

# **Strengthening Science Governance: Towards Innovation, Collaboration, and Sustainability**

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There are several indicators of progress made by any country in Science & Technology. These include Global Innovation Index, number of institutions in QS and/ or THE rankings, number of science graduates produced, number of scientific publications made, number of intellectual properties (including patents, copyrights, designs etc) filed/ granted etc. The majority depend upon the investment (as %age of GDP or in absolute currency terms) as well as on policies on how science is being administered in a country.

While on one hand, scientific research is a tool for knowledge generation and technology development leading to improved economy and strategic strength, on the other hands; it helps in solving several challenges being faced by the Society. Accordingly, governments across the world have opted to address various Sustainable Development Goals (SDGs), as identified by the United Nations as well as are looking for scientific research for development of newer technologies to attain strategic advantages. Countries are developing their niche in specific sectors and are marketing it selectively. It is important that all stakeholders, including government, industry, policy makers, researchers, academics, NGOs collectively contribute to the goal to reap advances of scientific excellence.

Several countries are exploring tools of international scientific collaboration to boost their national efforts on selected challenges, to expedite their commitments for SDGs by 2030 as committed by them, to participate in mega science programs, to address several global challenges (viz. climate change, COVID, etc.). This involves human capacity development,

R&D projects, creating centres of excellence in specific domains and marketing of technologies/technology products in friendly partner countries. While this endeavour is yielding good results, in recent issues of Data Sovereignty and Protection of Intellectual Properties (IPs) have surfaced. With the arrival of several digital technologies, data is the new fuel helping newer technologies like Artificial Intelligence, Machine Learning, Quantum Science, etc. Countries are struggling to arrive at a uniform data policy. Similarly, for protection of IPs, platforms like WTO, WIPO are coming forward trying to reach consensus.

While Israel spends > 6 per cent of its GDP on R&D; several developed countries, including Austria, Belgium, China, France, Germany, Japan, Korea, Italy, Singapore, UK, US etc. spend > 2 per cent of their GDP on research. This is possible because of the good contribution of public funds as well as those of industry. On the other hand, countries like Brazil, Canada, Egypt, India, Russia etc. are still looking to reach the 2 per cent mark and win the confidence of their industry to invest in in-country research.

Further, a large number of countries have invested more in application science to do product oriented research on higher Technology Readiness Level (TRL). Few countries are encouraging researchers to go beyond and suggest how much new technology products are prepared at Business Readiness Level (BRL). This has brought a tacit bias against basic science or discovery science, which in the recent past, is suffering silently. On the other hand, many governments across the world have changed their priorities and slashed science funding, making most of the public research funding more competitive.

There is an increasing realization that industry must also invest significantly in research. While in Developed countries, industry could contribute nearly equal to the government funding, in the developing world it is not happening. This is mainly because of trust deficit between industry and researchers. In order to remain market competitive globally, industry needs to re-orient/redesign their products based on latest research. Few industries have started in-house R&D, but it is rather miniscule. Time has come to bridge this trust deficit and look for new hi-tech indigenous products. This will help address various sustainable goals, rise in various rankings and also improve national economies of the countries.