper air parameters	[7.2.1] Finalisation DPR and circulation of EFC to seek the approval	Date	--	--	15/12/2012	--	--
[8] To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.	[8.1] Issues of Earthquake bulletin with minimum time lag after the earth quake on sea-bed	[8.1.1] Number of EQ bulletins issued within 12 minutes after the earthquake(%)	percentage	98	99	100	--	--
	[8.2] Issue of Tsunami Warning with minimum time lag after the earth quake on sea-bed	[8.2.1] Number of Tsunami Bulletins issued within 30 minutes after the earthquake(%)	percentage	98	99	100	--	--
	[8.3] Issue of Tsunami warning with minimum time leg after the earth quake on sea-bed	[8.3.1] Accuracy of warning(%)	percentage	70	75	77	80	82
[9] To promote basic research including Capacity building in the Earth System Science	[9.1] To strengthen capacity development and promote research outside the ministry	[9.1.1] Supporting research and academic programmes in Earth System Science	Number of Projects	90	100	110	120	130
	[9.2] To set training centres in the field of Operational Oceanography, Meteorology	[9.2.1] Finalisation of EFC and Circulation for appraisal	Date	--	--	01/11/2012	--	--
[10] To promote awareness and educate the public by extending support to seminars, symposia, conferences and conduct workshops with stakeholders	[10.1] Conducting user oriented workshops with key stakeholder to promote awareness	[10.1.1] Conducting user oriented workshops with key stakeholder to promote awareness	Number	38	20	15	20	25

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value FY 10/11	Actual Value FY 11/12	Target Value FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15
	[10.2] Support seminar/symposium/conference in the field of earth sciences	[10.2.1] Support seminar/symposium/conference in the field of earth sciences	Number	150	75	50	60	70
[11] To develop a national Geographical Information System	[11.1] To establish a centre for development of National GIS	[11.1.1] Preparation of DPR and EFC	Date	--	--	01/01/2013	--	--
[12] To conduct research in Seismology and Geoscience	[12.1] To setup a National Centre for Seismology	[12.1.1] Obtain the approval and launch of the programe of NCS	Date	--	--	31/10/2012	--	--
	[12.2] To conduct front ranking research of solid earth process for understanding seismic process	[12.2.1] Preparation of DPR and circulation EFC for Deep Sea borewell at Koyana	Date	--	--	15/09/2012	--	--
* Efficient Functioning of the RFD System	Timely submission of Draft for Approval	On-time submission	Date	--	--	06/03/2012	--	--
	Timely submission of Results	On- time submission	Date	--	--	03/05/2012	--	--
* Administrative Reforms	Implement mitigating strategies for reducing potential risk of corruption	% of implementation	%	--	--	95	--	--
	Implement ISO 9001 as per the approved action plan	Area of operations covered	%	--	--	95	--	--
	Identify, design and implement major innovations	Implementation of identified innovations	Date	--	--	06/03/2012	--	--
* Improving Internal Efficiency / responsiveness / service delivery of Ministry / Department	Implementation of Sevottam	Independent Audit of Implementation of Citizen's Charter	%	--	--	95	--	--
		Independent Audit of implementation of public grievance redressal	%	--	--	95	--	--

* Mandatory Objective(s)

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value FY 10/11	Actual Value FY 11/12	Target Value FY 12/13	Projected Value for FY 13/14	Projected Value for FY 14/15
		system						
* Ensuring compliance to the Financial Accountability Framework	Timely submission of ATNs on Audit paras of C&AG	Percentage of ATNs submitted within due date (4 months) from date of presentation of Report to Parliament by CAG during the year.	%	--	--	90	--	--
	Timely submission of ATRs to the PAC Sectt. on PAC Reports.	Percentage of ATRS submitted within due date (6 months) from date of presentation of Report to Parliament by PAC during the year.	%	--	--	90	--	--
	Early disposal of pending ATNs on Audit Paras of C&AG Reports presented to Parliament before 31.3.2012.	Percentage of outstanding ATNs disposed off during the year.	%	--	--	90	--	--
	Early disposal of pending ATRs on PAC Reports presented to Parliament before 31.3.2012	Percentage of outstanding ATRS disposed off during the year.	%	--	--	90	--	--

* Mandatory Objective(s)

Section 4:
Description and Definition of Success Indicators and Proposed Measurement Methodology

Objective	Action	Success Indicator	Definitions/Methodology
1. To improve weather forecast and provide specific advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal (Monsoon) forecast	Integrated Agro Advisory Services	Number of Districts covered y Agro Advisory	Weekly District level weather forecast &advisories to farmers in India
	Improve Operational Weather Services	Commissioning &Operation of High Performance Computing system	Computer of the order of the order of 100 –1000 Terra Flops required for running the numerical weather models
		Strengthen of Observational Network(AWS, ARGs)	AWS= Automatic Weather Stations to acquire real-time data ARG= Automatic Rain Gauge to acquire real-time data on rainfall
		Research Publications for operational forecast (IMPACT FACTOR	Impact Factor is a measure reflecting the average number of citations to articles published in science and technology journals.
		Application of higher resolution Numerical Models	Progressive decrease in Root Mean Square Error (RMSE) of forecast fields. (eq. 850hPa winds over the Indian region)

2. To provide a wide range of ocean information advisories including fishery information	Strengthening of Ocean Observational network	Number of deployments	Observational platforms viz Argo floats, satellite tracked drifters, current meter moorings, ADCP moorings, XBTs, etc are to be deployed to strengthen and expand the ocean observational network.
	Potential Fishing Zone Advisory &Ocean State Forecast Services	Increase in dissemination of Advisories through installation of Electronic Boards	The advisories on Potential Fishing Zone and Ocean State Forecast are provided to fishing community through the Electronic Display Boards installed at fishing harbours and fish-landing centers. More number of such boards will be installed at more locations to increase the dissemination
3. To improve our understanding of the Polar realm and its implications for climate change	Planning, Coordination and implementation of Indian Antarctic Program	Launching of Annual Expedition to Antarctica, Pre-construction and construction stage activities at the site of the new station, and completion of targeted scientific and logistics activities	Actual completion of all targeted scientific data collection; Launching and return of the expedition as per schedule.
	Planning, Coordination and implementation of Scientific Studies in the Arctic	Launching of Summer & Winter phases of the studies in the Arctic, and completion of all targeted scientific activities	Actual completion of all targeted scientific data collection; Launching and return of the expedition as per Schedule.

	Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	Launching of Southern Ocean Expedition, and completion of all targeted scientific activities	Actual completion of all targeted scientific data collection; Launching and return of the expedition as per Schedule.
	In-house R&D projects in the fields of cryospheric studies, polar remote sensing, paleoclimatology, polar biology and environmental studies	completion of all targeted scientific activities and publications in peer-reviewed journals	No. of samples analysed vis-à-vis the targets and the number of publications vs. targeted
4.To developing technology for harnessing marine resources	Technology Development for Gas Hydrates –Development of Autonomous coring system and sea trials	Development of ACS has been completed and tested at 100 m depth. A potential Gas Hydrate site is identified at 1000m in KG Basin in Bay of Bengal. Therefore sea trials above 1000 m at this site is given.	Major part of Gas hydrates project in the 11th plan is the exploration and ground truthing at Gas hydrate insite. A potential GH site is identified. Deployment of ACS at this site completes the objectives of the project. Hence, time is given as the unit.

Development of technologies for offshore structures Demonstration of suction pile anchors	Suction piles are widely used in mooring applications for floating production units and find widespread applications in the offshore oil industry. Suction caissons or piles are large cylindrical (inverted bucket type structure) open at the bottom and closed at the top. The caissons are being increasingly used these days for offshore foundations in deep waters. Development and demonstration of a methodology, design and logistics for suction pile installation and retrieval for the mooring systems at 50m water depths is proposed.	Timely completion of the demonstration of the technology in 50m depth is very important as the results will validate the levels of system integration and design capabilities in actual environmental conditions. So time of completion is indicated as the measure of success.
Integrated Deep-sea Mining System for 6000 m - Subsystems Testing.	Qualification of Collector, Crusher, Hydraulics, Electrical, Sensors, Electronics, Telemetry and Control Systems for operations in suspension at 2500 m or higher depths	Development of Exploratory Mining System using subsystems used for 500 m tests of Collector/ Crusher and qualification before the indicated dates, to ensure further development of 6000 m is possible. So dates are used in definitions

5 To conduct survey for assessing non-living resources	Survey, exploration for polymetallic nodules, Cobalt crust, hydrothermal sulphides,gas hydrates, and survey of Exclusive Economic zone Zone	completion of all targeted scientific activities and publications in peer-reviewed journals	Area surveyed vs. planned and no. of publications
	Geological and Tectonic Evolution of the Northern Indian Ocean and activities related to Integrated Ocean Drilling Program (IODP)	Completion of targeted scientific studies, finalization and submission of proposal for deep sea drilling under IODP	Studies carried out vs. planned, the no. of publications, and the date of submission of drilling proposal to IODP and its acceptance.
6. To assess the coastal marine productivity and Marine Ecosystems	Demonstration of hatchery technology on Ornamental fish and setting-up of field station at Lakshadweep.	Establishment of laboratory in Agatti for Ornamental fish culture.	Operationalisation of Hatchery
	Integrated Coastal Marine Area Management	Development of sediment transport model for Gopalpur, Orissa	Management Plan
7. To improve the understanding of Climate Change Science	To set up the Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	Establishment of centre by inducting scientists	Centre for conducting research in the field of climate change

8. To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.	Tsunami Advisory Services	Issue of Tsunami warning with minimum time lag after the occurrence of earthquake on the sea-bed	The process of issuing the tsunami early warning involves the detection of the occurrence of earthquake its magnitude and location, assessment of tsunami genesis potential and confirmation of the generation of tsunami through the real time monitoring of sea levels at nearest sea level Gauges and bottom pressure recorders. For the warning to be effective and useful, the time lag between the occurrence of earthquake on the sea bed and the tsunami Early warning should be minimum.
9. To promote basic research including Capacity building in the Earth System Science	To strengthen capacity development and promote research outside the ministry	Supporting research and academic programmes in Earth System Science	Number of i) Research projects awarded ii) Academic Programmes initiated iii) Centres Established with MoES Supported(iv) collaborative projects at national and international levels Supported (iv) collaborative projects at national and International levels

10. To develop a national Geographical Information System	To establish a centre for development of National GIS	Preparation of DPR and EFC	Development of Geographical Information System to cater to various national developmental activities
11.To conduct research in Seismology and Geoscience	To setup a National Centre for Seismology	Obtain the approval and launch of the programe of NCS	Improve earthquake research

Section 5:
Specific Performance Requirements from other Departments

S.No.	Objective	Department	Relevant Success Indicator	What do you need?	Why do you need it	How much you need?	What happens if you do not get it?
1.	To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	State Agriculture Department I.C.A.R (Ministry of Agriculture) Water Resources	Number of Districts covered by Agro Advisories	Feedback and dissemination of information	To validate the forecast	**50%**	Project could not be implemented fully
		Ministry of Civil Aviation Department of Space	Strengthen of Observational Network(AWS, ARGs, etc.,)	Coordination for deployment of observational systems	To install various in-situ and space based instrument	**50%**	Augment observational network of both insitu- and space based systems
2	To Provide a wide range of ocean information advisories including fishery information	State Fishery Department Fisherman association Department of Space	Potential Fishing Zone Advisories	Feedback and dissemination of information	To validate the forecast	**50%**	Project could not be implemented fully

3	To improve understanding of Polar Science and its implications for climate change	Planning Commission	Launching Expeditions to the Antarctic and Arctic	Mandatory ingredients for program implementation	Funds required for launching expeditions	In full measure	Project could not be implemented fully
4	Technology Development for Gas Hydrates –Development of Autonomous Coring System and Sea Trials	Williamson &Associates, USA NGRI and NIO	Depth of trial for collection of core	It is a joint development with Williamson &Associates, USA and timely action from their side is required, especially in drilling work. Co-ordination of NGRI and NIO scientists.	To carry out drilling work Required for indicating potential gas hydrates site	Full	Project will be delayed

Development of technologies for offshore structures Demonstration of suction pile anchors	Navy, Coast Guard and Port Authorities	Depth at which the test is conducted	Permissions and Cooperation to conduct necessary tests and exercises in the specified depths and specified areas	The tests are proposed in the 50m water depth, in locations suitable for the technology. With potential overlap with shipping, coast guard and marine activities, cooperation is necessary from the authorities to successfully complete the activities.	100%	The tests have to be rescheduled, delaying the project by 8-10 months	Integrated Deep-sea Mining System for 6000 m - Subsystems Testing
Inter NIOT. ROSUB Cable required	-	Umbilical Cable	For testing	-	Tests will be delayed	5	To assess coastal marine productivity and Marine Ecosystems
Lakshadweep Administration (Ministry of Home Affairs) Fishery Department	Establishment of Laboratory in Kavaratti f o r Ornamental fish culture	Transfer of Lakshadweep administration Bldg.	To set up Hatchery	50% of Lakshadweep Administration place.	Project gets delayed by 1- 2 years	6	. To provide early warning of natural hazards viz. Cyclone, tsunami, sea level rise

State Administration NDMA(Ministry of Home Affairs)	Issue of Earthquake bulletin with minimum time lag after the earth quake on sea-bed	Feedback and dissemination of information	To validate the forecast	**50%**	Project could not be implemented fully	7	To promote basic research including Capacity building in the Earth System Science

Section 6:
Outcome/Impact of Department/Ministry

Outcome/Impact of Department/Ministry	Jointly responsible for influencing this outcome / impact with the following department (s) / ministry(ies)	Success Indicator	Unit	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15
1 To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	State Agriculture Department I.C.A.R (Ministry of Agriculture) Water Resources State Government/	Number of Districts covered by Agro Advisory	Number	500	550	575	600	613
2 To Provide a wide range of ocean information advisories including fishery information	ISRO, State Fisheries Departments, Fishermen Associations, NGOs.	Potential Fishing Zone Advisory	number	72	140	130	150	160
		Ocean State Forecast	number	365	328	320	350	
		Preparation of DPR and EFC	Date			15/02/2013		
3 To improve our understanding of Polar realm and its implications for climate change	Participating Organsiations/ Institutions, Research Advisory Committee of NCAOR/ NCAP	Launching of the Annual Expedition	Date	17/12/2010	20/11/2011	20/11/2012	20/11/2013	20/11/2014
4 To developing technology for harnessing marine resources	Coastal and Island Administration	Sea trials of ROSUB in the DEEP Sea at 5200m depth	Date		31/12/2011	28/02/2013		
5 To conduct survey for assessing non-living resources	Shipping Corporation of India	Deployment of Resarch Vessel	number	20000	25000	15000	20000	30000
6 To assess coastal marine productivity and Marine Ecosystem	Coastal and Island Administration	Finalization of Shoreline Management Plan for Gopalpur Coast	Date	15/02/2011	31/01/2012	15/02/2012		
7 To improve understanding of Climate Change Science	Local State Government. Environment and Forest	Recruitment of Scientific positions	number	24	-	5	-	-

Section 6:
Outcome/Impact of Department/Ministry

Outcome/Impact of Department/Ministry	Jointly responsible for influencing this outcome / impact with the following department (s) / ministry(ies)	Success Indicator	Unit	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15
8 To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.	IMD, SOI, NIOT, ICMAM, ISRO, MHA, NDMA, NEOCs, DEOCs, Coastal State Governments	Number of EQ bulletins issued within 12 minutes after the earthquake(%)	percentage	98	99	100	-	-
9 To promote basic research including Capacity building in the Earth System Science	Academia, HRD, Universities	Supporting resarch and acedemic programme in earth system science.	Number of projects	90	100	110	120	130
10 To promote awareness and educate the public by extending support to seminars, symposia, conferences and conduct workshops with stakeholders	NGOs	Conducted user oriented workshop with key stack holder to promote awareness.	number	38	20	15	20	25
		Support Seminar/symposium/conference in the field of Earth Sciences	number	100	70	75	80	85