



# **Science, Technology and Innovation Policy 2013**

**Government of India**  
**Ministry of Science and Technology**  
**New Delhi**





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## *Shaping the Future of an Aspiring India*

Science, Technology and Innovation (STI) have emerged as the major drivers of national development globally. As India aspires for faster, sustainable and inclusive growth, the Indian STI system, with the advantages of a large demographic dividend and the huge talent pool, will need to play a defining role in achieving these national goals. The national STI enterprise must become central to national development.

## *Changing Phases of National Policies in S&T*

India's Scientific Policy Resolution (SPR) of 1958 resolved to "foster, promote and sustain" the "cultivation of science and scientific research in all its aspects". Technology was then expected to flow from the country's established science infrastructure. The Technology Policy Statement (TPS) of 1983 emphasized the need to attain technological competence and self-reliance. The Science and Technology Policy (STP) of 2003 brought science and technology (S&T) together and emphasized the need for investment in R&D. It called for integrating programmes of socio-economic sectors with the national R&D system to address national problems as well as creating a national innovation system.

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## ***The Need for a Science, Technology and Innovation Policy***

Scientific research utilizes money to generate knowledge and, by providing solutions, innovation converts knowledge into wealth and/or value. Innovation thus implies S&T-based solutions that are successfully deployed in the economy or the society. It has assumed centre stage in the developmental goals of nations. Paradigms of innovation have become country and context specific. India has, hitherto not accorded due importance to innovation as an instrument of policy. The national S&T enterprise must now embrace S&T led innovation as a driver for development.

India has declared 2010-20 as the “Decade of Innovation”. The Government has stressed the need to enunciate a policy to synergize science, technology and innovation and has also established the National Innovation Council (NInC). The STI Policy 2013 is in furtherance of these pronouncements. It aims to bring fresh perspectives to bear on innovation in the Indian context.

### ***STI Policy: A New Paradigm***

Science, technology and innovation can exist separately on their own in disconnected spaces. But, it is their integration that leads to new value creation. India’s global competitiveness will be determined by the extent to which the STI enterprise contributes social good and/or

economic wealth. There is, therefore, the need to create the necessary framework for enabling this integration in identified priority areas by exploiting endogenous resources, strengths and capacities. New structural mechanisms and models are needed to address the pressing challenges of energy and environment, food and nutrition, water and sanitation, habitat, affordable health care and skill building and unemployment. **“Science technology and innovation for the people”** is the new paradigm of the Indian STI enterprise. The national STI system must, therefore, recognize the Indian society as its major stake holder. Global innovation systems tend to bypass large sections of the community. Innovation for inclusive growth implies ensuring access, availability and affordability of solutions to as large a population as possible. Innovation, therefore, must be inclusive. The instruments of the STI policy will enable this to be realized. The policy will drive both investment in science and investment of science-led technology and innovation in select areas of socio-economic importance. Emphasis will be to bridge the gaps between the STI system and the socio-economic sectors by developing a symbiotic relationship with economic and other policies.

### ***Capturing Aspirations***

The key elements of the STI policy are:

- Promoting the spread of scientific temper amongst all sections of society.

- Enhancing skill for applications of science among the young from all social strata.
- Making careers in science, research and innovation attractive enough for talented and bright minds.
- Establishing world class infrastructure for R&D for gaining global leadership in some select frontier areas of science.
- Positioning India among the top five global scientific powers by 2020.
- Linking contributions of science, research and innovation system with the inclusive economic growth agenda and combining priorities of excellence and relevance.
- Creating an environment for enhanced Private Sector Participation in R&D.
- Enabling conversion of R&D outputs into societal and commercial applications by replicating hitherto successful models as well as establishing of new PPP structures.
- Seeding S&T-based high-risk innovations through new mechanisms.
- Fostering resource-optimized, cost-effective innovations across size and technology domains.
- Triggering changes in the mindset and value systems to recognize, respect and reward performances which create wealth from S&T derived knowledge.
- Creating a robust national innovation system.



## ***Investment in Research and Development***

Global investments in science, technology and innovation are estimated at \$1.2 trillion as of 2009. India's R&D investment is less than 2.5% of this and is currently under 1% of the GDP. Increasing Gross Expenditure in Research and Development (GERD) to 2% of the GDP has been a national goal for some time. Achieving this in the next five years is realizable if the private sector raises its R&D investment to at least match the public sector R&D investment from the current ratio of around 1:3. This seems attainable as the industrial R&D investment grew by 250% and the sales by 200% between 2005 and 2010. Increased private investment is necessary for translating R&D outputs into commercial outcomes. While maintaining current rates of growth in public R&D investments, a conducive environment will be created for enhancing private sector investment in R&D.

The gross budgetary support for the science and technology sector has significantly increased during the last decade. The impact of such increase is becoming evident. India ranks ninth globally in the number of scientific publications and 12<sup>th</sup> in the number of patents filed. The Composite Annual Growth Rate (CAGR) of Indian publications is around 12±1% and India's global share has increased from 1.8% in 2001 to 3.5% in 2011. But the percentage of Indian publications in the top 1% impact making journals is only 2.5%. By 2020, the global share

of publications must double and the number of papers in the top 1% journals must quadruple from the current levels. The citation impact of Indian publications must improve and match at least the world average. Initiatives under the new policy should enable these macro indicators of research to be achieved by 2020.

According to the Global Science Report of the UNESCO, India's current global ranking is commensurate with its number of Full-Time Equivalent (FTE) of R&D personnel. It is imperative that the total number of FTE of R&D personnel increases by at least 66% of the present strength within the next five years.

### ***Promoting Excellence and Relevance in R&D***

#### **Nourishing the Roots**

Ensuring sustainable pipeline of talented youth for science is a challenge. India has mounted some significant initiatives for attracting talent to science and careers with research. Empowering stakeholders for local actions is a key element of these initiatives. The policy framework will further enable school science education reforms by improving teaching methods, science curricula, motivating science teachers and schemes for early attraction of talent to science. Also special incentive mechanisms will be devised to stimulate research in the universities and develop young leaders in science and engineering.