

**GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
LOK SABHA
UNSTARRED QUESTION No. 2019
TO BE ANSWERED ON 29/11/2019**

MAJOR INNOVATIONS AND DISCOVERIES

†2019. SHRI KAPIL MORESHWAR PATIL:

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

- (a) the details of major innovations and discoveries made in the field of science and technology across the country during the last three years and the current year;
- (b) the steps taken for the commercialization of such innovations/ discoveries; and
- (c) the progress made in this regard?

ANSWER

**MINISTER OF HEALTH AND FAMILY WELFARE; MINISTER OF SCIENCE AND TECHNOLOGY; AND MINISTER OF EARTH SCIENCES
(DR. HARSH VARDHAN)**

स्वास्थ्य और परिवार कल्याण मंत्री; विज्ञान और प्रौद्योगिकी मंत्री; और पृथ्वी विज्ञान मंत्री
डॉ. हर्ष वर्धन

(a) Several scientific organisations such as Department of Science & Technology (DST), Department of Biotechnology (DBT), Indian Council of Medical Research (ICMR), Department of Space (DoS), Council of Scientific & Industrial Research (CSIR) have made new innovations and discoveries in the field of Science & Technology in the country during the last three years and the current year.

Indian Institute of Technology (IIT), Kanpur has developed an autonomous, unmanned, mini helicopter with support from DST. The indigenously developed vehicle has huge potential for use in agricultural spraying, surveillance, monitoring and aerial survey as well as for medical supplies and various defence applications. The helicopter is a result of a combination of innovations in mechanical systems, electrical systems and control aspects. The mini helicopter was developed with controls on-board and successfully flown in wireless mode with two phases of continuous support by DST and review and guidance by experts in the area drawn from different research organisations, National Laboratories and Academic Institutions.

31 technologies have been Developed/ Demonstrated/ Transferred under Technology Development Programmes of DST in the area of Advanced Manufacturing, Waste Management and Devices for Agriculture, Textile, Analytical and Biomedical Applications.

The Ultracapacitor based Powered Lift technology suitable for 10 persons has been developed that stores regenerated energy in an ultracapacitor bank and reuses it at the time of demand /power failure condition without any interruption for High Rise Buildings.

Carbon nanotube coated cotton yarns (CNT-wires) have been developed to power wearable devices. A simple and elegant approach of interweaving CNT wire across the electrolyte, supercapacitive junctions can store electrical energy.

Wind Augmentation and purifying Unit (WAYU) is an air purification system that can remove pollutants which are emitted by vehicles. It allows reducing ambient air pollution levels at traffic intersections.

An innovative and affordable technology product- Micro Solar Dome (Surya Jyoti) developed by NB Institute of Rural Technology (NBIRT), Kolkata under TARA scheme of DST would be useful for rural, tribal populations who do not have access to electricity or in forest areas. It has an additional feature for mobile charging.

Supercritical Brayton loop- A test loop has been established at Indian Institute of Science, Bangalore to generate necessary data for future development of scaled up supercritical carbon-dioxide power plants under Technology Missions Programme of DST.

13 innovations and discoveries/ technologies have been developed or transferred from projects funded by Indo-German Science & Technology Centre (IGSTC).

ICMR has developed more than 40 technologies of which 10 have been transferred to industry for up-scaling and commercialization during last three years. Truenat Rif, an indigenous, cost effective, rapid molecular diagnostic kit for TB/MDR-TB has been developed in collaboration with ICMR, DBT and the industry has been recommended for implementation in phased manner.

Many technologies have been developed by Department of Space such as Multilayer Printed Antenna Technology, DDV 100 Resin, Dual Polarisation LIDAR, Precision Tapping Mechanism, 15 W C Band Solid State Power Amplifier, DK-18 ceramic, Photosynthesis Irradiance Incubator Box, CSNM 0102 adhesive, Hard anodizing at room temperature, Polyimide film including production of Polyamic acid, HESC/CSNM-29M, Sesco-125 flame retardant coating, EPY 1061 coating compound, BMT ceramic, Benzoxazine Resin, EFA 4330 Film Adhesive, PC-10 Thermal Protection System, Silica Fiber, Silica Granule, Nickel Hydrazine Nitrate, Lithium Ion Technology, Fisherman NavICDevice, etc. About 20 technologies have been concluded with industries.

Several Innovations/Technologies have been developed by CSIR. Some of these are Jet fuel derived from Biomass, Waterless Chrome Tanning Technology, Zero liquid discharge leather technology, Coal dust collecting and briquetting system, Genomics and other Omics tools for Enabling Medical Decisions, Red mud based lead free material for X-Ray and CT Scanner Rooms, Technology for Carbonated fruit juice beverages from selected fruits, Prevention of Adulteration in Milk.

(b) & (c): Technology Development Board (TDB), a statutory body of Government of India, provides financial assistance, in the form of soft loans, equity and grants to Indian industrial concerns/companies attempting development and commercialization of indigenous technology or adaption of imported technology for wider domestic applications.

TDB has provided financial assistance to 37 industrial concerns/companies for projects covering various sectors such as Health & Medical, Engineering, Information Technology, Chemical, Agriculture, Tele-communications, Road Transport, Energy & Waste Utilization, Electronics, Textile, etc. Some of these projects are on commercialization of Pneumococcal Conjugate Vaccine, Lead-Acid Battery Recycling Technology, Development and commercialization of straw utilization technology (In-situ Accelerated and Sustainable Rice Straw Decomposition (ASRSD), Technology Adaption & Manufacturing of BS VI Quality Standard Pistons.

“Biotechnology Industry Research Assistance Council” (BIRAC) under DBT has provided funding to entrepreneurs, startups, SMEs and translational organizations. This has helped to bring high quality and affordable products towards commercialization. BIRAC has facilitated commercialization of several research & development based new products.

CSIR has an established system for commercialization of innovations/knowledge base. CSIR has incentivized commercialization of innovations/ knowledge base. The guidelines are in place with respect to incentives for licensing/commercialization of innovations/ technologies/knowledge base.

Several steps have been taken for commercialization from DST supported projects. A Laterite based Arsenic (As) filter that uses naturally abundant raw laterite modified by suitable chemical treatment has been developed at IIT Kharagpur and technology has been transferred to a start up for commercialisation. The technology requires no power for functioning. The adsorbent is cost effective and adsorbs both As (III) and As (V). It removes Arsenic, Iron and Bacteriological contamination.

Mercury Free Plasma UV (MFP-UV) lamp - A technology to produce UV radiation using plasma for disinfection has been successfully transferred for commercialization to Turners Pvt. Ltd. Jaipur.

An Electric Vehicle (EV) Charger prototype and its controlling software application has been developed at IIT Delhi and technology has been transferred to BSES Rajdhani Power Limited (BRPL) for testing and commercialisation.

AMRIT is an affordable solution for providing clean arsenic and iron free drinking water in arsenic affected areas. Technology has been already transferred to Start up Inno Nano Pvt Ltd and this start up incubated has commercialised nano based materials and water purification products.

Five technologies were transferred to industry by Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Trivandrum during the previous year.

International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad has transferred solar thermal energy technology for low temperature industrial heating to Greenera Energy Pvt Ltd Coimbatore.

Indian Association for Cultivation of Science (IACS), Kolkata has transferred triboelectric generator technology to Continental Automotive GmbH, Germany for further development and commercialization.

Some of the ICMR technologies launched in the market are given below:

- (i) Diagnostic kit for Crimean-congo haemorrhagic fever(CCHF) Sheep and Goat**
- (ii) Diagnostic kit for Crimean congo haemorrhagic fever (CCHF) in Cattle**
- (iii) Diagnostic kit for Japanese Encephalitis virus (JEV) from Mosquito**
- (iv) AV –Magnivisualizer for detecting cancer lesions**

Several technologies of Department of Space are being successfully used by industries today.
