



R F D

Results Framework Document
for
Department of Science and Technology

(2009-2010)

Section 1: Vision, Mission, Objectives and Functions

Vision

To enable India becoming a global knowledge power by promoting basic research, development of cutting edge technologies and innovation for globally competitive and inclusive growth to power technology-led economic progress of the society.

Mission

To strengthen the R&D base of the country through funding, development and utilization of technologies, building entrepreneurship and innovation, fostering international S & T cooperation, popularization and demonstration, generating S&T database, mounting mission mode initiatives, attracting talent to science and rejuvenating research in university and promotion of public-private partnerships.

Objectives

- 1 Leading the formulation of Science, Technology and Innovation policy and other enabling policies for the R&D sector
- 2 Strengthening Basic research and Expanding R&D base - Human Capacity
- 3 Strengthening Basic research and Expanding R&D base – Institutional Capacity
- 4 Implementing Technology Development Programs
- 5 Societal interventions of S&T
- 6 S&T co-operation / Partnerships and Alliances

Functions

- 1 Formulation of policies relating to Science and Technology: The Department plays an important role in the formulation of Science and Technology Policy (STP) of the country. In the changing context of the scientific enterprise of the country, the need to revisit and reformulate the Science and Technology Policy enunciated last in 2003 and include also innovations has been recognized. In the address to the joint session of the Parliament, the President of India has announced a “Decade of Innovations”. The Department of Science and Technology in close collaboration with other stakeholders and sister departments is undertaking to spearhead the reformulation of Science, Technology and Innovation (STI) Policy in 2010.

Section 1: Vision, Mission, Objectives and Functions

Apart from the STI policy, the department of science and technology is engaged in the formulation of other enabling policies for the research and development sector of India.

- 2 Strengthening Basic research and Expanding R&D base – Human Capacity: 2.1 Science & Engineering Research Council (SERC): SERC has been a flagship of DST and the major EMR research funding body of the country. 2.2 Science and Engineering Research Board (SERB): SERB with functional autonomy will perform the functions & tasks of funding research and partner DST in the development as well as promotional roles. 2.3 Innovation in Science Pursuit for Inspired Research (INSPIRE): It is a major programme for attraction of talent to study of science and careers with research. 2.4 Institution of Research Fellowships like Swarnajayanti Fellowship, the JC Bose Fellowship and the Ramanujan Fellowship. 2.5 Mentoring Programme: It targets a large number of researchers whose proposals are rejected by the Department.
- 3 Societal interventions of S&T Strengthening: 5.1 Autonomous Institutions of the DST have direct linkages with the society and has made significant impact in the R&D field. 5.2 Programmes for Science & Technology for Women is aimed to promote research, development and adaptation of technology, improve the working conditions and opportunities for gainful employment of women especially in rural areas. 5.3 Tribal Sub Plan (TSP), S & T application for weaker section (STAWS), Technology Interventions for addressing Societal Needs (TISN) are functioning in specific sectors. 5.4 National Science & Technology Entrepreneurship Development Board (NSTEDB) functions to promote and develop high quality entrepreneurship amongst S&T manpower and to promote self-employment by utilising S&T infrastructure. 5.5 Science and Technology based services such as Sol, NATMO, NABL, VP, TIFAC have been reinforced. 5.6 Science popularization activities and programmes have been intensified.
- 4 S&T co-operation / Partnerships and Alliances: 6.1 International S&T collaboration focused on the objectives viz. technology diplomacy, technology synergy and technology acquisition. These collaboration programs help in sharing the information and generate new knowledge, sharing of expertise to maintain pace, progress and growth of S&T. DST has signed S&T cooperation with 80 countries so far. The programmes involve Bilateral R&D projects, Joint Research Fund, Promotion of Fellowships, Mega Facilities for Basic Research, 6.2 National coordination among State Councils ensures the active participation of state governments in the S&T developmental process.

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 Leading the formulation of Science, Technology and Innovation policy and other enabling policies for the R&D sector	15.00	Preparation of first draft of the National Science and Technology policy framework document for national consultation	Date of finalization of the first draft	Date	8.25	19/03/2010	20/03/2010	25/03/2010	30/03/2010	31/03/2010
		Obtaining Cabinet Approval for the National Data Sharing and Access Policy	Date of obtaining cabinet approval after due processes	Date	6.75	19/03/2010	20/03/2010	25/03/2010	30/03/2010	31/03/2010
2 Strengthening Basic research and Expanding R&D base - Human Capacity	20.00	Optimized process Time of funding for Extra Mural Research projects in basic research as measured by time taken for sanction from submission in months	Definition of base line data and completion of process design for mean time	Date	3.00	15/03/2010	22/03/2010	29/03/2010	30/03/2010	31/03/2010
		Implementation of INSPIRE for attraction of talent to science: Number of INSPIRE Awards released	Number of students covered as an indicator of penetration of INSPIRE	Number	4.00	40000	30000	20000	10000	5000
		Implementation of INSPIRE for attraction of talent to science: Number of INSPIRE Internships covered through winter camps	Realization of quantitative targets for number of youth attracted to summer/winter camps	Number	4.00	5000	4000	3000	2000	1000
		Implementation of INSPIRE for attraction of talent to science: Percentage of funds earmarked for Scholarships for Higher Education and INSPIRE Fellowships released during the quarter	Realization of earmarked funds utilized as an indicator of target achieved as an indicator of implementation efficiency	%	4.00	100	90	80	70	60
		Establishment of new mechanism for promoting basic research	Time target for establishment of Science and Engineering Research Board, a new mechanism for supporting basic research	Date	3.00	21/03/2010	23/03/2010	25/03/2010	27/03/2010	31/03/2010
		Strengthening and expanding of Basic Research through competitive Grant support to Extra Mural Research in the	Size of the competitive research grant released during the quarter relative to that in the	Ratio	2.00	1.5	1.35	1.25	1.15	1

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%
		Science and Technology sector in the country	base year 2006-07							
3 Strengthening Basic research and Expanding R&D base – Institutional Capacity	13.00	Fund for Infrastructure strengthening S&T (FIST) for capacity building during the quarter	Level of Utilization of competitive Grants earmarked by 31 March 2010	%	7.15	99.6	99	98	97	96.4
		Development and pro-active promotional programmes for strengthening institutional capacities as measured by funds invested during the quarter: Promotion of University Research and Scientific Excellence	Release of Research Incentive grant provided for performing universities an indicator of implementation efficiency	%	2.60	100	99.5	98	96	95
		Development and pro-active promotional programmes for strengthening institutional capacities as measured by funds invested during the quarter: Consolidation of University Research, Innovation and Excellence for women universities	Release of R&D Development fund earmarked for women universities an indicator of implementation efficiency	%	1.95	100	99.5	98	96	95
		Development and pro-active promotional programmes for strengthening institutional capacities as measured by funds invested during the quarter: Special packages for regions - North Eastern Region, Jammu & Kashmir	Release of R&D Development fund earmarked under special packages as an indicator of implementation efficiency	%	1.30	100	99.5	98	96	95
4 Implementing Technology Development Programs	21.00	No. of technologies identified for development and demonstration	Number of technologies selected for demonstration	Number	3.15	30	25	20	15	10
		No. of technologies assisted for application and absorption	Number of technologies applied and promoted	Number	3.15	10	8	5	4	3
		Percentage of earmarked funds utilized for Drug and Pharma Research Programme during the quarter	Achievement of utilization of earmarked fund	%	3.15	100	80	70	60	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%
		Number convergent technology solutions for water challenges identified and selected	Convergent technology solutions for water challenges found out	Number	3.78	10	9	7	5	3
		Finalization of Detailed Project Report for indigenous Solar Energy Research Initiative	Achieving time target for finalization of DPR for Solar Energy Research Initiative	Date	2.73	20/02/2010	10/03/2010	15/03/2010	20/03/2010	25/03/2010
		Preparation of road map for Security Technology Initiative	Achieving time target for preparation of the road map for Security technology initiative	Date	1.05	21/03/2010	23/03/2010	25/03/2010	27/03/2010	31/03/2010
		Approval for National Centre for Nano Science & Technology (NCNST) at Bangalore under Nano Mission	Achieving time target for approval of NCNST	Date	1.05	21/03/2010	23/03/2010	25/03/2010	27/03/2010	31/03/2010
		PhD students trained in the area of nano science and technology in the country under nano mission	Quantitative number of PhD outputs	Number	1.89	30	27	22	17	15
		Implementing new thrust area: Cognitive Science	Number of projects supported	Number	1.05	10	8	6	4	2
5 Societal interventions of S&T	15.00	Assisting Technology Entrepreneurs	Number of entrepreneurs assisted	Number	4.50	25	20	15	10	5
		Assisting Micro Enterprises	Number of micro enterprises assisted	Number	2.25	500	400	350	300	250
		Support to Women for gender parity in S&T	Number of projects supported	Number	4.50	30	25	20	15	10
		Projects supported for S&T inputs for development of Weaker Sections for equity	Number of projects supported	Number	3.75	10	8	6	5	4
6 S&T co-operation / Partnerships and Alliances	11.00	Signing agreements, MoUs and protocols for S&T cooperation and partnerships	Number of agreements signed	Number	2.97	10	8	6	4	3
		Development and synergy of National knowledge networks for S&T cooperation	Number of networks developed and synergized	Number	2.97	6	5	4	3	2

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%
		Exchange S&T professionals for International cooperation	Number of exchange visits facilitated	Number	2.20	50	45	35	25	15
		Developing State S & T councils mechanism for S&T outreach	Ratio of Programmatic fund released to State S & T councils as a percentage of core grants sanctioned for manpower	Ratio	2.86	1	0.9	0.7	0.5	0.3
* Efficient Functioning of the RFD System	5.00	Timely submission of Draft for Approval	On-time submission	Date	2.00	30/11/2009	01/12/2009	02/12/2009	03/12/2009	04/12/2009
		Timely submission of Results	On- time submission	Date	1.00	30/04/2010	01/05/2010	02/05/2010	03/05/2010	04/05/2010
		Finalize a Strategic Plan	Finalize the Strategic Plan for next 5 years	Date	2.00	01/03/2010	02/03/2010	03/03/2010	04/03/2010	05/03/2010

* 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 Leading the formulation of Science, Technology and Innovation policy and other enabling policies for the R&D sector	Preparation of first draft of the National Science and Technology policy framework document for national consultation	Date of finalization of the first draft	Date	--	--	20/03/2010	--	--
	Obtaining Cabinet Approval for the National Data Sharing and Access Policy	Date of obtaining cabinet approval after due processes	Date	--	--	20/03/2010	--	--
2 Strengthening Basic research and Expanding R&D base - Human Capacity	Optimized process Time of funding for Extra Mural Research projects in basic research as measured by time taken for sanction from submission in months	Definition of base line data and completion of process design for mean time	Date	--	--	22/03/2010	--	--
	Implementation of INSPIRE for attraction of talent to science: Number of INSPIRE Awards released	Number of students covered as an indicator of penetration of INSPIRE	Number	0.00	0.00	50000	150000	200000
	Implementation of INSPIRE for attraction of talent to science: Number of INSPIRE Internships covered through winter camps	Realization of quantitative targets for number of youth attracted to summer/winter camps	Number	0.00	500	15000	40000	50000
	Implementation of INSPIRE for attraction of talent to science: Percentage of funds earmarked for Scholarships for Higher Education and INSPIRE Fellowships released during the quarter	Realization of earmarked funds utilized as an indicator of target achieved as an indicator of implementation efficiency	%	0.00	100	100	100	100
	Establishment of new mechanism for promoting basic research	Time target for establishment of Science and Engineering Research Board, a new mechanism for supporting basic research	Date	--	--	22/03/2010	--	--
	Strengthening and expanding of Basic Research	Size of the competitive research grant released	Ratio	1.2	1.4	1.6	1.7	1.8

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
	through competitive Grant support to Extra Mural Research in the Science and Technology sector in the country	during the quarter relative to that in the base year 2006-07						
3 Strengthening Basic research and Expanding R&D base – Institutional Capacity	Fund for Infrastructure strengthening S&T (FIST) for capacity building during the quarter	Level of Utilization of competitive Grants earmarked by 31 March 2010	%	100	100	100	100	100
	Development and pro-active promotional programmes for strengthening institutional capacities as measured by funds invested during the quarter: Promotion of University Research and Scientific Excellence	Release of Research Incentive grant provided for performing universities an indicator of implementation efficiency	%	0.00	0.00	100	100	100
	Development and pro-active promotional programmes for strengthening institutional capacities as measured by funds invested during the quarter: Consolidation of University Research, Innovation and Excellence for women universities	Release of R&D Development fund earmarked for women universities an indicator of implementation efficiency	%	0.00	0.00	100	100	100
	Development and pro-active promotional programmes for strengthening institutional capacities as measured by funds invested during the quarter: Special packages for regions - North Eastern Region, Jammu & Kashmir	Release of R&D Development fund earmarked under special packages as an indicator of implementation efficiency	%	0.00	0.00	100	100	100
4 Implementing Technology Development Programs	No. of technologies identified for development	Number of technologies selected for demonstration	Number	80	90	110	120	140

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
	and demonstration							
	No. of technologies assisted for application and absorption	Number of technologies applied and promoted	Number	20	25	30	35	40
	Percentage of earmarked funds utilized for Drug and Pharma Research Programme during the quarter	Achievement of utilization of earmarked fund	%	100	100	100	100	100
	Number convergent technology solutions for water challenges identified and selected	Convergent technology solutions for water challenges found out	Number	0.00	0.00	10	10	5
	Finalization of Detailed Project Report for indigenous Solar Energy Research Initiative	Achieving time target for finalization of DPR for Solar Energy Research Initiative	Date	--	--	25/02/2010	--	--
	Preparation of road map for Security Technology Initiative	Achieving time target for preparation of the road map for Security technology initiative	Date	--	--	22/03/2010	--	--
	Approval for National Centre for Nano Science & Technology (NCNST) at Bangalore under Nano Mission	Achieving time target for approval of NCNST	Date	--	--	22/03/2010	--	--
	PhD students trained in the area of nano science and technology in the country under nano mission	Quantitative number of PhD outputs	Number	50	100	120	130	150
	Implementing new thrust area: Cognitive Science	Number of projects supported	Number	0.00	0.00	10	40	50
5 Societal interventions of S&T	Assisting Technology Entrepreneurs	Number of entrepreneurs assisted	Number	75	80	90	100	120

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
	Assisting Micro Enterprises	Number of micro enterprises assisted	Number	2000	2000	2100	2200	2500
	Support to Women for gender parity in S&T	Number of projects supported	Number	80	100	120	140	160
	Projects supported for S&T inputs for development of Weaker Sections for equity	Number of projects supported	Number	30	35	40	50	55
6 S&T co-operation / Partnerships and Alliances	Signing agreements, MoUs and protocols for S&T cooperation and partnerships	Number of agreements signed	Number	30	35	40	40	45
	Development and synergy of National knowledge networks for S&T cooperation	Number of networks developed and synergized	Number	18	20	22	24	24
	Exchange S&T professionals for International cooperation	Number of exchange visits facilitated	Number	800	900	1000	1100	1200
	Developing State S & T councils mechanism for S&T outreach	Ratio of Programmatic fund released to State S & T councils as a percentage of core grants sanctioned for manpower	Ratio	0.6	0.7	1.0	1.1	1.2
* Efficient Functioning of the RFD System	Timely submission of Draft for Approval	On-time submission	Date					
	Timely submission of Results	On- time submission	Date					
	Finalize a Strategic Plan	Finalize the Strategic Plan for next 5 years	Date					

* Mandatory Objective(s)

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

The Department of Science & Technology is the largest funding body of Extra-Mural Research in the country with nearly 50% National share. The department has established a system for watching and monitoring the S&T outputs indicators originating from the non-strategic R&D sector in the country. Globally S&T output indicators are being used and competitive rating indices are employed for assessing global competitiveness of Nations. Currently, Scientific publications in scholarly peer reviewed and valued journals, indices like impact factors of journals in which the papers appear, number of citations of papers, average citation per paper are used. Currently based on Global Research Report of Thomson Reuters, India is emerging as an important player in the scholarship driven science in spite of relatively low levels of Gross Expenditure on Research and Development relative to other countries. Based on some data bases on scientific publications, India ranks currently 10th based on quantum and within top 20 on the basis of citations per paper. Assessing Technology competitiveness of Nations is more complex. Factors like percentage share of products exported based on advanced technologies and share of GDP growth attributable to technologies are being used. Competitiveness indicators for innovations are computed through an integrated approach to the levels of risk financing for innovations and support to early stage innovations through both development and policy. The Department of Science and Technology has been traditionally focused on supporting basic research through Extra Mural Research Grants with relatively moderate levels of budget support per scientist. Therefore, National outcome of the efforts of DST at the present time is best measured through improvements of the relative ranking of India with respect to the quantum of publications in peer valued journals. While India ranked 15th as per data of 2003, the country is currently ranked at 10th and is likely to move to 9th by 2010. Parameters of relative assessment and measurement of India in technology and innovation competitiveness will need to be fine tuned to suit the social context and stage of the economic development of the country. DST proposes to undertake studies relating to assessment and measurement of global competitiveness. The department is only one of the major players in strengthening the R&D system of India and the cumulative results are the outcome of the effort of many departments. However, the department will undertake to establish a watch system for monitoring the output to input ratios as well as growth processes of the country in the R&D sector and devise and formulate policies which would indirectly influence the global competitiveness of the India in the R&D sector.

The department has mounted major national initiative for attraction of talent to study of science and careers with research under New Scheme called INSPIRE with an expected long term outcome based on near term actions. Total of 29 success indicators for covering the six overall objectives have been selected with a blend of 23 non-financial and 6 financial targets. Wherever more than two types of outputs and external actions (like peer review, recommendations Expert committees for decision

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

some process innovations based on global bench marks. Performance improvement through enhanced system efficiencies of a department like DST with a mandate to expand the R&D base in the country can be assessed by the measuring the expansion of the stake holder base as evidenced from the number of R&D proposals received for funding referenced to a base year, which has been selected as the last year of the tenth plan namely 2006-07. Specified and number based quantitative targets have been selected wherever appropriate. For improving state-center cooperation in S&T, a new parameter like ratio of programmatic fund to core fund has been designed for measuring S&T outreach.

Some of the parameters used are based on increasing the efficiency and effectiveness of the department like speedy and transparent decision making. As the largest R&D funding body, improved process efficiency is measured by measuring the mean process time taken for sanctioning project funds. Scientifically a normal distribution of the percentage of projects cleared for funding as in Figure is expected. Mean time for processing will be measured by the full width at the half height of the normal Boltzman distribution of the process time consumed as shown in Figure. An attempt will be made to shorten the time taken for fund sanction from the date of submission of the proposal to sanction of funds from 9 months to 5 months. This would be better than the best global bench mark at this time. Strengthening of the institutional capacities and scientific excellence based on measurement of global bench marks like H-index for institutions to provide research incentive grants and special packages for North East and J&K regions are based on transparent parameters. Transparent decision logic is embedded in financial targets wherever feasible.

Section 5:
Specific Performance Requirements from other Departments

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?
State Science & Technology Department	Number of Students covered across the country under INSPIRE and SHE	Partnership in implementation	They have presence at the implementation levels and are linked to the State mechanism	Their partnerships would enhance the effectiveness of the Programme	We will have to identify alternate mechanism
State Department of Education	Number of Students covered across the country under INSPIRE and SHE	Partnership in implementation	They are the controlling department for and would help in identification of students to be supported	Their partnership would increase the reach and spread of the Programme	Their support is vital and critical

Ministry of Human Resource Development	Number of Students covered across the country under INSPIRE and SHE	Partnership in implementation	They are the controlling department for and would help in identification of students to be supported	Their partnership would increase the reach and spread of the Programme	Their support is vital and critical
Ministry of External Affairs	Number of International MoUs agreements and protocols signed	Partnership in implementation	They are the main Ministry for external relations and our agreements are within the framework of country cooperation	For enhancing Technology Diplomacy with relevant Nations their support is required	The number of agreements, MoUs and protocols will get affected