India's Performances in Research and Development (R&D)

Why in news?

Union Budget 2023-24 spurs research and development with the focus on 'Viksit Bharat'.

How India fares in R&D?

- India is on track to become the world's third-largest economy.
- **Increase in patent-** India saw a significant rise in patent grants.
    - It increased from fewer than 25,000 in FY20 to nearly 100,000 in FY24.
- **Growth in patent filings-** India shows increases in patent filings.
    - **World Intellectual Property Organisation** – India achieved the highest growth (31.6%) in patent filings in 2022.

The World Intellectual Property Organization (WIPO) is a United Nations agency that protects and promotes intellectual property (IP) rights around the world.

- **Improved global standings-** As per *Global Innovation Index* India improved its position from 81st place in 2015 to 40th in 2023.
- India moved to 9th place in the Nature Index 2023, surpassing countries like Australia and Switzerland.

***The Nature Index** is a database that tracks institutions and countries/territories and their scientific output since its introduction in 2014.*

- **High-quality research articles-** India's share of high-quality research articles rose by 44% from 2019 to 2023.

What are the prevailing issues in India's R&D sector?

- **Low investment-** Indian firms invest much less in R&D compared to global firms.
    - The Economic Survey 2023-24 pointing out the stark contrast between Indian and global R&D efforts.
- India's *R&D investment as a percentage of GDP* remains low, standing at ***just 0.64%.***
- It lags significantly behind China (2.41%), the United States (3.47%), and Israel (5.71%).
- **Lack of ambition-** Despite economic growth, there is a lack of ambition within India's business sector to invest in R&D.
- **Limited private sector contribution-** Their contribution to India's Gross Domestic expenditure on R&D (GERD) is only 36.4%.

- It is much lower than China (77%) and the United States (75%).

Gross domestic expenditure on research and development (GERD) is a measure of the total financial resources spent on research and development (R&D) within a country.

- **Lack of Indian innovation** - There is indeed a lot of cutting edge R&D done in India but not by Indian companies but by the global capability centres (GCCs) of foreign companies.
- **Low R&D Intensity-** A recent analysis by the Foundation for Advancing Science and Technology (FAST) revealed that the global R&D intensity is 2.8 times higher than that of Indian firms.

R&D intensity *measures the ratio of a firm's R&D investment to its revenue. This ratio reflects the percentage of revenue reinvested in research and development.*

What are the provisions for R&D in Union Budget 2024-25?

- It has a separate priority entitled “Innovation, Research and Development”.
- The space sector has received a massive boost.
- Other priority areas, such as “Productivity and Resilience in Agriculture”, “Energy Security”, and “Manufacturing and Services”, also provide research and development opportunities.
- It also spurs research and development in important areas such as climate-resilient agriculture, critical minerals, miniature and modular nuclear energy technology, energy-efficient technologies, etc.
- The proposed “Critical Minerals Mission” and the exemption of customs duties on 25 critical minerals will significantly boost critical minerals research.
- Water supply, sewage treatment and solid waste management also figure as priority areas.
- In agriculture, the research focus is on productivity and climate resilience.
- The angel tax abolition is a major incentive for startups raising private capital.

National Research Foundation (NRF)
• It was announced in 2019. • **Allocation** - Budget 2021-22 provides an outlay of Rs 50,000 crore over five years. • **Aim** – It aims to ensure that the overall research ecosystem in the country is strengthened with a focus on identified national priority thrust areas. • It will support peer-reviewed R&D of all types and across all disciplines including interdisciplinary and social science research • It will seed, grow, and facilitate research at academic institutions, particularly at universities and colleges where research capacity is currently in a nascent stage.

What lies ahead?

- Encourage private sector in R&D to make real progress and enhance its global competitiveness.
- Operationalisation of the Anusandhan National Research Foundation (ANRF) for basic research and prototype development with a corpus of Rs 1 lakh crore will pave the way for private sector-driven research and innovation.

Reference

Swarajyamag | India's R&D Crisis

