GOVERNMENT OF INDIA SCIENCE AND TECHNOLOGY LOK SABHA

STARRED QUESTION NO:336 ANSWERED ON:12.08.2015 Innovations of Global Standard Chandrappa Shri B.N.;Mani Shri Jose K.

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

(a) whether India has not had a single significant invention in the past sixty years due to lack of attention paid to impactful research in colleges/universities/institutes and if so, the reaction of the Government thereto;

(b) whether the Massachusetts Institute of Technology alone has accounted for more than 10 major inventions in the past 50 years including that of global positioning system, bionic prosthesis and microchip by demonstrating unusual intellectual provess that is lacking in Indian institutions and if so, the details thereof;

(c) whether the Government has set any target to position the country among the top five global scientific powers by 2020 and if so, the details and the present status thereof; and

(d) the steps taken by the Government in this regard along with the number of innovations/inventions recorded in the country?

Answer

MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES (DR. HARSH VARDHAN)

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

STATEMENT AS REFERRED IN REPLY TO PARTS (a) to (d) OF LOK SABHA STARRED QUESTION NO. 336 FOR 12/08/2015 REGARDING INNOVATIONS OF GLOBAL STANDARD

(a) No Madam, India has significantly contributed in past sixty years and has paid due attention to impactful research in colleges/universities/institutes. The indigenous Research and Development (R&D) has successfully delivered inventions to meet our societal needs and challenges. Under the aegis of Indian Council of Agricultural Research, more than 2300 high yielding, hybrid varieties of food grains and cash crops have been developed. India is a major supplier of vaccines to UNICEF, which meets about 40% needs of 100 countries. The country has launched its first indigenous anti-malaria new-age drug 'Synriam''. Similarly, the first indigenous vaccine against Rotavirus has also been developed. Our Scientists have also developed cheaper process for manufacturing anti-HIV cocktail of drugs, entering into a new era of drug development. The Kalam-Raju Coronary Stent was developed to dilate constricted arteries for the first time in India, at a fraction of cost of imported device. Scientists have developed missiles, tanks, satellites and light combat aircrafts to address our defence technological needs. India has also hosted the cheapest Mars Orbiter Mission, which was designed and developed indigenously.

Indian Scientists have been participating in the experiments at Large Hadron Collider at European Organization for Nuclear Research (CERN), Geneva and have contributed towards the discovery of 'Higgs Boson' in 2012.

Government of India has declared 2010-20 as the "Decade of Innovation". The Government has enunciated a policy to synergize Science, Technology and Innovation. A strong and viable Science, Research and Innovation System for High Technology-led path for India (SRISHTI) is the goal of the new STI policy. Innovation is also being aligned for "Make in India" initiative of Government of India.

(b) Indian institutions are not lacking in intellectual prowess for doing R&D in Science & Technology. The Indian institutions like Indian Institutes of Technology (IITs), Indian Institute of Science, Indian Institute of Science Education and Research (IISERs), National Institutes of Technology (NITs), Council of Scientific & Industrial Research (CSIR) laboratories, and universities are equipped with quality manpower and infrastructure. The intellectual vibrancy of Indian S&T system is reflected in huge number of scientific publications which place India in 6th spot globally. Even in the globally competitive cutting edge research in area such as nanotechnology, India is placed at 3rd position globally in number of publications.

(c) No Madam, while Government has not set any specific target to position the country among the top five global scientific powers by 2020, however, the Government has announced the Science, Technology and Innovation (STI) Policy-2013 in which ""positioning India among the top five global scientific powers by 2020"" is indicated as an aspiration. Accordingly, the STI Policy seeks to: (i) Enhance India"s global share of scientific publications from the present 3.6% to 7.0%; (ii) Establish world class infrastructure for R&D in some select areas; (iii) Make careers in science, research and innovation attractive enough for talented and bright minds; (iv) Create an environment for enhanced private sector participation in R&D, technology and innovation; (v) Seed S&T based high risk Innovation; (vi) Participate in international R&D projects that are high cost and high science.

As per UNESCO""s Global Science Report-2010, India"s global ranking in Science is commensurate with its Full Time Equivalent

(FTE) of R&D personnel engaged in R&D. According to the latest statistics available with the Department of Science and Technology, in 2013 India ranked sixth in the number of total annual research papers published and contributed 4.36% of the global research output. India is amongst the top five nations in the world in terms of scientific publications in nano science and technology (3rd position). The highly regarded science watch group Thomson Reuters predicts that "India's research productivity will be on par with most G8 nations within seven to eight years."

India is among the top 12 biotech destinations in the world and ranks third in the Asia-Pacific region and currently holding 2% share of the global Biotech industry. Department of Biotechnology is constantly interacting with various stakeholders to realize their needs so that the Indian biotech sector can be advanced to be a key player globally by 2020.

(d) The Government is continuously encouraging the Indian scientific community to bring out the path breaking innovations having greater social and market impact globally. To stimulate investment in invention/innovation, Department of Science and Technology (DST) has initiated Global Innovation and Technology Alliance (GITA) for Intellectual properties (IP) acquisition and scouting of Technologies across the globe. DST has promoted 75 "Technologies Business Incubator" (TBI) for fostering innovation, entrepreneurship and knowledge based start-ups. Through the efforts of TBI, 2000 new and innovative start-up companies have come up. Some of the Autonomous Institutions (AI) of DST are also involved in development and promotion of innovations at grass root levels as well as at industrial level. National Innovation Foundation Ahmedabad (NIF), an AI of DST, has an objective to provide institutional support for scouting, spawning, sustaining and scaling up the grassroots innovations across the country. Around 2 lakhs grass-roots innovations have been documented by NIF. Technology Development Board (TDB) and Biotechnology Industry Research Assistance Council (BIRAC) are set up to boost industrial innovation sectors.

Currently, there are several fellowship programmes at different levels of scientific career for academicians including attracting scientists from abroad. Extramural research grants are available for scientists/ researchers to work on scientific programmes in areas like Climate Change, Solar Energy, Water Technology, etc. through various departmental platforms, viz. Science and Engineering Research Board (SERB), Technology Development and Transfer, Technology Mission Cell, etc.

The Department of Scientific and Industrial Research (DSIR) is implementing schemes such as Promoting Innovations in Individuals, Start-ups and SME''s (PRISM), Patent Acquisition and Collaborative Research & Technology Development (PACE), Building Industrial R&D Promotion Programme (BIRD), Access to Knowledge for Technology Development & Dissemination (A2K+) and National Laboratories Scheme of Council of Scientific and Industrial Research. DSIR operates a scheme for granting recognition to In house R&D units established by corporate Industry and Scientific & Industrial Research Organizations. Broad objective of the scheme is to promote and support R&D initiatives of Industry and academic research Institutions. Government of India has announced several fiscal incentives and support measures to encourage investment and participation of private sector in R&D.

A single window Patent Facilitation Cell (PFC) has been created by the Department of Science and Technology in the year 1995. PFC has been in the fore front of the national scene in creating awareness about Intellectual Property Rights (IPR) in the country, assisting scientists and technologists in protecting their inventive work, spreading the IPR culture to the State level and evolving policies at the national level.

A number of patents have been obtained at national and international level for scientific and technological innovations. The following table gives the details of the patent applications filed and patents granted in India during last 5 financial years and the year wise grant of patents in all other countries to Indians:

Year Patent Applications Patents Granted Patents Granted to Worldwide Patents Filed in India1 in India1 Indian in India1 granted to Indians2

2009-10 34,287 6,168 1,725 3,192 2010-11 39,400 7,509 1,273 3,134 2011-12 43,197 4,381 699 2,880 2012-13 43,674 4,126 716 3,583 2013-14 42,951 4,227 634 Not available

(Source: 1. Annual Report, Indian Patent Office, 2013-14; 2. Word Intellectual Property Organization (WIPO) Statistics 2014.