

# Science Diplomacy



India's Global Digest of Multidisciplinary Science

## Science, Technology and Innovation Policy 2020



**1958**  
Scientific Policy Resolution (SPR)

**1983**  
Technology Policy Statement (TPS)

**2003**  
Science & Technology Policy (STP)

**2013**  
Science, Technology & Innovation Policy (STIP)

STIP2020: Experts' Recommendations during 'Across the Table' Online Series Discussions - I

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## Science, Technology and Innovation Policy 2020: Experts' Recommendations during 'Across the Table' Online Series Discussions - I

Science, technology and innovation (STI) are key drivers of any country's economic growth and societal well-being. To strengthen its STI ecosystem, the Indian Government has initiated the process of formulating its 5th Science, Technology and Innovation Policy (STIP) 2020. It has been jointly carried out by the Office of the Principal Scientific Adviser to the Government of India (Office of PSA) and the Department of Science and Technology (DST). The objective is to create a robust, holistic and transformative STI policy shaped by '**bottom-up, decentralised, experts-driven, evidence-informed and inclusive**' approaches. To achieve this, an expansive four-track consultation process has been adopted. The track-I process involves 'public and expert consultation process' under which six unique modes have been floated online to ensure inclusive representation from all segments of the society. These modes include: In Conversation With, Across the Table, Policy Compass, Open Letter, Thoughts for India, and Ideathon. The 'Across the Table' mode was a series of 16-panel discussions built around 21 identified thematic groups which are available on the 'Science Policy Forum' portal for public discourse. Readers are encouraged to go through the <http://thesciencepolicyforum.org/> and engage in the drafting process of STIP2020. It is an opportunity to recognise and address the weaknesses of our previous science policies and come up with a more robust STI policy framework. Here, an attempt has been made to collate the recommendations put forward by experts during 'Across the Table' mode, in a two-part series. The first part includes five-panel discussions in the current issue of *Science Diplomacy*. The discussions have been edited for brevity and clarity.

### 1. Research & Development Ecosystem

The panel discussion titled '**Research & Development Ecosystem**' was aimed at addressing weaknesses in the Indian R&D ecosystem and suggest course-corrections to improve and strengthen it. The recommendations have been summarised below:

**Collaborations and Partnerships:** Collaborations and networking are crucial for promoting R&D ecosystem. These linkages may include educational, and research institutions, universities, industries, non-governmental organisations (NGOs), philanthropists, and other national and international organizations financing R&D. Presently, only 1.2-1.3% of our research output involves industries and universities interaction. We need to establish more linkages for dialogues and collaborations between industries and universities. A 'triple helix' model between University-Industry-Government should be incentivised. This cross-fertilization would eventually result in new knowledge ecosystems that would enable research being translated into meaningful impacts for society.

**Augment R&D Infrastructure:** Very few institutes in India can brag about the education infrastructure. Basic infrastructure is missing in universities. There is a lot of heterogeneity in R&D investment with a few regions and states getting a sizable chunk of it. The state universities, thus lag in research activities. The faculties' job is restricted to teaching without any research, which also impacts the quality of imparted education. The panel asserted to expand R&D ecosystem beyond the elite institutions and provide sufficient infrastructural support in developing appropriate research culture and capabilities in R&D institutes and universities located in tier 2 and tier 3 cities.

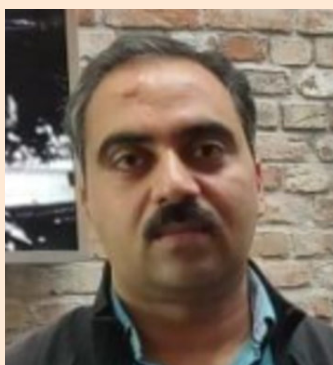


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**Leadership Training:** Early-career scientists and researchers should be provided with adequate independence to explore various possibilities. Their efforts should be reinforced with consistent funding, reliable infrastructure, manpower exchange, timely support and encouragement. Risk-taking attitude needs to be



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inculcated and supported. The emphasis was laid to create a right working environment that stimulates and encourages both academia and research. Greater representation of younger scientists in decision-making bodies should be preferred as per their areas of expertise. Give sabbatical to scientists at higher positions to spend a few months in other institutes, interact with students, expand a research program, establish new links, observe the administrative requirements and built a framework that could be beneficial for own institute.

**Merit-Based Selection:** Selections should be purely based on merit. It implies to each level starting with the higher education, faculty members, head of the institutes and selection-committees' members. Their selection should be transparent and based on their subject expertise and proven scientific excellence. The evidence-based selection should apply during promotions too. Indian Council of Agricultural Research (ICAR) is a good example where both types of selection process exist: entrance exam followed by an interview at the entry-level and subject or research-based selection through an interview at higher-level. Efforts should be taken to harness the local talent and promoting them. Age restrictions imposed on academic or research positions should be disposed of, a point highlighted in the 'Equity and Inclusion' segment as well.

**STI Indicators:** These indicators help in characterising and analysing a country's policy implementation, rules and regulations, the status of institutions, their infrastructure and capabilities. The panel accentuated on designing the right indicators which present a complete and true picture of India's R&D ecosystem. So

far, it is restricted to the number of PhDs, projects funded, publications, patents, citations, etc. The used indicators by other international organizations such as the Organisation for Economic Co-operation and Development (OECD), the World Bank, etc. are crude and present a partial picture. Thus, there is a need for developing country-specific STI indicators for evidence-based STI policy up-gradation.

**Fiscal Support:** The government should increase the budget in R&D. Presently, the funding support to R&D in India is significantly lower than other developed nations (0.7% for India vs 2.1% for China and 2.8% for the USA). New strategies should be placed to attract R&D grants from various sources such as non-governmental organisations, non-profit organisations, private sectors, state governments, philanthropic groups, charitable foundations and international funding agencies. Perhaps, a few extraordinary incentive mechanisms could be created to encourage private sector companies to fund R&D. Creating services for private companies at research institutions should be encouraged. This will bring funds to boost infrastructure. A few institutions have taken initiatives in this direction but more diverse services need to be generated. Corporate social responsibility (CSR) fund is a unique initiative to drive their participation and support for strengthening R&D institutions in India.

**Ease of Doing Science:** Consistent efforts are required to ensure the 'Ease of doing Science'. Government rules should be more flexible, and processes should be automated or digitised ensuring less paperwork, speed, transparency and reliability. Over the years, researchers have faced financial problems due to non-disbursal of funds at regular intervals. The responsibility of those monitoring fund disbursal and annual assessments in funding agencies should be fixed.

**Multidisciplinary Education:** Multidisciplinary education is the future. There is a need to set-up more diverse kind of institutes. Interdisciplinary and transdisciplinary research should be promoted. More start-up incubators, accelerators and corporate venturing should be established to advance India's STI ecosystem.

## 2. Equity and Inclusion

The objective of this panel discussion was to evaluate the significance of diversity in augmenting STI and harness the full potential of the available workforce.

**Prof. Godbole** addressed the issue of gender disparity and laid stress on maintaining gender equality. She exhorted of India's version of the Athena SWAN (Scientific Women's Academic Network) Charter that is used around the world to support and advance gender equality in higher education and research institutions. STIP2020 should aim to increase retention of women after PhD to fully utilize their enormous potential in Science, Technology, Engineering and Mathematics (STEM). Age barrier at every level should be abolished. Gender-neutral policies, including adequate parental leave for both men and women, should be devised. Introduce measures such as setting up day-care centres in institutions, tenure extension policies for women who need it due to childbirth and flexible working hours. Getting rid of implicit biases against women in academia is a must. Promoting and encouraging women in leadership positions are required. A more inclusive policy demand equitable and effective participation. Prof. Godbole also elaborated on the need to have last-mile connectivity for greater integration. She envisaged creating a mechanism enabling government agencies to work with NGOs as the latter has better connectivity on the ground. Bringing in the local corporate world through CSR could create channels for knowledge and resource exchange.

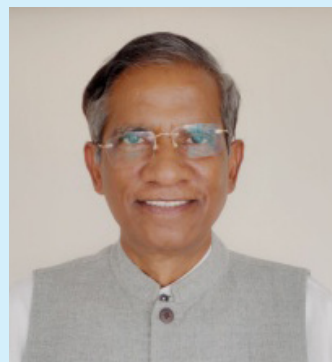
**Prof. Kattimani** stressed upon the need to include indigenous and traditional knowledge holders into mainstream science to make the best use of their competence. Combining the grassroots innovations with newer technologies such as information and communications technology (ICT) could help to unleash their commercial value, by proving their uniqueness and genuineness. He also suggested to set-up related incubation centres near villages to have functional connectivity and an enabling environment that can strengthen the



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*Professor Emeritus, Indian Institute of Science, Bengaluru*



**Ms Jyotsna Sitling**  
*Principal Chief Conservator of Forests – Van Panchayat, Govt. of Uttarakhand*



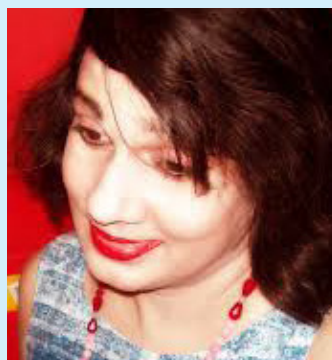
**Prof. T.V. Kattimani**  
*Vice-Chancellor, Central Tribal University of Andhra Pradesh*

grassroots innovation ecosystem. He underlined the need to devise a mechanism to connect the traditional knowledge holders with scientific institutes to get that information dispersed or translated for the general public. More investment should be diverted toward the base of the pyramid of the scientists. At present, more money is spent on the top of the pyramid.

**Dr Mishra** highlighted the under-representation of women in the workplace. He elaborated on bringing out diversity in the workplace and said, 'Diversity is



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**Prof. Dr A. Mani**  
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a virtue, not a weakness'. More diverse is the team, better is the performance and productivity. Not only gender but ethnic, regional, geographical and linguistic diversity should also be considered. Removal of such disparities will bring out positive change and aid in providing a more robust ecosystem. Science should be available in local and regional languages. The definition of science should be expanded to include social sciences, anthropology, etc. Therefore, a suitable system should be crafted to facilitate and reap the benefits of diversity in STI.

**Ms Sitling** spoke about knowledge access, assurance and affordability. Ensuring affordable access to information can open up new avenues and help overcome many pressing societal problems. Innovation can be a tool to achieve social equity. She proposed to develop a newer database for R&D and patenting. The innovations' tracking indicators are not very sensitive. Hence, an advanced metric is required to monitor the strategies and roadmap of future science policies.

**Dr Mani** pointed out the significance of gender education. Creating awareness via gender sensitisation workshops for staff and faculty members should be conducted regularly at all levels. She pressed the idea of the creation of an 'Office for Equity and Inclusion' in every institution. These will act as hubs connecting all women in the institution and promoting stable mentorships and support networks.

### 3. STI Policy Governance and Program Linkages

This panel deliberated on a critical issue underlining how policies should be established, implemented, monitored and reviewed routinely. It is imperative to have an interlinked and structured mechanism where the roles and responsibilities are clearly defined for an effective policy framework.

**STI Statistics:** ‘Data is the new oil’ stated Ms Sinha, Secretary S&T. This phrase was coined in 2006 by Mathematician Clive Humby, who further added that, like oil, data is valuable, but if unrefined it cannot be used. Thus, there is a huge potential in extracting information from the scientific data which can be leveraged for profits. Training in STI statistics must be provided to benefit from the huge data being generated each day. A strong program for building data architecture has to be established. It may even require setting up an institution engaging existing statistical institutes and hire human resources (data scientist, data engineers, software engineers), research and technological resources. She also asserted the need for a national compendium or inventory of not only PhDs, postdocs but science journals, ancient literature, monographs, etc.

**Science Outreach and Communication:** Orientation of administrators in science communication should become an integral part of the orientation programme of all training institutes which produce academicians, science administrators and communicators. Science writing is not easy and is still not actively practised by most of them. Therefore, more investment is desired in enhancing science communication skills among scientists, administrators, and academicians. Online courses should be designed as per the

demand of stakeholders. Foster necessary ecosystem by providing incentives and awards to those who are involved with science communication and outreach.

**Science, Technology and Innovation Councils:** With an aim of inclusive growth, the councils should include representation from various stakeholders such as eminent scientists, academicians, science administrators, chief secretaries of states, industry members, leading professionals, bureaucrats from the centre as well as from states. State boards need to be empowered and encouraged to contribute more in the innovation process. Rajasthan has many cohorts such as biotech cohort, IPR cohort, etc. that allows better connectivity. Other states should also focus on developing such cohorts. State councils should be given the liberty to customise as per states’ needs. An informed strategy and forecasting mechanism (autogeneration of problems to be addressed) should be devised.



**Dr Hiro Bhojwani**  
*Former Head, Research Planning & Business Development, CSIR*



**Ms Mugdha Sinha**  
*Secretary S&T, Govt. of Rajasthan*



**Dr Jatinder Kaur Arora**  
*Executive Director, Punjab State Council for Science and Technology*



**Prof. Sujit Bhattacharya**  
*Professor, AcSIR; Chief Scientist, CSIR- NISTADS*

**Funding State S&T Innovation Councils:** Ministry of Science & Technology, GoI has suggested finance commission to earmark 2.5% of state allocation for R&D. The centre should invest an additional 2.5% as an incentive to state councils to motivate them to take up STI seriously. If funds start flowing, state S&T councils can upgrade themselves by undertaking bigger projects.

**Coordinated Approach:** At present, lack of coordination among various ministries, and departments is a major constraint as they are working in silos. There has to be vertical and horizontal integration between the various actors at all levels (central, state and regional). Coordination can be achieved in implementation processes through joint programming. A proper governance mechanism should be established where the efforts are aggregated at the central level and should percolate down to the state level.

**Connected and Competitive Strategy:** State innovation councils should be more connected. Providing a single platform for sharing state activities' data would help in motivating and promoting states to compete and do better. Competitive collaborations between states are required. Regular sessions between state representatives and secretaries of DST, Department of Biotechnology (DBT), etc. can help in seamless integration and constant exchange of good practices, ideas and mutual learning. States need to be truly plugged in the national circuit. Hence, an institutional network is to be created to solve common problems relating to issues of regional concern, such as stubble burning, peaceful sharing of water resources and ways to achieve sustainable development.

**Fostering Linkages:** Both formal institutional linkages and informal networks between state councils and the centre should be strengthened. A well-structured coordinating body to see how the programs are linked at national, state, sectoral and regional levels should be set up. More efforts should be concentrated on establishing linkages via joint planning, joint implementation, division of tasks, and sharing of information and resources.

**Creating Awareness:** The science policies should be recognised as national policies for all citizens. They should be outcome-based and designed for a small duration (five years). Instead of long policies, small output-driven schemes should be advocated. Policy drafting should be simple, readable, understandable and action-oriented. Policymakers and parliamentarians need to be conversant with developments in STI, and their applications for the benefit of society. Regular sessions between scientists and government officials, ministers and legislators can help in creating awareness among all the stakeholders.

**Best Practices:** Entrepreneurship development institutes should be linked with the state and district innovation councils. District innovation councils should organise boot camps to identify local solutions and promote talent. Create linkages with bottom-up level. Expand the concept of innovation cities to the less-developed regions.

**Paradiplomacy:** At present, there is no integration at the international and state levels. There is a great need to establish partnerships directly between international bodies and state, regional and local governments. States must harness their abilities to create linkages with the foreign agencies. It is high time to establish an institute in the country for science diplomacy.

## 4. Skilled Human Resources and Capacity Building

With an aim to devise concrete strategies for advancing highly qualified and skilled human resources, the following action plan is recommended:

**Research Manpower:** With one of the lowest densities of scientists and engineers in the world, our focus should be on enabling talented young scholars to pursue education and training from the undergraduate level itself. For high-quality science education and R&D ecosystem, a continuous supply of scientifically-



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**Dr. Rupamanjari Ghosh**

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skilled people is mandatory. There is an urgent need to create a pool of STEM graduates, qualified PhDs and technologists.

**Funding Support:** To ensure highly qualified, innovative scientists and technologists, existing research institutions have to be supported and strengthened. Not only research institutions but universities should also be provided special support, enabling them to become centres of leadership and excellence. That would lead to a steady stream of qualified and enthusiastic young scientists. The funding should allow students and researchers to participate in under-graduate research attachments and doctoral and postdoctoral stints in foreign countries. It is crucial to the pursuit of excellent science as it introduces new networks and collaborations. Translational research ideas should be funded not only for permanent scientists but for experienced researchers, postdocs, too. Many talented researchers with great translational ideas fail to apply for big grants due to the lack of permanent positions. The translational research funding to the researchers without imposing



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*Former OSD (NEP), Secretary to the Committee to Draft National Education Policy, MHRD*



**Prof. Pratibha Jolly**

*Former Principal, Miranda House, University of Delhi*

the age-limit for at least five years can certainly bring new projects aiming to solve societal problems.

**World-Class Infrastructure:** India needs more world-class universities which are critical for breeding talent and driving innovation and economic competitiveness. Create good quality research universities, especially in states by providing them with autonomy, financial stability, modern equipment and access to information technologies. Good leadership and funding are crucial in building world-class universities.



**Prof. Gautam Menon**

*Professor, Ashoka University, Haryana*

**Reform Educational Systems:** The education system in India does not encourage inventiveness and creativity and hence, needs major reforms and changes. Those reforms should begin at primary level and then move on to secondary and senior secondary levels. Entire pedagogy has to be ameliorated to ensure all-round development of a child and to improve the quality of school education. Improving basic education,

stimulating young people to seek scientific careers and better distributing the scientific enterprise across the country is the need of the hour. Students should be trained for a range of career options with skill-sets that allow them to choose non-academic career paths. It is imperative to reorder curriculum broadening the scope of university education. The spiral curriculum could be one of the multipronged approaches. Emphasis should be given to the T-shaped education system imparting both depth and breadth of knowledge. In the present COVID-19 scenario, hybrid campuses offering a blend of online and offline courses should be explored. Recently, India's New Education Policy was launched on 29 July 2020.

**Enterprise Education:** It is the provision of learning opportunities which help students develop the attitude, knowledge and marketable skills of the entrepreneur. The government should formulate a range of initiatives and curriculum changes to promote and encourage enterprise education. The incorporation of such efforts into enterprise education in all phases beginning at primary school level would help address the need of a trained, skilled workforce.

**Interdisciplinarity:** Interdisciplinary education holds immense importance in today's world. We need to train our students in multidisciplinary fields to provide them with a global view of the world. To achieve this, the capacity building of teachers in the latest pedagogy and an exploratory approach to teaching and learning is desired. Refresher courses and continuing education programmes for teachers need to be refined to keep them conversant with the latest scientific advances and teaching practices. They should be regularly trained and updated in the latest educational trends' world over. The teachers should be encouraged by recognising and rewarding their efforts in academic settings.

**Enhance Skills and Apprenticeships:** Critical thinking and problem-solving approach skills are vital as they empower students to find effective solutions for social, scientific, and practical problems. Hence, skill-based learning should be encouraged. We also need to impart training that allows students to become problem-solvers, multi-taskers, systems-level thinkers, expert researchers, managers, communicators, and much more. The policy should aim to provide best practices for incorporating critical thinking instructional methods among students. By actively engaging students in project-based or collaborative activities can nurture an innovative mindset.

**Integrated Network:** Build a conducive space for enhanced participation of all stakeholders; private sectors, R&D, industry, international agencies and others. Dedicated efforts to strengthen linkages between industries and Micro, Small and Medium Enterprises (MSMEs) with research institutions should be made. Engage the non-governmental sectors also through in-house and extramural research, training, recruitment and related modes of support. Strong policy interventions are prerequisite to support strong and equitable partnerships. The latter has to be based on mutual strengths. It should also focus on facilitating international partnerships.

**Scaling Up of Professional Education:** Community colleges offer low-cost high-quality education locally. It amalgamates both skill development and traditional coursework, thereby enabling learners to shift directly to employment sector or higher education sector. It provides a flexible and open education platform which caters to community based life-long learning needs. It allows the students to have multiple exits after attaining a particular level of competency. There should be a provision of lateral exits and skills for Ph.Ds. Policy needs to focus on skill development of school dropouts too. Cluster-innovation centres are a good example where scholars are being taught industry-relevant skills. Concerted efforts should be made to successfully replicate such centres of excellence.

**Interconnectedness:** Facilitate fellowships, associateships and training programmes that keep scientists, technologists, technicians and students up-to-date with the latest information and connect with other research and educational centres across the world. More engagements and exchange of ideas at all levels of the education system with society should be exercised. Inspiring imaginations also play a crucial role.

## 5. STI Governance and System Interconnectedness

This panel deliberated on how STI governance can address the system interconnectedness under holistic STI ecosystem.

The main challenge to be addressed in STI governance is the lack of **coordination and connectedness** between academia, industry, different government agencies (including central, state and local councils) and other stakeholders. Even different ministries do not have a proper mechanism to interact. By enhancing ties between various stakeholders could help in strengthening the STI ecosystem in India. Hence, the panelists stressed the need to improve coordination and networking at different levels:

- a. Interconnectedness within Government (especially, inter-ministerial connectedness)
- b. Public-Private Partnership
- c. S&T connect with social sciences
- d. Science-industry linkages
- e. Interlinkages between scientists and administration



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**Dr Satya Prakash Dash**  
*Former Head, Strategic Partnerships & Entrepreneurship Development, BIRAC*



**Prof. Shubha Tole**  
*Professor, Dept. of Biological Sciences, TIFR, Mumbai*



**Dr Soumitra Pathare**  
*Director, Centre for Mental Health Law and Policy, ILS, Pune*

Another area demanding attention is a proper **evaluation and monitoring system**. There is no regulatory body for the timely disbursement of the research funds or fellowships. Researchers face complex funding challenges because of lack of timely financial support and sound infrastructure. Dealing with these problems affects their research quality. Most of the agencies either do not have a grievance portal or they fail to respond to such grievances. Thus, there is a dire need of a new framework which is not only more transparent and accountable but agile too. Overcoming this growing apathy would require major changes both in the formulation of STIP2020, and the distribution of roles between different actors. The example of DBT/Wellcome Trust India Alliance (India Alliance) was discussed which has a very good system of grant governance and delivery. Such a mechanism can be adopted by all the government funding agencies for the timely delivery of the funds. Introducing diversity of solutions has to be taken into account.

**Shoddy implementation** of policies is a major constraint holding back the country's STI development. Efforts should be made bringing in more transparency, flexibility and accountability. It is a dire necessity to modify the outdated rules and regulations that impede the file processing. It is imperative to make the system simplified and nimble. A closer and better alignment of STI governance structures and functions (e.g. policy advice, steering and funding, coordination, and evaluation and monitoring) at all levels is the need of the hour. Dr Pathare remarked that in general, the errors of omissions are not punished, but errors of commissions are. This has to be changed and a more robust system has to be put in place. Those delaying file processing and timely fund release should be held accountable. System innovation is also a part of technology innovation.

To accelerate the STI development, the aim should be on **human resources**. Selections should only be based on merit and not confined by any biases towards religion, region, gender, caste or language. Nepotism, favouritism and cronyism should be discouraged. The efforts should be focused on diversity. To achieve gender equality, all women and girls need to be empowered. According to Prof Tole, we need to catch them young (10-12 yrs old) and have to be thoroughly funded. The upcoming policy should be imbued with a spirit of gender equality. The endeavours to include other vulnerable or minority groups to 'leave no-one behind' should also be taken into consideration. Ms Deepanwita spoke about publicizing and sharing success stories of women scientists that can serve as role models for motivating women's participation in science. It would be a true example of 'success breeds success'. The policy should aim to achieve socially inclusive development by increasing diversity in the workplace.

Creating an appropriate ecosystem conducive to foster **innovation systems** is vital. The grassroots innovations which are of small-scale yet, need to be promoted to stay ahead, particularly in terms of economic growth. These innovations should be linked with industries and incubation centres for green leapfrogging. The startups as well as MSMEs should be supported through seed funding, increased financial support, mentoring, etc. Efforts should be made to rope in non-profit organizations.

The session concluded with the following recommendations: (1) the connectedness between academia, industry, different government agencies and other stakeholders; (2) stronger evaluation and monitoring system with transparency, efficiency and certainty of processes; (3) more diversity that is inclusive of gender and citizens; (4) more resources and support to encourage Public-Private Partnerships; (5) closer alignment of national-level STI governance structures; and (6) connect with social science.

## Science Technology and Innovation Policy 2020 Can Transform India

**Dr Bhaskar Balakrishnan**

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Science Diplomacy Fellow, Research and Information System for Developing Countries, New Delhi, India

The current exercise in framing a new Science, Technology, and Innovation Policy for India 2020 led by the Principal Scientific Adviser to the Government of India is unprecedented in scope and scale. Consultations have included a wide range of stakeholders across the entire spectrum of India's STI ecosystem, and have gone in-depth into all the key issues. The aim is ambitious, to frame a policy that will be a springboard for India's science and technology leap into the future. This article deals with some of the macro aspects of India's STI ecosystem and the STIP.



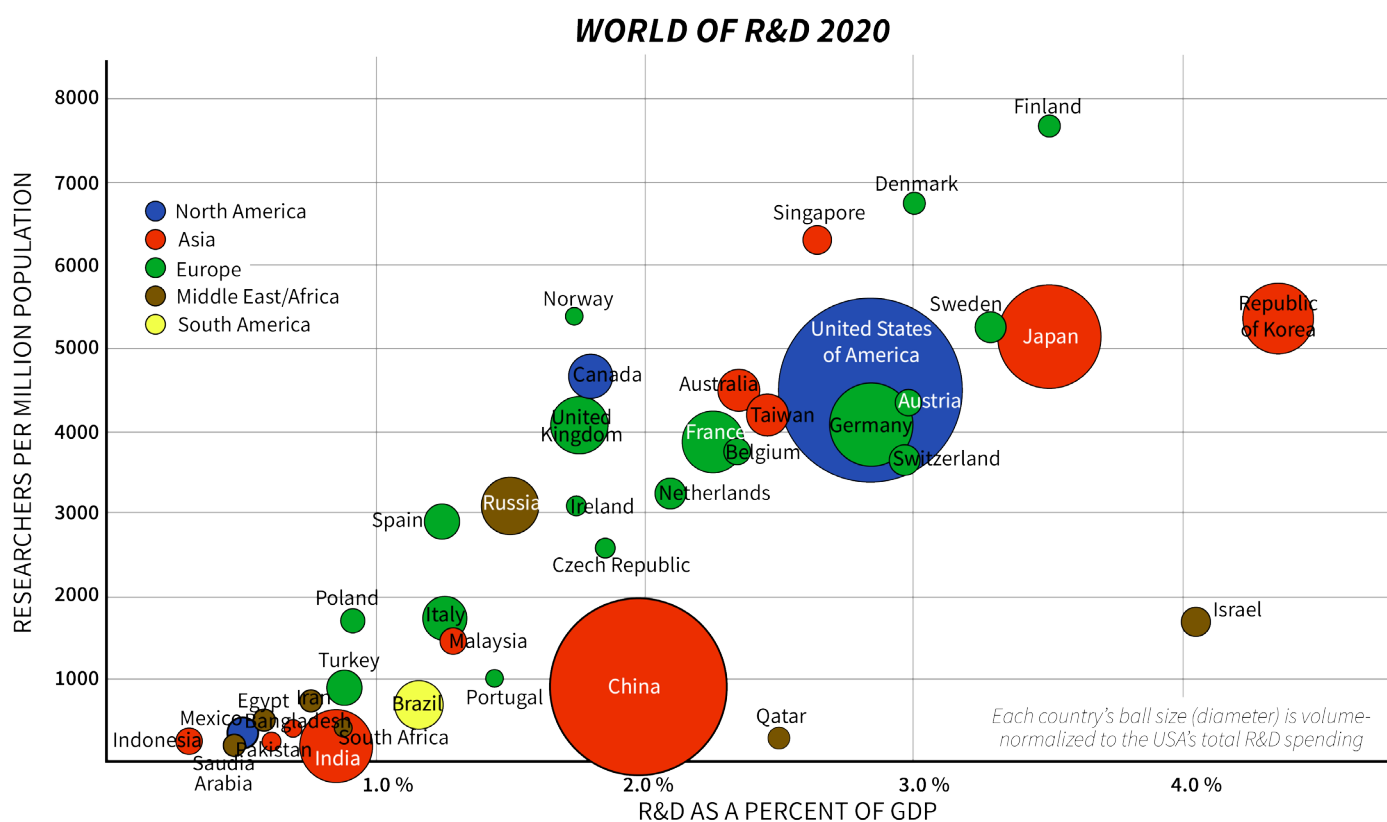
Compared to the four such exercises have been conducted since independence - Scientific Policy Resolution 1958 (SPR1958), Technology Policy Statement 1983 (TPS1983), Science and Technology Policy 2003 (STP2003), and Science Technology and Innovation Policy 2013 (STIP2013), the STIP2020 process is much wider and deeper. It comes amidst several challenges facing India – slowing economic growth, development challenges as embodied in the sustainable development goals (SDGs), weak manufacturing sector resulting in high trade deficits, rising population needing to be skilled, the recent Covid-19 pandemic induced economic losses, and the geostrategic threats from China, the world's second-largest economic power and R&D spender after the USA.

India is already the world's fifth-largest economy with a nominal gross domestic product (GDP) of about \$ 3.2 trillion. In purchasing power parity (PPP) terms, India is the third-largest economy with a GDP (PPP) of \$ 8.1 billion. India has ambitious plans to further grow and diversify its economy and international economic engagement through trade and investment, in order to achieve the best possible quality of life for its population. To do this India must transform its STI ecosystem to deliver the necessary R&D products to the economy and make India's economy competitive and strong. In the strategic sphere, S&T is even more critical in developing capabilities in defence systems and meeting external threats. The STIP2020 exercise should, therefore, be bold, forward-looking and ambitious, leading to a strong and resilient future India.

A country's STI capability depends on its STI ecosystem. Human resources in the form of STEM researchers are a necessary but not sufficient requirement. Other essential components are - R&D institutions, funding for R&D, and translation of R&D into economic or strategic activities. Higher education as well as R&D institutions are involved in training researchers. Hence, the national education policy (NEP) 2020 is extremely important for the new STIP2020 and both should reinforce each other. In particular, the NEP 2020 should revitalise STEM education from age 8 upwards, in schools. Children have a natural sense of curiosity, and by igniting their interest in STEM and a spirit of questioning and inquiry, we can unleash a whole generation of knowledge seekers, who can fuel India's R&D.

If the STI ecosystem has deficits, then the skilled STEM researchers will move to a better ecosystem in another country, leading to external brain drain, or to non-STEM professions (internal brain drain). Therefore, the development of India's STI ecosystem as a whole is necessary. The translation of R&D activity into economic activities depends on the national economic ecosystem, especially the environment for creating IPRs, new businesses including funding for startups and scaleups, and market and regulatory conditions. Conversely, if India can create a world-class STI ecosystem, it will be an attractive place for researchers from other countries to migrate to, including the Indian diaspora STEM professionals. Countries such as the US have benefited from the attraction of their STI ecosystem, and others such as Canada, EU, and China are trying to do so. Our STI ecosystem must be able to compete in the future with the best in the world if we are to retain our best talent.

However, in terms of key macro STI indicators, India has considerable space to cover. The Gross domestic expenditure on R&D (GERD) is only 0.71%, well below the UNESCO benchmark of 2%, and far less than the 2 to 3.5% of countries such as Japan, Germany and the Republic of Korea. The number of researchers per million population is also quite low, about 255 in 2017 improving from 110 in 2000. However, this is far below than countries like Israel (8,342), Denmark (7,899), Sweden (7,597), Republic of Korea (7,498) and Finland (6,722) during 2017. Fig 1 gives a good overall picture of where India stands. India must seek to move into the place occupied at present by Japan and the Republic of Korea, and set a target of 3-3.5% GERD of GDP



**Figure 1. GERD as per cent of GDP and Researchers per million**

and at least 4000 researchers per million. Both these targets must be achieved simultaneously, as a capacity to absorb R&D funding depends on the numbers of researchers.

Another important indicator is the share of the private sector in R&D. R&D spending is dominated by the Government sector - Central Government 45.4%, State Governments 6.4%, Higher Education 6.8% and Public Sector Industry 4.6% with Private Sector Industry contributing 36.8% during 2017. In a developed

STI ecosystem, the share of R&D of the Higher Education sector and the private sector should be higher. In many developed and emerging economies, the participation of Business Enterprises in GERD is generally more than 50% and more than 70% for China, Japan, Korea and the USA.

As outlined above, brainpower is an essential component for STI. The Higher Education sector has a critical role as the young brainpower for R&D is generated there. Both in quality and quantity, the expansion in the number of researchers and R&D spending depends on transforming our Universities into robust R&D institutions. NEP 2020 presents an opportunity for upgrading the quality of STEM education at high school and university levels. The close interaction of Universities and Industry is necessary to drive R&D along paths that lead to fruitful commercialisation. The CSIR lab network was an attempt to push R&D along areas that could be useful for the Indian economy, but this approach needs to permeate the University system which has an excessive preoccupation with teaching. Mobility of researchers, faculty and students across Indian and foreign universities can help improve research quality. Europe has made such reforms in its universities (Bologna Process) and has embarked on new ideas such as the European Research Areas (ERAs) which are worth adapting to Indian conditions. The recent clarification that CSR funds can be used for R&D is a welcome development. NEP 2020 has also endorsed the idea of a National Research Foundation (NRF) as a key funding vehicle for R&D. The NRF can play a vital role in stimulating R&D providing it moves aggressively to mobilise funding from all sources and adopts simple and clear priorities, guidelines and processes for approving funding for R&D activities, and equal treatment solely on merit for R&D proposals from public and private bodies. It should avoid the trap of excessive bureaucracy and caution, and be bold, as many R&D projects are a leap onto the dark and success cannot be guaranteed in advance.

The detailed contours of the STIP2020 are emerging as the very dynamic and inclusive consultation process is still ongoing. At some stage, consultation should include the policymakers from various political parties, and legislators who would be called upon not only to support the policy but also the various subsequent steps to implement it. Getting them on board would be an important step. STIP2020 implementation cannot proceed in isolation. It requires transformations as envisaged in the NEP 2020, as well as reforms to free up India's business environment and make it comparable with the best.

## The Dawn of Innovation Diplomacy

**Secretary Pedro Ivo Ferraz da Silva**

Ministry of Foreign Affairs, Brazil

Co-Founder and Executive Coordinator, São Paulo Innovation and  
Science Diplomacy School - InnSciD SP

Japan did not invent robots. Nor did it conceive the tiny electronic components that make these machines operate autonomously and, in some cases, in a human-like fashion. Yet, the ‘Land of the Rising Sun’ has gained global notoriety as a powerhouse in automated manufacturing and the semiconductor industry. Over the last 70 years since World War II, the country managed to build up the image of high-technology heaven, with its compact and resourceful electronic gadgets, super-speed trains, jaw-dropping video games, ubiquitous and colourful vending machines and, cross-cutting all these verticals, ultra-efficient fabrication methods. How come?



To some extent, this refers to physical and historical factors. Social scientists suggest that Japan’s insular geography and the absence of labour immigration have pushed its industry inevitably towards automation. Plus, it is said that the prevailing Shinto religion, which attributes a soul to both living and non-living objects, contributed to societal acceptance of machines in everyday life. This may all sound intuitive and culturally interesting, but the country’s astonishing development is most and foremost a consequence of pragmatic industrial policies, which aimed first at absorbing foreign high-end technology, and later mastering and adapting it to novel uses.

The former Japanese Ministry of International Trade and Industry (MITI) played the central role in this endeavour. Since 1949, when it was founded, it has conceived and implemented effective policies to increase the technological level, and thus the added value, of the country’s industry. One of the earliest and most successful missions was setting up the national semiconductor sector, which had a spillover effect on many other segments that today comprise Japan’s economic might. Through a well-thought mix of strategic acquisition of US-American intellectual property, high-tech foreign direct investment, trade and production subsidies and a focused research consortia model, the MITI has made Japan gradually move from cheap transistorized electronics to complex microchips and then up to large automated and semi-automated equipment. Though the transistor and the integrated circuit were born in the West coast of the United States, they found their fullest expression in terms of the organised manufacturing sector and innovative consumer product offering in Asia’s Far Eastern Island.

What MITI practised until 2001, when it was merged into the less specialized Ministry of Economy, Trade and Industry (METI), could be classified as ‘Innovation Diplomacy’ *avant la lettre*. The orchestrated effort of the Japanese government consisted in exploring a wide variety of international engagement mechanisms

(FDI, IP licensing, trade facilitation, etc.) in order to increase the innovative capacity of the country. Japan's diplomatic channels with other nations - in this case, specifically, the United States - were employed to harness economic benefits for its market and industry.

MITI's far-reaching industrial policies have anticipated many of the practices that the novel concept of 'Innovation Diplomacy' entails. In short, Innovation Diplomacy can be understood as the set of practices that lie at the intersection between innovation and foreign policy, and is employed to enhance national innovation capabilities and promote cooperation for common benefit<sup>1</sup>. Despite its long-lasting applications, Innovation Diplomacy has just recently been put forward as a discipline and as a specialised area of foreign policy. Pioneering articles by Kirsten Bound<sup>2</sup> and Jos Leijten<sup>3</sup> have described it as a field of diplomatic action that emanated from the more traditional domain of Science Diplomacy, but has differed from it by developing specific principles, targets and methods.

On broad and simplistic terms, the difference between Science Diplomacy and Innovation Diplomacy has been equated to the distinction between 'collaboration' and 'competition'. While scientific diplomacy or simply Science Diplomacy would be targeted towards fostering common research endeavours among academic institutions, laboratories, individual scientists of different countries to achieve common knowledge goals, Innovation Diplomacy would predominantly consist of individual strategic enterprises that aim at building up a technological competitive advantage. Under this conceptual differentiation, a typical example of a Science Diplomacy initiative is the launch of a bilateral or plurilateral call, in which scientists of the countries involved are encouraged to get together and apply for funds for research projects in predetermined priority areas. It is assumed that the results of the research conducted collaboratively would bring tangible and intangible benefits to all parties. And an emblematic illustration of an Innovation Diplomacy effort is the role performed by trade promotion agencies to facilitate the access of national technological products in foreign markets, thereby strengthening the position of their respective industries in global value chains.

Of course, the proposed distinction is essentially theoretical. In reality, Science and Innovation Diplomacy are not as clear cut as their conceptualization tends to imply. Governments that collaborate, e.g. in a multilateral health scientific endeavour do always envisage to develop some sort of national strategic leverage. And many market penetration processes of technological products or solutions are only successful when they are integrated into broader bilateral give-and-take programs, such as startups exchanges, in which both parties cooperate to obtain mutual advantages. Therefore, the 'collaboration-competition' binome should be merely understood as a conceptual framework that helps us understand where the focus of each of the two broader areas lies. An additional formal distinction, which can be regarded as a corollary to the previous, is to think of Science Diplomacy as pertaining to the domain of international engagements related to fundamental and applied sciences, whereas Innovation Diplomacy would be linked to activities associated with societal and market dissemination of novel technologies and solutions.

To shed light upon this yet recent debate, the Institute of International Relations and the Institute of Advanced Studies of the University of São Paulo (IRI and IEA-USP, respectively) in Brazil, supported by the São Paulo Research Foundation (FAPESP), organised the very first worldwide academic course in August 2019 that dealt with the two diplomatic domains: the 'São Paulo Innovation and Science Diplomacy School', or 'InnSciD SP' ([www.innscidsp.com](http://www.innscidsp.com)). During 10 days, 80 graduate students from 36 countries from all regions in the world gathered in São Paulo and had the opportunity to listen to and interact with a varied group of academic professors, entrepreneurs, executives, governmental officers on the multitude of topics related to both areas. In the Science Diplomacy trail, lectures and panels dealt with the history of the intersection between science and foreign affairs; the role of scientific data in the climate change regime and in international trade; how shared scientific infrastructure can advance diplomatic relations among

countries; and national and subnational science diplomacy initiatives. On the Innovation Diplomacy trail, topics ranged from the internationalization of technology companies and innovation ecosystems to attract FDI in R&D, and also included the international IP regime, international technology transfer agreements, role of science and technology diasporas, and the Internet governance structure. The second edition of the school took place virtually in August 2020, with a similar number of international students and speakers.

One of the main outcomes of InnSciD SP so far has been the 'São Paulo Framework of Innovation Diplomacy', a landmark document that was crafted by the lecturers, panelists, organisers and students of the school and puts forward a definition of Innovation Diplomacy and presents a non-exhaustive list of its practices.

Interestingly, and slightly deviating from the above-mentioned pioneering articles, the framework considers that Innovation Diplomacy pertains both to the domain of national strategic activities (i.e. the 'competitive' realm) and that of global cooperative actions (where 'collaboration' prevails). Each of the two dimensions comprises a set of practices, that may be performed by state and non-state actors, although some of them may be more relevant to certain parties than to others. Hence, the 'strategic' dimension involves actions such as 'access to foreign innovations', 'negotiation of technology transfer', 'mobilization of ST&I diasporas to meet national needs' and 'identification of foreign innovation best practices to improve national policies'. In the 'cooperative' domain, activities like 'defining common legal frameworks to promote innovation', 'fostering stakeholder participation in international networks', 'creating international innovation databases and benchmarks' and 'encouraging global value chain innovation' are listed.

To propound a proper definition for the novel term and a coherent group of practices, the São Paulo framework aimed at encouraging a worldwide debate and also serves as a reference for various actors to implement their own Innovation Diplomacy strategy. The intention was to consolidate it as a proper priority sector within the large palette of diplomatic activities, building on previous historic evidence, such as those of Japan's MITI, and taking into account its idiosyncrasies, when compared to more traditional fields such as Science Diplomacy.

As it was shown, Innovation Diplomacy has a past, and yet it hides a horizon of abundant opportunities, which has just started to be unveiled by recent efforts to conceptualise and organise it. The increasing number of stakeholders shows that an intriguing future lies ahead of us!

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## Role of Science, Technology and Innovation to achieve the Sustainable Development Goals

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India played a prominent role in the formulation of the United Nations Sustainable Development Agenda 2030 and committed to achieving the 17 Sustainable Development Goals (SDGs) and the 169 associated targets, also known as Global Goals<sup>1</sup>. These goals were adopted by all United Nations Member States in 2015 to bring the world to several life-changing ‘zeros’, including zero poverty and hunger. These goals are integrated and comprehensively cover social, economic, and environmental dimensions of development. To help achieve the goals, it promotes multi-stakeholder engagement, national to global action plans, public-private partnerships and it strives to harness Science, Technology and Innovation (STI) to accelerate progress.



STI is a fundamental tool to balance social, economic, technological, and financial resources during the process to achieve these goals. The STI community can help drive progress on the SDGs in preparing and advising policies, searching for the innovations to address the local needs, and monitoring the progress and challenges. STI facilitates to accelerate progress by promoting better use of evidence in policymaking and by addressing the gap areas in the process of development. The governments from different nations are already involved in the meaningful interaction of science advice and policymaking – from local to global – that increases the likelihood of significant impact.

Most of the nations have recognised the role of STI for their prosperity and to achieve the Agenda 2030. It may leapfrog social, diplomatic, and political obstacles and create new pathways for progress. The imperative for the STI community to support UN Agenda 2030 and the Sustainable Development Goals is clear but not easily put into practice. The inherent complexity of the SDGs and difficulty in rigorously evaluating their progress exacerbates this, as does the nature and organisation of science and policy.

An initiative called the Technology Facilitation Mechanism (TFM) is a collaborative platform for multi-stakeholders to support and strengthen synergies among science and technology initiatives within the UN system<sup>2</sup>. Apart from economic growth, STI contributes to addressing the societal issues both technically and



# SUSTAINABLE DEVELOPMENT GOALS



Figure 1. Sustainable Development Goals (Source: <https://www.undp.org/content/undp/en/home/sustainable-development-goals.html>)

non-technically. In the Addis Ababa Action Agenda, Member States committed to ‘adopt science, technology and innovation strategies as integral elements of our national sustainable development strategies’ (para 119)<sup>3</sup>. All participants recognised the importance of STI to achieve the Agenda 2030 and emphasised on the need of roadmaps and action plans at local, national and global levels during the annual meeting 2017. Their recommendations involved STI capacity building in each country, including human capacity; development of national policies addressing the SDGs; strengthening the science advisory ecosystem and the STI policy framework; and create private-public business opportunities in pursuing SDG solutions.

The Inter-Academy Partnership (IAP) project ‘Improving Scientific Input to Global Policymaking’ also sets out to explore some of the processes and mechanisms for STI-for-SDGs and to share its findings as a practical guide for academics and the wider science community<sup>4</sup>. Science and scientists can support the SDGs by maintaining an open and ongoing dialogue with policymakers, identifying challenges, advising on policy interventions, and devising solutions by understanding enabling conditions, constraints, and drivers in their respective geographic contexts. They may also contribute towards exploring future scenarios, including the impact of new and emerging (potentially disruptive and transformational) technologies; communicating science to policymakers and non-scientific audiences (including conveying risk and uncertainty); engaging the academic community and the wider public on the SDGs and encouraging them to get involved.

### Why Focus on STI for SDG Roadmaps?

The last four industrial revolutions helped tremendously in human progress by the advancement of STI. However, these revolutions also disrupt traditional and social life. The development made through science and technology increased inequality within and a great divergence between countries. The introduction of the fourth industrial revolution has widened the gap even further between countries that led these revolutions and the developing world. The developing countries are not very prompt to adopt emerging technologies and are far behind in productivity as compared to the developed ones.

Historically, some countries, such as Germany, Japan, and the Republic of Korea, have been very successful at technological catch-up and have become technology leaders themselves using STI as part of their development strategies. The developed countries are well prepared and have an explicit STI strategy with a strong base of human and institutional capital, and effective government policies. However, most of the developing countries are still in the process to place effective strategies to use STI for their economic and social development to achieve SDG goals. They need to take advantage of technologies that already exist, as well as to make effective use of the potential offered by new emerging technologies and to mitigate the risks they present. The impact of STI is more crucial and needs the highest level of involvement from the government during the development and implementation process.

## Challenges

At the same time, scientists face many challenges in applying science to the SDGs. Science and policy worlds are different and typically weakly connected. There is a lack of awareness and understanding of policy structures, processes, and players in the wider global science community. Another problem is the lack of reliable data for indicators, monitoring and evaluation, and assessment of progress. This is even true for the developed OECD countries; it has been estimated that only 57% of the targets can be quantitatively evaluated. Globally, the situation is dismal, with the lack of quantitative indicators combined with poor or incomplete data collection in many states.

Though all developments are directly and indirectly related to STI, most research and research support systems, including rewards, incentives, and career structures, are not typically designed around science for societal benefit. Apart from basic issues, interactions between the SDGs and their targets are complex and, in many cases, poorly understood. Action on one may reinforce or conflict with another. The nature of scientific research itself is incomplete and imperfect; it tends to lag the pace of change; both its development and its applications are unequally distributed, and; traditionally it is conducted in disciplinary silos.

At the global level, tools have been developed to track progress on the goals and some targets, e.g. the SDG tracker<sup>5</sup> and the Atlas of SDGs 2018<sup>6</sup>. For nation-states, the SDG Index and Dashboard<sup>7</sup> present useful indicators of where nations might prioritise and where science and science policy can contribute. Nevertheless, data gaps are significant, and these trackers and their appealing graphics can be misleading: for example, the SDG-13 map (climate action) gives an optimistic picture of progress, arguably because CO<sub>2</sub> emissions are difficult to attribute nationally and a few less-developed nations have low emissions.

## Conclusion

India has been explicit in its strategies for achieving rapid growth and development including STI. It is also focusing now on inclusiveness and environmental sustainability. India's ongoing major changes and a plethora of challenges encourage for the formulation of the 5th Science, Technology, and Innovation Policy, 2020 (STIP2020) which is being facilitated jointly by the Office of the Principal Scientific Adviser to the Government of India and the Department of Science and Technology<sup>8</sup>. The Science Policy Forum has put up a commendable effort to gather and process inputs from as many as 15,000 stakeholders from around the country and abroad. It encourages local to global innovation, need-based technology development, and sustainable growth.

The interdisciplinary and convolution of SDGs ought engagement at many levels of detail and many levels of governance. There are many international issues like climate change, extreme weather, deforestation, population, health, and pandemic that need attention and trust of multi-stakeholders at local to global levels. There is a need for strengthening the international partnerships on STI for SDGs. Otherwise, many third world countries and developing countries will be going to fall far short of other goals. Collaborative efforts, better coordination, and complementarity may change the trajectory and accelerate progress towards the achievement of SDGs.

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# MoUs Signed

## *India-US Strategic Energy Partnership (SEP)*

India and the United States announced new areas of research on transformational power generation based on supercritical CO<sub>2</sub> (sCO<sub>2</sub>) power cycles and advanced coal technologies, including carbon capture utilization and storage (CCUS) during a virtual ministerial meeting held on 17 July 2020. The meeting was co-chaired by U.S. Secretary of Energy Mr Dan Brouillette and Indian Minister of Petroleum & Natural Gas and Steel Mr Dharmendra Pradhan. The virtual meeting was also attended by U.S. Ambassador to India Mr Kenneth I Juster, Indian Ambassador to the United States Mr Taranjit Singh Sandhu and Secretary, Department of Science and Technology (DST) Prof. Ashutosh Sharma along with other concerned officials to review progress, highlight major accomplishments, and prioritise new areas for cooperation.



Source: PIB

## *India-Russia Joint Technology Assessment and Accelerated Commercialization Programme*



**INDIA-RUSSIA  
JOINT TECHNOLOGY ASSESSMENT  
&  
ACCELERATED COMMERCIALIZATION PROGRAMME**

[www.indiarussiainnovate.org](http://www.indiarussiainnovate.org)

The Department of Science and Technology launched the India-Russia Joint Technology Assessment and Accelerated Commercialization Programme in partnership with the Federation of Indian Chambers of Commerce and Industry (FICCI) and Foundation for Assistance to Small Innovative Enterprises

(FASIE) of the Russian Federation on 23 July 2020. The programme will connect Indian, and Russian Science & Technology (S&T) led SMEs and Startups for joint R&D for technology development and cross-country technology adaptation. The programme will run through two annual cycles with up to five projects to be funded under each cycle. Projects are being sought on leading S&T focus areas, including but not limited to, IT & ICT (including AI, AR, VR), Medicine & Pharmaceuticals, Renewable Energy, Aerospace, Alternative Technologies, Environment, New Materials, Biotechnologies, Robotics and Drones. On behalf of DST, FICCI will implement the program in India. A dedicated portal [www.indiarussiainnovate.org](http://www.indiarussiainnovate.org) has been developed for this purpose.

Source: PIB

## ***Cabinet approval to India-Zimbabwe Cooperation on Traditional System of Medicine and Homeopathy***

The Union Cabinet gave ex-post facto approval to an agreement signed between India and Zimbabwe on cooperation in the field of Traditional Systems of Medicine and Homeopathy on 29 July 2020. The MoU was signed on 3 November 2018 and aims to provide a framework for cooperation between the two countries for the promotion of traditional systems of medicine and homeopathy. The main objective of the MoU is to strengthen, promote and develop cooperation in the field of traditional systems of medicine on the basis of equality and mutual benefit.

In the MoU, eleven areas of cooperation have been identified that include promotion in the regulation of teaching, practice, drugs and drugless therapies, the supply of all medicine materials and documents necessary for demonstration and reference in achieving the objectives and exchange of experts for the training of practitioners, paramedics, scientists, teaching professionals and students among others.

Source: PIB

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## ***Japan extends ¥ 50 billion as Official Development Assistance for the COVID-19 Crisis Emergency Response Support***

The Government of Japan has committed Official Development Assistance loan of an amount of ¥ 50 billion (approx. INR 3,500 crores) for the COVID-19 Crisis Emergency Response Support on 31 August 2020. This loan aims to support India's efforts in fighting COVID-19 and to prepare the health system to manage future epidemics and also to improve the resilience of India's health systems against

infectious diseases. Besides, the Grant-in-aid of an amount of ¥ 1 billion (approx. INR 70 crores) from the Government of Japan is released for providing medical equipment to strengthen the public health and medical system in India. This will strengthen the health care facilities for managing critical and serious patients suffering from COVID-19 infection.

Source: PIB

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## **Publications** //

### **Science Diplomacy for Plant Health**

A recent article published in *Nature Plants* talks about how science diplomacy can play an effective role in taming the spread of pests which is expanding rapidly across the globe due to increased trade and tourism. This paper highlights the need for international multi-disciplinary collaborations and communications which could help in the dissemination of information regarding forecasting and early warning followed by

enhancing preparedness as well as implementing preventive measures and outbreak response. It also requires collaboration and cooperation between national communities such as customs, producers, inspectors, scientists, etc. The authors suggested developing National Systems to link the research to the end-users of information and to provide a collaborative space for plant health

stakeholders to work together. Furthermore, the authors exhorted about the global phytosanitary research coordination that could aid in promoting harmonization of approaches and minimizing duplication of national and regional research activities. The article concludes '*science diplomacy is the smartest approach to build a constructive international partnership by engaging governments at*

*all levels, increasing mutual understanding, catalysing harmonization and favouring international impactful actions on both well-known and newly emerging global plant health issues.'*

Full text available at: <https://www.nature.com/articles/s41477-020-0744-x>

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## Building a Science Diplomacy Curriculum

Science diplomacy is relatively a new and multidisciplinary field and has largely been taught through extracurricular courses and workshops targeting specific geographic audiences. As the field matures and expanding across the world, there is an increasing demand for education and training. So far, a structured foundational course on science diplomacy is still lacking. Furthermore, no academic institution offers yet a class solely dedicated to the theory and practice of science diplomacy. The latest article by J C Mauduit and

Marga Gual Soler in *Frontiers in Education* (2020) maps current educational offerings around the globe and introduces content and skills-based framework for science diplomacy education for students from STEM, international relations, public policy, etc. Instructors can design a syllabus tailored to their student backgrounds and learning goals.

Full text available at: <https://doi.org/10.3389/educ.2020.00138>

## News

### CSIR-CSIO's ENCEESPRAY Project Received COVID-19 Ignition Grant Award

In response to COVID-19 crisis, CSIR-Central Scientific Instruments Organisation (CSIR-CSIO) designed and developed an innovative technology for effective disinfection and sanitization to fight with corona pandemic. CSIR-CSIO transferred this technology to Rite Water Solutions Pvt. Ltd. for commercialization and large-scale production. This project named as ENCEESPRAY has been selected as one of the top COVID-19 innovations for COVID-19 Ignition Grants award of INR 1,00,00,000 for scaling up in India and USA. The partners are CSIR-CSIO, Rite

Water Solutions Pvt. Ltd., India and the University of Florida, USA.

US-India Science & Technology Endowment Fund (USISTEF) had announced a call for proposals under the category of COVID-19 Ignition Grants in April 2020. After a rigorous binational review process, USISTEF announced awards to 11 bilateral teams on 2 September 2020, proposing out-of-the-box, innovative ideas that address the COVID-19 challenge.

# Call for Proposals

## Information for Cfp2R Applicants - Platform Technologies to Rapidly Respond to Disease X

Last date: October 14, 2020

Further information at: [http://dbtindia.gov.in/sites/default/files/31.12-CEPI%20Platform%20Call\\_0.pdf](http://dbtindia.gov.in/sites/default/files/31.12-CEPI%20Platform%20Call_0.pdf)

## India-US Call for Joint R&D Proposals in Environmental Health Research Program

Last date: October 15, 2020

Further information at: <https://grants.nih.gov/grants/guide/rfa-files/RFA-ES-20-010.html>

## DBT-BMBF, Germany Joint Call on 'Phytherapies' in Health Research 2020

Last date: October 31, 2020

Further information at: <http://dbtindia.gov.in/sites/default/files/DBT-%20BMBF%20Call%20Text.pdf>

## Indo-German Cooperation in Health Research Call for Proposals 2020

Last date: October 31, 2020

Further information at: <http://dbtindia.gov.in/sites/default/files/DBT-%20BMBF%20Call%20Text.pdf>

## DST Jointly Launches Accelerating CCUS Technologies (ACT) Call

Last date: November 10, 2020

Further information at: <https://dst.gov.in/callforproposals/dst-jointly-launches-accelerating-ccus-technologies-act-call>

## DST-NWO Joint Indo-Dutch Call on Cleaning Ganga and Agri Water

Last date: November 26, 2020

Further information at: <https://dst.gov.in/callforproposals/dst-nwo-relaunches-cleaning-ganga-and-agri-water-call-revised-timelines>

## Call for Proposal in Fundamental Research Under the Bilateral Program with Germany (DBT-DFG)

Last date: February 28, 2021

Further information at: <http://dbtindia.gov.in/whats-new/call-for-proposals>

## Warsaw Science Diplomacy School 2021

Last date: June 2021

Further information at: <https://insscide.diplomats.pl/event/summer-school-2021/>

# Forthcoming Events

## Live Chat October 2020: Ask a Fellow Anything (Science & Technology Policy Fellowships)

Date: October 15, 2020 at 2 P.M. ET

Further information at: <https://www.aaas.org/events/live-chat-october-2020-ask-fellow-anything>

## Science & Technology Policy Leadership Seminar

Date: November 16-19, 2020 at 1:00 P.M. – 5:00 P.M. ET

Further information at: <https://www.aaas.org/events/science-technology-policy-leadership-seminar-0>

This Science Digest is always evolving - tell us what you think! If there is any science diplomacy/ policy related event which requires wider outreach, please share it with us. We know that our readers have great ideas, valid criticism, and constructive feedback. We welcome your articles/ feedback/ suggestions at [scidip@niscair.res.in](mailto:scidip@niscair.res.in)

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