**GOVERNMENT OF INDIA**
**MINISTRY OF SCIENCE AND TECHNOLOGY**
**DEPARTMENT OF SCIENCE AND TECHNOLOGY**
**LOK SABHA**
**UNSTARRED QUESTION NO. 785**
**TO BE ANSWERED ON 07/02/2024**

## Research Cooperation

**785. SHRIMATI SARMISTHA SETHI:**

**Will the Minister of SCIENCE AND TECHNOLOGY** विज्ञान और प्रौद्योगिकी मंत्री **be pleased to state:**

**(a) the details of the collaborations for research cooperation India is currently engaging in, with respect to other countries;**

**(b) the progress made in this regard and the benefits realized so far, country, field-wise; and**

**(c) the details of the proposed measures to be taken in this regard?**

**ANSWER**
**MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE MINISTRY OF SCIENCE AND TECHNOLOGY**
**(DR. JITENDRA SINGH)**
विज्ञान और प्रौद्योगिकी मंत्रालय के राज्यमंत्री (स्वतंत्र प्रभार)
(डॉ. जितेंद्र सिंह)

**(a) Ministry of Science & Technology has active international bilateral collaborations in Science, Technology and Innovation currently with 45 countries in the mutually identified areas. During the recent years the cooperation has strengthened significantly with multilateral and regional partners such as Association of Southeast Asian Nations (ASEAN), Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), European Union (EU), Brazil-Russia-India-China-South Africa (BRICS), Shanghai Cooperation Organisation (SCO), Indian Ocean Rim Association (IORA), Human Frontier Science Program Organization (HSFPO), European Molecular Biology Organization (EMBO), Mission Innovation and bilateral cooperation with Australia, Canada, France, Germany, Israel, Japan,**

**South Korea UK and USA. Cooperation with African countries has also been strengthened through India Africa S&T Initiative. The soft prowess of S&T has been leveraged to engage with several countries under India's Act East policy and with some neighbouring countries.**

**(b) to (c): All these agreements are aimed to encourage and facilitate developing cooperation in the fields of science, technology and innovation with these countries in the mutually identified areas. The stake-holders include researchers from scientific organizations, academia, R&D laboratories and companies. List of countries with active collaboration which has been signed agreement with the Department along with indicative areas is given in Annexure. International partnerships and alliances help in value addition to national programs. Such collaborations create opportunities for exchange of information, generation of new knowledge, sharing of expertise, cost and optimal utilization of resources, and provide access to advanced facilities and sophisticated instruments which are not available domestically. This in turn enhances the quality and output of scientific research and also boosts job employability. The research collaborations are being strengthened and continued with futuristic and frontier areas of science and technology.**

**Annexure**

| Sl. No. | Partner country | Partner Agencies | Areas of cooperation |
|---|---|---|---|
| 1. | AUSTRALIA | Department of Industry, Innovation and Science (DIIS) | . Advanced Manufacturing and Innovative Technologies<br>. Mining safety and efficiency (land and marine)<br>. Energy<br>. Marine science<br>. Climate change, mitigation and adaptation<br>. Food processing, storage and distribution |
| 2. | AUSTRIA | Austrian Science Fund (FWF) | . Physics<br>. Astronomy<br>. Astro-physics |
| 3. | ARGENTINA | Ministry of Science, Technology and Productive Innovation (MINCyT) | . Agriculture,<br>. Non-conventional energy sources,<br>. Science and technology,<br>. Information Technology, |
| 4. | BANGLADESH | Bangladesh Council for Scientific & Industrial Research | . Sphere of technological and scientific research<br>. (Also partner in our program for neighbourhood countries, SAARC, BIMSTEC, IORA) |
| 5. | BELARUS | State Committee on Science & Technology | . Energy;<br>. Information and Communications Technologies;<br>. Biotechnology, Medicine and Pharmacy;<br>. Agrotechnology and Food Security;<br>. Clean Technology for Environment and<br>. Materials Sciences & Metallurgy. |
| 6. | BELGIUM | Federal Public Planning Service Science Policy (BELSPO)<br>EU Member country | . Biological Sciences<br>. Astrophysics & Astronomy<br>. Materials Science and Computer Science Geodynamics<br>. Polar research, Marine modelling |
| 7. | BRAZIL | Ministry of Science, Technology, | . Biotechnology and human health, |

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| | | **Innovation and Communications (MCTIC) of Republic of the Brazil**<br>**(Also partner in IBSA, BRICS, ICSTI)** | **•Renewable energy including low carbon technologies,**<br>**•Earth system sciences including ocean sciences and climate change,**<br>**•Innovation and entrepreneurship, Information and communication technologies,**<br>**•Sustainable use of biodiversity , Agriculture,** |
| **8.** | **BULGARIA** | **Ministry of Education and Science (MES) of the Republic of Bulgaria.** | **. Information and communication technologies o Materials and Material Sciences**<br>**. Physics, including laser science and technology, nuclear physics, astronomy and space and technology research**<br>**. Chemical Sciences**<br>**. Renewable energy**<br>**. Earth science, geophysics, climate studies, oceanology and environmental protection, including waste management**<br>**. Biotechnology, agriculture and food technology**<br>**. Healthcare, biomedical appliances, bioethics, pharmacy and traditional medicine**<br>**. Social studies related to science and technology** |
| **9.** | **CANADA** | **Department of Foreign Affairs and International Trade, Canada**<br><br>**NSERC**<br>**(IC-IMPACTS)**<br><br>**National Research Council** | **. Structural Engineering**<br>**. Materials Science**<br>**. Cyber-Physical Interfaces**<br>**. Cyber-Physical Systems to Support Green Buildings in Smart Cities** |
| **10.** | **CZECH REPUBLIC** | **Ministry of Education, Youth and Sports (MEYS) of the Republic of Czech** | **. Information and communication technologies;**<br>**. Natural sciences and biotechnology;** |

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| | | | . New materials and nanotechnology;<br>. Medical sciences (including pharmaceutical sciences) and food safety;<br>. Research of climate change, environment and energy |
| 11. | DENMARK | (i) Ministry of Higher Education and Science<br>(ii) Innovation Fund Denmark<br>(EU member country, partner in Mission Innovation, International Solar Alliance) | . Energy;<br>. Water;<br>. Materials Science;<br>. Cyber Physical System |
| 12. | EGYPT | Ministry of Scientific Research of the Government of the Arab Republic of Egypt<br>(Partner in ACE and CV Raman program) | . Biotechnology (Agricultural & Enzyme Biotechnology)<br>. Nanotechnology (New Materials for Energy & Sensors)<br>. Information & Communication Technology (E-health, E-education and E-governance |
| 13. | ETHIOPIA | Ministry of Science and Technology | . Biotechnology,<br>. Renewable Energy,<br>. Geospatial Technology,<br>. Water Management<br>. Innovation Technology Transfer |
| 14. | FINLAND | (i) Ministry of Employment and the Economy<br>(ii) Academy of Finland<br>(iii) Business Finland – a Finnish funding agency for Innovation<br>(EU Member country, partner in Mission Innovation, ISA) | . Green Chemistry,<br>. Nanomaterials,<br>. Renewable Energy,<br>. Cleantech,<br>. Affordable health care,<br>. Smart Cities,<br>. ICT and ESDM |

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| **15.** | **FRANCE** | **Ministry of Foreign Affairs;**<br>**CNRS,**<br>**ANR,**<br>**Inria,**<br>**INRA**<br>**IFCPAR** | **. All frontier areas of Natural Sciences, Engineering;**<br>**. Medicine,**<br>**. Neurosciences,**<br>**. Mathematics,**<br>**. Computer and ICT etc.** |
| **16.** | **GERMANY** | **•Federal Ministry of education & Research (BMBF)**<br>**•DFG**<br>**•Foundation Lindau Nobel Prize Winners**<br>**•Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V.**<br>**•DESY facility**<br>**•DAAD** | **. Areas: Physics, medicine, chemistry**<br>**. Joint R & D projects**<br>**. Indo-German bilateral collaboration in basic and applied sciences research and technology**<br>**. Workshops, seminars, training programme** |
| **17.** | **HUNGARY** | **• National Innovation Office (NIH)** | **. Information and Communication Technologies**<br>**. Earth sciences**<br>**. Biological sciences**<br>**. Healthcare**<br>**. Green Chemistry**<br>**. Material sciences and nanotechnology**<br>**. Optics and laser physics**<br>**. Water treatment and purification**<br>**. Agriculture**<br>**. Renewable energy** |
| **18.** | **IRAN** | **Ministry of Science, Research and Technology (MSRT) of the Republic of the Iran**<br>**(Partner in IORA)** | **. Biotechnology and Human Health (focusing improvement in crop productivity, transgenic crops, microbial biotechnology with emphasis on cellulosic biofuel and microbial diversity and bioprospecting;**<br>**. Molecular Medicine focussing research on stem cell, cancer, tropical and infectious diseases;**<br>**. Animal Biotechnology (reproductive and nutrition),** |

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| | | | . Water resources management |
| 19. | ITALY | Ministry of Foreign Affairs;<br>University of Trento | . Information and Communication Technologies<br>. Physics, Astrophysic, Space sciences<br>. Ecological and environmental modeling<br>. Water management<br>. Disaster risk management<br>. Renewable energies; climate change and geohazards;<br>. Technologies applied to cultural and natural heritage.<br>. Biomedical Sciences leading to communicable and non-communicable diseases<br>. Sustainable agrifood.<br>. Environment: sustainable cities and circular economy, healthy and productive ocean/sea.<br>. Artificial Intelligence & Robotics<br>. Physics of Matter and New Materials<br>. Cognitive Science, |
| 20. | ISRAEL | Ministry of Science & Technology of the State of Israel<br><br>Israel Innovation Fund, Ministry of Economy Development | . All areas of Science & Technology |
| 21. | JAPAN | Ministry of Foreign Affairs (MOFA)<br><br>Ministry of Education, Culture, Sports, Science and Technology (MEXT)<br>Japan Science and Technology Agency (JST) | . Fundamental Sciences: Physical and Chemical Systems<br>. Materials and System Engineering: Man-made Systems<br>. Natural Systems: Life Sciences and Bioengineering<br>. Astronomy, Space, Earth System and Sciences<br>. Mathematics and Computational Science<br><br>. Cyber Physical System – IoT, AI, Big Data |

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| | | **Japan Society for the Promotion of Science (JSPS)** | **. Sakura Exchange Meeting**<br>**. Hope Meeting, and Asian Science Camps** |
| **22.** | **MAURITIUS** | **Mauritius Research Council**<br>**Participating in ACE and CV Raman programs** | **. Astronomy**<br>**. Ocean Sciences** |
| **23.** | **MEXICO** | **National Council of Science and Technology (CONACYT) of the United Mexican States** | **. Watersheds management**<br>**. Food Sovereignty**<br>**. Environment**<br>**. Sustainable cities**<br>**. Natural risks and disaster**<br>**. Sustainable and relevant housing, culturally and environmentally**<br>**. Eco-friendly partner systems and sustainability toxic agents and polluting process.**<br>**. Health, Science,**<br>**. Technology, engineering, mathematics and Medicine, Education for inclusion.**<br>**. Preservation of Cultural Heritage, Energy transition**<br>**. Interdisciplinary sciences including: computer Science and ICT, Engineering, Material Sciences and Nanotechnology, Physics and Mathematics** |
| **24.** | **MYANMAR** | **Ministry of Science & Technology**<br>**(Partner in BIMSTEC, SAARC, IORA, neighborhood program)** | **. Data Science in Agriculture Industry,**<br>**. Disaster mitigation,**<br>**. Cyber security and Geospatial system architecture**<br>**. Food technology**<br>**. Metal beneficiation** |
| **25.** | **NETHERLANDS** | **Ministry of Economic Affairs of the Netherlands** | **. Water Technologies and water management**<br>**. Sustainable Energy including New and Renewable Sources of Energy** |

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| | | Netherlands Organization for Scientific Research (NWO)<br>(EU Member country, Mission Innovation, ISA) | . Life sciences including Medical / Biomedical including Pharma<br>. Medical / Biomedical including Pharma<br>. New Materials |
| 26. | NORWAY | Research Council of Norway | . All areas of Science & Technology |
| 27. | PHILIPPINES | Department of Science & Technology | . All S & T areas |
| 28. | POLAND | Ministry of Science & Higher Education of the Government of Poland (MNISW) | . All areas of Science & Technology |
| 29. | PORTUGAL | Foundation for Science and Technology (FCT) of the Ministry of Science, Technology and Higher Education<br><br>EU Member country) | . Energy,<br>. Environment,<br>. Infrastructure Sustainability<br>. Climate Change<br>. Disaster Management<br>. Marine Science & Technology biotechnology |
| 30. | SOUTH KOREA | (i) Ministry of Science & ICT<br><br>(ii) Korean National Research Foundation<br><br>(iii) Ministry of Trade, Industry and Energy | . Green Mobility,<br>. Robotics & Engineering Sciences,<br>. Renewable Energy,<br>. Health & Medical science,<br>. Material Science & Technology,<br>. Information & Communication Technology including ESDM<br>. Industrial R&D |
| 31. | RUSSIA | (i) Russian Ministry of Education & Science for Cooperation in Applied Science<br>(ii) Russian Foundation for Basic Research in Basic Sciences, | . All frontier areas of Natural Sciences, Engineering;<br>. Medicine,<br>. Neurosciences,<br>. Mathematics,<br>. Computer and ICT etc. |

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| | | **(iii) Russian Science Foundation for cooperation in Basic Sciences for young achievers.**<br>**(iv) Foundation for Assistance to Small Innovative Enterprises (FASIE)**<br>**(v) Ministry of Economy Development for Indo-Russian Bridge for Innovation Partner in BRICS, SCO, ICSTI** | |
| **32.** | **SERBIA** | **Ministry of Education, Science and Technological Development (MESTD) of the Republic of Serbia** | **. Science & Technological Solutions against COVID-19/ Pandemic Challenges New Materials and Nanotechnology;**<br>**. Energy and Energy Efficiency;**<br>**. Information and communication technologies;**<br>**. Human Health; Biotechnology including food technology and food security** |
| **33.** | **SINGAPORE** | **Agency for Science, Technology and Research (ASTAR Singapore)** | **. Biotechnology, Advanced materials,**<br>**. Newer Sources of Energy,**<br>**. Water Technologies,**<br>**. ICT**<br>**. Health Sciences** |
| **34.** | **SLOVENIA** | **Ministry of Education, Science and Sport of the Republic of Slovenia and the Slovenian Research Agency of the Republic of Slovenia.** | **. Health, biomedicine and biotechnology;**<br>**. New materials, including polymers;**<br>**. Information and communication technologies;**<br>**. Renewable energy sources;**<br>**. Urban areas (smart cities);**<br>**. Artificial intelligence;** |
| **35.** | **SRI LANKA** | **Ministry of Science, Technology and Research** | **. Food Technology**<br>**. Plant base medicines**<br>**. Metrology**<br>**. Space Research & Applications** |

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| | | Participating in our neighbourhood program, IORA, SAARC, BIMSTEC | . Robotics & Automation<br>. Industrial Electronics<br>. Renewable Energy<br>. Waste Management<br>. Information and Communication Technology |
| 36. | SOUTH AFRICA | Department of Science and Innovation<br>Participating in CV Raman progran, BRICS | . Astronomy<br>. Health sciences<br>. Biotechnology<br>. IKS<br>. Grassroot innovations<br>. Agriculture Biotechnology |
| 37. | SPAIN | Ministry of Science and Technology<br>EU Member country | . All S&T Areas |
| 38. | SWEDEN | Swedish Research Council,<br><br>VINNOVA<br><br>Swedish Energy Association<br>EU Member country, Mission Innovation | . Science and Technology |
| 39. | SWITZERLAND | Swiss Secretariat for Education and Research (SER) | . Joint Research Projects<br>. Project based Personnel Exchange Programme<br>. Joint Workshops in identified themes<br>. Information & communication technologies<br>. Material sciences & nanotechnologies<br>. Human health sciences<br>. Sustainable urban development<br>. Renewable energy sources<br>. Translational Medical Science & Technology |
| 40. | THAILAND | Ministry of Science and Technology of the Kingdom of Thailand | . Agricultural Science,<br>. Biotechnology,<br>. Advanced materials, |

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| | | (Participating in our program for neighbourhood, ASEAN, IORA, | . Newer Sources of Energy,<br>. Geospatial Technology,<br>. Astronomy,<br>. Water Technologies,<br>. ICT and Health Sciences |
| 41. | TUNISIA | The Ministry of Higher Education and Scientific Research<br>Participating in ACE, CV Raman program | . Biotechnology<br>. Material Sciences and nanotechnology<br>. Information Science, including Software Development |
| 42. | UK | UK Department for Business,<br>Energy and Industrial Strategy<br>Science, Research and Innovation | . Medical Sciences<br>. Water Technology<br>. GeospatialTechnologies<br>. Science Popularization<br>. Renewable Energy Sources |
| 43. | UKRAINE | State Committee on Science & Technology Internationalization | . Agricultural Science,<br>. Biotechnology,<br>. Advanced materials,<br>. Newer Sources of Energy,<br>. Water Technologies,<br>. ICT and Health Sciences |
| 44. | UZBEKISTAN | Ministry of Innovative Development<br>(SCO member state) | . Agriculture and Food Technology; Engineering Sciences;<br>. ICT including Big Data and CPMS; Health and Medical Technology; Materials Sciences;<br>. Life Sciences and Biotechnology;<br>. Physics and Astrophysics;<br>. Energy, water, climate and natural resources |
| 45. | USA | US State Department | . All S & T areas |

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