FISD
Forum for Indian Science Diplomacy

SCIENCE DIPLOMACY REVIEW

Foreword

Science Diplomacy Review (SDR) provides perspectives from Indian Science Diplomacy, in theory and practice, to strengthen scientific capability and diplomatic decision-making. Science diplomacy has a key role to play in meeting our development agenda and the SDGs. In this context, the *Forum for Indian Science Diplomacy* (FISD), under the RIS-NIAS Science Diplomacy Programme envisages harnessing science diplomacy in areas of critical importance for national development and S&T cooperation. It seeks to harness diaspora capabilities in S & T and articulate the global South's concerns and approaches to Science Diplomacy. Under FISD, RIS has launched the *Science Diplomacy Review (SDR)* – A bi-monthly periodical, covering the theorisation, empiricisation and documentation of Science Diplomacy related activities.

The inaugural issue of SDR carries articles and updates on science diplomacy related themes, including developments in S&T policies, scientific advancements, multilateral cooperation and forthcoming events. The articles cover conceptual framework of Indian Science Diplomacy and insights on India-Russia STI cooperation. There is a policy section elucidating on PM-STIAC; updates in Science diplomacy and S&T are covered, followed by an event Broadcast section.

As a pioneering initiative on Science Diplomacy in India, SDR welcomes articles, views and opinion from diplomats, scientists, practitioners, academicians and scholars related to Science Diplomacy, for forthcoming issues. While unsolicited contributions will be considered, the decision to publish or not rests with the Editor. Please send your contributions to: editor.sdr@ris.org.in

Sachin Chaturvedi
Director General, RIS

Message

Dr. Ashutosh Sharma
Secretary, Department of Science and Technology (DST)

As India continues to advance in S&T, Science Diplomacy has become a vehicle for promoting India's socio-economic development and engagement with global issues and the global South. As science progresses, countries are increasingly joining hands in mega science projects and multilateral alliances. Sharing of science and technological knowledge, their implication for foreign policy and international relations and vice versa are the bases of Science Diplomacy. *Science Diplomacy Review (SDR*) is a forum to discuss and research on the various opportunities and challenges thrown up as a result of Science and Technology advances and foreign policy and international relations. The Department of Science and Technology is pleased to support RIS in its work programme on Science Diplomacy. As part of this, SDR will bring together perspectives of the global South in Science Diplomacy for development. I wish RIS a grand success in this endeavour.

Ashutosh Sharma

Indian Science Diplomacy: A Forward Looking Agenda

Dr Bhaskar Balakrishnan*

India's science diplomacy has evolved gradually over years in response to its changing needs and priorities. The Department of Atomic Energy (DAE) was one of the earliest to establish its international linkages and pursue bilateral and multilateral engagement through the IAEA. It navigated the difficult period of the nuclear embargo against India; which ended finally after the difficult negotiations in 2005-08. The Indian Space Research Organization (ISRO) also developed global linkages; starting from the initial years to meet its needs for satellites and launch vehicle technology and ground-based networks. It faced the challenge of being denied technology for the cryogenic engine, which was crucial for launching satellites into geostationary orbits.

Other Departments of the Government of India such as Department of Science and Technology (DST), Department of Biotechnology (DBT), Department of Information Technology, Defence Research and Development Organization, Department of Agricultural Research and Education, Department of Medical Research, Ministry of Environment and Forests, Ministry of Earth Sciences, etc. pursued international engagements in various fields, including partnerships involving research institutions in India and promoting international linkages in their respective fields. The Principal Scientific Adviser (PSA) to the Government provides strategic inputs into policy, and participates in an informal network with counterparts of several countries.

Ministry of External Affairs (MEA) has coordinated its diplomatic activities closely with many Scientific Departments, including application of its ITEC programme for capacity- building activities in other developing countries. Projects, such as the SAARC telemedicine project and the Pan-African Telecommunication network, have brought concrete benefits to partner- countries. The recent launch of the International Solar Alliance and its extension to all UN member-states has been widely acclaimed and supported by the international community. These are the examples of using science diplomacy to build stronger relations with partner -countries while deriving mutual benefits. However, the full potential of science diplomacy as practised on a wide scale by the advanced countries remains unexplored.

Today, the need is for science diplomacy to help India gain access to cutting-edge science and technology for national development and security at the early development stages. This requires more pro-active engagement with research and innovation agencies and with experts in various countries, including NRI/PIO professionals. It is necessary to exploit research and collaboration opportunities that are becoming readily available. Capacity building and strengthening India's S&T ecosystem is important to enable it to attract and retain the best S&T global talent. For these reasons, Indian Science Diplomacy must intensify and broaden its outreach in various countries, and help build linkages between the science and technology community abroad and in India

Strengthening India's S&T ecosystem implies improving areas such as research institutions, higher educational institutions, funding for research, better IPR management, funding for startups, conducive business environment, and good infrastructure. In addition, constructive engagement with business and civil society is important. Mobility of Science and Technology professionals across research institutions is of utmost importance. Though this is a huge task, it has to be undertaken, as deficiencies in the ecosystem would lead to migration of its S & T talent to better ecosystems to operate in, especially in an era

Continued on page 9...

**Science Diplomacy Fellow, RIS and Former Ambassador of India*

Promising Future for India-Russia STI Cooperation

Dr Abhishek Vaish*

The India-Russia STI cooperation is a well conceptualized, systematically organized and resilient partnership and has a robust platform to connect stakeholders at the different levels. It has the potential to provide ample opportunities to join hands to be the forerunner of the global knowledge powerhouse. India, being the leader in producing the highest number of engineers in the world and Russia as the inheritor of the legacy of strong scientific base, can set the right scientific temper to realize the potential of Industrial Revolution 4.0.

The bilateral STI cooperation between India and Russia spans across a wide range of scientific rainbow, including Realization of High Technologies; Basic Science, ICT, High Energy Physics, Renewal Energy; Biotechnology; Medical Sciences; Meteorology; Metrology, Standardization & Certification and Oceanology. The bilateral programme offers funding opportunities through many agencies from each side; and the funding portfolio covers basic, interdisciplinary, and translational, task oriented research and leads to a holistic environment to yield Innovation-led scientific development.

To effectively organize and review the success of these programmes, both the sides have to formally meet annually within the framework of the Indian-Russian Working Group on Science & Technology. The list of the programmes, some of them are out of the scope of the WG, but are important enough to be mentioned here are as follows:

- Basic Science cooperation programmes (DST-RFBR, ICMR-RFBR, DST-RSF)
- Applied Science cooperation programmes (DST-RMES, DBT-RMES)
- Cooperation in the field of science, technology and innovation (DST-FASO)
- Cooperation on Indo-Russia Unified Technology Assessment and Accelerated Commercialization (DST-FASIE)
- BRICS STI Framework Programme (DST-RFBR, RMES, FASIE)
- India-Russia Bridge Innovation Program (IRBI)
- TKDL Access Agreement (CSIR-Rospatent)
- Indo-Russian Science & Technology Centre (IRSTC)
- Faculty schemes (GIAN, VAJRA)
- Russia-India Network of Higher Education

The Russian scientific landscape is quite old, diverse and deep. Its roots goes back to the date when Tsar Peter, the Great, was inspired and advised by Gottfried Leibniz, and founded the Academy in Saint Petersburg; the Senate decree of February 8 (January 28 old style), 1724 [1]. Since then till now, the scientific and human resource generation establishments of Russian Federation have seen an extraordinary growth. The knowledge generation

Continued on page 11...

* *Former Science Counselor of India to Moscow*

Guidelines for Contributions to SDR

We invite contributions from interested scholars and practitioners on issues related to Science Diplomacy, in theory and practice. Reviews of latest publications - books, monographs, reports - are also welcome. Science Diplomacy Review (SDR) is also open to capture updates on any institutional upcoming events on science diplomacy. For contributions, feedback and comments, kindly email us at editor.sdr@ris.org.in. Details about manuscripts can be accessed at 'Guidelines for Authors'.

Constitution of PM-STIAC to Direct Scientific Innovation in India

As India is moving at a faster pace, the Union Government has constituted a new 21-member advisory panel on the Science, Technology and Innovation, called as the Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC), for its Science, Technology and Innovation endeavours in the spheres of Artificial Intelligence, Information Technology, Space Science, and other emerging technologies. The Council would replace the existing Scientific Advisory Committee (SAC) to Prime Minister. It is based on the premise that even though the quality of scientific efforts has escalated, still the country has not marched forward in terms of its scientific and technological innovations. Since the last two year, Prime Minister, Shri Narendra Modi, has been focusing on encouraging a conducive ecosystem for S, T and I in India; he had initiated dialogues with scientists, delegated tasks to secretaries of S&T departments; and has appointed a new Principal Scientific Adviser, following the constitution of the PM- STIAC.

The council is headed by the Principal Scientific Advisor to the Government of India, Prof. Krishnaswamy VijayRaghavan. He is a distinguished neurobiologist; who had held many academic and administrative positions in India and aboard. The PM-STIAC has nine members, including the Chairperson. Apart from the members, the council would have twelve special invitees—eleven ex-officio secretaries from ten central ministries, related to science, technology, energy and education. The members have been selected from different academic, research and administrative institutions, having experience and expertise in STI policy-making. They are Dr VK Saraswat (member of NITI Aayog and former Director General of Defence Research and Development Organization), Dr AS Kiran Kumar (former Chairman of the Indian Space Research Organization), Maj Gen Madhuri Kanitkar (Dean of Armed Forces Medical College, Pune), Prof. Subhash Kak (Professor at the Oklahoma State University), Mr. Baba Kalyani (Managing Director of Bharat Forge), Prof. Manjul Bhargava (Princeton University and a Fields medal winner) and Prof. Ajay Sood (Indian Institute of Science, Bengaluru).

Primary tasks of the council would be advising PM on science, technology as well as innovation; help coordinating implementation of PMs scientific vision; facilitating formulation and timely implementation of major science and technology missions and evolving interdisciplinary technology development programmes; advising Government on the development of 'Clusters of Excellence' in science including city-based R&D clusters; and bringing together all science and technology partners from academia and institutes to industries near such centres or cities. It is visualized that the council would go far beyond the earlier SAC; this would be advising and also be involved in follow-up of decisions to ensuring their implementation and in delivery of outcomes.

The first meeting of the PM-STIC was held on 9 October 2018 to chalk- out directives for some of the prominent S&T projects in India. The one-day meeting covered presentations on a wide range of topics; followed by discussions and relevant indications for action. Discussions were taken up on the projects like Accelerating Growth for New India innovation (AGNIi), Deep Ocean Mission, S&T Education in vernacular languages, Artificial Intelligence (AI) and Quantum Computing, Bioscience Mission for Precision Health and Optimal Well-being, Waste to Energy, Research, Development and Innovation towards making India a leader in Electric Vehicles, Indian Biodiversity: characterization, Preservation And Sustainable Use, to name a few. The discussions were transformed subsequently into action plans and allied deliverables. Regular meetings of the PM-STIAC would ensure adequate vibrancy in the implementation of all the programmes within a time period of one to three years.

The official notification of the PM-STIAC can be accessed at: http://psa.gov.in/whats-new/prime-ministers-science-technology-and-innovation-advisory-council-was-constituted

Climate Change

IPCC 48 approves Special Report on 1.5 Degree Celsius

The 48th Session of the Intergovernmental Panel on Climate Change (IPCC-48) convened during the first week of October 2018 has approved a Special Report on Global Warming of 1.5 degree Celsius (SR15) and its technical summary. This report was prepared in pursuance of the UNFCCC decision on adopting the Paris Agreement (2015) to combat Climate Change. Also, a special Summary for Policymakers has been approved and launched as part of this six-day discussion. The event held in Incheon, Republic of Korea, brought together more than 500 participants from 130 countries. It took combined efforts from a total of 91 authors from 40 different countries, 133 contributing authors, more than 6000 cited references and 42,001 expert and government review comments to come up with SR15.

The report highlighted the role of international cooperation as a critical enabler for developing countries and vulnerable regions to strengthen their action for the implementation of 1.5°C-consistent climate responses, including through enhancing access to finance and technology and enhancing domestic capacities and considering their national and local circumstances and needs. It acknowledged the importance of policy tools that can help mobilise incremental resources through shifting global investments and savings and through market and non-market-based instruments. It underlined the significance of education and information dissemination, including those from indigenous and local sources in accelerating the wide scale behaviour changes consistent with adapting to and limiting global warming to 1.5 degree Celsius. It stressed that the right kind of policy action along with major behavioural change in the communities through awareness building and using local wisdom can prove to be a key to achieving the SDG (Sustainable Development Goals) targets.

The summary report can be accessed at *http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf*

Source: IPCC. 2018. "An IPCC Special Report: Global warming of 1.5 degree Celsius". Intergovernmental Panel on Climate Change. IPCC, Switzerland. Retrieved on November 8, 2018 from http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf

EU and Gates foundation launched Clean Energy Fund

An investment vehicle worth Euro 1 Million has been set up jointly by the European Commission and Bill Gates led Breakthrough Energy Ventures. Innovative European companies that propose bringing about clean energy technologies to the market are going to be the primary beneficiaries of the fund. Chaired by Bill Gates, Breakthrough Energy is an investor-led fund which is committed to help cutting edge companies become energy efficient in the wake of climate change. With patrons like Amazon Boss Jeff Bazos, former New York city Mayor Michael Bloomberg, Alibaba founder Jack Ma and Reliance Director Mukesh Ambani backing the fund, it aims to invest in new technologies to find better, more efficient and cheaper energy sources. The newly announced EU based fund, a subsidiary of the former, and called Breakthrough Energy Europe uses InnovFin, which is a risk-sharing financial instrument funded under Horizon 2020, for seed capital. The new fund would focus on cutting greenhouse gas emissions and overall promotion of energy efficiency in the areas of electricity, transport, agriculture, manufacturing and buildings. Establishment of a dedicated fund for European region also raises new hopes for the Indian sub-continent for being a possible beneficiary of the Breakthrough Energy Ventures in the near future. This kind of dedicated clean energy fund can help India in a big way for fulfilling its highly ambitious Intended Nationally Determined Contributions (INDCs) announced as part of the Paris Climate Action Plan in 2015.

Source: Evans, S. 2018. "Bill Gates Partners with EU to launch $115.2m clean energy fund". Retrieved on November 15, 2018 from https://www.power-technology.com/news/bill-gates-partners-eu-launch-115-2m-clean-energy-fund/

Space

France-ISRO launched India's Manned Space Mission 'Gaganyaan'

A working group for Gaganyaan has been announced by India and France, where scientists from the Indian Space Research Organization (ISRO) and the French National Space Agency (CNES), would be involved. The aim of this collaboration is to combine expertise in the fields of space medicine, astronaut health monitoring, life support, radiation protection, space debris protection and personal hygiene systems. The teams have initiated discussions and training of future Indian astronauts, and exchange of expert personnel is also the part of the collaboration. The two institutions have plans to jointly work on Mars, Venus and asteroids.

The strategic initiative is a part of the India-France Joint Vision for Space Cooperation agreement, signed in April 2015. The MoU has highlighted ISRO and CNES jointly working on two world-class space Missions, and the agreement would further strengthen partnerships in crucial research areas, including Space domain and situational awareness, Space Transportation Systems, technologies for human exploration of the universe, satellite navigation and related technologies, solar system exploration and addressing international issues like climate change, space security, safety and sustainability, to strive for societal benefits from space technology.

Source: Narasimhan, T E. 2018. "Gaganyaan project: France to help Isro in the human space programme". Retrieved on October 19, 2018 from https://www.business-standard.com/article/current-affairs/gaganyaan-project-france-to-help-isro-in-the-human-space-programme-118090600434_1.html

ISRO places two British Satellites in the Orbit

The Indian space agency, Indian Space Research Organization (ISRO), has recently attached two satellites, NovaSAR and S1-4, to the Polar Satellite Launch Vehicle (PSLV). These satellites were manufactured by the UK-based firm, Surrey Satellite Technologies Ltd (SSTL) and have been put into sun-synchronous orbit under the arrangement with Antrix Corporation Ltd, the commercial wing of ISRO. NovaSAR is an S-Band Synthetic Aperture Radar satellite, weighs 445 kg, and would be used for forest mapping, land use and ice-cover monitoring, flood and disaster monitoring. And S1-4 is a high-resolution optical Earth Observation satellite with a weight of 444 kg. It would be used for resource surveys, environment and disaster monitoring as well as urban management.

This has ascertained increased number of PSLV launches due to demand for more nano and small satellites. It would also encourage ISRO and allied organizations to develop dedicated small launchers to cater to the market demand. As per the ISRO's estimates in October 2018, 239 foreign satellites from 29 countries could be launched successfully using PSLV.

Source: Somasekhar, M. 2018. "PSLV-C42 puts 2 UK satellites into orbit", retrieved on November 8, 2018 from https://www.thehindubusinessline.com/news/science/isro-launches-2-uk-satellites/article24965948.ece

Science and Technology

DARPA investing $2 Billion for Common Sense Reasoning to Machines

The Defense Advanced Research Projects Agency (DARPA) is all set to teach machines 'common sense' reasoning, under its multi-year "AI Next" "campaign, worth USD 2 Billion. The campaign was announced in the last month. The initiative has been undertaken in response to the existing gap AI experts have noted between AI inference and ability to design systems, which can draw directly on the rules of inference to achieve common- sense reasoning as well as the limited understanding of learning capabilities of machines, which has been found beyond the reach of current Artificial Intelligence (AI) constructs. The agency is planning to launch a "third wave" of AI technology adaptable while shedding light on the mystery of how machines' learn.

As per the future course of action, the agency intends to fund research exploring developmental psychology, establishing a set of cognitive development milestones for determining how the resulting computational models can work in three areas: experience learning, prediction and "expectation" as well as problem solving. Simultaneously, web- browsing would be used to assemble a repository of machine common-sense capable of answering queries based on natural language and images. The results would be tested against the Allen Institute for Artificial Intelligence benchmark.

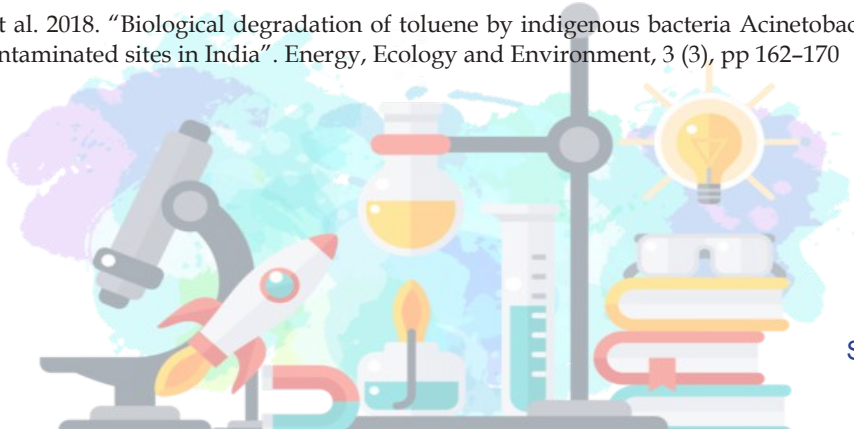
Source: DARPA. 2018. "DARPA Announces $2 Billion Campaign to Develop Next Wave of AI Technologies". Retrieved on September 30, 2018 from https://www.darpa.mil/news-events/2018-09-07

Bacteria to degrade Toulene- An Indian study

A group of researchers form IIT BHU (Banaras Hindu University) and University of Delhi has succeeded in degrading toluene into less toxic by-products. For this purpose, bacteria samples were taken from soil and effluents near an oil refinery to which was added 100 mg/L of toluene and the mixture was incubated for four weeks. The bacteria were then isolated and studies for their toluene-degrading abilities. Out of the isolated eight to ten strains, one particular consortium of Acinetobacter junii bacteria was found to be more effective showing good degrading potential.

Toulene is an aromatic hydrocarbon, colourless and water-insoluble liquid with paint thinners like smell. It occurs naturally at low levels in crude oil and is a by-product of gasoline production. This petrochemical waste is released without any treatment from industries like refineries, paint, textiles, paper and rubber. Its other use is that of a recreational drug due to its intoxicating effect. It has been reported to have caused serious health problems in marine life and studies point out that it may have carcinogenic and genotoxic effect on human beings. There is a need for more such studies to degrade toluene at an industrial level, beyond laboratory conditions, and hence contain its harmful effects on human health.

Source: Singh, P. et al. 2018. "Biological degradation of toluene by indigenous bacteria Acinetobacter junii CH005 isolated from petroleum contaminated sites in India". Energy, Ecology and Environment, 3 (3), pp 162–170



NDDB's Software to cut methane emission from cattle waste

The National Dairy Development Board, Karnal, India has developed a new software tool which is helping balance the cattle diet which in turn leads to increased milk production and reduced methane emissions. The tool called Information Network for Animal Productivity and Health (INAPH) is a Desktop/ Netbook/ Android Tablet based IT application that facilitates the capturing of real time reliable data on breeding, nutrition and health services delivered at farmer's doorstep. The software was recently presented at the annual Global Agenda for Sustainable Livestock meeting at Ulan Batar, Mongolia 11-15 June 2018, and it was claimed that the programme has helped reduce enteric methane emissions by 12-15 per cent while raising the average daily incomes of farmers by US $ 0.37 per day per animal. A research study published in ecotoxicology and environmental safety suggests that methane can significantly raise global temperatures and has 20 to 60 times more warming potential than carbon dioxide. The purpose behind development of this IT tool is to make dairying more sustainable and more attractive to the farmers.

The National Dairy Development Board was founded in 1965 to promote, finance and support producer-owned and controlled organisations. The institution seeks to support and strengthen farmer cooperatives and is rooted in the conviction that India's socio-economic progress lies largely on the development of rural India.

Source: SciDevNet. 2018. "Software helps cut Indian cows' methane emissions". Retrieved on October 28, 2018 from https://www.scidev.net/asia-pacific/livestock/news/software-helps-cut-indian-cows-methane-emissions.html

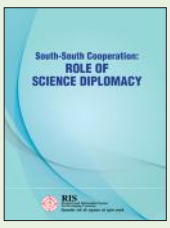
Asia's first reactor Apsara recommissioned after nine years

India's oldest nuclear research reactor designed by the Bhabha Atomic Research Centre (BARC) in 1956 with assistance from the United Kingdom has been restored nine years after it was shut down permanently in 2009. According to official statement made by BARC officials, the light water swimming pool type reactor was recommissioned after upgradation on 10.9.2018. This is a major achievement of the Indian nuclear scientists and engineers and has re-emphasised their capability to build complex facilities for health care, science education and research.The indigenously built nuclear reactor is now upgraded and thus has been renamed as Apsara-U (U stands for upgraded). This development will strengthen research in nuclear science, material science and radiation shielding. It also augments its capacity for building radioisotopes for medical applications.

The reactor has been instrumental in carrying out researches in the frontier areas of basic sciences such as neutron scattering, neutron and gamma ray emission studies and neutron activation analysis besides fulfilment of the societal needs. Because of Apsara, the production of radioisotopes was made possible in the country which was subsequently used in the field of medicine for medicine and therapy, in industry for radiography in addition to a number of other practical uses such as food sterilisation.

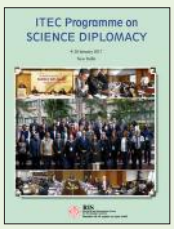
Source: PIB. 2018. "Apsara – U Reactor Becomes Operational at Bhabha Atomic Research Centre, Trombay", retrieved on November 2, 2018 from http://pib.nic.in/newsite/PrintRelease.aspx?relid=183384

PUBLICATIONS



South-South Cooperation: Role of Science Diplomacy
RIS, New Delhi, 2018

Focus on Science Diplomacy
RIS, New Delhi, 2018



ITEC Programme on Science Diplomacy
RIS, New Delhi, 2017

Chemical protection gel for farmers developed by the InStem

Researchers at the Institute for Stem Cell Science and Regenerative Medicine (InStem), Bengaluru, have developed a gel, named polyoxime which can be applied on the skin and can break down toxic chemicals in pesticides, insecticides and fungicides, including most hazardous and widely used organophosphorus compounds. Indian farmers usually do not wear any protective gear while spraying chemicals in the fields and are subject to severe health problems and in extreme cases even death. The gel deactivates these chemicals, and has been found effective in tests performed on rats, and researchers hope to test sooner on humans. It may prove useful to protect against chemical weapons or for chemical accidents.

Source: Biovoice News. 2018. "This gel can protect farmers from toxic pesticides". Retrieved on November 1, 2018 from https://www.biovoicenews.com/this-gel-can-protect-farmers-from-toxic-pesticides/

Indian Science Diplomacy.....

...Continued from page 2

of global integration. Science Diplomacy can help by acting as a transmission belt for best practices.

In a highly competitive world, scientific talent is being actively wooed by many countries, and India must not lag behind. S&T is a key to global competitiveness, and can be a key to economic power too. Indian experience and competitive advantage in the ICT sector has demonstrated this. The Indian Diaspora is well known for its S & T expertise which has contributed to the wealth of many of the countries. Involving them into India's national S&T effort can bring huge dividends. The same is true in the case of Diaspora S&T professionals of other countries

Science Diplomacy has been defined by some as a triad of: (1) Science in Diplomacy-where scientific inputs go into foreign policy (2) Diplomacy for Science, where diplomacy helps to bring benefits in the field of S&T and (3) Science for Diplomacy, where S&T cooperation serves to improve relations between countries. Science Diplomacy has some additional aspects which need to be considered, especially their relevance and impact on development.

For developing countries, the most important priority is the use of S&T for national development, especially as defined in the Sustainable Development Goals (SDGs); secondly to build capacity in S&T, and to participate effectively in international negotiations on S&T related issues. There is a growing list of such issues as nuclear energy, climate change, ICT and cybersecurity, biodiversity and genetic resources, human health, the oceans, outer space, etc. It is important to participate more effectively in large-scale international scientific research programmes, including shaping the agenda and direction of such researches.

There are various models of Science Diplomacy and all have their advantages and disadvantages. Deployment of scientists as science attachés has been practised. Special science diplomacy fellowships for scientists, to work in specific thematic science and technology areas, is another option. The training of career diplomats to carry out the function of science attachés similar to economic diplomacy can be another practice. Some countries have set-up independent networks for science and technology diplomacy. The limitations of human and financial resources need to be considered. Strategy, policy and coordination from the headquarters is a critical requirement, especially in the era of rapid communication. The use of internet and social media as outreach tools also merits consideration. Perhaps each country has to evolve its unique combination of practices and modes to suit its interest and capability. There would be considerable advantage in sharing best practices, especially in the areas of science diplomacy training, policy and management.

There is good scope for countries of the global south to work together in science diplomacy to meet these challenges. The scope for triangular cooperation is also very large. The future agenda for Indian Science Diplomacy is rich with challenges.

FORTHCOMING EVENTS

12th Global Healthcare Summit to be held in December 2018 at Mumbai

The Association of American Physicians of Indian Origin (AAPI), in collaboration with Government of India, will be organizing 12th Global Healthcare Summit (GHS) from 28th to 31st December 2018 in Mumbai. The event aims to provide a platform to different stakeholders, particularly world's renowned Physicians, industry experts and policy- makers to share knowledge regarding their respective medical fields and discuss critical issues, challenges and opportunities in the realm of Indian health-care. The theme of the 12th GHS is H3C: Health Care, Commerce and Career. The agenda of the event will encompass various programmes and fora like the Continued Medical Education (CME) sessions for skill enhancement and advance learning by academicians from India, US, UK and Canada; CEO fora, where industry leaders would share potential avenues of collaborations and the International Research Competition to encourage spirit of innovation and acknowledge entrepreneurial talent amidst medical students, residents, fellows and junior doctors.

The AAPI-GHS has been the epitome of Indo-US cooperation in health-care, since its first conference in 2007. The outcome of the conference is to develop a robust agenda for creating networks with Indian experts for capacity-building and infrastructure development. Subsequently, the event will create opportunities for bilateral cooperation between India and US in health-care. *For details, visit: https://aapisummit.org/*

ITEC Training Programme in Science Diplomacy at RIS

RIS Training Programme in Science Diplomacy will be held from 7 January to 18 January 2019. This programme was launched in 2017, and was conducted in January 2018. Primarily meant for diplomats, civil servants, academics, scientists/technocrats and those representing civil society, from developing countries and LDCs, this two-week programme would cater the need for capacity-building in Science Diplomacy. The program would have lectures, field-visits, self-learning modules, assignments and group discussions. The participants would be exposed to various facets of Science Diplomacy and would provide learning about, inter alia, S&T and International Affairs, SDGs and S&T as well as South-South Co-operation and Science Diplomacy.

Participants from the previous programmes were from 45 countries with varied backgrounds. While most of them were diplomats, civil servants, academics, a few were media persons. The number of participants is limited. As this is a programme offered under ITEC Training Programme administered by Ministry of External Affairs (MEA), the participants would be provided with travel, local hospitality (including accommodation), book allowance and maintenance allowance. RIS would conduct this programme for MEA at RIS premises. For more details, **click here.**

continued...

The applicant should apply at the Indian Embassy situated at his/her home country. For more information please contact Mr. M.C.Arora, Director (F&A) (Email: mc.arora@ris.org.in; Tel: +91 11 24682177-2180; Fax: +91 11 24682173/2174)

Promising Future for India-Russia STI Cooperation

...Continued from page 3

machinery of Russian Federation is assigned into two major clusters:—The Russian Academy of Science (RAS) and the Universities system. The Russian Academy of Science is one of the oldest formal establishment of network of scientists in the world, which was mandated to do science; in-fact there are theories, which have mentioned that the Chinese were impressed with the structure of RAS and requested the premiers of RF to help them to develop similar structures in China.

The RAS is a cluster of 1000 + institutions (figures are indicative due to merger); spanned across the entire Russian Federation. RAS consists of 13 specialized scientific divisions, three territorial branches and 15 regional scientific centers. The major cluster is the Siberian branch, Novosibirsk, Far East branch, Vladivostok and Ural branch of Academy of Science, Yekaterinburg. The other major concentration of the Institutions of RAS is in Moscow. In other words, it can be seen that these places are important scientific hubs and have some strong areas of science with them. For example, Yekaterinburg is strong with Chemistry, Metallurgy, Chemical Science, etc. The Novosibirsk region has strong base in modelling, simulation, bio-technology, laser science, data science, etc. Most of the institutions are located in a place called Akademgorodok – The academic city of Russia. It is quite old establishment. Recently, a new science city has been created with modern facility to create innovation eco-systems and is known as Kolstsovo. In short, it is designed in a very European style. Presently, Kolostsovo focuses on bio-technology, virology and drugs designing.

The Universities in Russia have improved tremendously in terms offering courses for International students, ranking in QS, Shanghai and Times Ranking of the world which was further supported by "5-100 academic excellence" programme to fuel the Universities with massive funding support; this helped them to scale-up the state of art research facilities in diverse areas like Civil Engineering; mechatronics; system and software engineering; Machine Learning and Data Analysis; Big data and Extreme Computing; nano-engineering for green chemistry; mesoscopics and advanced materials; photonics and Nanoelectronics; Microelectronics of Telecommunication; Molecular Biosensing and Biorobotics; Advance Material Science Beam plasma systems; Advance cybernetics; Quantum Physics; Multi-component Nanostructures; Optical design; Cellular and Molecular Biophysics; Space Science and Technology . The Universities are offering attractive incentives to bring in the best research talent in their University and have also created comfortable environment and language is no more a bottleneck for the students for learning. The programme is running successfully and the inflow of the international students has increased many folds.

The India-Russia STI cooperation has a very bright and a vibrant future based on the principle of reciprocity. The statistical projection of rate of India's growth invokes need for overwhelming demand of highly skilled resources to support flagship programme of Government of India like GIAN, Vajra, renewal energy, smart cities, supercomputing mission, digital India, infrastructure, cognitive science, future transport system, manufacturing of low cost medical devices, space exploration, data science, ocean and sea exploration, disaster management, etc. India has not only evolved as a market for merchandizing but has created successfully perfect eco-system to absorb skilled resources of the world. On the other hand, Russia has enormous skilled resources and has created perfect ground to generate skilled human resources and scientific know- how to fuel the demand of economic power of the world, and therefore both the countries have enough to offer to each other for a long-term basis.

[Disclaimer: The views and opinions expressed are those of the authors and do not necessarily reflect the official policy or position of any other agency, organization, employer or company.]

CONTENTS

About FISD `

The Forum for Indian Science Diplomacy (FISD), under the RIS-NIAS Science Diplomacy Programme, envisages harnessing science diplomacy in areas of critical importance for national development and S&T cooperation. The key objective of the FISD is to realize the potential of Science Diplomacy by various means, including capacity-building in science diplomacy, developing networks and science diplomacy for strategic thinking. It aims for leveraging the strengths and expertise of Indian Diaspora working in the field of S&T to help the nation to meet its agenda in some select S&T sectors.

About RIS

Research and Information System for Developing Countries (RIS) is a New Delhi-based autonomous policy research Think tank that specialises in issues related to international economic development, trade, investment and technology. RIS is envisioned as a forum for fostering effective policy dialogue and capacity-building among developing countries on global and regional issues. RIS has more than three decades of experience in researching and providing policy advice on trade, economic and commerce policy. It has worked with government departments and ministries on issues related to technology, trade and innovation. The organization is actively engaged with European Commission, FAO, UNESCO and other institutions, of national and international repute.

RIS
Research and Information System for Developing Countries
विकासशील देशों की अनुसंधान एवं सूचना प्रणाली

Core IV-B, Fourth Floor, India Habitat Centre
Lodhi Road, New Delhi-110 003 India.,
Ph. 91-11-24682177-80Fax: 91-11-24682173-74,
Email: dgoffice@ris.org.in
Websites: www.ris.org.in; www.fisd.in

Follow us on:

facebook FISD-Forum-for-IndianScience-Diplomacy twitter @fisd19 YouTube RISNewDelhi