

**GOVERNMENT OF INDIA  
MINISTRY OF SCIENCE AND TECHNOLOGY  
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH**

**LOK SABHA  
STARRED QUESTION NO. \*84  
TO BE ANSWERED ON 22.11.2019**

**COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH**

**\*84. SHRI NALIN KUMAR KATEEL :**

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

- (a) whether the Government has set any target for the Council of Scientific and Industrial Research (CSIR) in the field of research and development;**
- (b) if so, the details thereof and the achievements made by the CSIR till date;**
- (c) the number and details of projects taken up by the CSIR for progress and development of the country; and**
- (d) the total funds allocated and spent for the CSIR during the last three years and the current year ?**

**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 एवं प्रौद्योगिकी मंत्री; तथा पृथ्वी विज्ञान मंत्री  
(डॉ. हर्ष वर्धन)

**(a) to (d) : A statement is laid on the Table of the House.**

**STATEMENT REFERRED TO REPLY TO PARTS (a) TO (d) OF  
LOK SABHA STARRED QUESTION NO. \*84 ON 22/11/2019  
REGARDING COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH.**

- (a) **Council of Scientific & Industrial Research (CSIR) has been assigned specific functions aimed at strengthening National Innovation System (NIS). CSIR's focus is on pursuing science which strives for global impact, technology that enables innovation driven industry and nurtures trans-disciplinary leadership thereby catalyzing inclusive economic development for the people of India. It thus provides: Science & Technology interventions to benefit society; cutting edge technologies to industry so as to enhance national competitiveness; and technological support to the strategic sector to strengthen and deepen the capability and capacity base. It catalyses S&T based entrepreneurship as well, and, has been building a sustainable ecosystem for S&T based Human Resource development including Skill Development.**

**CSIR has been providing significant technological interventions in many areas which include environment, health, drinking water, food, housing, energy, specialty chemicals & petrochemicals, glass & ceramics, medicinal plants & plants of economic value, leather, mining, metals & minerals, machinery & instrumentation, strategic sectors including aerospace etc. In doing so, CSIR partners with Industry in a significant manner.**

**CSIR has covered over the years, a wide spectrum of Science and Technology. It ranges from radio and space physics, oceanography, earth sciences, geophysics, chemicals, drugs, genomics, biotechnology and nanotechnology to mining, materials, aeronautics, instrumentation, environmental engineering and information technology.**

**CSIR is the Nation's custodian for Measurement Standards: Mass, Distance, Time, Temperature, Current etc. CSIR has created and is the custodian of Traditional Knowledge Digital Library (TKDL) which is a powerful weapon against unethical commercial exploitation of "Indian Traditional Knowledge".**

**CSIR is amongst the top 50 global institutions by normalized World Intellectual Property Organization (WIPO) patent families, standing at 16, and is the only Indian organization in this top 50 lineup.**

- (b) The major recent achievements/initiatives of CSIR are given at Annexure -1.
- (c) R&D activities are being pursued by CSIR in following categories of projects namely: (i) Fast Track Translation (FTT); (ii) Fast Track Commercialization; (iii) Mission Mode; (iv) Focused Basic Research (FBR); and (v) Niche Creating High Science/ High Technology (NCP). These are grouped under eight themes: (i) Aerospace, Electronics, Instrumentation & Strategic Sectors (AEISS); (ii) Civil, Infrastructure & Engineering (CIE); (iii) Ecology, Environment Earth & Ocean Sciences and Water (E3OW); (iv) Mining, Minerals, Metals and Materials (4M); (v) Chemicals (including leather) and Petrochemicals (CIP); (vi) Energy (Conventional & Non-Conventional) and Energy Devices (EED); (vii) Agri., Nutrition & Biotech (ANB); and (viii) Healthcare (HTC). Apart from this, CSIR has supported specific laboratory and rural development oriented projects such as HARIT (Harnessing Appropriate Rural Interventions and Technologies) to leverage its strong scientific and technological knowledgebase for the benefit of people of the country lying at the bottom of the economic pyramid. A total of 473 projects are under implementation during current financial year, their details are attached at Annexure-2.
- (d) The total fund allocated to and spent by CSIR during the last three years and the current year is as follows:

<b>Financial Year</b>	<b>Fund Allocated / Spent (Rs in Crores)</b>
<b>2016-17</b>	<b>4013.06</b>
<b>2017-18</b>	<b>4582.12</b>
<b>2018-19</b>	<b>4521.28</b>
<b>2019-20 (Budget Estimates)</b>	<b>4831.58 2615.517 (spent upto October, 2019)</b>

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## **Major recent achievements/initiatives of CSIR**

### **India's first biofuel-powered flight: CSIR Technology for Aviation Grade Biofuel**

A historic flight powered by indigenously produced aviation biofuel based on patented technology of CSIR-Indian Institute of Petroleum (IIP), Dehradun completed journey from Dehradun to Delhi on August 27, 2018. With this maiden flight India joined the exclusive club of nations using biofuel in aviation. The use of bio jet fuel, apart from reducing greenhouse gas emissions by about 15 percent and Sulfur Oxides (SOx) emissions by over 99 percent, is expected to provide indigenous jet fuel supply security, possible cost savings as feedstock availability at farm level scales up, superior engine performance and reduced maintenance cost for the airline operators. For the first time in the country, on 26th January 2019, an An-32 transport aircraft of IAF flew with blended bio-jet fuel produced by CSIR technology.

### **Successful Inaugural Flight of SARAS PT1N**

SARAS PT1N (14 seater) light transport aircraft designed and developed by CSIR-National Aerospace Laboratories (CSIR-NAL) was flown successfully on 21.02.2018. The primary objective of PT1N is to evaluate system performance in about 20 flights and the data collected from this shall be used to freeze the design of 19 seater production version aircraft - SARAS MkII.

### **Drishti Transmissometer: Deployment across Indian Airports**

Drishti is an Indigenous - Innovative –Cost effective visibility measuring system -- First of its type and CSIR is the only organization to have developed this technology in the country. It is useful for airport operations and gives information to pilots on the visibility at the runway. Drishti Transmissometers have been installed at a number of civilian and Indian Airforce airports across the country.

### **CSIR Technologies for India's First Light Combat Aircraft - TEJAS**

CSIR has been Integral Partner with ADA in Design and Development of TEJAS. CSIR developed and fabricated 165 composite parts, Fly-by-Wire (FBW) Control Systems and State of art training simulator

### **CSIR Mission on Sickle Cell Anaemia**

CSIR is implementing a Mission on Sickle Cell Anaemia. The project envisages managing genetic burden of Sickle Cell Anaemia and understanding genetic basis of differential response to Hydroxyurea Therapy, Drug discovery and development for management of SCA, Genome editing and stem cell research approach for the treatment of SCA and development and on-ground implementation of an affordable, accurate and accelerated diagnostic kit.

### **CSIR Aroma Mission**

The CSIR Aroma Mission is envisaged to bring transformative change in the aroma sector through desired interventions. It is aimed at development of superior aroma crop varieties and their agro-technologies and assessment of their suitability for the large scale cultivation

in specific agro-climatic regions; In 15 months since the project was launched, an area of about 50000 hectare has been brought under cultivation of aromatic plants across the country under the project.

### **CSIR Phytopharmaceuticals Mission**

The CSIR Phytopharmaceutical Mission is envisaged to bring transformative change in the medicinal plants sector through captive cultivation of selected medicinal plants, including rare, engendered and threatened species, production of quality planting material and development of region specific agro technologies; technology packages for production of GMP grade medicinal plant extracts; and phytopharmaceutical development from important medicinal plants. In the first year of project implementation, mass multiplication of quality planting material and captive cultivation of target plant species in different states/districts has been achieved. Further, plants of 25 Rare, Engendered and Threatened (RET) species have been collected for genebank.

### **Innovative Processes and Technologies for Indian Pharmaceuticals and Agrochemical Industries (IMPROTICS)**

CSIR has launched a Mission Mode Project on "Innovative Processes and Technologies for Indian Pharmaceuticals and Agrochemical Sector Industries (INPROTICS-Pharma and Agro)". The project aims to develop cost effective, profitable processes for key drugs and agrochemicals. In case of pharmaceuticals, new or non-infringing processes that are free to operate shall be developed. Thus this proposal wishes to serve the country with its contributions to 'Make in India' program and also toward better health and food security for all Indians.

### **CSIR Mission on 'Safety and Security of Vital Installations'**

CSIR has recently launched a mission on 'Safety and Security of Vital Installations' which envisages to address following issues: Earthquake Hazard quantification studies in Uttarakhand; Design and development of efficient slope stabilization measures of mitigate landslide hazards for the safety of vital installations in hilly regions of NW Himalayan Belt; Safety of Hospitals particularly in seismic prone zones; To evolve blast and impact resistant design of Hardened Aircraft Shelter with layered configuration for a specified threat; Structural Health Monitoring (SHM) through innovative solutions consisting of smart video camera system, smart video surveillance system, Real-time system for identification of outsiders; Border security management system based on intelligent multi-sensor approach; and Active Fire Protection System for the design and development of customized fire safety and security solutions for Hospitals. CSIR has already prepared Earthquake Risk Index Map of the City of Dehradun which can be used to prepare for facing the expected Earthquake event in its aftermath.

### **CSIR Mission on Development of Fast, Durable and Energy Efficient Mass Housing Scheme**

The mission is aimed at developing and deploying at a scale in partnership of stakeholders the prefab technologies for construction of fast, durable, energy efficient and affordable interventions for mass housing. Efficient design of precast structural panels using various materials will be developed to achieve desired performance such as light weight (50%

reduction), improved fire rating (minimum 2hrs), durability (70-80years), cost effective (25% lesser compared to lowest available) with reduced cycle time of 5-7 days compared to existing 16-19 days. The mass housing schemes are planned to be developed suiting to socio-cultural requirements in different geo-climatic regions across the country. The developed technology(ies) /know-how(s) will be demonstrated by 3D virtual displays and by prototype demo units for the purpose of end to end training and needful deployment.

### **CSIR Mission on Technologies for Robust Structural Health Monitoring of Critical Infrastructure and Conservation & Restoration of Heritage Structures**

The mission comprises of two verticals namely Robust Structural Health Monitoring Technologies for Critical Infrastructure Management (Vertical 1) & Conservation and Restoration of Heritage Structures (Vertical 2). Mission Vertical 1 is aimed at developing technologies for structural health monitoring of critical Infrastructure using advanced signal processing, machine learning techniques combining with IOT and cloud-enabled technologies for early detection of damage in civil infrastructure. Vertical 2 of the mission is aimed at developing state-of-the-art technologies for conservation and restoration of heritage structures. Guidelines for conservation and restoration of heritage structures in India will also be prepared.

### **CSIR's new patented Clot buster, PEGylated Streptokinase set to revolutionize the treatment of Strokes**

Ischemic stroke is a condition caused by a dysfunction in the supply of blood to the brain due to emboli, thrombus or atherosclerosis occurring in cerebral arteries. Surprisingly, the prevalence of stroke is much higher in India than the West and about 87% of all strokes are ischemic strokes. CSIR-IMTECH and Epygen have entered into an agreement for the latter to develop PEGylated Streptokinase for treatment of Ischemic Stroke.

### **Non-vascular self-expandable stents**

Stents are used in the treatment of numerous biliary tract diseases, ranging from benign biliary diseases to malignant strictures. Two types of biliary stents find extensive use: plastic stents and self-expanding metallic stents. Amongst these while the self-expandable metal stents offer longer patency their prohibitive cost makes them unaffordable. CSIR-NCL in collaboration with a start-up has developed a new class of self-expandable stents based on a novel scroll design. These stents have been made with simple polymer-metal composites unlike the shape memory alloy based stents. These stents could be made a much lower costs than the currently available ones. Process for transferring the technology to two companies is on.

### **CSIR's Divya Nayan for Visually Impound**

CSIR-Central Scientific and Industrial Organization has developed a Personal Reading Machine named- Divya Nayan, for Visually Impaired which can read any printed and digital books available in Hindi and English. Divya Nayan has been tested with a number of visually impaired people with different age groups and has gained wide popularity.

## **Development and licensing of affordable Water Disinfection System Oneer™**

CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow has developed technology for “Drinking Water Disinfection System” with Trade name “Oneer™”. It is useful for continuous treatment of water. The technology of “Drinking Water Disinfection System” was transferred to M/s Bluebird Water Purifiers, New Delhi. Oneer developed by CSIR-IITR will provide safe and clean drinking water at a cost of just 2 Paise / Ltr. The Community level model is of 450 LPH capacity. It can be scaled up to 5000 to 1 lakh L/day;

## **Waterless Chrome Tanning Technology- a Game Changing Technology**

Chromium is the most sought after tanning agent with about 2.0 billion sq. ft. of leather being made in India. About 20 thousand tons of chrome tanning agent is discharged in the wastewater. In order to overcome the problem, CSIR-CLRI has developed waterless chrome tanning technology.

The waterless tanning technology has now found PAN INDIA acceptance, with tanners in all clusters enrolling for its adoption. The technology has been put to use in about 50 tanneries in the country. This is truly a game changing technology that has emerged from the CSIR through CLRI.

## **Zero liquid discharge leather technology**

A zero wastewater discharge process technology based on Electro-oxidation (EO) has been developed for the first part of the leather manufacturing process, the pre-tanning processes. The potential environmental benefits and potential social impacts for India includes: No discharge of wastewater from tanneries; The possible reduction of cost will be about Rs. 96 million per annum from reduction in the cost of wastewater treatment; This system does not result in generation of sludge (about 160 tons’ sludge per annum) and less average annual fatalities due to release of H<sub>2</sub>S. The technology has been transferred to M/s Leayan Global Pvt Ltd, Kanpur; M/s Royal Tanners, Kanpur; and AN Leathers Pvt Ltd, Agra.

## **High Grade Gelatin from and Protein Hydrolysate from Raw Hide and Skin Trimming Wastes**

Gelatin is widely used in the pharmaceutical industry to make capsules for drugs as well as in the food industry to make jelly candies, ice cream, and as thickening agent in cakes and soups. Leather processing generates huge amount of raw trimming wastes. CSIR-CLRI has developed technology for making high grade gelatin from waste material-trimmings of raw hide. The technology developed by CSIR-CLRI is towards complete utilization of proteinous constituents present in the trimmings. This technology is exclusively licensed at a cost of Rs. One Crore to M/s Anipro Manufacturing Company for making gelatin and protein hydrolysate within India.

## **Coal dust collecting and briquetting system**

It is pertinent to collect the dust from mine roads and put it to alternative use not only for reducing air pollution but also for improving the health of local populace. Road dust collecting system has been developed. CSIR-CIMFR has transferred the patented technology to M/s Tata Motors Limited, Mumbai.

### **Phytopharmaceutical for Glucocorticoid-induced Osteoporosis**

Globally glucocorticoid is the third biggest cause of osteoporosis. CSIR-CDRI has developed a standardized fraction of *Cassia occidentalis* Linn. for the treatment of glucocorticoid-induced osteoporosis and muscular atrophy. Technology licensed to M/s Pharmanza Herbals Pvt Ltd., Gujarat for further development and commercialization as a Phytopharmaceutical drug. The product is under development in Phyto-pharmaceutical mode and would be available in Indian and the U.S. market after completing necessary studies as per the regulatory guidelines.

### **Safe Disposal of Municipal Solid Waste utilising high temperature plasma**

The technology has been developed for effective & eco-friendly disposal of municipal solid waste material generated on daily basis and generation of fuel gas containing predominantly CO and H<sub>2</sub> utilizing high temperature (>3000 °C) Plasma arc. The technology has been licensed to M/s Positronics Innovation Pvt. Ltd, Kolkata, WB for commercialization on non-exclusive basis for a period of 5 years.

### **Development of Solar Tree/Artifacts for generation of power utilizing lesser ground area**

Solar Power Tree is the perfect solution to the question of availability of the land in the future for generating solar power - It take up only a fraction of land consumed by conventional systems. To bring visibility to solar technology and to enhance the beautification of a site, CSIR-CMERI has developed solar artifacts.

**Attapatram** is of 1kWp capacity and can provide 0.5kW electricity for 3 hours. These can be installed in the beaches, river banks, parks and even in the lawn of a bungalow.

**Solar Flora** is of 3kWp capacity and can be installed in the road side, parks and other remote areas to provide electricity.

**Surya Banaspati** is of 5kWp capacity and can be installed in the road side, parks and other remote areas to provide electricity.

The technology has been transferred to 9 Industries for commercialization in non-exclusive basis for a period of 5 years.

### **Development of Intelligent & powered wheel chair**

CSIR-CMERI developed system has immense societal value for the physically challenged people, old age population for mobility and rehabilitation purpose. Intelligent & powered wheel chair design provides enhanced mobility and stability and capability to turn full 360 degrees in any narrow corridor. The Technology has been transferred to Indian Industry for commercialization for a period of 5 years.

### **Large Scale Production of Graphene Oxide**

Graphene oxide is extensively used in energy storage devices, polymer composites, desalination of water, conducting ink, aqueous lubrication, nano-coolant, additive for phase change materials, etc. Graphene oxide is not toxic and hazardous for the environment. The cost of commercially available graphene oxide is very high and scaled-up production of graphene oxide at reasonable price without compromising the quality is a challenging task.



The technology developed by CSIR demonstrates the production of graphene oxide starting from natural flake graphite. The Technology has been transferred to one Indian Industry for commercialization for a period of 5 years.

### **Salivary Fluoride Detection Kit**

The indigenous salivary fluoride level detection kit and sensor station is unprecedented in its kind towards diagnosis of salivary fluoride level for the welfare and betterment of the society. It protects from Dental Caries; helps in remineralization; protects against tooth decay; and helps prevent premature tooth loss. The Technology has been transferred to two Indian Industries for commercialization for a period of 5 years.

### **Boring machine based on trenchless technology**

Trenchless construction limits the amount of excavation and the surface repairs needed after digging. Available imported machines are of large capacities for big projects and very expensive. No such machine is being manufactured indigenously. To address this gap, boring machine based on trenchless technology has been designed and developed.

The developed machine can bore upto 14 m length and 160 mm dia. holes under the roads and buildings for laying sewer/ pipe lines and cables. The developed machine is affordable and can be used by small/middle class contractors. It is light in weight, portable and requires low maintenance and Suitable for both wet and dry boring. The technology has been transferred to M/s Techno Industrial Marketing, Uttarakhand

### **Micro Fuel Cell**

Micro fuel cell is a power source for electronic devices that converts chemical energy into electrical energy. The scaled down fuel cells can be used in electronic devices such as digital cameras, radios, toys and other low power applications. CSIR has developed cost effective, simple and easy to fabricate micro fuel cell for use in low power applications. Technology has been transferred to M/s Victor Industries Pvt. Ltd., Sangli, Maharashtra on non-exclusive basis.

### **New Rice Variety with Low Glycemic Index Released- A Diabetic Friendly Rice**

CSIR-CCMB in collaboration with the Indian Institute of Rice Research at Hyderabad has released a new variety of rice that resists pests and is also beneficial for those with diabetes. The new Improved Samba Masuri (ISM) rice variety is resistant to Bacterial Blight (BB) and at the same time has the lowest Glycemic Index (GI) at 50.9 among all major rice varieties, which is an improvement over the 52.9 GI of the earlier Samba Masuri variety. At present, almost 40 per cent of the normal Samba Masuri rice crop is being lost due to Bacterial Blight (BB). The new ISM variety of rice is, therefore, expected to significantly reduce this crop loss, which eventually would lead to reduced prices of rice and increased profit margins for farmers and traders. The traditional Samba Masuri rice is commonly called Sona Masuri and Kurnool Masuri and has very low resistance to BB, a pest disease for which there is no chemical solution yet.

### **Handheld GPS-Enabled 'Ksheer Tester'-System for detection of Adulteration in milk**

'Ksheer Tester', newly developed by CSIR, is a handheld GPS-enabled version of the recently launched Ksheer Scanner technology to check adulteration in milk. It will empower the common man with a technology to tackle a national level health hazard due to adulteration in milk. The device would enable any person to track the location of the tested sample and receive the test results through SMS on the device.

### **Lithium Ion Battery: India's first indigenous fabrication facility**

CSIR has set up the first indigenous Li-ion fabrication facility that has applications in defense, solar powered devices, railways and other high end usages. It is in a step towards self-reliance to meet defense requirements and to cut the dependence on imports. Mass production of indigenous Li-ion batteries would reduce the cost manifold as compared to the imported batteries. The CSIR technology includes solution for a 400 mAh (milliampere hour) battery to power solar lanterns. The other versions have different user-end capabilities, including heating power tools and those used in firing torpedoes, for which India procures batteries from abroad. The application is also for railway lighting and signaling, for which Indian Railway majorly uses lead acid batteries which are polluting. Railways also use Li-ion batteries which are imported and expensive.

### **CSIR's certification for coal used power plants**

CSIR has signed an annual Rs. 250-crore deal with several state-run coal and thermal power companies to certify the quality of the coal being supplied and used in their facilities. The certification helps power plants to use coal appropriate to the machinery and technology available in the plant and contribute to efficient use and, in the long run, reduce emissions. It provides a robust mechanism for proper inspection of coal and overtime [and has led to an improvement in the quality of coal.

### **Development of Green crackers with less pollutant emission**

Ahead of Diwali, CSIR launched green firecrackers in a bid to "resolve the crisis of air pollution" in the capital. These environment friendly Crackers are of new formulations for reduced emission light and sound emitting crackers with 30% reduction in particulate matter. CSIR has also successfully developed various environment-friendly fireworks such as sound emitting crackers, flowerpots, pencils, chakkar and sparklers.

CSIR in developing these green crackers have signed nearly 230 MoUs and 165 Non-disclosure Agreements with firework manufacturers in order to deliver the crackers. Also these green crackers are equipped with a green logo as well as a Quick Response (QR) coding systems which have been developed for differentiation of green crackers from conventional crackers.

### **1000 Genome Sequencing completed**

CSIR has conducted Whole Genome Sequencing of 1,008 Indians from different populations across the country. The whole genome data is important for building the knowhow, baseline data and indigenous capacity in the emerging area of Precision Medicine. The outcomes of this will have applications in a number of areas including predictive and preventive medicine with faster and efficient diagnosis of rare genetic diseases. CSIR also pioneered the

application of genomics in clinical settings in the area of rare genetic diseases in India by means of DNA/Genome based diagnostics and interaction with large number of clinical collaborators.

### **CSIR's Integrated Skill Development initiative**

CSIR labs established connect with various Sectoral Skill Councils (SSC):

- Leather Sector Skill Council (CSIR-CLRI);
- Life Sciences Sector Skill Council (CSIR-IICT);
- Capital Goods Sector Skill Council (CSIR-CSIO);
- Automotive Sector Skill (CSIR-CSIO);
- Aerospace & Aviation Sector Skill Council (CSIR-NAL);
- Agriculture Sector Skill Council (CSIR-NIO/ CSIR-NBRI/CSIR-IITR);
- Skill Council for Mining Sector (CSIR-CIMFR); and
- Health Care Skill Council (CSIR-IICB) and Paint & Coating Skill Council (CSIR-CECRI).

### **CSIR JIGYASA: Inculcating Scientific Temper in Youth Through Vibrant Scientists-Students Interaction**

Under CSIR & KVS Student-Scientist connect programme "JIGYASA". 1151 Kendriya Vidyalayas connect with 38 CSIR Laboratories targeting one lakh students and nearly 1000 teachers annually. The focus is on connecting school students and scientists so as to extend student's classroom learning with that of a very well planned research laboratory based learning.

The programme is a unique platform to bringing in teachers and scientists for nurturing young minds. The programme envisages opening up the national scientific facilities to school children, enabling CSIR scientific knowledgebase and facility to be utilized by school children.

**Details of CSIR projects in various categories****A. Fast Track Translation (FTT) Projects completed**

Sr. No.	Lab	Project Title
1.	CSIR-CCMB	Paper based affordable microfluidic kit for early pregnancy detection in cattle and buffaloes
2.		Development of simple and affordable diagnostic protocols and diagnostic kit for genetic diagnosis of musculopathies and hemoglobinopathies
3.	CSIR-CDRI	Clinical development of Candidate Drug 99/373 (Anti-osteoporotic)
4.		Clinical development of candidate drug 97/78 (anti-malarial)
5.	CSIR-CFTRI	Know-how of the isolation of arabinoxylans from defatted cereal brans
6.		Development and production of anti-obesity DAG Oil
7.		Non-thermal processing of liquid foods
8.		Technology for carbonated fruit juice beverages from selected fruit crops
9.	CSIR-CIMAP	Development of a high yielding variety of Artemisia annua
10.		Development of improved variety for high root yield with better quality of Yellow Satwar ( <i>Asparagus adscendens</i> Roxb.)
11.		Development of a linalool rich cold tolerant <i>Ocimum</i> chemotype
12.		Development of withanolide rich, quality root & early maturing advance breeding line with a novel ideotype
13.		Calliterpenone for enhancing crop yields
14.	CSIR-IGIB	Go-Med
15.		NGS based high resolution HLA typing kits
16.		NGS for mitochondrial diagnosis
17.		PulmoScan
18.	CSIR-IHBT	Developing L-Asparaginase with Low Glutaminase Activity for Therapeutic Applications
19.		Process for substituted cyclohexane-1-3-dione synthesis
20.	CSIR-IICB	Rapid Assay System and Clinical Validation of Biomarker for Rheumatic Heart Disease
21.		Serum and urine-based kits for diagnosis (VL) and post kala-azar dermal leishmaniasis (PKDL) in the field setting
22.	CSIR-IIIM	Mupirocin + IIIM-1133/06: A topical formulation for improved bioefficacy
23.		Agrotechnology transfer and thymol crystal from Jammu monarda
24.		IND filling of anti-cancer lead IIIM (N)-290/13 (Cdk inhibitor)
25.	CSIR-IITR	Development of biosensors ( <i>Indicator-eye Test Range</i> ) for detection of adulterants in food products
26.		Development of a new real time PCR based system for the quantification of small RNAs and circular RNA and development of a new kit for absolute quantification of miRNAs
27.		An electric device for online drinking water disinfection
28.	CSIR-IMTech	Technology for Recombinant Streptokinase
29.		For market-gelsolin estimation kit and gelsolin(s)

30.		A universal expression platform for low cost production of biotherapeutic proteins in S.pombe
31.		Technology Development for production of pullulan
32.		Production of a biomedically important glycolipid bio-surfactant sophorolipid
33.	<b>CSIR-NBRI</b>	Thebaine rich opium poppy lines for suitable cultivation through narcotics department
34.		Low grain arsenic rice variety for safer human consumption
35.		Anacardic acid: A potential molecule to increase cotton fibre yield and quality
36.	<b>CSIR-CECRI</b>	Development of Zinc Bromine redox flow battery (500 W)
37.		Electrochemical remediation of industrial effluents and recovery of chromium
38.		Development of accurate, reliable and cost effective sensor for the electrochemical detection of multiple analytes
39.		Development of High temperature ceramic Thermal barrier coatings for Missile components
40.	<b>CSIR-CIMFR</b>	Coal dust collecting and briquetting system
41.	<b>CSIR-CLRI</b>	Waterless chrome tanning
42.		High grade gelatin and protein hydrolysate from trimmings
43.		Zero Wastewater Discharge Technology
44.		Cocktail of carbohydrases for rapid fiber opening
45.	<b>CSIR-CSMCRI</b>	Technology for double fortified salt composition containing iron and iodine to control both deficiencies
46.		Hollow fiber membrane based high flux domestic filter for water clarification and disinfection
47.		Novel cost effective process for high purity solar salt production with reduced contents of carbon, iodine, suspended solids and sulfate content directly in solar salt fields from high sulfate containing brines (particularly for Rajasthan inland/lake brines)
48.		A consolidated biomass process for integrated production of multiple products from fresh marine macroalgae
49.	<b>CSIR-IICT</b>	Development of multipurpose thermal insulation coatings for different substrates
50.		Development of novel processes towards Eribulin, Nicotine, Bedaquiline
51.		Discovery of Novel Anticancer Agent (HDAC Inhibitor)
52.		Polymeric excipients for pharmaceutical applications
53.	<b>CSIR-IIP</b>	Setting up 1 TPD pilot plant for converting waste plastics to diesel
54.		Technology demonstration and process flexibility for production of Bio-Aviation fuels
55.		Demonstration and Process Validation of Laboratory scale Vacuum Swing Adsorption (VSA) Process for Biogas Up-gradation to Pipeline Quality Fuel from Raw Biogas
56.		Development of Adsorption Based Technology for the Production of Ultra Low Sulfur Diesel meeting BS IV /BS VI specification Development Positioning
57.	<b>CSIR-NCL</b>	Synthesis of 5-Hydroxymethyl furfural from sacharides
58.		Continuous Dinitration for Manufacturing of Pendimethalin

59.		Development of penicillin V acylase system for industrial production of semi-synthetic antibiotics
60.		Non-vascular self-expandable stents
61.	CSIR-NEIST	<i>In-situ</i> bioremediation technology
62.		Herbal product for management of pain
63.		Membrane Based Process Technology for Commercial Production of Biomolecules
64.		Modular Bricks from Brahmaputra River Bed Sand
65.	CSIR-NIIST	IR reflecting rare earth blue pigment for solar heat control cool-roof applications
66.		Scaled up process for the upgradation of Low grade of Ilmenites
67.		Development of process for large scale production of $\beta$ -glucosidase (BGL) enzyme for blending in biomass hydrolyzing cocktails to be used in Lignocellulosic Biorefineries
68.	CSIR-AMPRI	Aluminium Composite Foams (ACFs) for Crashworthiness Applications
69.		Fibre and particulate reinforced hybrid polymeric composite as architectural interior for building construction material
70.	CSIR-CBRI	Building products using Kota stone cutting and slurry waste
71.		Foundation system for light structures
72.		Development of a boring machine based on trenchless technology
73.	CSIR-CGCRI	Paper-based Ceramic Separator for Li-ion Battery Application
74.		Packaged Fiber Laser Modules for Industrial and Medical Applications
75.		Development of Reaction Bonded Silicon Nitride Ceramic Radome
76.		Superior Refractory for Induction Furnace to enable Refining of Steel
77.		SiAlON Insert for High Speed cutting of hard materials
78.		Fast Recovery Trace moisture sensor and meter for detection of trace moisture present in transformer oil
79.		Development of novel Ion doped Hydroxyapatite (Ap) by spray drying method and its utilization for plasma spray coating on medical implants with/without ion doping
80.	CSIR-CMERI	Field deployment of indigenous 4-axis controller for multi-process micro machine
81.		Graphene based Aqueous lubricants
82.		Development of Domestic Iron Removal Filter
83.		Micro Fuel Cell
84.		Design and Development of different prototypes of Solar Power Tree for independent area electrification
85.		Intelligent and Powered Wheel Chair
86.		Process technology for manufacturing of ADI components for minning application
87.		CSIR-CRRI
88.	Development and evaluation of "Soil Nailing Technique" for stabilisation of soil slope for the construction of underpass below Road traffic	
89.	Design & Performance of Cement Grouted Bituminous Mix (CGBM) for Urban Roads	
90.	CSIR-IMMT	Electrophoretic Deposition (EPD) for Industrial Application

91.		Maximize the recovery of iron values from lean grade iron ore by reduction roasting and pelletisation of high LOI and high Blaine number iron ore fines
92.		Process Development for production of flaky graphite, high purity graphite and graphite from natural graphite
93.		Recovery of Alumina from fly ash
94.	<b>CSIR-NAL</b>	Design and Development of Cost Effective and Advanced Polymer Composite Processing Equipment
95.		Fully Autonomous fixed wing mini UAVs under 5.0 kg class - Enhancement of existing UAV models
96.		Design, development and certification of Avionics Video and Data FPGA based IP Core
97.		VTOL based MAV using indigenously developed electrically driven co-axial motor (VTOL)
98.		Development of Medium Wind-Solar Hybrid (WiSH) Systems of 7 – 10 kW class for Agricultural and other rural applications
99.	<b>CSIR-NEERI</b>	Solar Disinfection Systems for potable water
100.	<b>CSIR-NML</b>	Technology for extraction of tungsten (yellow tungsten oxide or ammonium paratungstate or metallic W-powder) from a variety of scraps
101.		Development of Hydrogen standard in Steel
102.		Low Phosphorus steel through furnace route using DRI as major ferruginous raw material-an industrial assessment
103.	<b>CSIR-SERC</b>	Glass Textile Reinforced Concrete Crash Barrier System
104.		Design of Emergency Restoration System for Power Lines
105.		अहल्या ( AHALYA )” RFID based Battery less Wireless Embedded Sensor for Structural Health Monitoring of Reinforced Concrete Structures (Corrosion, Humidity, Temperature)
106.		Precast Ferrocement Toilet Core Unit (Prefer Toco)
107.		Improved Design and Retrofit Methodology for Seismically Vulnerable Open Ground Storey (OGS) Structures
108.		Development of cost effective water tanks using flowable cement mortar
109.	<b>CSIR-CEERI</b>	Prevention of adulteration in milk-real time remote milk supply monitoring network (PRADUMAN)
110.		Handheld milk quality analyser
111.		Gas sensor for environmental monitoring
112.		Development of 3D rigid and flexible Endoscopes for Denture examination
113.		Development of Silent Killer Gas Detector using LTCC Technology
114.		High Frequency RF MEMS Capacitive Switches
115.		Development of MEMS-based Accelerometer
116.	<b>CSIR-CSIO</b>	Development of Water Quality Monitoring Watchdog Pod
117.		Reading Machine for visually impaired
118.		Power Quality Analyser
119.		Head gesture based control module for Intelligent Patient Vehicle
120.		Postural Stability Assessment System
121.		Portable Energy Audit Tool
122.		Pump Efficiency Monitoring System
123.		AutoCEPH: A software for 2-D Computerized Cephalometric Analysis

124.		Earthquake Warning System
125.		Touch based Finger Gesture control for Intelligent Patient Vehicle
126.		Antiglare Filter for Automobiles
127.		Avionics Head Up Display Test Rig
128.		Head up Display Mk1N-NP for Naval LCA
129.		Head up Display for Intermediate Jet Trainer Aircraft
130.		Indigenous development of laser lithotripsy system for medical applications
131.	CSIR-NGRI	Earthquake hazard assessment of the Himalaya and the Indo-Gangetic plains
132.		Imaging sub-volcanic mesozoics in Kerala-Konkan (KK) offshore from wide-angle seismic data (Energy and Mineral Resources)
133.	CSIR-NIO	Development of software for High resolution velocity analysis for mapping of gas hydrate deposits/support for strategic sector
134.		Microbial consortium for aquaculture waste management and disease control
135.		Melanin from sponge associated bacteria
136.		Low cost Multipurpose Multichannel data logger unit
137.	CSIR-NPL	Low-cost Peltier based refrigerators for rural regions
138.		Sunlight sensitized long afterglow phosphor powder & paint
139.		Fonoclock with a time synchronization accuracy of $\pm 10$ ms

## B. Fast Track Translation (FTT)/ Fast Track Commercialization (FTC) Ongoing Projects

Sr. No.	Lab	Project Title
1.	CSIR-AMPRI	Red mud based lead free material for X-ray and CT scanner rooms
2.		Development of multilayer sandwich panel for defense applications
3.		Development of Fly Ash based Geopolymeric Materials for Broad Application Spectrum
4.		Pilot scale production and demonstration of closed cell aluminum composite and hybrid composite foams for transportation, defence and construction sectors
5.		Advanced Geopolymeric Coating Material for Structures of Mild Steel (AGCM)
6.		Development and Manufacturing hybrid green composites using industrial and agro wastes in pilot scale and facilitating entrepreneurship
7.		Development of solid-state electromagnetic joining technique for materials of interest in aerospace/space
8.		Design & Development of bamboo structures (Bamboo/composite sections & joints)
9.	CSIR-CECRI	A surface treatment process for enhanced corrosion resistance of Iron and steel
10.		SX-EW process for the regeneration of etchant and recovery of copper from spent alkaline ammoniacal cupric chloride PCB etchant
11.		Multi-analyte sensing platforms and molecular probes for detection of target biomarkers using electrochemical and optical methods
12.		Thermal barrier coatings for strategic applications
13.		Self-humidified Nafion based composite membranes for open cathode PEMFC stacks



14.		Development of 2.5V / 1A sodium-ion batteries with performance scalability possibilities
15.		Development and demonstration of rechargeable Li-S batteries for lighting and consumer electronics applications
16.	CSIR-CGCRI	100 W CW/Modulated Thulium fiber laser: at 1.94 $\mu\text{m}$ for efficient tissue vaporization and at 2.05 $\mu\text{m}$ for strategic application
17.		Wear resistant Ceramics for cutting & milling operation: Process optimization of SiAlON-WC composites for rock drilling application
18.		Synthetic high alumina aggregate from sillimanite beach sand for refractory application
19.		Superior fused magnesia from impure Indian magnesite for self sustenance
20.	CSIR-CMERI	Process technology for large area (10 cmX10 cm) manufacturing of micro-nano patterned (300 nm-300 micron) hydrophobic surfaces
21.		An engineered design and development of a solar assisted community level multifunctional adsorbent based integrated water filtration unit for removal of ground water fluoride, microorganism with supported handy fluoride level detection kit and proper management of generated sludge
22.		Design and Development of 1 TPD Fully Automatic Biodiesel Plant
23.		Design and development of Mob Control Vehicle (MCV)
24.		Development of Carbon-Graphite Piston Ring and Solenoid Valve suitable for high temperature aircraft LRUs
25.		Development of self-propelled specialty harvester for leafy crops with a minimum field capacity of 4 acre/day (ex. Stevia, mentha, vegetables)
26.		Design of a combined cutting, binding and bailing equipment for stubble management
27.	CSIR-CCMB	Develop novel DNA based identification system of Plant bioresources (both agri and wild varieties grown/harvested) for conservation
28.		Development of male infertility diagnostic kits (DeMID)
29.		Up scaling of high yielding / elite Samba Mahsuri mutant line 'SM93' for product translation
30.	CSIR-CBRI	Pilot Scale Preparation of Silica Nanoparticles and their applications in cement based materials
31.	CSIR-CDRI	Clinical development of antiplatelet compound S007-867 for treatment of cardiovascular diseases. (Antithrombo-867)
32.		Development of a small molecule inhibitor of PCSK 9
33.	CSIR-CEERI	Design and Development of Dispenser Cathodes for Microwave Tubes
34.		Development and optimization of software for real-time monitoring of milk supply chain
35.		Solar PV based Smart Multi-vehicle EV Charging Station
36.	CSIR-CSMCRI	Energy efficient process to treat the reject stream of water desalination plant
37.		Generation of energy from microalgal feedstock through CO <sub>2</sub> capture from flue gases
38.		Greener process for the synthesis of 3-methyl-5-phenylpentanol (Mefrosol) at 1 Kg level with >90% yield ad 98% purity
39.	CSIR-CSIO	Smart Electrochemical Tongue (e-Tongue) to detect heavy metal ions in potable water
40.		Image Guided vascular vein visualizer: VeinViz
41.		Electromyogram (EMG) controlled Below Elbow prosthesis
42.		Technological solutions for contactless alive/dead detection of victim soldier in battle field

43.		Precision instrumentation towards whole-slide digital microscopy for high-throughput analytics
44.		Ligament Injury Assessment & Therapy Device for motor-rehabilitation of Soldiers "L-GEAR"
45.		Online Monitoring System for detection of Night-time Poor Visibility areas in Urban settings
46.		Harvesting of electrical energy using geared AC synchronous motor to charge batteries of mobile phones
47.		Design and Development of Airfield Ground Lighting Systems (AGLS)
48.		Design and development of enhanced vision system for military surface transport vehicles
49.		Design & Development of Head Up Display for Passenger Aircraft
50.		Divya Nayan: A personal reading machine for visually impaired
51.		Scale - Up of AutoCEPH: A software for 2D computerized Cephalometric Analysis as a web service
52.		Design and Development of Indigenized Lyophiliser for preservation of Indian fruits and vegetables
53.	CSIR-CIMFR	Bio-methanation of coal rejects / low grade coal and biomass-Demonstration Model at village Gaurigram, Chandankiyari, Dhanbad
54.		Installation and commissioning of a 10000 LPH coalmine water reclamation plant for obtaining drinking water
55.	CSIR-CLRI	Retanning cum fatliquoring agent
56.		Retanning agent from Paper Industry Wastes
57.		Waterless Chrome Tanning Technology
58.	CSIR-IICT	Development of Engineered Biochar from non-edible de-oiled seed cake/stubble wastes for the removal of targeted herbicides/pesticides from agricultural wastewaters and subsequent soil remediation
59.		Catalytic conversion of linear alkylbenzene raffinate to be utilized for Jet rocket fuel
60.		Indigenous enzymes for degumming of rice bran oil and other vegetable oils
61.		Preparation of polymer-grade vinylidene fluoride (VDF) and chlorotrifluoroethylene (CTFE) and their polymerization processes
62.	CSIR-IMMT	In-house development and fabrication of stirred mills for energy-efficient processing of low-grade ores
63.		Synthesis of Mg-Y <sub>2</sub> O <sub>3</sub> magnesium nano-composite by hot consolidation process for light weight applications
64.		Production of Sm <sub>2</sub> O <sub>3</sub> and CO <sub>3</sub> O <sub>4</sub> from SmCo permanent magnet scrap
65.		Design & development of a vertical slurry transport system for lifting of minerals/ores in heterogeneous regime
66.		Recovery of Nickel, Chromium and Iron from Chromite Overburden (COB) in 100 kg scale
67.		Membrane technology for separation/recovery of heavy metals (Cr, Ni, Zn) from industrial waste water: Mathematical modeling and process development
68.		Development of advanced Tribological Coatings and Environmental Barrier Coatings (EBC) by Electrophoretic deposition and thermal spraying for mining equipments, pipeline, industrial applications and processes
69.		Development of Novel Tungsten Alloy Cubes for Strategic Applications
70.		Wireless Thermocouple for temperature measurement of rotating and moving surfaces

71.		Development of cost effective Industry grade non contact type online moisture sensor using microwave and NIR
72.		Development of an Image Processing based system for monitoring feed rate of materials moving on a conveyor
73.		Development of an induration furnace monitoring system with IoT and Artificial Intelligence (AI) technique in a pelletization plant
74.		Processing of secondary resources for the production of battery materials
75.		Rapid and Point Care Microfluidic kit for multiplex diagnosis of viral diseases in tomato and apple
76.	<b>CSIR-IHBT</b>	Development of bacterial formulations and organic dustbin for organic waste degradation in cold hilly regions
77.		Optimization of aeroponic and hydroponic conditions for increasing commercial crop productivity
78.		Introduction of high value spice Saffron ( <i>Crocus sativus</i> L.) in unexplored areas
79.		Identification of improved clone(s) of <i>Stevia rebaudiana</i> (Bertoni)
80.		Combating Iron and Zinc deficiency using microalgae based foods
81.		L-Asparaginase (HimAspase™) with no glutaminase activity for food processing and therapeutic applications
82.		Design and Development of Indigenized Lyophiliser for preservation of Indian Fruits and Vegetables
83.	<b>CSIR-IGIB</b>	Genomic Approaches for Rare Genetic Disease Diagnosis (RareGen)
84.		Radiological AI system for Parallel Informatic Detection of Clinical Triage emergencies (RAPID-CT)
85.		GOMED-TeCh: Development, Translation and Commercialization of Genetic tests for prevalent genetic diseases in India
86.		Genomics for Public Health in India (IndiGen)
87.	<b>CSIR-IMTECH</b>	Development of bio-better of G-CSF (Granulocyte-Colony Stimulating Factor) for prophylactic and therapeutic interventions in neutropenia
88.		Validation of potential biomolecules against Parkinson's disease: A pre-clinical study
89.		Development of Anti Thrombin-Clot Specific Streptokinase (ACSSK), for Treatment of Acute Myocardial Infarction and Ischemic Stroke
90.		Technology development for Gellan gum production
91.		Development of applications of laccase for Diverse (Food health and cosmetic) Industries (DALDI)
92.	<b>CSIR-IIP</b>	Aircraft testing with Bio-Aviation fuel blended in Jet-A1 fuel
93.		Development of Catalyst and Alternate Process for Producing Light Olefins (C2-C4)
94.	<b>CSIR-NEIST</b>	Efficient and large scale production of carbon quantum dots (CQDTs) from cheap coal feedstock
95.	<b>CSIR-NIIST</b>	Development of an onsite sewage treatment for small establishments
96.		Development of Cellular Sensors: Biocompatible fluorescent molecules for sensing and cellular imaging of PH, Zn <sup>2+</sup> and reactive oxygen species
97.		Fused Thiophene based FET devices for lung cancer VOC biomarker detection
98.		Electrochromic Devices for Efficient Energy Management and Utilization
99.		Development of lithium silicate based ceramics as CO <sub>2</sub> sorbents for sorption enhanced steam methane reforming

100.		Technology assessment and integration of CSIR's lignocellulosic ethanol programs/facilitating technologies for a feasible 2G ethanol technology (CSIR-2GE)
101.		Fluorescent Materials for Security Applications
102.		Annealing simulator integrated with online process control sensors for run out table process simulation
103.		Piloting of the process for Production of Premium Grade Iron Oxide from Waste Ferrous Chloride Solution Generated from Steel Pickling and Ilmenite Processing Units
104.	CSIR-NML	Pilot scale processes for recycling of metals/ materials from E-waste
105.		Development of biodegradable eco-friendly flotation reagents for sillimanite, limestone, iron ore fines and coal
106.		Smart sensing system for cold drawn high end wires
107.		Scale up and commercialization of indigenously developed hydrogen standard in steel
108.	CSIR-NBRI	Bio-prospecting plant diversity for food grade colors
109.		Restoration of Nallah with Ecological Units - RENEU
110.		Development, Demonstration and Dissemination of Improved Ceramic based Cook-stoves (Both domestic and Community) for Particulate Emissions Control
111.	CSIR-NEERI	RISK-PiNET : GIS based Risk Assessment Modelling Tool for Water Distribution System
112.		Smart Disposal, Incineration and Carbonization Systems (SMART-DISC) for Menstrual Waste Management
113.		Utilization of industrial waste through appropriate technologies for developing value-added Products
114.		Scale-up of process for CO <sub>2</sub> capture based on biogenic molecules and pilot scale demonstrations
115.	CSIR-NAL	Stealth Technologies: Development of Radar Absorbing Materials/ Coatings for Airborne Platforms
116.		VTOL Winged UAV for multi-mission application (VTOL-UAV)
117.		Energy efficient clean production of hydrogen
118.	CSIR-NCL	Smart AGroinformatics with Internet of Things to enable Agriculture-4.0 (SAGITA)
119.		Continuous manufacturing platform for diazonium salt based reactions for synthesis of Azo dyes and APIs
120.	CSIR-NIO	Coral Reef Monitoring and Surveillance Robot (C-Bot)

### C. Details of Mission Mode Projects

S.No	Mission Title	Code	Total cost (FY 2018-19) (Rs in Lakh)	Total cost (FY 2019-20) (Rs in Lakh)
1	CSIR Aroma Mission	HCP-0007	2835.752	2793.252
2	CSIR Sickle Cell Anemia Mission	HCP0008	1952.164	1392.936
3	Catalysis for Sustainable Development (CSD)	HCP0009	3532.00	2180.60
4	CSIR Phytopharmaceutical Mission	HCP0010	2008.54	2061.77
5	INPROTICS-Pharma and Agro	HCP0011	3517.16	1797.64
6	Nano-Biosensors and Microfluidics for Healthcare	HCP0012	1686.154	1110.029
7	Intelligent System (IS) - Intelligent Technologies and Solutions	HCP0013	2712.756	931.696
8	Development of fast Durable and Energy Efficient Mass Housing Scheme	HCP0015	3321.2	2319.02
9	Safety and Security of Vital Installations	HCP0017	3213.12	1990.12
10	Technology for Robust Structural Health Monitoring of Critical Infrastructure and Conservation & Restoration of Heritage Structures	HCP-0018	2477.87	1827.67
11	Nutraceuticals and Nutritionals	HCP0019	920.39	910.15
12	Drone based Electromagnetic and Magnetic System DREAM	HCP0020	1128.68	368.40
13	Development of Affordable Technologies for Quality Milk Assessment	HCP0014	293.080	138.08
14	Establishment of CSIR-CMERI Centre for Post-harvest Processing and Research to augment the economy of rural tribal people of Arunachal Pradesh	MLP216212	155.00	120.00
15	Next Generation insect resistance in cotton	HCP0023	102.73	296.03
16	Food and Consumer Safety Solution (FOCUS)	HCP0016	1683.16	868.91
17	CSIR Mission Mode Project on Crop Protection Chemicals	HCP0021	244.94	1984.19
18	Mission Mode Programme on Commercial Deployment of Salt & Potash Technologies to Augment National Capability	HCP0022	379.35	1010.65
19	Technological convergence for sustainable production and utilization of seaweeds (TCSProUS)	HCP0024		312.925
<b>Total</b>			<b>32164.046</b>	<b>24414.068</b>

#### D. Details of NCP/ FBR Projects

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
1.	CSIR-AMPRI	Additive Manufacturing of Graphene reinforced metal and polymer composites	AEISS	NCP	26.06
2.	CSIR-AMPRI	Hierarchical Reinforcement Approach for improved ILSS of CFRP	AEISS	NCP	65.00
3.	CSIR-AMPRI	Prospects in Development of Magnesium Alloys for engineering and biological applications	4M	NCP	48.00
4.	CSIR-AMPRI	Development of Metallic foam for biological, thermal and engineering applications	4M	NCP	123.20
5.	CSIR-AMPRI	High performance metal matrix composites for transportation, defense, aerospace and engineering sectors	4M	FBR	97.11
6.	CSIR-AMPRI	Electrical insulating Hybrid Composite Sheet using Industrial Inorganic Wastes	CIE	NCP	17.20
7.	CSIR-CCMB	Apomixis Technologies for Increasing Agricultural Production	AGRI	FBR	134.25
8.	CSIR-CCMB	Towards product development in rice using mutants that have traits of agronomic importance	AGRI	FBR	349.42
9.	CSIR-CCMB	Genome sequencing of the halophyte <i>Salicornia brachiata</i>	AGRI	FBR	24.00
10.	CSIR-CCMB	Genome Regulatory Elements and the Evolution of Complexity	HTC	NCP	35.00
11.	CSIR-CCMB	Mechanistic and functional role of a 'Chiral Proofreading' variant in Animalia	HTC	NCP	50.00
12.	CSIR-CCMB	Genomics and epigenetics in health and disease (GEHead)	HTC	NCP	39.00
13.	CSIR-CCMB	Mechanistic insights into bacterial growth and morphogenesis	HTC	NCP	25.00
14.	CSIR-CCMB	Generation of monoclonal antibodies for research and diagnostics.	HTC	NCP	120.00
15.	CSIR-CCMB	Generation of Hepatic organoids by tissue engineering approaches	HTC	NCP	120.00
16.	CSIR-CCMB	Tissue Engineering of cartilage and IVD for arthritic and disc degeneration problems	HTC	NCP	55.00

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
17.	CSIR-CDRI	Non-alcoholic Steatohepatitis (NASH)	HTC	NCP	20.00
18.	CSIR-CDRI	Chronic Respiratory Disease Innovation and Solution Program(CRISP)	HTC	NCP	7.50
19.	CSIR-CDRI	Investigating chemical therapeutic space and determinants of survival and virulence in malaria [ParaDIgM]	HTC	FBR	20.00
20.	CSIR-CDRI	Development of identified lead molecule as novel anti-leishmanial therapeutic agent	HTC	FBR	25.00
21.	CSIR-CDRI	Development of therapeutics against skeletal targets to improve bone health	HTC	FBR	40.00
22.	CSIR-CDRI	Dissecting the architecture and molecular mechanism of multi-protein complexes (BERosomes) involved in DNA Base Excision Repair (BER) repair and Transcription Coupled DNA repair (TCR) pathways from M. tuberculosis	HTC	FBR	20.00
23.	CSIR-CDRI	Development of therapeutics against skeletal targets to improve bone health: therapeutic repurposing of pentoxifylline	HTC	NCP	35.00
24.	CSIR-CDRI	Regulatory Development of CDRI Prioritized Lead Compounds	HTC	NCP	45.00
25.	CSIR-CDRI	Therapeutics for Lifestyle Disorders [TheraLSD]	HTC	NCP	37.10
26.	CSIR-CDRI	Cell penetrating peptide, IMT-P8 as a drug delivery vehicle in management of MRSA infections (PEPTIDOCURE)	HTC	NCP	32.95
27.	CSIR-CEERI	Development of novel compact high power THz device technologies	AEISS	NCP	71.47
28.	CSIR-CEERI	Development of new generation nano metal-oxide/graphene-polymer composite materials for use in wearable electronics (with CGCRI as implementing lab)	4M	NCP	24.00
29.	CSIR-CECRI	In-silico guided design of Corrosion Inhibiting Molecules to Materials (CIM2M)	CLP	NCP	62.00

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
30.	CSIR-CFTRI	Data analytics based on diet diversity, food consumption and nutritional deficiency targeted to the selected aspirational districts in Karnataka and Kerala	AGRI	NCP	27.00
31.	CSIR-CFTRI	Establishment of 'National Analytical Facility' for analysis of nutraceuticals and chemical markers in food products (NAFANC)	AGRI	FBR	45.80
32.	CSIR-CFTRI	Translation of pre-clinically tested probiotic formulation to human population with emphasis on immuno-modulation and gut microflora	AGRI	FBR	15.00
33.	CSIR-CFTRI	Understanding structure-function relationships in enzymes critical for the survival of bacterial food pathogens	AGRI	FBR	20.00
34.	CSIR-CGCRI	1KW Fiber Laser for Industrial and Strategic Applications (LISA)	AEISS	NCP	156.00
35.	CSIR-CGCRI	Development of new generation nano metal-oxide/graphene-polymer composite materials for use in wearable electronics	4M	NCP	22.00
36.	CSIR-CGCRI	Development of Hydrophobic Ceramic Hollow Fiber Membrane for MD-based Domestic Water Purification System	4M	FBR	34.60
37.	CSIR-CGCRI	Chalcogenide glass and fibers for mid infrared photonics applications	4M	FBR	20.90
38.	CSIR-CGCRI	Development of surface modified adsorbents with higher sorption capacity for specific contaminants removal in water/ industrial wastewater (SMA).	4M	FBR	25.25
39.	CSIR-CIMAP	Development of Withanamide enriched high yielding, variety of Ashwagandha (Withaniasomnifera)	AGRI	NCP	34.30
40.	CSIR-CIMAP	DNA-free CRISPR-mediated Genome-editing in rose-scented Geranium	AGRI	FBR	17.00



S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
41.	CSIR-CIMAP	Understanding the biosynthesis of bioactive triterpenes in the medicinal tree banaba ( <i>Lagerstroemia speciosa</i> ) for the development of yeast-based synthetic biology platform	AGRI	FBR	22.00
42.	CSIR-CIMAP	Identification of molecular targets towards improvement of root biomass and/or texture in <i>Withania somnifera</i>	AGRI	FBR	19.00
43.	CSIR-CIMAP	UAV based high resolution remote sensing for modernized and efficient cultivation practices of commercially important medicinal and aromatic crops. (Acronym: DroneAgri)	AGRI	NCP	25.90
44.	CSIR-CIMFR	Studies on Sorption-Induced Strain and Permeability Changes in Coal and Shale as a Result of CO <sub>2</sub> Injection	4M	NCP	45.80
45.	CSIR-CIMFR	Preparation of <i>in-situ</i> stress map of Jharia Coalfield	4M	FBR	585.00
46.	CSIR-CIMFR	Catalytic Petcoke Gasification	CLP	FBR	27.10
47.	CSIR-CLRI	Polymer Filaments for 3D printing	CLP	FBR	18.80
48.	CSIR-CMERI	Development of multifunctional care device for army personnel	AEISS	NCP	37.20
49.	CSIR-CMERI	Indigenous development of LRUs suitable for small aircraft (InDeLiRU)	AEISS	NCP	262.00
50.	CSIR-CMERI	Robotic Intervention for Industrial and Strategic Applications	CIE	NCP	235.00
51.	CSIR-CRRI	Development of Rejuvenating Agent (RA) for use in recycling of Asphalt Pavements RAP	CIE	FBR	9.00
52.	CSIR-CRRI	Cold Mix Technology for High Volume Roads	CIE	FBR	9.00
53.	CSIR-CRRI	Upgradaton of Half Warm Mix Technology for Construction and Maintenance of Bitminous Surfacing	CIE	FBR	9.80
54.	CSIR-CSIO	Design & Development of Angle Independent Multilayer Thin Film Filter (AIMTF) on Foldable and Military Grade Optical Optical Substrates	AEISS	FBR	95.97

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
55.	CSIR-CSIO	Design and development of precision optics for soft X-Rays	AEISS	FBR	44.10
56.	CSIR-CSIO	Development of multifunctional care device for army personnel	AEISS	NCP	40.20
57.	CSIR-CSIO	Energy Management using Non Intrusive Load Monitoring (NLIM) Technique	AEISS	NCP	44.40
58.	CSIR-CSIO	Magnetic Graphene Coated Polymeric Stationary Phase Ion-Exchangers for Ion Chromatography Column Separations	4M	FBR	49.53
59.	CSIR-CSIO	Low cost functional materials in Selenium Detection in Water	4M	FBR	12.60
60.	CSIR-CSIO	Photonic meta-surfaces for smart applications	4M	FBR	12.20
61.	CSIR-CSIO	Development of Customized Flow Hive for quality Honey Harvesting & Extraction	AGRI	NCP	51.44
62.	CSIR-CSIO	Development of Mobile-Soil-Sensing-System and Digital Spatial Repository for Precision Agriculture using Fusion of Proximity Sensors and Geo-statistics Modelling	AGRI	NCP	31.03
63.	CSIR-CSMCRI	Indigenously developed reverse electro dialysis process for salinity gradient based power generation	EED	FBR	42.40
64.	CSIR-CSMCRI	Genome sequencing of the halophyte <i>Salicornia brachiata</i>	AGRI	NCP	17.00
65.	CSIR-IGIB	Chronic Respiratory Disease Innovation and Solution Program(CRISP)	HTC	NCP	16.00
66.	CSIR-IGIB	Genomics and epigenomics in health and disease (GEHead)	HTC	NCP	51.00
67.	CSIR-IGIB	GEAR – Genomic, Evolutionary and Big Data Analytic strategies to address antimicrobial resistance	HTC	NCP	20.00
68.	CSIR-IGIB	Mechanistic basis of lncRNA mediated regulation in organ development and function (DevoRNA)	HTC	FBR	30.00

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
69.	CSIR-IGIB	Decoding telomerase reactivation in cancer - molecular mechanisms of G-quadruplex-mediated telomerase (hTERT) control	HTC	FBR	18.95
70.	CSIR-IGIB	GRAFT(Garnering Regenerative Approaches For Transplantation)	HTC	NCP	111.70
71.	CSIR-IHBT	UAV based high resolution remote sensing for modernized and efficient cultivation practices of commercially important medicinal and aromatic crops. (Acronym: DroneAgri)	AGRI	NCP	23.46
72.	CSIR-IHBT	Molecular mechanism underlying Apple scar skin viroid-whitefly interaction	AGRI	NCP	41.85
73.	CSIR-IHBT	Development of process for converting raw cellulosic biomass into textile fiber and nanocellulose	AGRI	NCP	106.97
74.	CSIR-IHBT	Creation of aroma bank by utilization of western Himalayan biodiversity (AROMA-BANK)	AGRI	NCP	30.33
75.	CSIR-IHBT	Bisoprospection Microbiome from Himalayan niches	AGRI	NCP	62.61
76.	CSIR-IHBT	Non-invasive technology for production of naphthoquinone pigments from Arnebia species on sustainable basis	AGRI	NCP	52.80
77.	CSIR-IHBT	conservation and sustainable resource generation of high altitude bioresources at CSIR – Centre for High Altitude Biology	AGRI	NCP	593.33
78.	CSIR-IHBT	Development of high-throughput genotyping platform for next generation plant breeding in tea	AGRI	FBR	103.30
79.	CSIR-IHBT	characterization and development of agro and process technology for low calorie natural sweetener (Siraitia grosvenorii)	AGRI	FBR	43.00
80.	CSIR-IHBT	Exploration of Himalayan Plants for Novel Antimalarial Agents: Characterization of potential molecules	AGRI	FBR	30.00
81.	CSIR-IICB	Non-alcoholic Steatohepatitis (NASH)	HTC	NCP	40.00

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
82.	CSIR-IICB	Chronic Respiratory Disease Innovation and Solution Program(CRISP)	HTC	NCP	21.00
83.	CSIR-IICB	Genomics and epigenomics in health and disease (GEHead)	HTC	NCP	8.00
84.	CSIR-IICB	EXosomal MIRna Inhibitor: Identification of the new classes of inhibitors of miRNA trafficking via exosomes (EXOMIRIN)	HTC	FBR	25.00
85.	CSIR-IICT	Non-destructive depth profiling and identification of debonding defects across polymer interfacial layers by using portable single-sided NMR	AEISS	FBR	26.50
86.	CSIR-IICT	Mimicking Muscles: Electroactive Polymers for Bionics	4M	NCP	31.90
87.	CSIR-IICT	Development of hybrid flocculants at 100g scale for selective adsorption of low grade iron ore slimes and fines to recover iron ore more than 80 %.	4M	FBR	26.00
88.	CSIR-IICT	Vegetable oil-based Gels as trans free fat (Oleogel)	AGRI	NCP	10.72
89.	CSIR-IICT	Sustainable production of Edible oils from Microalgae	AGRI	FBR	77.98
90.	CSIR-IICT	Chronic Respiratory Disease Innovation and Solution Program(CRISP)	HTC	NCP	10.00
91.	CSIR-IICT	Autologous Transplantation of Transgenically Modified Hepatic Progenitor Cells expressing therapeutic genes-mediated Liver Regeneration (PROMPT)	HTC	NCP	28.00
92.	CSIR-IICT	Enzymatic Process for the prepoaration of API intermediates	CLP	NCP	209.52
93.	CSIR-IICT	Scale up of materials for Dye Sensitized Solar Cells and Organic Photovoltaics	CLP	FBR	120.62
94.	CSIR-IICT	Accelerated Wound Healing by Bone marrow Stem Cells delivered using PEG-PU porous Polymer Scaffolds Grafted with KGF- and/or VEGF- Mimetic Peptides (GRAFT)	HTC	NCP	37.00
95.	CSIR-IIP	Modeling of mono/bi-metallic catalysts for hydroprocessing	4M	FBR	12.00

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
		reactions			
96.	CSIR-IIP	Carboxylation of naphtha grade olefins to high value chemicals using CO <sub>2</sub>	CLP	FBR	10.00
97.	CSIR-IIP	Catalytic oxidation of propylene to propylene oxide	CLP	FBR	33.00
98.	CSIR-IIP	Methane Transformation over Nanostructured Catalyst	EED	FBR	20.40
99.	CSIR-IIP	Process/catalyst development for reduced hydrogen consumption for the hydrocracking of renewable oils (HLess-HCRO)	EED	FBR	29.50
100.	CSIR-IIP	Catalytic process for the production of BTX/gasoline from bio-naphtha	CLP	FBR	48.00
101.	CSIR-IIP	Electric Conversion of High Polluting Diesel/Petrol 3W, 4W Vehicles in Electric Vehicles and Development of Solar Charging Station	E3OW	NCP	20.00
102.	CSIR- IMMT	Green synthesis of Silver nanoparticles against plant pathogens: An alternative solution for chemical pesticides	AGRI	FBR	17.10
103.	CSIR-IMMT	Developing magnetic refrigerant materials for cooling applications at cryogenic temperatures-(MRM)	AEISS	FBR	22.25
104.	CSIR-IMMT	Development of Active Noise Control Chair for Aircraft Cabin	AEISS	NCP	11.00
105.	CSIR-IMMT	Sensors for detection of heavy metal ion contaminations	AEISS	FBR	18.00
106.	CSIR-IMMT	Preparation of coke and ferro-coke from low ash non-coking coal	4M	NCP	142.00
107.	CSIR-IMMT	Recycling of spent battery materials for value addition	4M	NCP	26.80
108.	CSIR-IMMT	Solvatometallurgical extraction of Cu and Zn from low grade ores and secondaries through Deep Eutectic Solvents(DES)	4M	NCP	17.60
109.	CSIR-IMMT	Dephosphorization of high phosphorus iron ore	4M	FBR	115.00
110.	CSIR-IMMT	Ferro Manganese production from lean grade Manganese ore	4M	FBR	65.00

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
111.	CSIR-IMMT	Processing of Mineral & Metallurgical Wastes, and Flyash for their value addition	4M	FBR	76.00
112.	CSIR-IMMT	Kinetics and thermodynamics study on reduction roasting of low and lean grade iron ores using fluidized bed roaster to maximise the recovery of iron values	4M	FBR	348.00
113.	CSIR-IMMT	Thermodynamics and kinetics study of ferruginous ilmenite reduction and smelting for production of titania slag	4M	FBR	88.00
114.	CSIR-IMMT	Highly Ordered Functionalized Nano structured Electrolytic Manganese Dioxide with enhanced electrochemical performance for Batteries and Supercapacitors	4M	FBR	13.75
115.	CSIR-IMMT	Protective conducting materials coating of La <sub>0.6</sub> Sr <sub>0.4</sub> Co <sub>0.2</sub> Fe <sub>0.8</sub> O <sub>3</sub> (LSCF), MnCo <sub>2</sub> O <sub>4</sub> and Mn <sub>1.5</sub> Co <sub>1.5</sub> O <sub>4</sub> on SOFC interconnect Crofer 22 APU by Electrophoretic deposition to mitigate high temperature oxidation and degradation	EED	FBR	18.00
116.	CSIR-IMTECH	GEAR-Genomic, Evolutionary and Big Data Analytic strategies to address antimicrobial resistance	HTC	NCP	20.00
117.	CSIR-IMTECH	Identification of Missing Phosphatase in Metabolic Pathway (IMP2)	HTC	FBR	20.00
118.	CSIR-IMTECH	Evolutionary studies on Flexibility and Function of Lipid-bound efflux proteins for Understanding eXtreme drug resistance in microbes (EFFLUX)	HTC	FBR	20.00
119.	CSIR-IMTECH	Cell penetrating peptide, IMT-P8 as a drug delivery vehicle in management of MRSA infections (PEPTIDOCURE)	HTC	NCP	75.05
120.	CSIR-IMTECH	Developing high yielding CHO cell clone producing the anti-RSV mAb	HTC	NCP	103.00
121.	CSIR-IMTECH	Development of mass spectral library for characterization of recombinant therapeutic monoclonal antibodies (MSLab)	HTC	NCP	49.41

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
122.	CSIR-IMTECH	Mega-genomic insights into co-evolution of rice and its microbiome	AGRI	NCP	46.68
123.	CSIR-IMTECH	Exploring the Indian coastal and marine biodiversity for discovery and production of industrially important microbial proteins	E3OW	NCP	31.00
124.	CSIR-IMTECH	Development of a microbial system for the production of neo-glycopeptides/ neo-glycoproteins for useful applications	AGRI	NCP	30.40
125.	CSIR-NAL	Active Thermal Imaging for Non-destructive Evaluation (NDE) of thin composite aircraft structures	AEISS	NCP	0.00
126.	CSIR-NAL	Aerodynamic studies of aircraft configurations including wing-propeller interaction	AEISS	FBR	0.00
127.	CSIR-NAL	Certification of 30 HP Indigenous Wankel Rotary Combustion Engine	AEISS	NCP	40.42
128.	CSIR-NAL	Design and Development of Integrated Avionics Display Processing Computer(IADC)	AEISS	NCP	219.30
129.	CSIR-NAL	Development of Airboat (JALDOST)	AEISS	NCP	0.00
130.	CSIR-NAL	Development of Active Noise Control Chair for Aircraft Cabin	AEISS	NCP	38.00
131.	CSIR-NAL	Development of Aeroelastic Algorithms in Aircraft Design	AEISS	FBR	15.00
132.	CSIR-NAL	Environment Establishment for generating Flight Worthy Code from the Display Simulator Code	AEISS	FBR	0.00
133.	CSIR-NAL	Iron Bird Technology Platform for Evaluating Aircraft Actuation Systems	AEISS	NCP	46.00
134.	CSIR-NAL	Tailoring of Carbon Fiber Reinforced Composites for Enhanced Heat Dissipation Capability, Mechanical Properties and Electrical Conductivity using Carbon Nanotubes /Carbon Materials for Aerospace Applications	AEISS	FBR	8.50

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
135.	CSIR-NAL	UAV based high resolution remote sensing for modernized and efficient cultivation practices of commercially important medicinal and aromatic crops. (Acronym: DroneAgri)	AGRI	NCP	90.00
136.	CSIR-NBRI	Genome-editing for enhanced yield and quality traits (GE-plant)	AGRI	NCP	250.00
137.	CSIR-NBRI	Characterization and value addition of plant-based resins, gums and waxes	AGRI	NCP	85.00
138.	CSIR-NBRI	Small RNAs and Associated factors for enhanced post-harvest Life (sRNA-life)	AGRI	FBR	56.00
139.	CSIR-NBRI	Pathway elucidation and identification of genes involved in guggulsterones biosynthesis in <i>Commiphora</i> sps	AGRI	FBR	32.50
140.	CSIR-NBRI	Sub-genome dominance in endoreduplication and its implication in heterotic benefits to F1-hybrids for biomass and their adaptation	AGRI	FBR	60.00
141.	CSIR-NBRI	Understanding the epigenetics of fitness advantage of high altitude <i>Arabidopsis thaliana</i> populations under new environments	AGRI	FBR	39.00
142.	CSIR-NCL	Scalable synthesis of multifunctional nanomaterials for advanced applications (batch processing/flow synthesis)	4M	NCP	59.00
143.	CSIR-NCL	Nanofiber membrane of PET-cellulose derivative immobilized with nanocomposites as separators in lithium ion battery	4M	FBR	18.00
144.	CSIR-NCL	Towards Large Scale Solar Hydrogen Production (SoHy)	EED	NCP	114.90
145.	CSIR-NCL	Insight into cell physiology for cell culture medium formulation	HTC	NCP	49.00
146.	CSIR-NCL	Development of mass spectral library for characterization of recombinant therapeutic monoclonal antibodies (MSLab)	HTC	NCP	44.74



S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
147.	CSIR-NCL	In-silico guided design of Corrosion Inhibiting Molecules to Materials (CIM2M)	CLP	NCP	95.44
148.	CSIR-NCL	Design and Development of Indigenous Strain Portfolio for the Production of Penicillin V (PenV-IP)	AGRI	FBR	450.00
149.	CSIR-NEERI	Estimation of Ecosystem Services and Environmental Damage Cost Due to Climate Change: Biodiversity Perspective	E3OW	FBR	180.00
150.	CSIR-NEERI	Understanding Critical Zone Structure: WRJ-1 Critical Zone Observatory	E3OW	FBR	10.00
151.	CSIR-NEERI	Waste to Wealth	E3OW	FBR	37.00
152.	CSIR-NEIST	Utilization of North East Region (NER), India clay minerals for ceramic applications	4M	FBR	36.23
153.	CSIR-NEIST	Value addition of non-timber wood available in the North Eastern region of India by chemical modification for different industrial applications	4M	FBR	17.46
154.	CSIR-NEIST	Plasmonic nanoparticles decorated 2D nanosheets for detection of the fluoride and arsenic in drinking water: Fabrication of a paper strip based analytical device	4M	FBR	53.02
155.	CSIR-NEIST	Ammonia from dinitrogen at ambient condition by new advanced material: a potential energy saving process than Haber-Bosch	4M	FBR	35.00
156.	CSIR-NEIST	Development of brown spot (Drechsleraoryzae) disease tolerance in rice through multiplex-multi-gene CRISPR-Cpf1 genome editing system	AGRI	FBR	25.00
157.	CSIR-NGRI	Geodynamics and Metallogeny of parts of the East Indian Shield with specific reference to Diamond, Iron Ore & Chromitite-PGE occurrences (GeoMet)	E3OW	FBR	229.00
158.	CSIR-NGRI	Synthesis of Earthquake Hazard scenario in NW Himalaya by Investigating the multi-scale Variations in structural and	E3OW	FBR	320.00

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
		seismotectonic Assemblages (SHIVA)			
159.	CSIR-NIIST	Development of Mn-based RE-free intermetallic permanent magnets for automotive and energy generation	4M	FBR	14.25
160.	CSIR-NIIST	Exploring in-situ synthesis for Titanium Metal Powder by direct reduction of synthetic rutile	4M	FBR	9.48
161.	CSIR-NIIST	Development of Warm White Light Emitting Single Phased Oxyfluoride Phosphors for Energy Efficient and High Color Rendering LEDs	4M	FBR	9.00
162.	CSIR-NIIST	Chromogenic Materials for Smart Coating Applications	CLP	NCP	42.86
163.	CSIR-NIIST	Deciphering the microbiome of native wild coastal saline tolerant rice varieties of southern India and understanding the impact of seawater in structuring the root associated core microbiota using pokkali rice as a model plant	AGRI		19.00
164.	CSIR-NIO	Impact of Climate Change on the Physics, Biogeochemistry, and the Ecology of the North Indian Ocean (CliCNIO)	E3OW	FBR	300.00
165.	CSIR-NIO	Enhancing live stocks of herbivore fishes through captive breeding to control the macroalgal dominance in coral reefs to sustain the fishing revenue	AGRI	NCP	47.80
166.	CSIR-NML	Self-healing Coatings for Corrosion Protection of Steel & Aluminium alloys	4M	NCP	26.00
167.	CSIR-NML	Synthesis of new 2D materials other than graphene for energy application	4M	NCP	39.00
168.	CSIR-SERC	Development of Methodologies for Remaining Life Assessment and Risk-based Inspection Scheduling of Piping Systems under Corrosive Environment (ReLife-InS)	4M	NCP	38.00
169.	CSIR-SERC	Multi-scale damage characterization of laminated FRP composites under fatigue loading	4M	NCP	37.50

S.No.	Lab.	Title of the Project	THEME	Category	Total cost (Rs in Lakh)
170.	CSIR-SERC	Development of composite Bridge Deck Systems for Fast Track construction	CIE	NCP	143.00
171.	CSIR-4PI	Carbon and Nitrogen cycling in the Earth Sciences (CNCES)	E3OW	NCP	91.00
GRAND TOTAL					10976.66

#### E. Details of Lab Projects

S. No.	Lab: Name	Title of the Project	Total (Rs in Lakh)
1	CSIR-CEERI	Indigenous design, development & qualification of Ku band (140-210 watts) and Ka band (100-150 watts) Travelling wave tube (TWT)".	10.60
2	CSIR-NPL	Creation and Calibration Facility for LED and LED based Lighting	409.00
3	CSIR, URDIP	Informatics for drug-repurposing and rescue discoveries (IDrRD);	98.97
4		Intellectual Property Evaluation and Commercialization (IPEC);	189.94
5		Creation of E-Markets for Knowledge Products and Services	66.86
6	CSIR, TKDL	Modernization and upgradation of Information Technology Infrastructure of Traditional Knowledge Digital Library Unit (TKDL)"	214.50
7		Digitising Traditional Indian Systems of Medicine	993.10
8	CSIR-NAL	Design, Development and Certification of HANSA-NG	174.62
9		Development and Certification of 19-Seat Light Transport Aircraft (LTA)	49592.00
10	CSIR-NPL	Excellence for Ballistic Material Testing at CSIR-NPL, Delhi under Make in India Project in Body Armour.	3808.38
11		Production of Certified Reference Materials- Bharatiya Nirdeshak Dravya (BND)	1960.00

#### F. Details of HARIT projects

S. No.	Lab	Project	Budget Rs. lakhs
1.	CSIR-CCMB	Popularization of Improved Samba Mahsuri, a bacterial blight resistant and diabetic friendly rice to increase farmers' income	189.60
2.	CSIR-CFTRI-1	Empowerment of Rural Women in Food Processing Sector through CSIR-CFTRI Intervention with Select Technologies	45.00
3.	CSIR-CFTRI-2	Dissemination of Nutrition, Food Safety, Food Research and Hygiene practices to general public through social media	04.50
4.	CSIR-CFTRI-3	Establishment of Common Facility Centre for Spice	82.00

		processing (150-200 kg /day)	
5.	CSIR-CLRI-1	Enhancement of Economic and Social Status of Rural Populace of North-east India	80.00
6.	CSIR-CLRI-2	Social Intervention on augmenting Job opportunities & Women Empowerment in Punjab through HRD Initiatives	42.00
7.	CSIR-CSIO	Rural Penetration and Pilot Trials for Divya Nayan	32.81
8.	CSIR-CSMCRI-1	Empowering coastal population by training on cultivation and harvesting value added product from economically important halophytes <i>Salicornia brachiata</i> and <i>Juncus rigidus</i>	36.70
9.	CSIR-CSMCRI-2	Improving quality of salt with simultaneous recovery of sodium sulphate through scientific intervention, in Nawa - Didwana region of Rajasthan	137.23
10.	CSIR-CSMCRI-3	Popularizing sustainable and alternative livelihood options for low income coastal communities through imparting training on cultivation of economically important seaweeds	46.89
11.	CSIR-NEERI+6	Technologies and Products for Reduced Emission Fireworks	422.57
12.	CSIR-NISTADS-1	Increased crop productivity and enhanced income generation through smart micro irrigation system (More yield per Drop).	44.00
13.	CSIR-NISTADS-2	Intervention for herbal health and nutrition	23.00
		Total	1186.30

## **Establishments of CSIR are as given below:**

### **Biological Sciences Cluster**

- (i) CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB), Hyderabad
- (ii) CSIR-Central Drug Research Institute (CSIR-CDRI), Lucknow
- (iii) CSIR-Central Food Technological Research Institute (CSIR-CFTRI), Mysore
- (iv) CSIR-Central Institute of Medicinal and Aromatic Plants (CSIR-CIMAP), Lucknow
- (v) CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB), Delhi
- (vi) CSIR-Institute of Himalayan Bioresource Technology (CSIR-IHBT), Palampur
- (vii) CSIR-Indian Institute of Chemical Biology (CSIR-IICB), Kolkata
- (viii) CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu
- (ix) CSIR-Institute of Microbial Technology (CSIR-IMTECH), Chandigarh
- (x) CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow
- (xi) CSIR-National Botanical Research Institute (CSIR-NBRI), Lucknow

### **Chemical Sciences Cluster**

- (i) CSIR-Central Leather Research Institute (CSIR-CLRI), Chennai
- (ii) CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi
- (iii) CSIR-Central Salt & Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavnagar
- (iv) CSIR-Central Institute of Mining and Fuel Research (CSIR-CIMFR), Dhanbad
- (v) CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad
- (vi) CSIR-Indian Institute of Petroleum (CSIR-IIP), Dehradun
- (vii) CSIR-National Chemical Laboratory (CSIR-NCL), Pune
- (viii) CSIR-North-East Institute of Science & Technology (CSIR-NEIST), Jorhat
- (ix) CSIR-National Institute of Interdisciplinary Science & Technology (CSIR-NIIST), Thiruvananthapuram

### **Engineering Sciences Cluster**

- (i) CSIR-Advanced Materials and Processes Research Institute (CSIR-AMPRI), Bhopal
- (ii) CSIR-Central Building Research Institute (CSIR-CBRI), Roorkee
- (iii) CSIR-Central Glass and Ceramic Research Institute (CSIR-CGCRI), Kolkata
- (iv) CSIR-Central Mechanical Engineering Research Institute (CSIR-CMERI), Durgapur
- (v) CSIR-Central Road Research Institute (CSIR-CRRI), New Delhi
- (vi) CSIR-Institute of Minerals and Materials Technology (CSIR-IMMT), Bhubaneswar
- (vii) CSIR-National Aerospace Laboratories (CSIR-NAL), Bengaluru
- (viii) CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur
- (ix) CSIR-National Metallurgical Laboratory (CSIR-NML), Jamshedpur
- (x) CSIR-Structural Engineering Research Centre (CSIR-SERC), Chennai

### **Physical Sciences Cluster**

- (i) CSIR-Central Electronics Engineering Research Institute (CSIR-CEERI), Pilani
- (ii) CSIR-Central Scientific Instruments Organization (CSIR-CSIO), Chandigarh
- (iii) CSIR-National Geophysical Research Institute (CSIR-NGRI), Hyderabad
- (iv) CSIR-National Institute of Oceanography (CSIR-NIO), Goa
- (v) CSIR-National Physical Laboratory (CSIR-NPL), New Delhi

### **Information Sciences Cluster**

- (i) CSIR-National Institute of Science Communication & Information Resources (CSIR-NISCAIR), New Delhi
- (ii) CSIR-National Institute of Science, Technology and Development Studies (CSIR-NISTADS), New Delhi
- (iii) Fourth Paradigm Institute (CSIR-4PI), Bengaluru.

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