India's Research & Development Sector

What is the issue?

1. With the G20 presidency, India has an opportunity to set the global agenda and be in the limelight for at least a year.
2. But, experts say that if it has to be a real leader, it has to do some heavy lifting for quite a number of years.

Which country is the real leader now?

- The U.S. is the real leader, as it has retained its global leadership for almost a century since World War I.
- It is not just its military might but its technological superiority in various fields that has made the US the largest competitive open economy.
- This success is also attributed to the culture of innovation backed by a solid base of research and development (R&D).

What are India's initiatives?

- In 2016, India launched the Atal Innovation Mission (AIM) to create an ecosystem to promote innovation and entrepreneurship in the country.
- All these are steps in the right direction, but the foundation of all this lies in how much India spends on R&D, in relation to other G20 countries.

What does SDG say about R&D?

- Even the Sustainable Development Goals (SDGs) Agenda 2030 aims to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
- In particular, **SDG Target 9.5 calls upon nations to encourage innovation** and substantially increase the numbers of researchers as well as public and private spending on R&D.

What are some of the methods to quantify innovation?

Gross domestic expenditure on R&D (GERD) is the proposed aggregate to quantify a country's commitment to R&D.

- According to UNESCO's Institute for Statistics (UIS) latest report, G20 nations accounted for 90.6% of global GERD (current, PPP$) in 2018.
- Global R&D expenditure has reached a record high of 2.2 trillion current PPP$ (2018).
- Research Intensity (R&D expenditure as a percentage of GDP) has gradually increased

from 1.43% in 1998 to 1.72% in 2018.



- Looking at spending in PPP terms is a reasonable metric for welfare measurement in the economy.
- But, when it comes to technological prowess in high-end activities of R&D, it all boils down to measuring hard currency in US dollars.

What is the position of G20 countries?

- The G20 countries, accounting for 86.2% of the global GDP and over 60% of the global population in 2021, are the leaders in every way.
- The US leads the G20 by spending $581.6 billion on R&D followed by the European Union ($323 billion), and China ($297.3 billion) in 2018.
- India lags way behind with a paltry R&D expenditure of only $17.6 billion in 2018.
- In terms of their relative shares in G20 R&D expenditure, the US is way ahead with 36%, followed by the EU (20%), and China (18%).
- India's share is less than 1% of G20 R&D expenditure in dollar terms.

What is the lesson?

- The only way to achieve India's dream of becoming a real leader seems to be by **repurposing its massive expenditures** on various subsidies towards a multi-fold increase in expenditure on research and innovation.
- While the absolute expenditure on R&D provides a sense of scale, their percentage to the respective GDP provides the research intensity (RI).
- In 2018, South Korea has the highest RI at 4.43%, followed by Japan (3.21%), Germany (3.09%), the US (2.83%), France (2.19%), China (2.14%) and EU (2.02%). India is ranked 17th (RI of 0.65%) in the G20.
- One of the non-G20 countries that have a higher RI than the G20 countries is Israel, which, while having an R&D expenditure of just $18.6 billion, a population of only 9.3 million, has the highest RI of over 5%.
- Israel is known as a land of innovations, be it in defence or agriculture.

Why Israel is known as a land of innovations?

- The innovation system in Israel is a fundamental driver of its economic growth and competitiveness.
- The government has played an important role in
    1. financing innovation, particularly in SMEs, and
    2. providing well-functioning frameworks for innovation, such as venture capital (VC), incubators, strong science-industry links, and high-quality university education.
- Israel builds a strong case to show that despite being a smaller nation, sustainable growth can be achieved by prioritising investments in R&D. This is a lesson India can learn.

What can India do during its G20 Presidency?

- During India's G20 presidency, the Science20 group, has the theme of "Disruptive Science for Innovative and Sustainable Development".
- This focuses on universal holistic health; cure and prevention of disease; clean energy for a greener future; and connecting science to society and culture.
- It will be interesting to see how India can leverage this for the shared prosperity of the world.
- India needs not only technological development and brilliance in various sectors ranging from defence to agriculture to manufacturing.
- But it also needs innovations that can safeguard its basic environment - land, water, and air.

Reference

1. Indian Express | India needs to increase its spending on R&D to become a global leader

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