GOVERNMENT OF INDIA
SCIENCE AND TECHNOLOGY
LOK SABHA

STARRED QUESTION NO:340
ANSWERED ON:25.08.2011
LAUNCHING OF NANO MISSION
Singh Shri Vijay Bahadur

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether Nano technology has varied applications and far reaching impact and implications in prominent sectors;

(b) if so, the details thereof;

(c) whether the Government has launched Nano Mission to promote Research and Development in Nano Science and Technology;

(d) if so, the details thereof including funds allocated, R&D projects undertaken and their output during the last three years and the current year;

(e) whether there is urgent need to formulate national level regulatory framework for Nano-technology; and

(f) if so, the steps being taken by the Government for the development of Nano-technology and physical and human infrastructure in this sector?

Answer

MINISTER OF SCIENCE AND TECHNOLOGY AND MINISTER OF EARTH SCIENCES (VILASRAO DESHMUKH)

(a) to (f): A statement is laid on the Table of the House.

STATEMENT AS REFERRED IN REPLY TO PARTS (a) to (f) OF LOK SABHA STARRED QUESTION NO. 340 FOR 25.08.2011 REGARDING "LAUNCHING OF NANO MISSION"

(a) Yes, Madam.

(b) Applications of nano technology are expected to have significant impact on a large number of sectors. For example, nano-membranes and nano silver have already led to newer water purification technologies. Nano silver also finds applications in anti-microbial bandages, textiles and other anti-microbial applications. Carbon nanotubes and other nano-sized materials have shown promising properties as hydrogen storage materials which will lead to use of hydrogen as a fuel for energy. Nano-sized particles of different materials are able to carry drugs to specific diseased sites, thereby reducing the drug intake and adverse side effects on non-diseased parts. Nanomaterials mixed with other materials form composites which have considerably greater strength and these will find applications in sectors ranging from civil construction to aircraft manufacturing. Nanosensors will lead to cheaper and easier-to-use diagnostic kits for diseases in plants, animals as well as human beings. Nanomaterials are very effective catalysts which lead to improved catalytic converters for curbing air Electronic devices on computer chips have been in the nano domain for quite some time. The list of possible applications of nano technology is very long. It is truly a multi-disciplinary and `enabling` technology which will impact large number of products and processes.

(c) Yes, Madam.

(d) The Government launched a Mission on Nano Science and Technology (Nano Mission) on 3rd May, 2007 with an allocation of Rs. 1000 crore for 5 years. Nano Mission is an umbrella programme to promote R&D in this emerging and highly competitive field of research. The objectives of Nano Mission are:

Basic Research Promotion. # Infrastructure Development for Nano Science & Technology Research. # Nano Applications & Technology Development Programmes. # Human Resource Development. # International Collaborations.

The details of funds allocated, R & D projects undertaken and their outputs during the last three years and the current year (till 31st July, 2011) are given below:

Finan cial year	Funds allo cated (Rs.	Number of R&D pro jects	No. of Papers published/	No. of Confe rence Papers	No. of PhDs Produced/ ongoing	No. of other Man power	No. of patents granted/ fields

Crore)	sanc tioned	submitted in Journals		trained			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2008-09	130.00	21	72	31	25	66	8
2009-10	70.00	31	134	81	48	79	19
2010-11	99.00	40	5	3	3	5	-
2011-12	100.00	5	-	-	-	-	
Total	399.00	97	211	115	76	150	27

(e) Yes, Madam. With large-scale active research in nano science and technology being carried out in laboratories in the country and increase in the number of nano-enabled products entering the market, it has become important to have a national-level regulatory framework for nano technology. As nano technology finds wide-ranging applications in a large number of sectors, development of an appropriate regulatory framework is quite challenging. Countries all over the world are working on this. In India also, the Nano Mission has undertaken a national-level inter-agency exercise to lay down a road-map for a regulatory framework for nano technology in India.
(f) The Government has taken, and is continuously taking, a number of steps for development of nano technology and physical and human infrastructure in this sector.
Initiatives of Nano Mission
Establishment of 12 Units on Nano Science.
Establishment of 7 Centres for Nano Technology besides a Centre for Computational Materials Science.
Setting-up of an Institute of Nano Science & Technology at Mohali.
Setting-up of an Ultra High Resolution Aberration-Corrected Transmission Electron Microscope as a National Facility at the International Centre for Materials Science, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore.

Setting-up of India-Japan beam line at Photon Factory, Tsukuba, Japan.

Setting-up of a beam line, and access to all the beam lines, at PETRA III Synchrotron Radiation Source at Hamburg, Germany.

Establishment of 3 Accelerator-based Research Facilities at IIT-Kanpur, Kurukshetra University and University of Allahabad.

Setting-up of 8 Thematic Units of Excellence on specific themes in different institutions across the country.

Enabling Scientists to carry out experiments at various Synchrotron Radiation Sources and Neutron Sources abroad.

Establishment of a Centre for Knowledge Management of Nano Science and Technology (CKMNT) at the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad.

Augmentation of computing resources for simulation and data analysis at Inter University Accelerator Centre, New Delhi.

Support to M.Sc./M.Tech. programmes in Nano Science and Technology in 17 institutions across the country.

Grant of Post-Doctoral fellowships through JNCASR, Bangalore. # Funding of 249 Individual scientist-centric research projects. # Funding of 5 application-oriented Industry-Institute collaborative projects. # Launch of Indo-Canada Scientist Exchange and Training Programme. # Organization of 5 Advanced Schools. # Support to International/National Conferences, Seminars, Workshops etc. # Institution of Annual National Research Award in Nano Science and Technology.

Initiatives of other Ministries/Departments/Agencies:

In addition to the above activities of the Nano Mission, other agencies have also been taking steps to develop nano technology and physical and human infrastructure in this sector. For example,the Department of Information Technology (DIT) has set up Nano Electronics Centres at IIT-Bombay and Indian Institute of Science, Bangalore to embark upon R&D activities in the area of nanoelectronics including materials, devices, sensors, etc. and their characterization. A Nanometrology Laboratory has been set up at the National Physical Laboratory, New Delhi which provides a variety of calibration facilities. Some other major research facilities have also been set up at IIT-Kharagpur, IIT-Delhi and IIT-Madras. These facilities are being used by large number of scientists from 40 other institutions under the Indian anoelectronics Users Programme (INUP). These efforts have led to the development of some novel and useful sensors and training of manpower. The Laboratories of CSIR (Council of Scientific and Industrial Research)are carrying out wide-ranging research on nano technology thereby producing intellectual capitaland valuable human resource. Department of Biotechnology is carrying out R&D on nanobiotechnology, Indian Council of Agricultural Research (ICAR) and Indian Council of Medical Research (ICMR) on applications of nano technology in agriculture and health. Defence Research and Development Organization (DRDO), Department of Atomic Energy (DAE) and Department of Space (DOS) have well-orchestrated and focused nanotechnology programmes in relevant sectors.