

No. Misc.1/20/2018-CDN (Vol-II)
Government of India
Ministry of Science and Technology
Department of Science & Technology
(CDN Section)

Technology Bhawan,
New Mehrauli Road,
New Delhi - 110 016

Dated: 10.01.2020

OFFICE MEMORANDUM

Subject: Monthly Summary to the Cabinet for the month of December, 2019.

The undersigned is directed to enclose a copy of the Monthly Summary of Important policy decisions taken and major achievements of the Department of Science & Technology for the month ending 31.12.2019 for information.

2. This has already been approved by Secretary, DST.



(Balram Goel)

Under Secretary to the Govt. of India

To,

All Members of the Council of Ministers

Copy with enclosures, forwarded to:-

1. The Principal Scientific Adviser to the Government of India
2. Secretary to the President of India
3. Secretary to the Vice-President of India
4. The Principal Secretary to the Prime Minister, Prime Minister Office, South Block, New Delhi - 110 011.
5. Chairman, NITI Aayog, NITI Bhawan, New Delhi.
6. Vice Chairman, NITI Aayog, NITI Bhawan, New Delhi.
7. Chief Executive Officer, NITI Aayog, NITI Bhawan, New Delhi.
8. All Members of NITI Aayog, NITI Bhawan, New Delhi.
9. The Chairman, Union Public Service Commission
10. Secretaries to the Government of India (as per list)
11. The Principal Director General, Press Information Bureau, Ministry of Information & Broadcasting
12. The Director, Cabinet Secretariat, New Delhi - 4.
13. Shri Sanjay Kumar Mishra, Sc. 'G', DST for uploading the monthly summary on DST's website.
14. Sr. PPS to Secretary, DST.

Department of Science & Technology
Monthly Report
December, 2019

I. Important policy decisions taken and major achievements during the month:

A. Science for Society

1. Union Minister for Health & Family Welfare, Science & Technology & Earth Sciences, **Dr. Harsh Vardhan, launched a Water Innovation Centre** on 6th December 2019 set up by Department of Science and Technology (DST), Government of India nucleated at Indian Council of Agricultural (ICAR) –Central Arid Zone Research Institute (CAZRI), Jodhpur for enhancing Food and Water security in Arid Region. This centre, which has been established at a collective investment of around Rs 6 Crore, has the mission of **providing state-of-art research led innovative technological solutions for enhancing food and water security** which is a major challenge for arid regions. DST-ICAR-CAZRI Water Innovation Centre for Enhancing Food and Water Security in Arid Region through Improved Understanding of Quantity, Quality and Management of Blue, Green and Grey Water is a network of 6 research institutions.
2. Expert Committee meeting of Scheme for Young Scientists and Technologists (SYST) was organized at IIT Delhi on 2-4 December 2019 to evaluate 90 proposals.
3. An interactive group discussion for **technology upscaling and effective delivery for addressing livelihoods and conservation challenges involving mountain communities in the North-West Himalayas** was organized during review of Technology Intervention in Mountain Ecosystem - Livelihoods Enhancement through Action research & Networking (TIME-LEARN) program held at Wildlife Institute of India (WII), Dehradun during 26-27 December, 2019. S&T led NGOs and Institutions from Uttarakhand, Jammu & Kashmir and Himachal Pradesh participated in the event. Twenty ongoing projects were reviewed and its possible convergence to SDGs 1,2 ,5, 7, 8,9, 13,14,15 was examined.
4. Inclusiveness is an important aspect of KIRAN Division's programmes for women scientists and technologists and therefore, Division has planned its outreach activities in interior parts of the country. In this connect, a **sensitization workshop on 'Women Scientists Programmes'** of DST was conducted on 14th December 2019 at Berhampur University,

Berhampur, Odisha wherein around 200 women scientists from aspirational districts of Odisha have participated.

5. 9th Subject Expert Committee Meeting on Chemical Sciences under Women Scientists Scheme (WOS-A) programme was conducted on 19-21 December, 2019 at DDU College, New Delhi. 45 Women Scientists have been selected to pursue research in Chemical Sciences under WOS-A.
6. An inter-ministerial meeting of Hon'ble Minister of S&T and Earth Sciences with Hon'ble Minister of Women & Child Development was held on 26th December, 2019 to explore various **possibilities of working together for gender parity and betterment of women in STEM** (Science Technology Engineering Mathematics).

B. National Technology Mission

1. The Union Minister for Health & Family Welfare, Science & Technology & Earth Sciences, **Dr Harsh Vardhan, launched the 'Technology Fusion & Applications Research Programme (TFAR)'**, to be implemented by the Department of Science & Technology (DST) at a total outlay of Rs 250 Crore for a period of three years, addressing the ever increasing technological requirements of the society and taking into account the international trends of next generation technologies. The programme will boost research for fusion, convergence and application of emerging technologies like Quantum Enabled Science & Technology, Imaging Spectroscopy, Epidemiology Data Analytics and Indian Heritage in Digital Space. The programme is being operated in the knowledge generation domain, and its beneficiaries are slated to be mainly researchers, scholars and students. However, the technology outcomes and innovations could lead to start-ups and technology-driven economic growth. Such technologies would be of benefit for the general public. All the advanced technologies in TFAR are continually evolving beyond the boundaries of single disciplines, thereby generating innovations. Resulting patents can feed into a Start-up ecosystem and help employment generation. It can also create specially trained human resource & skilled workforce. These technologies are highly prominent today and compiling them on one platform could serve those engaged in R&D, translational research, policy and technology management, and accelerate the process of technical developments and societal problem solving. The TFAR would also establish outcome-based research collaborations within India and with International academic institutions for the advancement of interdisciplinary research in the country.

2. The 2nd Meeting of Mission Governing Body (MGB) on National Mission on Inter-Disciplinary Cyber Physical Systems (NM-ICPS) was held on 12th December, 2019 at Knowledge Park, C-DAC, Bengaluru under the Chairmanship of Dr. Kris Gopalakrishnan. The following were the major recommendations of MGB:
- The Mission to establish 25 hubs i.e., 18 Technology Innovation Hubs (this) and 7 Sectoral Innovation Hubs (SAHs) in current cycle itself. After completion of 1 year, 4 of these hubs could be elevated to Technology Translation Research Parks (TTRPs) based on performance, industry linkages established, CSR funds mobilised etc. Accordingly, the current call for proposal issued by SERB be modified to invite proposals for 25 hubs and last date for receipt of proposal be extended up to 16th January, 2020.
 - NIRF ranking up to 50, i.e., institutes with NIRF ranking in Engineering or institutes with NIRF ranking in Overall should be considered and in both the cases the upper limit of NIRF ranking is 50 in each. Accordingly, all proposals to be evaluated. Host Institutes (HI's) can apply for a technology vertical or application vertical as primary and also have the options to mention two secondary areas in their proposals. However, HI's to submit only one application.
 - An International Symposium on Cyber Physical System (CPS) technologies to be conducted jointly by the selected host institutes. This symposium will be on a rotational basis.
 - SERB to recruit project staff at the earliest for the Mission Office, DST. The tenure of the SERB recruited project staff will be till Mission positions are approved by D/o Expenditure and DST completes the recruitment process.
3. 4th National Consultative Meeting for DPR formulation of National Mission on Quantum Technologies and Applications (NM-QTA) was held on 30th November and 1st December, 2019 at Indian Institute of Technology (IIT), Hauz Khas, New Delhi. Nearly 40 participants attended the meeting comprising of academicians, Scientists from National labs, industrialists and various other stakeholders. The theme for discussion was Quantum Materials.
4. 9 projects on Methanol & di-methyl ether (DME) utilization engines and fuel cells indicated utilization pathways for methanol and DME for transportation and fuel cell application.
5. Solar Energy Research and Development- 2019 programme for development of equipment and consumables, affordable solar innovation, demonstration of increase in technological readiness of devices and system, convergent solar solution stream for public goods and to support disruptive ideas garnered tremendous response in the form of 350 research

proposals from academics and industries for moving to higher Technology readiness levels and innovative disruptive break thoughts.

6. Water Technology Initiatives (WTI) 2019 titled programme on Water Research, Technology and Innovation on Nexus of water with Energy, Food, Health” in the context of existing and emerging water challenges in the country especially with reference to reliable availability of water for drinking, municipal, and agricultural requirements got an overwhelming response and 396 full proposals were submitted by the premier institutions and groups. 31 proposals for applied research and 11 proposals have been identified under the Convergent solution stream initially.
7. In order to address the challenges of water management in fast growing cities on Rajasthan titled “*Structured Dialogues for Sustainable Urban Water Management (SDSUWM)*” was initiated in partnership with Aligarh Muslim University, Aligarh ; Birla Institute of Technology and Science, Hyderabad ; Amrita School of Engineering Coimbatore, Tamil Nadu.

C. Technology Development

1. DST organised 2 Industry Academia Conclave on Clean Energy Materials at Trivandrum and Jaipur which deliberated various research models and R&D roadmaps for Energy Storage Materials and its industry applications. It was recommended that aggressive targets meeting global benchmarks and accelerated discovery of clean energy material utilising multidisciplinary expertise was need of the hour.
2. Review of Research Program on Improving Building Energy Efficiency (IBEE)” highlighted notable outputs related to Indian Climatic Zones design guidelines, a prototype development to test the Double glazed Flat Plate Solar thermal Collector (FPSC) and Modular Thermally Activated Solar Cooling and Ventilation Systems.

D. International Cooperation

1. **Collaboration in STI with the Indian Ocean Rim Association (IORA):** India (Department of Science & Technology (DST) chaired the Indian Ocean Rim Association (IORA)- 1st Expert Group Meeting on Academics, Science & Technology Cooperation (EGMASTC) held in New Delhi on 12th December 2019. Prof Ashutosh Sharma, Secretary DST delivered the Key-note address at the inaugural session of the Meeting attended by 22 IORA member countries.

Secretary DST announced the launch of 100 IORA-India Fellowships for scientists/ researchers from India and IORA countries. He also called upon IORA to work towards developing Grand Challenges R&D projects. The EGMASCTC finalized the draft Terms of Reference (ToR) for creation of an IORA-Working Group for cooperation in the fields of Science, Technology and Innovation and also its draft Work Plan 2019-2022.

- 2. Award of International Ramanujan Prize in Mathematics funded by India:** The ICTP 'Ramanujan Prize of US\$ 15000, for outstanding contributions by Young Mathematician from the developing countries, was instituted in 2005 by ICTP. The prize is currently being funded by DST through an MoU originally signed in 2014 and renewed for a further period of five years with effect from the 2019 prize.

Prof Hoàng Hiệp Phạm, from Vietnam was selected for the 2019 Ramanujan prize for his outstanding contributions in the field of complex analysis, and in particular to pluripotential theory, having important applications in algebra and geometry and for his important organizational role in the advancement of mathematics in his country, Vietnam. Dr Pham was awarded the prize in a ceremony held in Trieste, Italy on 10th December 2019 which was attended by the India's Ambassador to Italy.

- 3.** DST supported 5 projects on Carbon Capture Utilisation and Storage (CCUS) under the umbrella of Mission Innovation – Innovation Challenge 3. The objective of this programme is to undertake joint Research & Development with member MI countries to identify and prioritize breakthrough technologies in the field of CO₂ capture, separation, storage and CO₂ value addition.
- 4. IFCPAR Finance Committee meeting of Secretary with President CNRS:** On 16th December, 2019 a French delegation led by Dr. Antoine Petit, President of the French National Centre for Scientific Research (CNRS) met Secretary DST. During the meeting discussion was held to upgrade the level of ongoing cooperation between DST and CNRS France. It was agreed to explore joint collaboration in the areas of Cyber Physical System (AI; Machine Learning; Big Data; IoT; Industry 4.0; 5G +), Advanced Manufacturing, Quantum Science & Technology (Technologies in Quantum Communication, Computing and Materials), Electric Mobility (Focus on Tropical and Disruptive Technologies Batteries; EV Motors; Power Electronics; Charging), Clean Fuels (Catalysts, Methanol From Coal and Biomass etc), Women in Science and Open Science through supporting joint research projects, network centres, applied R&D.

- 5. India Canada Science & Technology Innovation Dialogue announces several Joint Projects:** Six new joint projects on Cyber Physical Systems to support Green Buildings in Smart Cities was announced under India-Canada IC-IMPACTS programme at the India-Canada Science & Technology Innovation Dialogue organized on 9th December 2019. The award winning projects included large area micro bolometer; Uncooled focal plane arrays for thermal imaging; carbon neutrality through combined carbon dioxide capture and novel hydrogen technology with production of non-conventional fuels for smart cities; meta-material based lightweight panel wall for enhanced building acoustic and seismic resistance; metal material walls for improved acoustic performance in green buildings; improving building energy demand predictions in smart cities through sensor observations and considerations of landscape characteristics; harnessing the potential of renewable energy for sustainable building energy management through compressed air energy storage.
- 6. India-Czech Bilateral Scientific and Technological Cooperation:** 20 high ranking projects from 187 joint proposals received against the Indo-Czech call for joint proposal 2019 in the areas of Information and communication technologies; Natural sciences and biotechnology; New materials and nanotechnology; Medical sciences (including pharmaceutical sciences) and food safety; Research of climate change, environment and energy were recommended for support.
- 7. Announcement of DST-UKIERI joint workshop Call:** An India-UKIERI joint workshop call for proposals under the collaboration between DST, India and UK India Education & Research Initiative (UKIERI) was announced in last week of September in the select areas of Science and Technology. Based on scientific merit, national priority of both the countries and scientific strengths of the project coordinators, Department of Science & Technology, Govt. of India and UKIERI have jointly shortlisted 16 joint workshop proposals which were recommended from both sides.

E. Human Capacity Building

- 1.** Progress of the School Awareness Projects sanctioned last year at 115 Aspirational Districts under Schedule Caste Sub-Plan (SCSP)/Tribal Sub-Plan (TSP) were reviewed by the Programme Advisory and Monitoring Committee (PAMC) on 26th November, 2019 at DST, New Delhi. Some of the new proposals received against the Call for proposals (CFP) for conducting training programmes, workshops, conferences and Advanced/emerging

technologies awareness programme at school level students under Schedule Caste Sub-Plan (SCSP)/Tribal Sub-Plan (TSP) were scrutinized/considered by the PAMC on 27th November, 2019 at Technology Bhawan, New Delhi. Next meeting of PAMC to scrutinize/consider the remaining new proposals received against the CFP has been scheduled for 4th& 6th January, 2020 at DST, New Delhi.

2. INSPIRE Internship:

One meeting of the Expert Committee for considering the INSPIRE Internship Proposals under the INSPIRE Program was organized. In this meeting, Committee considered 17 INSPIRE Internship proposals for organizing the INSPIRE Internship camps from all across the country. Out of 17 proposals, only 1 proposal covering 200 INSPIRE interns was recommended for support.

3. Scholarship For Higher Education (SHE):

- 1705 SHE scholars received their scholarship for pursuing B.Sc./M.Sc. Degree course in basic and natural sciences.
- 102 INSPIRE Scholars/visitor's queries were responded.

4. INSPIRE Fellowship:

- 436 INSPIRE Fellows received their fellowship for pursuing their doctoral degree program.
- 97 INSPIRE Fellows have been upgraded from Junior Research Fellowship to Senior Research Fellowship.

5. INSPIRE Faculty Fellowship:

- 10 INSPIRE Faculty Fellow's grant was released for pursuing their Post-doctoral program.
- "INSPIRE Scheme" in general demonstrates the 'Minimum Government, Maximum Governance Model' due to the use of technology in its operations right from submission of the application to the delivery of grants including its operations.

6. Twentieth Core National S&T Survey meeting for the development of latest statistics and indicators on Science & Technology was held at TERI, New Delhi.
7. Selection of 13 BHAVAN Scholars to get research exposure in advanced research labs on energy efficiency at United States was done.
8. To provide an opportunity to the best and the brightest Indian students and scientist to gain exposure and access to world class research facilities in leading USA institutions, the Bhaskara Advanced Solar Energy Fellowship program was announced.

9. Vigyan Samagam, a multi-venue mega science exhibition completed its journey in its 3rd leg at Science City, Kolkata during the month. 209636 persons visited Vigyan Samagam exhibition during the month.
10. **Launch of India Science and Research Fellowship Call 2019-20:** As a part of our initiatives to engage with our neighbouring countries to develop S & T partnerships, DST has launched India Science and Research Fellowship (ISRF) Programme for the Afghanistan, Bangladesh, Bhutan, Maldives, Myanmar, Nepal, Sri Lanka researchers to work in Indian Universities and Research Institutions.

F. Scientific Infrastructure Building

1. Hon'ble Union Minister for Health & Family Welfare, Science and Technology & Earth Sciences, Dr Harsh Vardhan remotely dedicated Micro industrial complex for sustainable rural industrialization as one of the viable technology option at an event held at ICAR CAZRI Jodhpur on 6 December 2019. A micro industrial complex has been set up at Malunga, Jodhpur which utilises local produce for value addition through efficient use of renewable energy, conserving water without generating waste. This complex has been set up with an investment of Rs 6 Crore under Science Bridges Program implemented by R & D Infrastructure Division, DST.
2. **Fund for Improvement of S & T Infrastructure in Universities and Higher Educational Institutions (FIST)**
- a) The FIST Advisory Board (FISTAB) recommended a total of 95 proposals in seven subject areas with an amount of Rs 120.94 Crore for a duration of 5 years for Scientific Infrastructure Building in various academic institutions, Universities Departments and PG Colleges.
- b) 163 projects were reviewed in Seven Subject areas during the year. The minutes of the review meetings were also endorsed by the FIST Advisory Board.
- c) The third meeting of "Evaluation of the Impact of DST FIST Program" was organized in December 2019 at Nagpur University, Maharashtra. The consolidated report of four regions was presented and deliberated in detail.
3. **Promotion of University Research and Scientific Excellence (PURSE)**: The final review of the PURSE Program at University of Delhi and Jawaharlal Nehru University, New Delhi was organized in December 2019. The different activities in the projects and the impact of

PURSE were technically evaluated by Programme Management Board Members and the visit to various facilities established out of PURSE was carried out. PURSE Phase II Support at University of Delhi and Jawaharlal Nehru University, New Delhi has resulted in 3633 research publications in reputed journals, organization of 81 Workshops & 493 Manpower have been trained.

4. **“Sophisticated Analytical and Technical Help Institutes”- (SATHI):** The First Expert Committee meeting of Sophisticated Analytical and Technical Help Institutes (SATHI) & “SATHI Ki Baat” was held on 19th December 2019 at IIT Bombay. The Expert committee reviewed the progress of three SATHI centres and related catalogue /brochure pertaining to each centre. The Expert Committee recommended to set up a few newer SATHI centres across the country during next FY 2020-21, to be hosted at the established academic institutions. The material for inclusion in Finance Minister’s Budget Speech 2019-2020 has been prepared & conveyed.
5. **Sophisticated Analytical Instrument Facilities (SAIF):** The Facility Management Committee were held in December 2019 at Central Drug Research Institute, Lucknow and All India Institute of Medical Sciences, New Delhi Centres to monitor the performance of the SAIF Centre, to consider its requirement for the ensuing year and to discuss for its future course.
6. A review meeting of the Network Mode Project – Evaluation of DST – Fund for Improvement of S&T infrastructure in universities & higher educational institutions (FIST) Program was held at Nagpur University.
7. The design and development of in-kind items for Facility for Antiproton and Ion Research (FAIR) and Thirty Meter Telescope (TMT) projects is in progress. For TMT project, 20 Actuators sent to Project Office, TMT at USA successfully completed life-cycle tests. Also, 21 Leaf Springs, an important component of Segment Support Assembly successfully completed life-cycle tests. The civil construction of state-of-the-art India-TMT Optics Fabrication Facility (ITOFF), situated at Hoskote, Bengaluru has been completed and its commissioning is expected to commence soon.
8. DST supported setting up of Turbine Rotor Test Rig facility at BHEL Corporate R&D which is first of a kind facility in the country.