

No. DSIR/MS/2019/04

Government of India

Ministry of Science & Technology

Department of Scientific & Industrial Research

MONTHLY SUMMARY FOR THE CABINET

(For the month of **April 2019**)

(Part-I Unclassified)

Ministry/Department: Department of Scientific & Industrial Research (DSIR)

Council for Scientific and Industrial Research (CSIR)

CSIR's key achievements and contributions encompass and impact various sections of society, Industry and strategic sector. It also generates knowledge base and fundamental discoveries through its R&D, which form the bedrock of tomorrow's technologies and solutions.

Societal Contributions of CSIR

- **A first of its kind Waste Management Park has been** commissioned by CSIR-NEERI in Nagpur. It is built in partnership with NGO Swachh Association and aimed at creating mass awareness about the importance of reuse, recycle and segmentation of waste, the park itself is an example of 'best out of waste'. The park has an exhibit area inside a hut, which highlights what citizens can do to reduce waste.
- CSIR's Phytroid technology to be used to treat sewage water on the bank of Sonegan Lake in Nagpur. CSIRs Technology based on the floating rafts to combat water pollution with plants to absorb pollutants and phosphates, and improve water quality was launched to fix water pollution in Delhi's Rajokri's lake.
- Traditional Medicine, which has been the strength of India over the ages has received a boost with the **signing of MoU between CSIR and Ministry of Ayush**, which will facilitate evidence generation and integration with modern science to boost the confidence in traditional medicine and increase its uptake in the country and globally
- Inauguration of **Traditional Knowledge Digital Library (TKDL)** unit at CSIR-CLRI, which helps in protecting India's traditional knowledge from infringement by MNCs

Farmer Centric Activities

CSIR has been promoting various farmer centric initiatives through its Phytopharma, aroma mission and CSIR Harit missions, in order to enhance their incomes. Some of the key activities are -

- Installation of **aromatic plant distillation unit** at Tamhalong village, Khetri, Assam under CSIR's Aroma mission was done by CSIR-NEIST, showing CSIR's commitment to rural farmers for high economic returns.
- First lot of essential oils was handed over to tribal farmers at Vellimudi tribal settlement in **Anamalai Tiger Reserve**, Western Ghats under Aroma Mission for 48 tribal families

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- Field visit of CSIR-IHBT scientists to Manipur for farm training for cultivation of **low chilling varieties of apple** along with NERCORMP officials of **Ukhrul district, Manipur**.
- Two days training program for farmers organised at CSIR-CIMAP under CSIR Aroma mission as a collaborative project being funded by HCL foundation.
- Distribution of seeds of Wild marigold variety Himbala to the farmers of aspirational district Chamba (**HP**) for plantation in 75 acres of land by team CSIR-IHBT
- Visit of CSIR-IHBT team to Kangpokpi Distt. (Senapati), Manipur for creating awareness among tribal farmers on cultivation, processing and marketing of aromatic crops under Aroma Mission. The team along with North Eastern Council members also inspected essential oil extraction unit installed by CSIR-IHBT.
- Outreach and Workshop on Indian Population was carried out by CSIR-IGIB at Vinoba Bhave University Hazaribagh, **Jharkhand, India**

Contributions to Strategic Sector

- CSIR has been contributing to strategic sector by working with DRDO, Indian Navy, Air Force among others. Towards further indigenization and self-reliance in advanced technologies an **MoU was signed between Indian Navy and CSIR**. Futuristic technology developed by CSIR will be used for enhancing operational availability and combat capabilities of Naval platforms. Some of the key areas of collaboration are alternative desalination technologies, installation of wireless MEMS based sensors for remote operation, residual life assessment studies of gas turbine generator blades to improve reliability.
- In contribution to nation's strategic sector, **CSIR-NEERI with DRDO, filed patent** on innovative product "A Radio Photo Luminescence (RPL) Phosphor Based Dosimeter, Corresponding Reader & Overall System"
- CSIR technology Induction Motor Performance analyzer (IMPA) developed by CSIR-CSIO deployed in strategic sector

Activities in Industrial Sector

- Two MOUs were signed for Induction Motor Performance analyzer (IMPA) with Industrial Control and Drives and Earth Tekninks in Chennai and other for Smart energy meters for mass housing with Shree Nagadevi Hitech Industries in Vellore, by CSIO.
- CSIR-CLRI, Chennai signed a MoU with **TATA International** ltd., Mumbai for joint collaborations.
- CSIR-NIIST, Thiruvananthapuram organized a 3rd one-day **Industry Innovator Meet** CSIR-NIIST to showcase the expertise of NIIST to solve the problems of Industries.

- CSIR-CCMB, Hyderabad signed an MoU with the Indian Pharmacopeia Commission (IPC), Ghaziabad, **to facilitate the regulatory process for biosimilar and herbal drugs**. The MoU deals with the development of biopharmaceutical reference standards and impurities therein, development of monographs for important Monoclonal antibodies and identification of herbal drugs based on DNA Barcode analysis.
- CSIO organized, a one-day **Technologist Industrialist Meet and Expo (TIME 2019)** to identify the issues of mutual interest and forge alliances. Around 100 industry experts and entrepreneurs from across the country took part in a one-day R&D Industry meet
- CSIR **technology showcase** event was organized by CSIR-IITR at Lucknow to showcase key technologies developed at the laboratories of CDRI, CIMAP, IITR and NBRI and outreach centers CFTRI and CLRI
- Open Dialogues Chandigarh Chapter with IKP Science Park and CSIR_IMTECH to foster synergies among the stakeholders, understand the needs of start-ups and innovators and decide on a road map for future
- On the **Intellectual Property** front CSIR filed 32 patents in India and 11 patents abroad. CSIR was also granted 37 patents abroad and 18 patents in India

Skill Development

Under the skill development initiative, CSIR labs are conducting many skill-training activities across the country. On average about 500 persons are participating in various skill training activities. Key highlights include:

- CSIR-Central Building Research Institute, Roorkee, State Centre for Climate Change & State Council for Science Technology & Environment, HP jointly organized a two days Training programme for 58 Master Trainers on Earthquake Resistant Construction in Himachal Pradesh from different Polytechnic Collages/IITs and State Government departments of Himachal Pradesh.
- CSIR-CBRI organized 5 days' skill development training programme on Multi-Hazard Resistant Housing and Habitat for Engineers of Uttarakhand during April 22-26, 2019 at Roorkee under CSIR Integrated skill Development Initiative
- One-month foundation course on welding training program was organized by CSIR-National Metallurgical Laboratory (NML).
- CSIR-Central Drug Research Institute (CDRI) is preparing skilled human resource for hospital, diagnostic pathology, forensic lab, research industry, laboratory and academia by giving hands-on training in the various biomedical techniques.
- Dr. B. R. Ambedkar International Training Centre built in CSIR-IIP campus to provide training courses to India and South-Asian countries.

- CSMCRI recently concluded skill development training program related to seaweed cultivation & processing
- Center of Skill Development and Training at CSIR-NEERI was inaugurated to impart training to enhance professional skills in environment, strengthening personnel and competence.

Student Outreach:

To promote scientific spirit and enthusiasm among students CSIR through Jigyasa and other activities is reaching out to students from Kendriya Vidyalaya and others schools. Key highlights are

- CSIR-CSIO, Chandigarh organized four-day science summer camp 2019 for school students with 'Hands on Session in Physics" and 'Science Quiz' at CSIR-CSIO, Chandigarh. Around 170 students and 30 teachers from different KVS and JNV attended the event.
- CSIR-CDRI organized science outreach program for batch of 33 students from Jawahar Navodaya Vidyalaya, Sarsaul, Kanpur Nagar (UP)
- CSIR-IMTECH conducted a summer research camp for 5 days for about 50 students from Kendriya Vidyalaya school children (class VII to XII).
- Visit of CSIR-IMMT Scientists to Kendriya Vidyalaya during as a part of Jigyasa Programme
- 3 days Summer Plant Science Fest-2019 was conducted by CSIR - NBRI.

Awards and Laurels

- **CSIR-IIP has won National Technology Award 2019** of Rs.25 lakhs, for its technology of simultaneous production of US grade gasoline and high purity benzene from olefin rich fluid catalytic cracking or FCG. This technology has been licensed to Reliance Industries Limited and a plant has been commissioned in Jamnagar Petrochemical complex, based on the technology.
- Dr Subir Kumar Bhaumik from CSIR-NAL received **commendation certificate from chief of Air Staff** for his exemplary contributions to accident investigations of Indian Air Force.

New Major Initiatives:

- In a first major Human Genomics initiative, CSIR labs CCMB and IGIB aims to sequence 1000 Indian genomes representative of country's population diversity. This would prove India's capabilities at executing whole-genome sequencing at a large scale and increase awareness about genomics and reveal gene-disease link in Indian population and pave way tailored therapies in future.

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Social Media Outreach

Twitter: A total of 210.5K impressions in April

Facebook: 72,000 followers with 71.5K likes

Research Highlights:

- CFTRI has found that Corn gromwell is a **potential oil crop that can match fish oils in nutritional value**. The oil is rich in polyunsaturated fatty acids (PUFA), including nutritionally important omega-3 fatty acids. CSIR is working on developing appropriate cultivation practices for commercial cultivation of this oilseed crop and develop different food products using this oil in collaboration with agricultural universities and institute
- Studies from CSIR-NEERI on Assessment of Water Quality and Sediment to Understand Special Properties of River Ganga, which assessed the water quality for “radiological, microbiological and biological” parameters in Ganga, found that **Ganga has higher proportion of anti-bacterial agents** the bacteriophages which were detected to be approximately 3 times more in proportion than bacterial isolates.
- CSIR scientists at CCMB in collaboration with National Research Centre on Meat (NRCM) have embarked on research to produce ‘**cultured meat**’ - meat made by cells extracted from animals, with out slaughtering animals and enhancing access to protein diet to people. This has been funded by Department of Biotechnology (DBT) for 4.6 crores. CCMB has also signed an agreement with HSI to launch a ‘Centre for Predictive Human Model Systems’.
- CSIR-NCL Scientists have **synthesized cannabis like products in lab** through a chemical process that could be used in a range of medical applications and overcome regulatory and other restrictions on cultivation of cannabis for the products.
- Research on Indian tigers indicate the reasons for stress which may reduce fertility and hamper successful breeding and **tiger conservation efforts**
- **Novel way of tackling antibiotic resistance**, which is a major concern in India and globally due to indiscriminate use of antibiotics. CSIR-CCMB scientists have isolated an anti-microbial protein found in mil of egg laying mammal has potential to address the rise of superbugs due to the indiscriminate use of antibiotics by the animal husbandry industry to raise livestock.
- Scientists at the Centre for Cellular & Molecular Biology (CCMB) have discovered a new drug target and offer a potential for a new drug delivery route to **arrest the anti-bacterial resistance through existing antibiotic drugs**.
- Scientists from CSIR CCMB identify **genetic factors responsible for male infertility in India**, which is very high occurrence in India. Genetic studies reported from Europe and elsewhere do not match with observations in Indian population and a unique combination of genetic changes in infertile Indian men have been found, could potentially help in infertility treatment.

Collaborations with other Academic organizations/Workshop/ Policy Conclaves

- MoU between CSIR-CFTRI and Directorate of Food Processing, Govt. of Meghalaya
- CSIR-NEERI conducted a "National Working Group" meeting for development of LCA database roadmap for India. Experts from NEERI, CII, IIT, Indian Steel Association, NGT, INSDAG, Mahindra & RSM-GC participated in the sessions.
- CSIR-IMMT inked MoU with Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad to ensure collaboration in advanced materials technology.
- CSIR-IMMT inked MoU with IIT, Bhubaneswar aimed at promoting collaborative research work in the fields of Metallurgical Engineering, materials science & Engineering and Mechanical Engineering.
- 7th International conference on rare and undiagnosed diseases by CSIR-IGIB to promote diagnosis of rare diseases
- CSIR-NEERI has organized a Brainstorming on Closing the Loop: Sustainable Environmental Challenges to discuss about the role of Governance & Policy and Sustainable technologies.
- CRISPR-Cas9 based precision **genome editing** hands on workshop by CSIR-IGIB
- CSIR-NEERI organized National interaction meet at Kolkata on sector specific initial assessment of mercury in India.
- CSIR CECRI e-mobility meeting was held in presence of Dr V.K. Saraswat, Chairman, Niti Aayog
- Signing of MoU between CSIR-AMPRI, Bhopal and Nirma University, Ahmedabad in presence of Director, CSIR-AMPRI and DG, Nirma University.
- The Urban Ore Recycling Centre, and site for Amorphous Electrical Steel (AES) Pilot Plant was inaugurated
- CSIR-IICT, Hyderabad organized a one-day workshop on 'Indo-UK Consortium-Global Challenge Research Fund Meeting'.
- CSIR-IIIM, Jammu in collaboration with Department of Pharmacognosy & Phytochemistry, School of Pharmaceutical Education and Research, Jamia Hamdard, New Delhi organized a one-day interactive session on 'Development, Regulatory, IPR & Marketing challenges' that was sponsored by UGC-SAP.
- CSIR-AMPRI Bhopal signed an MoU with King George's Medical University, Lucknow to develop radiation shielding materials useful for the society

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Departmental Achievements and Major Activities

DSIR mandate is to promote industrial R&D besides technology promotion, development and utilization. Industrial R&D Promotion Programme of the department provides recognition and registration of in-house R&D units of industries, not for profit Scientific and Industrial Research Organizations (SIROs) and Public Funded Research Institutions (PFRIs), by virtue of which these organizations are able to obtain customs and other tax exemptions, including weighted tax exemptions. This scheme helps in encouraging industrial R&D in the country.

Fiscal Incentives for R&D by Industry: Weighted tax deduction in case of 45 applications from industries was reported in form 3CL to CCIT under Section 35(2AB) of IT Act. This involved a total amount of **Rs.28237.87 Lakhs** incurred on **R&D by Industry**.

Recognition/Registration and renewal of In-house R&D units of Industry

- ✓ 17 in-house R&D units of industries were granted fresh recognition as well as registration certificates
- ✓ 17 in-house R&D units of industries were granted renewal of recognition as well as registration certificates.

Recognition/Registration and Renewal of Scientific and Industrial Research Organization (SIROs)

- ✓ 46 SIROs were granted renewal of recognition certificates and 17 were granted renewal of registration certificates.

Registration and Renewal of PFRIs (Universities and Institutes)

- ✓ 04 PFRIs were granted renewal of registration.

Central Electronics Limited (CEL)

CEL is an enterprise under DSIR objective to commercially exploit the indigenous technologies has developed a number of products for the first time in the country through its own R&D efforts. It continues to emphasize its leading role in in the area of solar photovoltaic systems, electronic gadgets for Railway and other electronic equipment/components among others.

- ✓ The company manufactured electronic components/systems/SPV products worth Rs.855.81 Lakhs
- ✓ Sale of items worth Rs.411.90 Lakhs was reported in this month

Other Highlights

- Central Electronics Limited received Platinum Certification under IGBC Green Existing Building category for its administrative area.

- The company produced its first Ceramic Radome for Missile Radar using the technology from DMRL/DRDO.
- CEL's In-House Solar Power Plants have generated 52% of total power consumption of the company.
- CEL's manpower has been certified by ISRO-SAC for Circulator/Isolator production.
- The company has developed GARNET material for high frequency Circulator/Isolator applications.

National Research Development Corporation (NRDC)

NRDC continues to lay emphasis on broadening and strengthening the technology resource base by nurturing long-term relationships with R&D institutions as well as universities, technical organizations, industries and also individual inventors.

- NRDC has facilitated patenting and trademarking of India's first home made long-range howitzer gun Dhanush, which was formally inducted into the Indian Army recently after trials in the desert regions, and glaciers of the Himalayas. Dhanush which has inertial navigation-based sighting system, onboard ballistic computation and most advanced any time firing system was made by Indian Ordnance Factory, Jabalpur (Madhya Pradesh) providing thrust on indigenization in defence production.
- NRDC has paid Rs.9.87Crores to DSIR and CSIR towards Premia & Royalty share for commercialization of their technologies to SME's/start-ups/corporate for the year 2018-19.

MoUs signed by NRDC

- NRDC signed an MoU with M/s IOCL for monitoring and mentoring of Start-ups and managing their IP for Rs.1.86 Cr.
- NRDC signed 5 new MoUs with NIPER (Hyderabad), University of Hyderabad, Annamacharya Institute of Technology and Sciences, AP and others for assignment of technologies developed by provide marketing services
- 4 new technologies assigned by National Institute of Ocean Technology, (NIOT) to NDRC for licensing to industry.
- Corporation also conducted one-week workshop for all the ASEAN Member States (MS) with an objective to impart knowledge about Intellectual Property Rights in ASEAN (MS) in order to promote technological growth of the nation, technology transfer process and facilitate networking between member countries.
