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Results Framework Document

for

Ministry of Earth Sciences

(2009-2010)

Section 1:
Vision, Mission, Objectives and Functions

Vision

To excel in knowledge and technology enterprise for the earth system science (atmosphere, biosphere, hydrosphere, cryosphere and geosphere) realm towards socio-economic benefit of the Indian Sub-continent and in the Indian Ocean region.

Mission

- Developing and improving capability to forecast, weather, climate and hazard related phenomena for societal, economic and environmental benefits.
- Understanding climate change science and developing climate services including integrated Himalayan meteorology
- Exploring ocean resources for socio-economic benefit.
- Develop state-of-the art technology for harnessing marine non-living resources
- Defining and deploying satellite based, airborne and in-situ atmospheric, ocean and lithosphere observing systems.

Objectives

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	VISION: To evolve further on the Vision for the ministry

Functions

1	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

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

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	VeryGood	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	20.00	Integrated Agro Advisory Services	Number of Districts covered by Agro Advisory	number	5.000	--	--	--	--	--
		Improve Operational Weather Services	Commissioning & Operation of Super Computer	number	4.000	--	--	--	--	--
			Strengthen of Observational Network(AWS, ARGs)	number	4.000	--	--	--	--	--
			Research Publications for operational forecast	number	1.000	--	--	--	--	--
			Quality of Research Publications	number of publication	2.000	--	--	--	--	--
			Application of higher resolution Global Numerical Models	Horizontal resolution (km)	1.000	--	--	--	--	--
			Obtaining Approval for setting up of a training School in the field of Earth/Atmospheric Sciences	Date	2.000	--	--	--	--	--
			Short-term weather forecast	Date	1.000	28/02/2010	10/03/2010	15/03/2010	25/03/2010	31/03/2010
2 To provide a wide range of ocean information advisories including fishery information	10.00	Strengthening of Ocean Observational network	Number of deployments	number	4.500	80	70	60	50	40
		Site Preparation for Oceansat-II-ground station	Establishment of ground station for Oceansat–II	Date	2.500	10/03/2010	15/03/2010	20/03/2010	25/03/2010	31/03/2010
		Potential Fishing Zone Advisory & Ocean State Forecast Services	Increase in dissemination of advisories through installation of Electronic Boards	number	3.000	70	65	60	55	50

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

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	VeryGood	Good	Fair	Poor
						100%	90%	80%	70%	60%
3 To improve the understanding of Polar Science and its implications for climate change	13.00	Planning, Coordination and implementation of Indian Antarctic Program	Launching of Southern Ocean Expedition	Date	6.500	10/03/2010	15/03/2010	20/03/2010	25/03/2010	31/01/2010
		Planning, Coordination and implementation of Scientific Expeditions to the Arctic	Launching of 29th Indian Antarctic Expedition, preparatory work for 3rd station, and completion of targeted scientific and logistics activities	Date	2.600	01/02/2010	15/02/2010	01/03/2010	15/03/2010	31/03/2010
		Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	Launching of Winter Indian Arctic Expedition, and completion of targeted scientific and logistics activities	Date	2.600	15/01/2010	01/02/2010	15/02/2010	01/03/2010	31/03/2010
		Collection and analysis of ice core from Antarctica	Ice Coring and Cryospheric research	number of core samples collected	1.300	5	4	3	2	1
4 To developing technology for harnessing marine resources	12.50	Design, Development, installation and Commissioning of Desalination Plant	Land trials for Collection core from the Bay of Bengal	Date	8.750	15/03/2010	20/03/2010	25/03/2010	28/03/2010	31/03/2010
		Shallow water trials of Autonomous Coring System (ACS) in India	Setting up of one land based desalination plant in the lakshadweep islands	Date	3.750	31/01/2010	10/02/2010	20/02/2010	01/03/2010	15/03/2010
5 To conduct survey for assessing non-living resources	10.00	Creation of Marine Geophysical Data Centre at NCAOR - Design of a structured RDBMS capable of archiving & retrieving marine geophysical data	Migration of data, Design of geophysical Data Testing and Integration of various components & Commissioning	Line Kilometer	3.000	31600	31400	31200	31100	31000
		Survey, exploration for Polymetallic Nodules, Cobalt crust, hydrothermal sulphides ,gas hydrates,and topographic survey of Exclusive Economic Zone	Deployment of Research Vessel	Number	7.000	30	29	28	27	26

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

Objective	Weight	Action	Success Indicator	Unit	Weight	Target / Criteria Value				
						Excellent	VeryGood	Good	Fair	Poor
						100%	90%	80%	70%	60%
6 To asses coastal marine productivity and Marine Ecosystems	5.00	Demonstration of hatchery technology on Ornamental fish and setting-up of field station at Lakshadweep.	Establishment of laboratory in Kavaratti for Ornamental fish culture	Date	3.000	31/01/2010	15/02/2010	28/02/2010	15/03/2010	31/03/2010
		Collection of field data and analysis required for preparation of Shoreline management plan for Gopalpur	Completion of collection of field data and analysis of data	number	2.000	100	90	80	70	60
7 To improve understanding of Climate Change Science	10.00	To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	Establishment of centre by inducting scientists	Percentage	10.000	100	90	80	70	60
8 To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.	10.00	Tsunami Advisory Services	Issue of Tsunami warning with minimum time lag after the earth quake on sea-bed	Minutes after the quake	5.000	30	45	60	90	120
			Accuracy of Warning	Percentage	5.000	95	85	75	70	65
9 To promote basic research including Capacity building in the Earth System Science	2.50	To strengthen capacity development and promote research outside the ministry	Supporting research and academic programmes in Earth System Science	Number of Projects	2.500	99	90	80	75	70
10 VISION: To evolve further on the Vision for the ministry	2.00	A set of 4 committees have been constituted for development of long-term vision.	Vision Documents in Ocean Technology, Atmospheric Services, Ocean Research & information services Geology	Date	2.000	05/01/2010	21/01/2010	31/01/2010	15/02/2010	28/02/2010
* Efficient Functioning of the RFD System	5.00	Timely submission of Draft for Approval	On-time submission	Number	2.000	0.00	1.00	2.00	3.00	4.00
		Timely submission of Results	On- time submission	Number	2.000	0.00	1.00	2.00	3.00	4.00
		Finalize a Strategic Plan	Finalize the Strategic Plan for next 5 years	Number	1.000	0.00	1.00	2.00	3.00	4.00

* Mandatory Objective(s)

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value for FY 07/08	Actual Value for FY 08/09	Target Value for FY 09/10	Projected Value for FY 10/11	Projected Value for FY 11/12
1 To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	Integrated Agro Advisory Services	Number of Districts covered by Agro Advisory	number	200	300	440	500	600
	Improve Operational Weather Services	Commissioning & Operation of Super Computer	number	0	0	1	3	4
		Strengthen of Observational Network(AWS, ARGs)	number	50	100	190	600	800
		Research Publications for operational forecast	number	90	92	94	95	98
		Quality of Research Publications	number of publicatio n	--	--	42	45	50
		Application of higher resolution Global Numerical Models	Horizontal resolution (km)	75	45	40	35	35
		Obtaining Approval for setting up of a training School in the field of Earth/Atmospheric Sciences	Date	--	--	20/03/2010	30/03/2011	28/03/2011
		Short-term weather forecast	Date	--	--	10/03/2010	--	--
2 To provide a wide range of ocean information advisories including fishery information	Strengthening of Ocean Observational network	Number of deployments	number	59	70	80	90	100
	Site Preparation for Oceansat-II- ground station	Establishment of ground station for Oceansat–II	Date	--	--	15/03/2010	--	--
	Potential Fishing Zone Advisory & Ocean State Forecast Services	Increase in dissemination of advisories through installation of Electronic	number	30	40	70	100	125

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value for FY 07/08	Actual Value for FY 08/09	Target Value for FY 09/10	Projected Value for FY 10/11	Projected Value for FY 11/12
		Boards						
3 To improve the understanding of Polar Science and its implications for climate change	Planning, Coordination and implementation of Indian Antarctic Program	Launching of Southern Ocean Expedition	Date	--	--	15/03/2010	--	--
	Planning, Coordination and implementation of Scientific Expeditions to the Arctic	Launching of 29th Indian Antarctic Expedition, preparatory work for 3rd station, and completion of targeted scientific and logistics activities	Date	--	--	15/02/2010	--	--
	Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	Launching of Winter Indian Arctic Expedition, and completion of targeted scientific and logistics activities	Date	--	--	01/02/2010	--	--
	Collection and analysis of ice core from Antarctica	Ice Coring and Cryospheric research	number of core samples collected	15	25	55	65	75
4 To developing technology for harnessing marine resources	Design, Development, installation and Commissioning of Desalination Plant	Land trials for Collection core from the Bay of Bengal	Date	--	--	20/03/2010	--	--
	Shallow water trials of Autonomous Coring System (ACS) in India	Setting up of one land based desalination plant in the lakshadweep islands	Date	--	--	10/02/2010	--	--
5 To conduct survey for assessing non-living resources	Creation of Marine Geophysical Data Centre at NCAOR - Design of a structured RDBMS capable of archiving & retrieving marine geophysical data	Migration of data, Design of geophysical Data Testing and Integration of various components & Commissioning	Line Kilometer	--	--	31400	31500	31500
	Survey, exploration for Polymetallic Nodules, Cobalt crust, hydrothermal sulphides ,gas hydrates,and topographic survey of	Deployment of Research Vessel	Number	160	320	480	640	800

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value for FY 07/08	Actual Value for FY 08/09	Target Value for FY 09/10	Projected Value for FY 10/11	Projected Value for FY 11/12
	Exclusive Economic Zone							
6 To asses 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 Kavaratti for Ornamental fish culture	Date	--	--	15/02/2010	--	--
	Collection of field data and analysis required for preparation of Shoreline management plan for Gopalpur	Completion of collection of field data and analysis of data	number	--	--	90	--	--
7 To improve understanding of Climate Change Science	To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	Establishment of centre by inducting scientists	Percentage	2	20	30	60	80
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 earth quake on sea-bed	Minutes after the quake	70	80	95	98	100
		Accuracy of Warning	Percentage	--	--	85	--	--
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 Projects	29	64	99	110	122
10 VISION: To evolve further on the Vision for the ministry	A set of 4 committees have been constituted for development of long-term vision.	Vision Documents in Ocean Technology, Atmospheric Services, Ocean Research & information services Geology	Date	--	--	21/01/2010	31/12/2010	--
* Efficient Functioning of the RFD System	Timely submission of Draft for Approval	On-time submission	Number	23	20	125	23	25
	Timely submission of Results	On- time submission	Number	23	20	23	23	23

* Mandatory Objective(s)

Section 3:
Trend Values of the Success Indicators

Objective	Action	Success Indicator	Unit	Actual Value for FY 07/08	Actual Value for FY 08/09	Target Value for FY 09/10	Projected Value for FY 10/11	Projected Value for FY 11/12
	Finalize a Strategic Plan	Finalize the Strategic Plan for next 5 years	Number	23	40	32	23	23

* Mandatory Objective(s)

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

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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 by Agro Advisory	Weekly District level weather forecast &advisories to farmers in India
	Improve Operational Weather Services	Commissioning &Operation of Super Computer	
		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	
		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.
	Site Preparation for Oceansat-II- ground station.	Establishment of ground station for Oceansat-II.	ISRO has agreed for the set up ground station at INCOIS for the direct reception of ocean colour data used to issue the potential fishing zone advisories. The ground station includes the installation of 7.5 dia antenna, tracking system and data processing system. The construction of tower for the installation of antenna will be completed in March 2009.
	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 the understanding of Polar Science and its implications in climate change	Planning, Coordination and implementation of Indian Antarctic Program	Launching of Annual Expedition to Antarctica, Strengthening of Maitri, Establishment of New Station, and completion of targeted scientific and logistics activities	Actual completion of all targeted scientific data collection; Launching and returning of the expedition as per schedule.
	Planning, Coordination and implementation of Scientific Expeditions to the Arctic	Launching of Summer &Winter Indian Arctic Expeditions, and completion of targeted scientific and logistics activities	Actual completion of all targeted scientific data collection; Launching and returning 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	Actual completion of all targeted scientific data collection; Launching and returning of the expedition as per schedule.
	Collection and analysis of ice core from Antarctica	Ice Coring and Cryospheric research	No. of cores collected vis-à-vis planned and No. of samples analysed vis-à-vis planned
4. To developing technology for harnessing the marine resources	Design, Develop, install, and Commission of Desalination Plant	Setting up of land based desalination plants in the lakshadweep islands	Desalination Plants to convert sea water into potable water
	Development of Remotely Operable Vehicle(ROSUB 6000) for survey at PMN site	Sea trials of ROSUB in the Deep Sea	Equipment for survey and exploration
	Technology Development for Gas Hydrates – Development of Autonomous coring system(ACS) and sea trials	Sea trials of ACS	Equipment for collection of samples

	Maintenance of buoy network	Continuous, high quality data return	Instrument for Acquisition of real-time data from seas around India
5. To conduct survey for assessing the non-living resources	To acquire the scientific and technical data from parts of the Bay of Bengal and the Arabian Sea in and off the Indian EEZ and to prepare and submit the claims in accordance with the provisions of United Nation's Convention on Law of Sea (UNCLOS).	Preparation of Documentation and submission of India's claim to the Commission on Limits of Continental Shelf (CLCS)	Submission of India's claims to the CLCS Completion and commissioning of the marine geophysical data base.
6. To asses 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

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Section 5:
Specific Performance Requirements from other Departments

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 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
2	To develop technology for harnessing the marine resources	Lakshadweep Administration	Setting up of one land based desalination plant in Lakshadweep island	Provide Logistical support for construction and transport of material	To set up Desalination Plant	Full	Project gets delayed 6 to 8 months
3	To assess coastal marine productivity and Marine Ecosystems	Lakshadweep Administration	Establishment of Laboratory in Kavaratti for Ornamental fish culture	Transfer of Lakshadweep administration Bldg.	To set up Hatchery	50% of Lakshadweep Administration place.	Project gets delayed by 1- 2 years