

**GOVERNMENT OF INDIA  
SCIENCE AND TECHNOLOGY  
LOK SABHA**

UNSTARRED QUESTION NO:2144  
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LACK OF QUALITY RESEARCH WORK  
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**Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:**

- (a) whether the country's research and development establishments have achieved their desired objectives;
- (b) if so, the details thereof in the 11th and 12th Plan period and the amount spent for this purpose.
- (c) whether despite having better scientific research institutions, R&D and innovation capabilities in the country are lower than other Brazil, Russia, India, China, South Africa (BRICS) countries;
- (d) if so the details thereof;
- (e) whether innovation is lacking in the country and the research undertaken by institutions, Public or Private, is not turning out into commercial ventures in significant way, and
- (f) if so, the details thereof and the corrective steps taken/proposed to be taken in this regard?

**Answer**

MINISTER OF SCIENCE AND TECHNOLOGY AND MINISTER OF EARTH SCIENCES (S. JAIPAL REDDY)

(a) & (b): India has been extensively pursuing research in strategic and non-strategic sectors. Though the research in strategic sectors has achieved many of its desired objectives, there are a few segments of research, because of its inherent nature, may not yield results in the desired lines. Significant achievements have been made in XI Plan in the areas of nuclear and space science, electronics, IT and defence. The investments in these sectors have resulted in enhanced global visibility in research publications in peer reviewed journals. India's position globally in the field of scientific research and development, as measured by the number of research papers published, has improved from 10th position in 2006 to 9th position in 2010 as per the Scopus International database. In 2010 India was ranked at 6th in terms of publications in Nanoscience and Nanotechnology. In case of research in chemistry, India ranks 5th in the world with respect to scientific publications. Launch of nuclear submarine (ARIHANT) and Chandrayaan-1 on-board PSLV-C11, a historic feat of placing Indian tri-colour on lunar surface and detection of water molecules on Moon surface, development of transformation technologies for rice etc. in the XI Plan demonstrate the Indian capability in research and development. Institution of the Science and Engineering Research Board, a statutory body and Implementation of new programs like PAN India Mission, Challenge Award for Global Positioning, Start-up Research grant for Indian Diaspora undertaking faculty assignments in Indian academia, Overseas Doctoral Scholarships and Post-doctoral Fellowships, Building Educators for Science Teaching, Private Partnerships for R&D, Disha Programme for Women in Science, Platforms for Technology Solution, Biotechnology Development Strategy etc. would enhance the R&D capability of the country in XII Five Year Plan to higher levels.

The funds utilized and allocated by various segments for scientific research during XI and XII Plan under the Ministry of Science and Technology are given below:

Sl. No.	Department	Utilization / Outlay	
		(Amount in Crores of Rupees)	
		XI Plan (2007-12)	XII Plan (2012-17)
		Utilization	Approved Outlay
1.	Science & Technology	8551.79	21596.00
2.	Scientific & Industrial Research	6939.10	17896.00
3.	Biotechnology	4672.38	11804.00
4.	DoS	15,834.79#	39,750
5.	DAE (R&D sector)	8,068.26#	19,878
6.	Total	44066.32	110924

#anticipated expenditure

(c) & (d): The Global Competitiveness Report 2012-13 brought out by the World Economic Forum has ranked Brazil at 49, Russian

Federation at 85, India at 41, China at 33 and South Africa at 42 in terms of innovation capabilities. Though the number of research publications of China is ahead of India, the publication per dollar investment of India is about 1.5 times the China output.

(e) & (f): As an indicator of degree of innovation, the rate of commercialization of patents emanated from Council of Scientific and Industrial Research (CSIR) laboratories is above 13% while the global average is 3-4%. Many of CSIR led innovations such as streptokinase (life saving cardiac drug), risorine (a combination therapy for tuberculosis), prostalyn (a drug for prostate cancer) are innovations of their own kind and have led to creation of unique placement for the development through commercialization. Research and Development efforts in space technology and applications have yielded many spin-off technologies, which have been commercially exploited by Indian Industries. Adhesive and sealants for a wide variety of applications, dry power for extinguishing of oil fires, high silica cloth for insulation and thermal protection are some examples. Other innovative products resulting out of projects funded by the Ministry include an anti-malarial drug "SYNRIAM", H1N1 pandemic influenza vaccine, procedure for tumor ablation using Maxico (The Integrated planning navigation and Training Platform for Tumor Ablation), Oral Rota virus vaccine etc.

Government has declared 2010-2020 as the "Decade of Innovations" which is aimed to develop an innovation eco-system in the country to stimulate innovations. Innovations at various level are promoted through various schemes such as Technopreneur Promotion Programme (TePP); technology business incubators under Science and Technology Entrepreneurship Development scheme; Drugs and Pharmaceuticals Research; Mission on Nano Science and Technology, Small Business Innovative Research Initiative (SBIRI); Biotechnology Industrial Partnership Programme (BIPP); Biotech Ignition Grant Scheme (BIG); New Millennium Indian Technology Leadership Initiative (NMITLI); open source drug discovery (OSDD) projects; and grass root innovations through National Innovation Foundation. In order to synergize science, technology and innovation and to bring fresh perspective to bear on innovation in the Indian context, the Government has recently enunciated Science, Technology and Innovation Policy 2013 (STIP).