

Compendium on the activities of Science & Technology Councils of States / UTs of India 2020

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Department of Science & Technology
Govt. of India

**STATE SCIENCE & TECHNOLOGY PROGRAMME (SSTP)
DEPARTMENT OF SCIENCE & TECHNOLOGY
GOVERNMENT OF INDIA**

Hosted by



Karnataka State Council for Science and Technology

Indian Institute of Science campus, Bengaluru – 560012

Tel: +91-080-2334 1652 / 2334 8848 / 2334 8849 / 2334 8840

E-mail: office@kscst.org.in, office.kscst@iisc.ac.in

Website: www.kscst.org.in, www.kscst.iisc.ernet.in



सत्यमेव जयते



एक कदम स्वच्छता की ओर



प्रो. आशुतोष शर्मा
Prof. Ashutosh Sharma

सचिव
भारत सरकार
विज्ञान एवं प्रौद्योगिकी मंत्रालय
विज्ञान एवं प्रौद्योगिकी विभाग
Secretary
Government of India
Ministry of Science and Technology
Department of Science and Technology



FOREWORD

India's development process has also transformed the societal aspiration across the nation. The emerging vibrant Science, Technology and Innovation (STI) ecosystem of the country has the responsibility to address this transformative societal need in a sustainable and inclusive manner. Department of Science & Technology (DST), Government of India (GOI) through its State Science and Technology Programme (SSTP), is strengthening the STI ecosystem at State and National level through State S&T Councils (SSTCs), a unique Centre–State Science and Technology (S&T) Cooperation mechanism.

Although, SSTCs are doing commendable work over the years in creating scientific awareness and strengthening the S&T infrastructure at state level, however, during the Years to come these SSTCs must evolve as knowledge managers and take up lead role in assessing and implementing socially acceptable, commercially viable and environmentally sustainable solutions for state specific needs through appropriate delivery mechanism. This structural change would lead to adoption of new technologies not only for the benefit of the society, but also would increase the resource-efficiency.

As the world is going through the difficult phase of COVID-19 pandemic, I would suggest that the SSTCs should come forward to develop State specific STI based strategy for economic regrowth during Post-COVID 19 period.

It gives me a great pleasure to learn about the best practices and achievements of various SSTCs in States and Union Territories, which has been compiled in the form of Compendium to provide a glimpse of the accomplishments of this unique mechanism. It has clearly emerged that SSTCs must learn from each other and replicate successful models wherever appropriate for socio-economic progress.

I must compliment the team of SSTP especially Dr. Debapriya Dutta, Head & Adviser, SEED-SSTP, DST and Dr. Rashmi Sharma, Programme In-charge, SEED-SSTP, DST, for their sincere efforts to bring out this publication "Compendium on Science & Technology Councils of States/ UTs of India - 2020".

(Ashutosh Sharma)

Technology Bhavan, New Mehrauli Road, New Delhi - 110016

Tel: 0091 11 26511439 / 26510068 | Fax: 00 91 11 26863847 | e-mail: dstsec@nic.in | website: www.dst.gov.in



सत्यमेव जयते

Dr. Debapriya Dutta
Head [SSTP] / Scientist-G / Adviser
Govt. of India
Tel.011 26964793

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग
नई दिल्ली-110 016

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
TECHNOLOGY BHAVAN, NEW MEHRAULI ROAD
NEW DELHI-110 016

MESSAGE

Science Technology and Innovation (STI) is the key to the development process of any nation. In this context, Central and State Science & Technology (S&T) Departments are major actors. The process to strengthen the Centre-State S&T partnership was initiated 50 years ago in 1971 by Bharat Ratna Late Shri C. Subramaniam, then Minister for S&T and Chairman, National Committee for Science & Technology (NCST) through establishment of State Science & Technology Councils (SSTC). It initiated in four States viz. Karnataka, Kerala, Uttar Pradesh and West Bengal, SSTCs are now established in almost all the Indian States and Union Territories.



The budgetary support for Scientific and Technical Secretariat at State S&T Councils was initiated during Ninth Five Year Plan to accelerate S&T activities at the State level through State Science and Technology Programme (SSTP). The well thought process enabled integration of S&T for overall socio-economic development with special emphasis on location specific needs and research, development of appropriate technologies and its adaptation and transfer to beneficiaries. Over the years, the focus remained on scientific awareness creation at the bottom of the pyramid of the society. However, with the augmented role of STI in the nation building, the focus should also be on research and development capacity building and catalyzing innovation ecosystem at the State level. Many of the SSTCs have significantly contributed in this endeavor. Exchanging their best practices and experiences for the benefit of the other SSTCs and S&T community at large requires documentation of the activities of the SSTCs and has become an annual exercise.

It gives me immense pleasure to inform that this year, even during the challenging COVID – 19 pandemic situation, Karnataka State Council for Science and Technology successfully hosted Annual Meeting of SSTP virtually during June 18 to July 1, 2020. In collaboration with all the State Science & Technology Councils (SSTCs), DST, Government of India is bringing out this “**Compendium on Science & Technology Councils of States / UTs of India - 2020**”. This document contains all the major scientific, technological, innovative programmes, outputs and success stories of all the State S&T Councils.

I take this opportunity to congratulate Mr. H. Hemanth Kumar, Executive Secretary, KSCST and his team, the ‘Team SSTC’ and my colleagues at SSTP, Department of Science and Technology, Government of India for bringing out this nationally important compendium.

December 12, 2020
New Delhi

(Dr. Debapriya Dutta)



Karnataka State Council for Science and Technology

Indian Institute of Science campus, Bengaluru

Website: www.kscst.iisc.ernet.in || E-mail : office.kscst@iisc.ac.in

Tel: 080 – 23341652, 23348848, 23601824, 23348840

Editor's Note

Mr. H. Hemanth Kumar

Executive Secretary, KSCST



The Department of Science and Technology (DST), Government of India is supporting State Science & Technology(S&T) Councils including Union territories (UT's) in the country through its State Science and Technology Programme (SSTP). This programme initiated by DST to promote S&T through strong Centre–State partnership for strengthening the State Science, Technology and Innovation (STI) ecosystem. Application of Science, Technology and Innovation for the management of resources, improvement of environment, quality of life and socio-economic conditions have been the goals of all State S&T Councils (SSTC) since inception. The SSTC's have also been striving to develop scientific attitude and temperament among various sections of society. Over the years, a number of technologies have been translated, from research and demonstration phase, to the implementation and operational phase by the SSTCs. In this direction, the contribution of S&T Councils in applications of science & technology interventions is laudable.

I am happy to inform that the Expert Group Meeting of SSTCs coinciding with the Annual Meet of SSTCs of DST, GoI – 2020 was organised through virtual platform during this COVID – 19 pandemic situations by the Karnataka State Council of Science & Technology (KSCST), during June – July, 2020 at the instance of DST, Govt. of India.

This **Compendium on Science & Technology Councils of States / UTs of India - 2020** was brought out as per the suggestions of DST, Government of India. Every effort is made to give a true reflection of the focus areas and activities of the SSTCs within the scope and mandate of this Compendium. The compendium is concise and highlights major programs/interventions and success stories of SSTCs. I thank each one of the Heads of SSTCs who have participated in the Meet for providing the information to bring out this compendium and appeal to them our inability to accommodate all the material provided by them due to space constraint and not for any other reason.

I extend my heartfelt gratitude to Prof. Ashutosh Sharma, Secretary, Department of Science & Technology, Government of India for his special address during the inaugural session and for entrusting this assignment to KSCST. I am thankful to Dr. Debapriya Dutta, Head, SEED and SSTP Division, DST, Govt. of India and Dr Rashmi Sharma, Scientist-E, DST, Govt. of India, for their support/guidance in organising this the National Meet and for their excellent coordination with Scientific Advisory Committee - SSTP.

I am grateful to Prof. Ashok M. Raichur, Secretary, KSCST and Professor, Department of Materials Engineering, Indian Institute of Science for his guidance and support in hosting this meet. I thank all my colleagues at KSCST in organising this meet and assisting in bringing out this compendium.

(H. Hemanth Kumar)

01/12/2020

Bengaluru

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1) ASSAM SCIENCE TECHNOLOGY & ENVIRONMENT COUNCIL

Assam Science Technology & Environment Council (ASTECC) was established in 1987 under Department of Science Technology & Environment, Government of Assam for implementation of major programmes in the sectors of science & technology, remote sensing, energy (non-conventional & renewable sources) and environment.

Assam Remote Sensing Application Centre (ARSAC) has developed a **Web based GIS application for Rashtriya Uchattar Siksha Abhiyan (RUSA)** for planning and information.

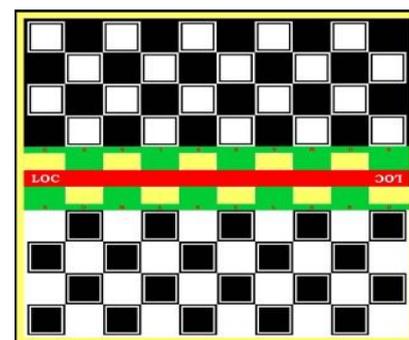


Conceptualization, Design & Development of a **pedal propelled vehicle to collect and dispose of household solid waste** in municipal areas considering ergonomic & usability factors: developed in association with Dr. Vikramjit Kakati, Associate Professor, Department of Mechanical Engineering, Assam Don Bosco University



Vehicle security system device: protects a vehicle from being stolen by using GPS receiver and GSM modem. Device was invented by Mr. Bhaskar Barman.

Mr. Tapan Deb, an innovator from Gor-Ali Jorhat, Assam invented an improved Chess Board Game with the addition of modern-day warfare elements to make it more exciting. Copyright and Design registration has been filed through council.



Design of chess board game

Innovation, Technology Generation and Awareness for Karbi Anglong and Dima Hasao. Under the scheme “Project Related Grant (PRG)” 8 innovative projects have been supported.

Kokrajhar Planetarium cum Science Centre was inaugurated on 10th Feb, 2020 by the honourable Chief Minister of Assam in presence of Minister of S&T, Assam



Kokrajhar Planetarium cum Science Centre inauguration

3D printing & doodling – a platform for students to run their ideas into reality; Mind Bending – a science and mathematics based Puzzle competition; Mathematics made easy – an interactive session with renowned mathematician and demonstration of Mobile Science Laboratory – to expose the facilities of mobile science laboratory designed and developed by ASTECC were carried out through Aryabhata Science Centres



Science and Mathematics Facilitators: Promoting teaching method of Science and Mathematics, 44 Science Facilitators and 44 Mathematics Facilitators have been engaged in 65 high and higher secondary schools of the state. Grooming and Mentoring of Students – a six days programme by a group of Science and Mathematics Facilitators are also being conducted among selected 20 students from each Legislative Assembly Constituency of the state. During the year 1300 students are being groomed by the Facilitators



Mobile Science Laboratory (MSL), vehicle designed by ASTEC is also helping Science & Mathematics Facilitators for strengthening science practical classes in schools. **National Science Day** and **National Mathematics Day** are also being celebrated by the facilitators in their schools involving school students and common mass of the locality. **Sanskar Manuhe Manuhar Babe:** a Scientific Awareness Campaign against superstitions conducted.



State Science Award: categories as Young Scientist Award, Lifetime achievement award to Eminent Scientist and Award for Promoting Scientific Research and Disseminating Science in the State for 2020.

- Lifetime Achievement Award in Science-2020: Dr. Joyanti Chutia
- Young Scientist Award 2020: Dr. Hemen Kumar Kalita
- Award for Promoting Scientific Research and Disseminating Science in the State for 2020 Institute of Advanced Study in Science and Technology (IASST)

Environmental Information System Hub to collate and disseminate information on status of environment of the state and its related issues. Further, the hub is skilling student through **its Green Skill Development Programme (GSDP)**. Under **National Green Corps Programme**, school plant diversity centres, environment and climate Cells have been set up at schools.



Development of traditional technology (location specific), indigenous goods Industry by GI registration, Food Processing Technology, application of Remote Sensing and GIS in Natural Resource Management are the major activity sector of the council. RS & GIS based mobile application has been developed for specific governance application, such as Crime GIS on pilot basis.



Patent Information Centre (PIC) has supported the filing of 7 patents for inventors. PIC extends support to the inventors/innovators in registering their Intellectual Property (IP) and also creates awareness on IPR.

2) ARUNACHAL PRADESH STATE COUNCIL FOR SCIENCE & TECHNOLOGY

Arunachal Pradesh State Council for Science & Technology (APSCS&T) was established in the year 1992 to cater to the need of Science & Technological requirements of the state and to advise government on policies and measures necessary to promote utilization of Science and Technology for achieving the socio-economic objectives of the state. Since 1995 onwards, APSCS&T have been playing catalytic role with the basic objectives for promoting application of science & technology for proper utilization of natural resources, mapping, documentation and development of **Indigenous Knowledge System (IKS)**, replication of technologies and popularization and communication of science & technology.

Rural Appropriate Technology Demonstration Centre is being set up at Kimin, Papumpare district of Arunachal Pradesh with the aim to impart skill training and provide economic sustainability to the rural population of the state. Procurement of instruments, training of the technical staffs, cultivation of citronella and technology transfer from respective CSIR Institutes is currently being carried out. The future prospects will involve training for the farmers, entrepreneurs and women of the state on different aspects of entrepreneurial skills using science and technology intervention for economic sustainability.

Centre of Excellence (CoE) in Bioresources and Sustainable Development: unexplored wild edible and ethno-medicinal importance plant species was selected for nutritional profiling and phytochemical characterization. An around 35 alpine species from Arunachal Pradesh has been enlisted among which 8 taxa seems to be new records for Arunachal Pradesh. The bacterial isolates of the alpine areas of the state have been identified using the 16srDNA techniques and phylogentic construction of the isolates has found it similar to important psychrophilic microbes recorded from Himalayan glacial regions. Database preparation of the traditional knowledge of the state is undertaken with the help of bioinformatics tools.



Soil nutrient profiling of the agricultural field of kimin area has been undertaken. Study was also done to identify beneficial bacterial diversity from undisturbed soil of Kimin and In Vitro screening of the beneficial microbial strains for their plant growth promoting activities (PGP) activities.

Sanitary Napkin Production and Training for Self-sustainability for Rural Tribal Women a sustainable processing unit for development and empowerment of rural tribal women through science and technology intervention.

To meet the energy requirements of the Kimin General Hospital, Papumpare district of Arunachal Pradesh, **demonstration of the technology on Geo-thermal energy for heating and cooling system** has been taken up.



Study on Traditional alcoholic beverage "Black Apong, Chang" for its Preservation and Commercialization: project is being implemented in active collaboration with Chemistry Department of Dibrugarh University, Dibrugarh, Assam and a Memorandum of Understanding has been signed in this regard. The research work is under progress and efforts are being made to preserve rice beers up to 8-12 months by using other stabilizing agents such as potassium sorbate, sodium benzoate etc.(ii) Controlling alcohol production

between 11-12% (v/v) by fermenting ~130-140 hours only keeping at 3000C.and (iii) Reducing colloidal instability in beer, which is caused mainly by interactions between polypeptides and poly-phenols. They combine to produce visible haze that reduces shelf life of the product. By reducing the levels of both precursors using suitable stabilizing treatments (with silica gel, polyvinyl polypyrrolidone,) may extend physical stability.



Rainwater Harvesting System is been set up at Arunachal Pradesh Science Center to encourage and sensitize the local populace on the importance of water conservation as well as demonstrate technology.

In 27th National Children’s Science Congress, 10 (ten) students from Arunachal Pradesh participated in National level event held at Kerala. Celebrated National Mathematics Day 2019 and National Science Day 2020 to generate scientific temperament and awareness among various cross-section of the society through various activities. Council showcased the activities in 5th Indian International Science Festival (IISF) held at Kolkata.



Innovation Hub of Arunachal Pradesh Science Centre organized LEGO EV3 Robotics Competition for school students to create awareness in robotics, artificial intelligence, concept of programming and to promote innovation, creativity. Two teams participated in North East Zonal Level Robotic Olympiad - Regional Level Robotic Competition held on 21st January and 22nd January, 2020. State level Innovation Festival was organized at Guwahati on 8th and 9th February 2020.



To imbibe and inculcate the scientific temperament amongst the children, exposure tour was organized to 10 meritorious students



Science Drama: Ten schools participated in state level science drama competition during September 2018 at Itanagar on the theme “science and society”. The winner of this science drama competition will participate in “National Science Drama Festival” organized by National Council of Science Museums, Ministry of Culture, GoI, Kolkata.

Students Solar Ambassador Workshop held on 2nd October, 2019 at Indira Gandhi Park, Itanagar: more than 1 million students across the world were got hands on training on solar study lamp



3) ANDHRA PRADESH STATE COUNCIL OF SCIENCE & TECHNOLOGY

APCOST was established in the year 1986 with the intention of formulating measures to foster the spirit of science at all levels of society, particularly among the youth. It was also intended to evaluate scientific and technological aspects for the benefit of society.

APCOST with the support of Ministry of Culture, Government of India & Government of Andhra Pradesh establishing **Sub-Regional Science Centre** in Rajahmundry East Godavari district. It is expected to be completed by May 2021 and will cater its services to North Coastal Districts of Andhra Pradesh (i.e., Srikakulam, Vizianagaram, Visakhapatnam, East Godavari and West Godavari districts).

Eco – Eureka: A Program entitled “**Development of Eco Eureka Youth in Tribal Predominant districts of Andhra Pradesh**” sanctioned by NCSTC, DST, Govt. of India, for six (6) selected (by GoI) districts namely Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, Chittoor & Kurnool. Project Officers, ITDAs of concerned have selected 2 villages in each ITDA purview for implementation of the program. Workshop for Organizers of 6 Districts has been conducted. 20 members Eco-Hunts teams have been selected by screening of tests. 5 – Days Training has been deployed in each village and Pre – Assessment and Post – Assessment survey is under progress in all the 6 districts.

APCOST is popularising science among young minds through marking scientific days such as

- **World Environment Day 2019** celebrated on the theme “Air Pollution”: 6861 people including students & teachers participated in the programme organized through the state
- **World Ozone Day** celebrated at 55 venues, covering all 11 districts of Andhra Pradesh - 20289 participants (teachers/ guests) have taken part in the program.
- **National Mathematics Day 2019:** 48049 participants (teachers/ guests) have taken part in the program from 156 Schools / Institutions.
- **National Science Day 2020:** 48049 participants (teachers/ guests) have taken part in the program from 156 Schools / Institutions.
- **Safe viewing of solar eclipse camps** was organized about 3250 people have witnessed the eclipse in 13 districts.



Seminars / Workshops/ Exhibitions / R& D Programs:

- “National Conference on Recent Trends in Science Engineering & Technology-2019” at Annamacharya institute of Technology & Sciences, Tirupati entitled
- **Science Week** at Ms. Y A Govt. Degree College for Women, Chirala, Prakasam District at 20 venues. Total 1296 participants (teachers/ guests) have taken part in the program.

17 students participated in 27th National Children’s Science Congress held at Kerala. Council was also represented in 107th Indian Science Congress held in Bengaluru, Karnataka.

Preserving agricultural and food products for longer period using advanced technologies, creating awareness on conservation of conventional energy. Demonstrations of rural technologies such as preparation of leaf plates, Agarbathi making, Candle making, Screen printing, Photo lamination are major activities of the council.



YOUNG MINDS AT WORK IN CHILDREN'S SCIENCE CONGRESS

167 projects from 13 districts are being evaluated at State-level Congress. 17 will be selected for national level event to be held in Kerala during December 27-31.

HANS NEWS SERVICE

Tirupathi. Understanding the hazards of using plastic carry bags, young student V Sravan of Santanulapada mandal in Prakasam district has worked on suggesting some alternatives to it. With the help of her guide teacher T Ramesh and fellow student S.H. Hansela, she undertook the survey and collected data from her village to develop her project as plastic was taking away the sleep of environmentalists as it destroys the ecosystem and is considered fatal to the life on the Earth. The project suggested the use of alternatives like wood, paper, cloth bags, etc. in day to day life awareness through various competitions can be created among young minds towards a plastic free society with the slogan "Carry a bag not carry bag".

This is one of the 167 projects that have been selected at district level and will be evaluated at the 27th National Children's Science Congress (NCSC) being held in Tirupathi on November 24-25. Students along with guide teachers have reached Sri Padinevali Mahila Viswavidyalayam (SPMVT) to get their projects evaluated to be selected for National level event to be held at Thiruvananthapuram in Kerala from December 27-31. A total of 17 projects will be selected out of 167 from 13 districts in AP for national level.

NCSC, has been instrumental in providing a very creative channel in learning science in its true spirit by the application of scientific principles. NCSC provides a unique opportunity to the child scientists to present their investigatory projects and interact with eminent scientists and thereby creates a zeal for entering into the exciting world of science and technology, said the member secretary of AP State Council of Science and Technology (APCOST), P. Phala Chandra Rao.

To provide a forum to the children to showcase their creativity, APCOST in nodal agency to department of Science and Technology (OST), New Delhi, has been working with the school education department in the state. The aim was to encourage children throughout the country to visualize the future of the nation and help in building a generation of sensitive and responsible citizens, he outlined.

The focal theme for this year was "Science, technology and innovation for a clean, green, and healthy nation" with related sub-themes. Children in the age group of 10-17 years were encouraged to undertake innovative project works for presentation at the district level Congress with 13-14 best projects to be selected for state level Congress, he said.

With experts and jury members actively involved in the evaluation process of 167 projects, 17 will be selected by Monday. The best two projects out of them will be allowed to participate in Indian Science Congress to be held from January 9-7, 2020 at Bengaluru.

THE HANS IN INDIA

24-02-2020

NATIONAL SCIENCE DAY

APCOST holds essay competition for Agency students

HANS NEWS SERVICE

Kakinada. AP Council of Science and Technology (APCOST) organized an essay-writing competition to mark the occasion of National Science Day at Kakinada Girls' High School (KGS), Maredani, East Godavari district on Sunday.

Rala Venkaiah, convener, Niti Baharan Krishna participated as chief guest in the occasion.

He wished the students should get inspired by the scientists. With discipline and dedication, they should contribute for sustainable development of the country.

Kakinada encouraged students to write their essays not only in celebration point of view but also for the betterment of the society and living conditions.

India needs to progress yet in terms of science and technology, he said.

Special Officer M Lakshmi said that National Science Day was celebrated every year to encourage young scientists in India in honour of physicist Sir CV Raman for his discovery of dispersion of light on 28 February 1928.

In theory as 226 students participated in the competition.

APCOST coordinator Keesari Srinivasa Rao, resource persons S. Srinivasulu, N. V. Srinivas Krishna, D.V. Ramana and others were present.

Students holding their participation certificates at National Science Day celebration at Maredani on Sunday

Partial Solar Eclipse

December 26, 2019
8 am to 11:13 am

Organized by
AP PRADESH COUNCIL OF SCIENCE & TECHNOLOGY, Kakinada
Department of Parents, Students & Teachers Welfare

Venue
SRIRAM NAGAR, KAKINADA, East Godavari District

Students viewing the solar eclipse at the Sri Ramnagar Municipal High School in Kakinada on Thursday

Students catch glimpse of solar eclipse

HANS NEWS SERVICE

Kakinada. Andhra Pradesh State Council of Science and Technology (APCOST) coordinator Keesari Srinivasa Rao said that the solar eclipses occur when the moon casts a shadow on the earth, thereby totally or partially obscuring the sun for viewers on earth.

The APCOST made arrangement for viewing partial solar eclipse at the Municipal High School in Sriramnagar on Thursday. Srinivasa Rao distributed 200 solar filters to the students. He said that these kinds of sessions would benefit the students in gaining more knowledge on the subject. These sessions would motivate the students and create interest in the subject as physical science was a difficult and one of the important subjects.

School Headmaster Mohammad Rabbani said that annular solar eclipse takes place when the moon covers the Sun's centre, leaving the Sun's visible outer edges to form a "ring of fire" or annulus around the moon. He said that the partial eclipse started at 8.04 am when the moon "touched" the Sun's edge, and at 9.24 am the annular phase started and the full eclipse was visible. The total eclipse lasted for 3.12 minutes. Hindus offered special prayers outside temples. And the people avoided eating anything during the eclipse.

4) BIHAR COUNCIL ON SCIENCE & TECHNOLOGY

Bihar Council on Science & Technology, Patna was set up on 1984 with the vision to become facilitator and mentor for promoting R&D on technological requirements of the common man through development of science and technology. The main mission of the council is to promote science and technology in the state by encouraging scientists, academicians and technologists to pursue world class research and to nurture a scientific temper in young scientists in their early stage.

Covid-19 dashboard has been prepared in response to the Covid Pandemic by Bihar Remote Sensing Application Centre with an objective for Planning and Decision support to take appropriate measures to curb Covid-19 in the state of Bihar which include information like positive recover, death cases in the state.

Under **Student Project Programme**, 500 projects of Under Graduate students were supported. Parali burning is a major threat to environmental pollution which are continuously being surveillance of Khari and Rabi crops. **Surveillance of Parali burning** activities are also being mapped regularly by Bihar Remote Sensing Application Centre using Satellite images, VNIR sensor which provide 370 mts spatial resolutions so that administration may take appropriate step. It has shown very positive impact.

Bihar Remote Sensing Application Centre has started a new initiative to make inventory of forest/ tree cover of the state. In the study LISS IV satellite images of 5 mts spatial resolution have been used. The study has revealed that the state is having 15.04 % area under forest & tree cover. Forest Cover Mapping of the entire state of Bihar using Remote Sensing and GIS.

Inventory of Fisheries Resources like lakes ponds, reservoirs, waterlogged areas, hatchery / seed farm and other water bodies mapping of entire state of Bihar. In the study the LISS IV satellite images of 5 mts. spatial resolution has been used. The study has been done for pre-monsoon and post-monsoon period for the year 2019.

Surveillance of sand mining and stone mining of the state using Remote Sensing & GIS has also been done by Bihar Remote Sensing Application Centre Patna which has been proved quite beneficial in curbing the illegal mining and improving the Government revenue.

Improved Magnetic Filtration Device for removal of arsenic from drinking water; Hydrogen Fuel Generator with enhanced safety for Internal Combustion Engine; Development of Low-Cost Drone are the three innovative projects recommended prototype development by Innovation Promotion Appraisal Committee (IPAC). An around 10 grass-root innovators have been encouraged for documenting their innovations.

30 students participated in **27th National Children's Science Congress-2019** held at Kerala. Celebrated **National Mathematics Day 2019** through various activities like Quiz, Debate, Mathematics, Science Model competition and Robotics Exhibition. A series of **lectures on science communication** was organised at various Engineering Colleges and Polytechnics all over the state.

5) GOA STATE COUNCIL FOR SCIENCE & TECHNOLOGY

Goa State Council for Science & Technology implements various activities towards popularization of science, environmental awareness, promotions of Science & Technology (S&T) projects relevant to the State, implementation of renewable energy programmes, application of remote sensing technology.

Wipro Earthian, a Sustainability Education program is being organized every year since 2015 in association with C.P.R. Environmental Education Centre, Chennai. In past four years Goan schools have excelled in this programme and won the award at National level.



Patent Information Centre (PIC) has established 06 IPR cells in institutions to tap the possible invention for its fruitful patenting. Search facilities for patents are also made available for inventors. GI has been obtained for Harmal Chilli, Myndoli banana and Goan khaje.



State Council with the support of State Government is working on **student's project program** for promoting new technologies. The promising technologies will be given appropriate platform for its further development. A mechanized feni distillation processing device is presently under trial.

Goa State being a coastal State, coconut trees are seen spread all over state and coconut (khobra) is a daily requirement for preparing goan food items. The age-old traditions of collecting toddy from coconut sap is diminishing today, being a labour intensive and thus the toddy products such as jaggery, vinegar and coconut feni is reducing day by day. So as to work out the alternative, it is proposed to devise a suitable process for preparing jaggery from the cashew apple juice which is available locally in sufficient quantity

Study will be undertaken to revive the traditional process for preparation of various value-added items for jackfruits, kokum, mango pickles and other items and to adopt best one w. r. t. its quality, taste and preservative quality with locally available resources.

Popularization of Science has been routine activities of the State Council, celebrated **National Mathematics Day 2019**, **National Science Day 2020**, organised **National Green Corps**, **National Nature camp** with various activities such as expert lectures, demonstrations, presentations, debates, competitions, quizzes etc., **AARUSH 2019: Seminar cum Exhibition for Engineering Students**.

The Ministry of Environment, Forest and Climate Change, (MoEF&CC) Government of India, New Delhi, had identified 06 beaches in Goa for undertaking a Beach Cleanliness drive as a part of **National Beach Cleaning Drive**.

Considering the average performance of Goan students in many of the National level entrance exams and particularly in Maths for JEE and NTSE etc, a Capacity Building program for maths teachers was organized **Learning Maths through Origami** with the support of NCSTC, DST, GoI, New Delhi wherein 150 maths teachers from govt and govt. aided schools were trained with the various aspects of theorems, formulas and paper folding.



6) GUJARAT COUNCIL ON SCIENCE & TECHNOLOGY

Gujarat Council on Science and Technology (GUJCOST) was established in September, 1986 council has been catalyzing interaction between developers and users of technologies, by bringing on a common platform to training Scientists and Engineers on the one hand and policy makers as well as administrators on the other.

GUJCOST under the scheme of Science popularization has initiated set up of Five **Regional Science Museums** at Rajkot, Bhuj, Bhavnagar, Patan and Vadodara.

Established 18 Design Labs to provide the facilities to students and faculties with creative and innovative ideas. Each of the institutions has received equipments worth 25 lakhs.

Establishment of Supercomputing facilities for research and development in frontier areas of Science and Technology in the State:

A total of 16 institutions with PARAM Shavak Supercomputer equipped with latest Intel processor and high speed Nvidia GPGPU accelerator technologies. The concerned faculties and the M. Tech students are now initiating big-data analysis project to help the on-going COVID 19 surveillances as well as its healthcare facility projects in the state.

GUJCOST is implementing Science Technology and Innovation (STI) Policy under two key schemes:

- Research Support Scheme for R & D in emerging fields of S & T on State Priority Areas (RSSR&D)
- Technology Demonstration and Pilot Deployment on Innovative Solutions (TD&PD)

39 proposal under RSSR&D and 15 under TD&PD has been shortlisted for further development. Orientation programmes are also organised in various universities and institutions of the state.

Vikram Sarabhai Chair for interdisciplinary research and innovation in emerging areas of Science and Technology at IIT, Gandhinagar: to promote excellence and leadership in teaching, research and development activities in the state identified emerging area as per STI policy such as Artificial Intelligence, Robotics, Polymer & Specialty Materials, Nanotechnology, Energy Storage Solutions at IIT, Gandhinagar. Additionally, the said establishment of Chair will also help in inviting international experts, scholars to IITGN for training to researchers of Gujarat and international fellowship to our PhD scholars, interactions with world's top scientists and many more.

ROBOFEST: In order to improve the level of competence and skill set among the students of STEM discipline, a robot making competition

GUJCOST is engaged in popularization of science at grass root level by taking science to people and people to science. GUJCOST has developed a strong network of Community Science Centres in every district and 3000 plus School Science Clubs across the state to engage, educate and empower children and citizen at the interface of science technology and society. In addition, four state-of-the-art Regional Science Museums are



in the advance stage of completion which will add an impetus in the science education and popularization movement in the state and country.

State Level Rural IT Quiz Competition, State Level Science Seminar Competition, State Level Science Drama Festival Competition, Nature Education and celebrating special S&T days, weeks with children were science awareness, literacy and outreach activities.

GUJCOST celebrates special S&T days, weeks with children and common citizen including Community Science Centres and GUJCOST Science Clubs for science awareness, literacy and outreach. The following days, week and months have been celebrated as mentioned in the table:

Date	Name of Programme
26 th April 2019	Celebration of World Intellectual Property Day on the theme of “Let’s have Fun with IP” at Gujarat Science City, Ahmedabad
30 th April 2019	Brainstorming programme for Community Science Centre for Planning and Discussion on programme / activities for the year 2019-20, Discussion on Summer Programme / Activities and National Children Science Congress 2019
21-25 th May 2019	Workshop for Community Science Centre Facilitators at Indian Institute of Technology (IIT), Gandhinagar
5 th June 2019	Celebration of World Environment Day on the theme of “#BeatAirPollution at Gujarat Science City
29-30 th June 2019	Sponsoring National Green Mentors Conference 2019 at Karnavati University
12 th August 2019	Celebration Birth Anniversary of Dr. Vikram A Sarabhai at Gujarat Science City
18 th August 2019	Brainstorming Session for Science Writers in collaboration with Vigyan Prasar
5 th September 2019	Brainstorming Session among Academia, R&D laboratories and Industry located in and around Ahmedabad / Gandhinagar for Establishment of City Knowledge Innovation Cluster for Ahmedabad / Gandhinagar
6 th September 2019	Organizing programme on Chandrayan-2
14 th September 2019	Orientation workshop of National Children’s Science Congress 2019 programme at TRC, Gandhinagar
16 th September 2019	Celebration of World Ozone Day 2019 programme on the theme of “We saved the Ozone layer” at Gujarat Science City, Ahmedabad
17 th September 2019	State Level Rural IT Quiz 2017 in collaboration with Tata Consultancy Services at Town Hall
20 th September 2019	Organization of one-day Workshop on Augmenting Writing Skills for Articulating Research (AWSAR) for the Ph.D. Scholars and Post- Doctoral Fellows in S & T Stream of Gujarat in collaboration with Vigyan Prasar
12-13 th October 2019	Organizing Annual Review Meeting of Community Science Centres for year 2018-19
23 rd October 2019	Organizing the “State Level Science Seminar 2019” in collaboration with NCSM on the theme of “Periodic Table of Chemical Elements: Impact on Human Welfare”

23-24 th November 2019	Organizing the “ State Level Science Drama Festival 2019 ” in collaboration with NCSM on the theme of “Science and Society” at Bharad Vishwa Vidhyalay, Tramba, Rajkot
28-29 th November 2019	Organizing the 27 th Gujarat State Level National Children’s Science Congress 2019 in collaboration with NCSTC, DST, Govt. of India on the theme of “ Science, Technology & Innovation for a Clean, Green and Healthy Nation ” at Gujarat Vidyapith, Ahmedabad
18 th December 2019	Organizing the Orientation programme of National Children’s Science Congress 2019 for 28 child scientists at GUJCOST office
26 th December 2019	Organizing Annular Solar Eclipse programme across the state including Regional Science Museum site and Community Science Centre
3-7 th January 2020	Participate in 107th Indian Science Congress at University of Agricultural Sciences, Bangalore
20-24 th January 2020	Workshop for Master Resource Persons on Nature Education in association with Vigyan Prasar, DST Govt of India at Gujarat Forest Ranger College, Rajpipla, Narmada
2 nd February 2020	Celebration of World Wetlands Day 2020 on the theme of “ Wetlands and Biodiversity ” at Manav Seva Education and Charitable Trust, Ahmedabad.
21 st February 2020	Celebration of International Mother Language Day at Jawahar Navodaya Vidyalay, Dahegam
28 th February 2020 to 1 st March 2020	Celebration of National Science Day 2020 on the theme of “ Research and Innovation in Science for Sustainable Development ”
12 th March 2020	Organizing the Popular Science Talk on Understanding Corona Virus at Science City, Ahmedabad

Vibrant Gujarat Summit 2019, GUJCOST organized Beyond Planet Earth: The Future of Space Exploration – Travelling exhibition designed by American Museum of Natural History with content curation by NASA at Science City. The exhibition was inaugurated by the Hon’ble Union Minister of HRD and Hon’ble CM of Gujarat on 17th January 2019 and was continued up to 11th May 2019. A total of 3,50,000 visitors comprising students, teachers, parents and common visitors visited the exhibition and participated in its activities and outreach programmes. 20 projects participated in 27th National Children Science Congress.

7) Haryana State Council for Science, Innovation & Technology

Haryana State Council for Science, Innovation & Technology has developed and standardized protocols for large scale multiplication of Sugarcane, Sarpagandha, Banana, Bamboo, Brahmi, Gladiolus, Eucalyptus, Dahlia, Potato, Strawberry, Mehandi, Stevia and Aloe vera at Centre for Plant Biotechnology, Hisar to increase the number of plants per culture bottle and to reduce the *in vitro* multiplication time.



To enhance the general capability of scientists for pursuing innovative research ideas having socio-economic relevance/benefit for the state, three R&D projects has been supported. Organised training programmes on Plant Tissue Culture technology for graduate and post graduate students, scientists and farmers of Haryana & adjoining states.

HSCSIT has established a **Renewable Energy Test Centre (RETC)** at Deenbandhu Chhotu Ram University of Science & Technology to provide testing facilities to test Solar Thermal Gadgets, promote use of solar thermal systems for various applications and develop entrepreneurs for manufacturer of Solar Thermal Systems.



Thermal Performance Test Set-up

In order to popularize Science & Technology in the State, Science Quiz Contest for school students and college students, Science Essay Writing Competition, **Celebration of National Mathematics Day (NMD)** and **National Science Day (NSD)**, two exposure visits of meritorious students studying in Govt. Schools. **Space on Wheels** in collaboration with Indian Space Research Organization (ISRO), Bangalore; **Science Conclave**; **Haryana Vigyan Ratna** and **Yuva Vigyan Ratna Awards**; **HSCST Fellowship Programme**; **Promotion of Science Education (POSE)**; **Science Olympiads**; **Haryana Science Talent Search Scheme**; **A Tribute to Kalpana Chawla**: a special program organized at Kalpana Chawla Memorial Planetarium (KCMP) on Annular Solar Eclipse had been organized.



Council participated in **International Science Festival (IISF) 2019 & State Science & Technology Ministers Conclave (SSTMC)**.

Patent Information Centre (PIC) had supported filling of 34 trademark, 7 patent, 4 Industrial design, 3 copyright applications and have organised around 20 workshops in last 2 years.



8) HIMACHAL PRADESH COUNCIL FOR SCIENCE, TECHNOLOGY & ENVIRONMENT

Himachal Pradesh Council for Science, Technology and Environment is the nodal agency for the promotion of science & technology and creation of environment awareness in the state. The council was established at Shimla by govt. of Himachal Pradesh on January 3, 1986 under the country wide programme of the department of science, technology, govt. of India to promote science & technology in the state. Chief Secretary/Additional Chief Secretary/Principal Secretary/Secretary, Environment, Science and Technology, to the Govt. of H.P is the Chairman and overall In-Charge of the H.P. Council for Science, Technology and Environment, H.P. and Member Secretary (E.C.) is the Administrative Head of the State Council and looks after day-to-day activities of the H.P. Council for Science, Technology and Environment.

The council works with different departments such as Aryabhata Geo-informatics and Space Application Centre (AGiSAC), H.P. State Biodiversity Board, H.P. State Centre on Climate Change and also focus in the areas of technology dissemination, IPRs, Creating & Strengthening of Science and Technology facilities in H.P, Ecology and Environment, Science Popularization and Promotion, Environment Information System (ENVIS), Research & Development Projects, Capacity Building through Science & Technology Interventions.

In line with the Skill India Mission of Hon'ble Prime Minister, **Green Skill Development Programme (GSDP)** initiated three courses on **People's Biodiversity Register (PBR), Medicinal Plant & Bee Keeping.**

Under **DBT-Skill Vigyan program** the council is providing 3 months training programme on Quality Control Biologist and Lab Technician / Assistant for graduate students. The training programme has been certified by Life Sciences Sector Skill Development Council (LSSSDC).

HIM-INNOVATE Incubation Centre will provide supports to the startups & innovative projects by providing mentoring services, access to labs, facilities, etc on

Under NMHS programme of MoEF&CC, Govt. of India, Council in collaboration with IHBT, Palampurthe initiated a **study to understand the nature of alpine timberlines and its impact on climate change on these ecosystems by considering the socio-ecological aspects.** This long-term ecological study will not only enhance the understanding of the relationships of vegetation & environment but also a pre-requisite for documenting impacts of global climate change. The Long-Term Ecological Research Plots (LTER) have been established at Khanjar, Trilokinath & Muling of Lahaul & Spiti, Chhitkul of Kinnaur and Pangi of Chamba district based on probabilistic sampling among representative timberline species. At these LTER plots ecosystem functions viz. key species phenology, net primary productivity & nutrient dynamics are being studied. The biotic and abiotic parameters generated through LTER



Position of Litter traps in the Mooling LTER



Ecophysiological studies - performing stomatal sampling

and climate simulation studies will be utilized to train ecological models. In addition, ‘Scenario Studies’ by involving local communities and other stakeholders will be undertaken. These scenario studies will provide a useful context for addressing questions of future climate change and thus the increased involvement of local communities in assessing climate change impacts will enable people to be more responsible for sustainable utilization of natural resources.

Snow-Ice Harvesting at Pooh Village, District Kinnaur, Himachal Pradesh is being carried out in collaboration with SASE, Chandigarh. The objective of the pilot project is to generate slope, aspect, morphological and to study the change detection of snow-ice accumulation pattern using archive satellite data as well as the latest high-resolution satellite data.

During the course, field and lab visits to students were organised to best institutions in HP and Uttarakhand. Some of them include HFRI & Potters Hill; Indian Agricultural Research Institute; Water Catchment Area, Kufri, Forest Research Institute; Uttarakhand State Biodiversity Board; Uttarakhand Council for Science & Technology; Wildlife Indian Institute, Botanical Survey of India, Zoological Survey of India and Rajaji National Park.

The HIMCOSTE organized **Swachhata Campaign** in seven districts Sirmour (Paonta Sahib, Kala Amb & Nahan), Solan (Baddi, Parwanoo & Nalagarh), Hamirpur (Hamirpur, Deotsidh & Nadaun), Mandi (Mandi, Sundernagar & Jogindernagar), Kangra (Dharamshala, Nurpur & Jawalamukhi), Una (Una, Haroli & Amb), Bilaspur (Bilaspur, Ghumarwin & Sri Naina Devi) under Swachhata Action Plan 2019-20 in collaboration with the Education Department, Urban local bodies, Nehru Yuva Kendra and Voluntary organizations from January 28, 2020 to January 30, 2020.

The HIMCOSTE had also organized **Swachhata Hi Sewa Campaign** on October 2, 2019 by involving school students of Shimla.

Two days regional workshop on “**Conservation and Management of wetlands for wetland managers & stakeholders of Northern States /UTs**” was organized on December 16-17, 2019 by HP State Wetlands Authority & Ministry of Environment, Forest & Climate Change at Chandigarh. The Seven Northern States and Union Territory (H.P, Uttarakhand, Punjab, Haryana and J&K, Ladakh and Chandigarh) participated in this workshop.

The Himachal Pradesh Council for Science, Technology & Environment (HIMCOSTE) organized Regional workshop on “Challenges of Disaster Risk Reduction in Hill Towns of North-Western Himalayas. In order to address the issues arising out of the hazards of various forms, whether natural or human-made from the Himalayan perspective and the challenges for the disaster risk reduction in hill towns being faced by the mountain states of Himachal



Pradesh, Uttarakhand and the Union Territories of Jammu & Kashmir and Ladakh.

The workshop was attended by the practitioners, administrators, researchers, technocrats and policy makers from the northwestern Himalayan States. Sh. Jai Ram Thakur, Hon'ble Chief Minister Himachal Pradesh was the Chief Guest on this occasion. Smt. Sarveen Chaudhary, Hon'ble Minister (Urban Development, Town & Country Planning & Housing) was the Guest of Honour and Sh. Kamal Kishore, Hon'ble Member, NDMA was the Special Guest on this workshop who delivered the keynote address. Besides this, Smt. Kusum Sadrate, Mayor MC-Shimla; Dr. Shrikant Baldi, Worthy Chief Secretary, Govt. of H.P; Prof. Ravi Sinha, IIT Bombay were the imminent panelists in the inaugural session.

Himachal Pradesh State Biodiversity Board (HPSBB) has constituted 3371 Biodiversity Management Committees (BMCs) at every Local level i.e at Rural and Urban body level covering all agro-climatic zones on the State. The Board is also preparing Peoples Biodiversity registers (PBRs) in the selected Biodiversity Management Committees (BMCs). A total of 112 Peoples Biodiversity Registers have been prepared and 200 PBRs are in the process of preparation. HP State Biodiversity Board intends to prepare PBRs at every local level by the end of this year.



Board has also made agreements related to Access and Benefit Sharing (ABS) with Dabur India and Organic India Ltd. Other related activities are in process. HPSBB has initiated the process for notifying 2- Sacred Grooves i.e. Kamroo Nag, Nachan, Mandi and Jagdamini Rishi, Kullu as Biodiversity Heritage Sites.

HIMCOSTE deployed many technologies into the field. In this direction council installed 40 tunnel type greenhouses in the districts of Chamba, Kullu, built LDPF ponds of capacity 25000 lts in Mandi and Kullu, district of Himachal Pradesh. Further, training on snow harvesting at Pooh, District Kinnaur along with SASE Chandigarh was also provided. The council also works in the State Spatial Data Infrastructure (SSDI) which helps in development of geo spatial database network, easy mechanism for data access, data handling and data sharing on affordable cost where spatial based specific planning & its implementation of the specific location can be done in a scientific manner.

The council demonstrated many technologies and provided trainings on the same. Trainings on solar water heating systems, waste water disposal system, popularizing conversion of pine needles biomass into coal (Briquettes), skill development training programmes, GIS based mapping of soil health card for 25 villages of Chamba district, GIS based Integrated Planning under MGNREGA for 2 Panchayaths, training on Remote Sensing - GIS & mobile applications in the horticulture crop mapping for officers of HP State Horticulture Department at Shimla under Coordinated Programme on Horticulture Assessment and Management (CHAMAN) Project 2019-20 were conducted.

In view of popularizing science many workshops entitled below were conducted.

- Challenges of Disaster Risk Reduction in Hill Towns of North- Western Himalayas
- 27th Children's Science Congress (theme- "Science, Technology and innovation for Clean Green and Healthy Nation)
- National Science Day

- National Mathematics Day
- Yuva Vigyan Purskar
- First Lunar Eclipse
- Vedic Mathematics
- Periodic Table
- Para-taxonomy [Peoples Biodiversity Register (PBR) focused]
- Implementation of Biological Diversity Act, 2002 and Rules, 2004 in Himachal Pradesh, Biological Diversity Act, 2002
- National Nature Camping Programme (NNCP),
- World Wetland Day

So, for Patent Information Center facilitated 3 patent filings, a design registration and 2 GIs filings (i.e. Chamba Chappal & Chilgoza). It conducted more than 20 IPR workshops, assisted in filing 52 GI and also established 14 IP cells in the state. The center also conducted 11 patent searches and granted 2 GIs (Himachali Kalazeera & Himachali Chulli Oil) with efforts by the council.

The council under the National Wetland Inventory and Assessment (NWIA) (Ph-II under SARITA Program of ISRO-SAC Ahamdabad) updates the data on all the wetlands in HP with reference to 2006 & 2007 using satellite data for 2017 & 2018. LISS-IV data is used to prepare wetland inventory of Himachal Pradesh of 1:25000 scale. Further under the GoI-UNDP-GEF Project "Securing livelihoods, Conservation, Sustainable use and Restoration of high range Himalayan Ecosystems" (SECURE Himalaya) of the H.P. forest Department, one-month duration training program on Para-taxonomy [Peoples Biodiversity Register (PBR) focused] conducted by HP ENVIS HUB. This program was conducted in collaboration with HP Forest Department and State Biodiversity Board. Under this program, nine selected youth from Shimla, Lahaul and Pangri were trained for documenting local biodiversity in the form of Peoples Biodiversity Registers (PBRs).

9) KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Karnataka State Council for Science and Technology (KSCST) founded in the year 1975 is the one among the first State council to be established in the country. During the last 45 years, KSCST has been pro-actively engaging itself to identify, propose and implement S&T based solutions to locale specific needs / problems in the broad areas of Water, Education, Energy, Environment, Housing, Geo-Information Communication Technologies, IOT/Cyber Security and Infrastructure.

Some of the success stories arising from the activities of the council include - Design of Novel Biogas Plants, Solar Collectors and Ponds, Gasifiers, Design of High Efficiency Cooking Stoves, Setting up of Rural Energy Centres and innovative use of Sisal plant. Some of the recent major initiatives of the council include Rainwater Harvesting, Creation of National Spatial Data Infrastructure and Waste Management. In addition to such catalytic role in the application of simple S&T solutions to variety of problems, the Council has also been promoting innovation in scientific and technical education.

Utilization of crude glycerol obtained in biodiesel production as an alternate to glycogenic feed supplement for dairy cows project aims to characterize and purify crude glycerol produced during biodiesel production from non-edible oils seeds (NEOS) viz., Pongamia, Jatropha, Neem, Mahua and Simarouba. At NDRI, crude glycerol obtained from various sources was purified at different levels of purity and used for invitro experiments. Utilization of crude glycerol obtained from non-edible oils in cattle feed can reduce methane production in rumen and improve the biological efficiency of dairy cattle. Animal trial is in process. Patent filling is in progress.

Assessment of hydrological and physical status of traditional water harvesting systems in Karnataka state using geo-spatial technologies and measures for restoration & rejuvenation: linked more than 30 related attributes to support restoration and rejuvenation surface water bodies. District wise reports have been submitted to the respective Zilla Panchayath, DC's office and RDPR department. The information is being used in formulation action plan under JALAMRUTHA, MGNREGA and Jalashakti Mission programmes.

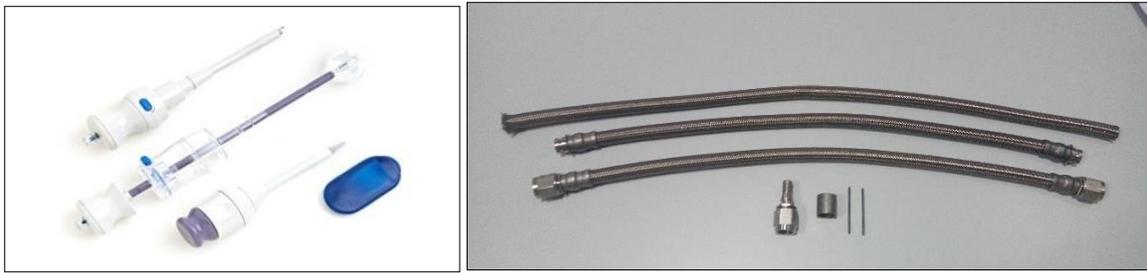


Kalyani in Rangasthala, Chikkaballapura taluk before and after rejuvenation

One of the flagship programme of the council is **Student Project Programme (SPP)**: under 42nd series of SPP KSCST has sanctioned 798 projects out of 3800 projects proposals received and awarded 50 student projects as “Best project of the year”. 40 projects have been identified for prototype development and commercialization.



M/s. Blue Neem Medical Devices Pvt. Ltd. and M/s. Rangsons Schuster Technologies Pvt. Ltd. has been supported under **Karnataka-Israel Program for Industrial R&D (KIRD)** for developing and commercializing novel products in collaboration with Israeli companies. “Contisphere” and flexible hoses with titanium end fittings are the products developed by respective small scale industries.



Contisphere and Hose with end fittings

Developing **Highly Dispersible Silica (HDS)** from RHA using **IISc technology** to meet specific product requirements of Goodyear. As of now two products have been developed.

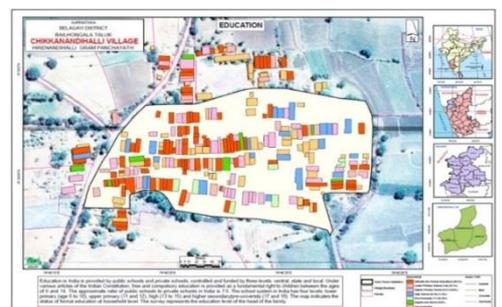
Natural Resources Data Management System Programme established

in 1992 has been providing geospatial data and services for a wide range of uses and have seen steady growth in the requests for both data and services since inception. All the district development departments prepared detailed geospatial action plan for all the taluks and districts of Karnataka as per the direction of planning department with the support and assistance of District NRDMS Centre. Supports RDPR (MGNREGA) in identifying suitable sites for soil and water conservation. NRDMS centres are continuously supporting the all the district and state line departments in developmental planning activities. Along with above activities, organised over 250 District and Taluk level workshops on “Use of Geospatial Technologies for Preparation of Action Plan” to senior level officers of line departments.



Under development of geospatial web applications on Karnataka geoportal for G-governance established the NDR portal and as a proof of concept successfully demonstrated NDR for Mysuru district by coordinating with all the NDR participating agencies i.e., SOI, NBSSLUP, MOSPI, FSI and GSI.

Village Information System programme develops a procedure/guideline to generate cadastral, settlement maps along with soil & water parameters using high resolution satellite imageries. The developed guidelines are being extensively used by all the participating agencies. Mapping of five Gram Panchayaths covering 13 villages across Kodagu, Udipi, Mysore and Belagavi district has been completed.



Energy Efficient Buildings Workshop on low carbon materials and building systems was organised for six day during August 2019 to provide a platform for information dissemination and exchange, discussions and debates on research and sustainable practice in the field of earthen structures, building materials and techniques, climate responsive architecture, building-comfort, energy in buildings, climate-change mitigation and emission reduction. A



program was exclusively organised for Karnataka Nirmithi Kendra (KARNIK) engineers during February, 2020 at Challakere campus of IISc to disseminate the these technologies across Karnataka.

To improve livelihood opportunities and decrease malnutrition in tribal dominated areas, 51 kitchen gardens has been developed in Chamarajanagar district in association with KVK. 20 different varieties of vegetables were grown in kitchen gardens with an additional income of Rs.200/week to each farmer.



Hybrid Ultra-Capacitors (HUC) lighting kits developed by IISc and manufactured by M/s. Mesha industries have been deployed across 10 states to field test its performance under varying climatic conditions. The industry partner patenting the process for turning traditional lead acid batteries into high performance with benefits such as:

- a. Quick charging/ better charge acceptance
- b. Longer cyclic life for the product
- c. Better performance across different load conditions

HUC technology is being optimized for enhanced performance and lower costs.



A digital mini-spectacle for showcasing the glory of Hampi generated 3D data of over 80 monuments of Hampi to create virtual walk through of monuments and to support restoration & reconstruction of Hampi monuments. In association with IIT, Delhi and DST, GoI **International heritage symposium and exhibition** was organised at New Delhi on 15-16 January 2020. Under **Karnataka Digital Heritage** it is proposed to scan all 844 protected monuments of state for restore and protect the monuments. The work in Bengaluru division is in final stage of completion.



National Conference on Bioenergy: A two-day national conference on Bioenergy was held 6th & 7th January 2020 at Central Hall, Suvarna Soudha, Belagavi on the Theme: “Decoding National Policy on Biofuels - 2018 and Exploring Opportunities in Karnataka” to allow networking of stakeholders from industry, policy makers, investors, and researchers to exchange their experiences, challenges and government support in realizing the adoption of biofuels for creating viable bio economy in the country.



KSCST pioneered the development of RWH through ideation, patenting, policy, trainings, awareness and capacity building programs. The RWH cell has been providing technical guidance to implement Rain Water Harvesting for individuals, institutions and private sectors by carrying out field survey and preparation of DPR. More than 1.2 lakh households installed RWH in Bengaluru. Provided Detailed Project Report (DPR) to 15 government and private institutions under Rainwater Harvesting Cell activities during 2019. So far, organized 80 training programmes to plumbers, contractors and



engineers. KSCST trained over 2500 members and 150 awareness camps has been conducted. About 45,000 visitors including Govt officials, VIPs, NGOs, and about 30,000 students from Schools and Colleges visited RWH theme park at Jayanagar, Bengaluru.

E-Learning centres (virtual laboratories) have been established in 21 high schools across backward talukas of Karnataka to demonstrate the potential of E-Learning in improving the quality of school education through IT enabled software & tools. KSCST has also deployed digital contents and 3D experiments based on state syllabus.



Celebration of National Mathematics Day 2019 on 24th December 2019, National Science Day 2020 on 3rd march 2020, radio serial on “Climate change and global warming” in Kannada and Konkani language, Vigyan Darshan, **Science outreach activities in rural schools were organised as a mandate for science popularization.** In association with the Vigyan Prasara, KSCST organised “Augmenting Writing Skills for Articulating Research (AWSAR)” workshop



PIC established by KSCST with the support of DST-GoI acts as a nodal agency in the State of Karnataka for engineers and Degree College / universities. PIC also supports start-ups, MSME and individual innovator in the broad area of IP spectrum i.e., Patents, Trademarks, Copyrights, Industrial Designs, Plant Variety Protection and Geographical Indication. Established 28 IP Cell across Karnataka. Facilitated the filing of three trademarks; 2 applications through PFC-TIFAC and twelve patent applications were filed directly with the Controller General, Patents office. IP cells established by KSCST have filed for 30 patents. Established TISC centre at KSCST.

Teachers’ Enrichment Programme is a yearlong programme with 15 days of contacting sessions organised for Government of Higher Primary school teachers teaching science and mathematics at Magadi taluk, Ramanagara district and Malavalli taluk, Mandya district. 45 teachers from Magadi taluk and 40 teachers from Malavalli taluk has been benefitted with this programme. **Teacher’s training workshop on science for tribal region of Karnataka** organised in Shimoga from 25th to 28th June 2019 and at Mysuru on 5th & 6th December 2019. **Two days mathematics workshop** in 9 locations for high school teachers were some of the efforts made by KSCST to strengthen paedagogical techniques among teachers.



10) KERALA STATE COUNCIL FOR SCIENCE TECHNOLOGY AND ENVIRONMENT

Kerala State Council for Science, Technology and Environment (KSCSTE) was constituted in November 2002 as an autonomous body under the Government of Kerala to encourage and promote Science and Technology related activities in the Kerala State. There are 6 scientific divisions in the Headquarters for implementing various schemes and programmes related to the Science & Technology activities of the Council. The Council has implemented 37 Schemes & Programmes through the 6 divisions.

1. Human Resource Development in S & T
2. Ecology & Environment Programme
3. Science in Society
4. Infrastructure Development
5. Technology Development & Transfer
6. Women Empowerment

Kerala Biotechnology Commission is also functioning at Council Headquarters for implementing and co-ordinating biotechnology programmes in the State and the Biotechnology Commission supporting 8 Schemes & Programmes. There are eight R& D centres under the umbrella of the Council which does research work in specific identified domains. They are

1. Centre for Water Resources Development and Management (CWRDM)
2. Jawaharlal Nehru Tropical Botanic Garden & Research Institute (JNTBGRI)
3. Kerala Forest Research Institute (KFRI)
4. Kerala School of Mathematics (KSOM)
5. National Transportation Planning and Research Centre (NATPAC)
6. Malabar Botanical Garden & Institute of Plant Sciences (MBGIPS)
7. Srinivasa Ramanujan Institute of Basic Sciences (SRIBS)
8. Institute of Advanced Virology (IAV)

The following Grant in Aid institutions are also functioning under KSCSTE:

1. Integrated Rural Technology Centre (IRTC):
2. Sophisticated Test and Instrumentation Centre (STIC)
3. M.S. Swaminathan Research Foundation (CABC-MSSRF)

The Council under the scheme of [Science Research Scheme \(SRS\)](#), [Student Project \(SP\)](#), [Technology Development & Adaptation Programme \(TDAP\)](#), [Engineering & Technology Programme \(ETP\)](#), [Rural Technology Programme \(RTP\)](#), [Selective Augmentation of Research and Development \(SARD\)](#) supporting research and developmental projects.

Considering the necessity of inculcating scientific temper among public and students and also for increasing the public attitude towards science, several schemes are being supported by KSCSTE which are as follows:

- Kerala Science Congress
- Biotechnology Integration in Rural

- Development (BIRD)
- Sastraposhini in schools
- Kerala Sasthra Puraskaram
- Scheme for Promoting Young Talents in Science (SPYTiS)
- Prathibha Scholarship Programme
- Student Programme for Excellence in Experimental Design (SPEED)
- Nurturing Excellence in Science Teaching (NEST)
- International Year of Pulses
- National Science Day celebrations
- World Wetland Day
- National Technology Day
- Science Literature Awards
- ENVIS Newsletter
- Eco- clubs
- National Green Corps
- National Children Science Congress-(NCSC)
- Environment Management Training
- World Environment Day
- I AM KALAM-Science Exhibition Programme
- Student Projects
- Curtain Raiser Programmes in connection with Kerala Science Congress
- Technological advances in transforming Women's lives

KSCSTE imparted one-month training programme on propagation techniques, breeding and nursery management of orchids, bamboos and medicinal plants were conducted as part of Green Skill Development Programme (GSDP) on Quality Planting Material Producer at JNTBGRI, Palode.



The council organized a National Symposium on ‘**Modern Trends in Biosystematics of Angiosperms**’ along with 29th Annual Conference of Indian Association for Angiosperm Taxonomy at JNTBGRI during 11-13, November 2019. Further, CWRDM has organized III **Indian National Groundwater Conference** at CWRDM HQ from 17 to 20 February 2020. Jointly conducted with Central Groundwater Board and NIT Calicut. Around 200 delegates from different countries participated in the event.



As part of the **Swachh – Nirmal Tat Abhiyaan**: Mass Beach Cleaning cum Awareness Drives were conducted in various parts of Kannur and Kozhikode districts during 11th – 18th November 2019. This programme was supported by Ministry of Environment, Forest & Climate Change (MoEF & CC), Government of India, and Kerala State Council for Science, Technology & Environment (KSCSTE), Government of Kerala. During this programme awareness classes on Coastal ecosystem conservation and Demonstration of waste upcycling model were also arranged.



KSCSTE organized hands on training workshop on Ecological Niche Modeling from 22.11.2019 to 24.11.2019 at KSCSTE – MBGIPS. About 31 participants attended the workshop from various institute across the country.



Two day workshop on Botanical Nomenclature on the topic ‘Botanical Code & Stability of Names’ was conducted at MBGIPS on 06th & 07th March 2020, with the participation of 25 Research Fellows/Teachers from various parts of the country, aiming to understand/learn the basics in plant nomenclature and also to clarify the nomenclatural doubts and queries.

A new work-based experience programme, providing a real-life organizational experience for UG & PG students of Botany/ Plant Sciences to develop specific or generic skills valuable to their academic development was initiated at MBGIPS. About 47 Botany students and two faculties of St. Therasas College, Eranakulam participated in this two-day programme.



The Council celebrated International Ozone Day 2019. This programme was celebrated between 16 September to 26 September, 2019 by KSCSTE through 84 institutions including R&D Institutions, University Department, Professional Colleges, Government Colleges, Aided Colleges, Govt. Polytechnic Colleges, Govt. Schools, Aided School, Industrial Training Institutes and Registered NGOs across the State. The direct beneficiaries of this programme were students, teachers, academicians and public and approximately more than 10,000 target groups were involved in various types of competitions, talks, lectures, demonstration activities, cultural activities relating to programme



National Children’s Science Congress

The state level Children’s Science Congress of NCSC was organized by Kerala State Council for Science, Technology and Environment on 2nd and 3rd December 2019 at Jawaharlal Nehru Tropical Botanical Garden and Research Institute, Palode, Thiruvananthapuram.

Kerala State Council for Science Technology and Environment (KSCSTE) hosted the 27th edition of National Children’s Science Congress and the 1st in Kerala during 27th to 31st December 2019 at

Mar Ivanios Vidyanagar, Thiruvananthapuram, with the participation of 652 Child Scientists from 28 States, 8 Union Territories, Navodaya Vidyalaya, Kendriya Vidyalaya Sangathan and Gulf Countries. A total of 228 Escort teachers, 91 Organising/Academich coordinators, National Academic committee members and eminent scientists participated in the programme.



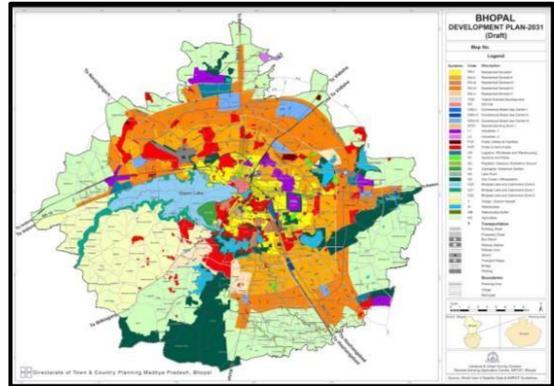


The 32nd Session of Kerala Science Congress was held at Yuvakshetra Institute of Management Studies, Palakkad from 24th to 27th January 2020. Hon'ble Chief Minister Shri. Pinarayi Vijayan inaugurated the session on 25th January 2020. He presented Dr. S. Vasudev Award to Dr. N. Sandhyarani, NIT Calicut, Chief Minister's Gold Medal to 3 numbers of Young Scientist Awardees and 3 numbers of Science Literature Awards. The focal theme of 32nd KSC was "Science & Technology for Climate Change Resilience & Adaptation". Dr Akhilesh Gupta, Adviser and Head, Climate Change Programme, SPLICE, Department of Science and Technology, Govt. of India, Dr Subimal Ghosh, Professor, Dept. of Civil Engineering, IIT, Mumbai, Dr. Nambi Appadurai, Director, World Resources Institute (WRI India), Parel Mumbai were the speakers in this session.

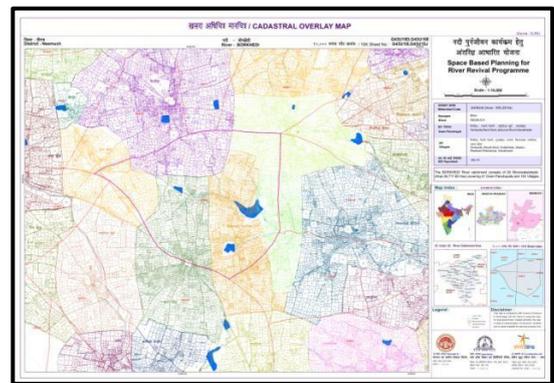
11) MADHYA PRADESH COUNCIL OF SCIENCE & TECHNOLOGY

M.P. Council of Science & Technology was established under MP Society Registration Act, 1973 in October, 1981. Apex body of the Council is General Body and Chief Minister is the President of General Body. There are 61 members consisting of ministers and secretaries of different state department and head of the departments of water resources, PHE, PWD, Forest, Agriculture, Industry and Technical education.

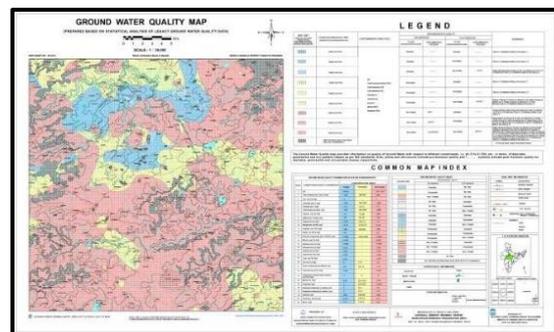
The Council has developed various GIS based technologies for modernization of the activities of various departments of Madhya Pradesh. This was initiated as the first step towards Digital India. The following are few examples where MPCST has provided technological intervention for providing digital support to various Government Departments. MPCST is the nodal agency for preparation of GIS based Master Plans of M.P. in collaboration of Town & Country Planning Department, Govt of M.P. Madhya Pradesh is the first State in India to complete first Draft Master Plan based on AMRUT Guideline. Six master plans were prepared based on AMRUT Guidelines



A project has been sponsored by CMC for preparation of property tax register using GIS based survey for all properties under municipal limit. This project will help in controlling revenue leakage and improve coverage of properties for the purpose of taxation (Under Assessed and Unassessed Properties).

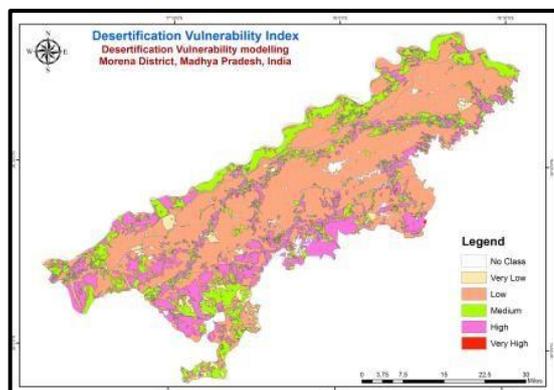


Ground Water Quality Mapping of M.P. Under NRDWP using Legacy Data from PHED For 36 Districts of M. P. using GIS: MPCST has completed preparation of seamless layers in GIS environment for all the important quality parameters for all the districts of Madhya Pradesh on 1:50,000 scale.



The Panchayat & Rural Development Department, Government of Madhya Pradesh has assigned the task of Remote Sensing & GIS based Planning for Watershed Development Activities to MP Council of Science & Technology for the River Rejuvenation Programme. The programme envisages a holistic water management activity through rain water harvesting and groundwater recharge. In the first phase of the programme, 40 rivers have been selected from 36 districts.

The council is also working on **Desertification and Land Degradation:** Monitoring Vulnerability Assessment and Combating Plans. The study area is Morena of Madhya Pradesh & Raipur of Chhattisgarh. Studies were made on Vegetation, Soil, Socio-Economic, Climate and Terrain Index for Desertification and Land Degradation Vulnerability assessment.



The Council with support of the State Forest Department digitally analysing the Ground truth surveys and measurements for development of new methods for biomass estimation with the help of PolSAR satellite data.

Further the council also working in the project enlisted:

- Forecasting Agricultural output using Space, Agro-meteorology and Land based observations (FASAL)- Operational project
- Soil Moisture Change using ScatSat satellite data
- CHAMAN Phase-II - is inventory of horticultural crops in selected districts of Madhya Pradesh
- SUFALAM - crop discrimination techniques development for Kharif crops and optimization of CCE.

With the order of Honorable High Court, M.P., Income Tax of India has assigned the task to MPCST for assessment of status of ground condition of plantation for which the farmers claim rebate in income during successive years of 2014-2018. Claiming of income tax rebate by the tax payer has been assessed using very high resolution satellite data for the successive years. On the basis of earlier success story, income tax department using this technology for all such disputed cases pending because of the ground evidences.



MPCST demonstrated many science and technology based programmes like briquette technology, Agri-technology, eco-friendly technology and Lac cultivation technology. The following major programmes are implemented by the Council for economic upliftment of the people under this category.

M.P. Council of Science & Technology, National Academy of Sciences (NASI) Bhopal Chapter and M.P. Ayurved Adhikari Sangh Bhopal jointly organized one day workshop on “World Nature Conservation Day 2019” on 28th July, 2019 at Council.

M.P. Council of Science & Technology, National Academy of Sciences (NASI) Bhopal Chapter, National Mission for Clean Ganga, GOI and Hindustan Lever Limited has jointly organized two days brainstorming on “Safe and Sustainable Water Including Sanitation – A Road to Swachh & Swasth Bharat” on 19-21 Sept, 2019 at Council.

MPCST and Regional Science Centre, Bhopal organized observation of Partial Solar Eclipse held on 26th Dec, 2019. This was organized at Awasiya Vidyalaya Gurukulam, Bawadia Kalan, Bhopal. Total of 425 students of Gurukulam along with 150 other local citizens participated in the programme.

M.P.Vigyan Pratibha Samman Samaroh- this programme was regularly organised by the council to encourage scientific talent of M.P. The occasion was always graced by the eminent scientists, educationists and public representatives.



Vigyan Mantha Yatra of students under Mission Excellence Programme – this was the 13th programme conducted in the month of October 2019, a total of 563 students and 46 science teachers visited scientific institutions at Ahmedabad, Chandigarh, Lucknow, New Delhi & Hyderabad and a total 100 students were selected for scholarship in 2019-20.



Madhya Pradesh Young Scientist Congress (MPYSC): The 35th MPYSC was organized at Shri G.S. Institute of Technology and Science, Indore during February 28-29, 2020. A total 207 young researchers have presented their research papers in 17 disciplines. Total 27 researchers were conferred with M.P. Young Scientist Award.



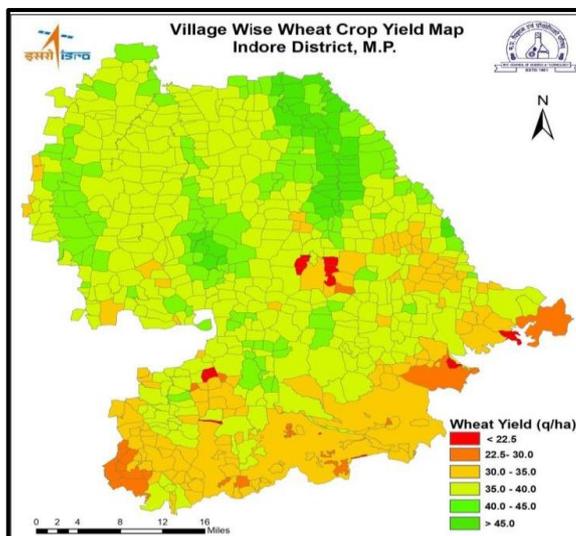
The Ujjain Planetarium under the MPCST conducted several activities during 2019-20. The major activities are mentioned below.

- Procurement of five new movies for Taramandal.
- Replacement of projector lamps.
- Establishment of network with academic institutions.
- Administrative handling and execution of Taramandal.
- More than 8000 students from different school and colleges has visited and seen shows.
- Organized one-week winter school on Astronomical observations during January 29th to February 4th 2020 at Taramandal Ujjain and Dongla.
- Meetings held with academic institutions and different science communicating groups to enhance the popularity of Space Science at Taramandal.
- Organized one day YUVA VIGYANIK SAMVAD at Madhav Science College Ujjain on September 28, 2019, which is attended by 2000 students. For promotion of Intellectual Property Rights (IPR), the council provides all expert services including patent filing, search facilities, design filing, trademark filing, copyright filing, create awareness among universities, research institutions, industries, government department and guidance to inventors in patent filing.



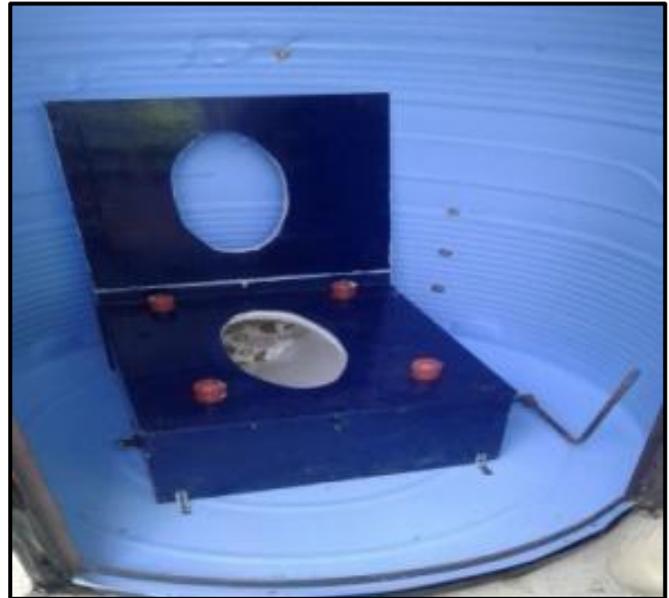
The major success stories of council include:

- Use of Smart Sampling CCE for Assessing Crop Damage
- Winter School in Observational Astronomy at Varahamhir Astronomical Observatory, Dongla, Ujjain during 29th January to 04th February 2020
- Vigyan Mantha Yatra of students under Mission Excellence Programme



The **Innovation Promotion Cell at council** at identifying and promoting innovators of Madhya Pradesh in the field of agricultural machinery and practices; tools and machinery used by artisans; application of non-conventional energy; teaching and research in Science & Technology. During 2019-20, Council has identified various innovators and help to develop following prototype model.

- Life Saving device for bore well fallen kids
- Waterless Toilet
- Water conservation by paddle operated tap
- Pit for dry toilet
- Automatic paddy sowing machine



12) RAJIV GANDHI SCIENCE AND TECHNOLOGY COMMISSION MAHARASHTRA

Rajiv Gandhi Science and Technology Commission has been set up for the purpose of advancement, propagation and promotion of application of science and technology for development. The Commission is implementing various schemes with a focus on project-based activities related to Science and Technology and its utilization for the benefit of common people.

The Commission activities broadly aimed at the following

- Development oriented scientific research & development
- Technology translation & deployment
- Demonstration of science based sustainable development
- Scientific data generation
- Leveraging technology for enriching education and livelihood
- Facilitating National Program Outreach

The above listed activities are distributed in following major schemes:

- a) Assistance for S&T Applications.
- b) Assistance for S&T Applications through University System.
- c) Setting up Science and Innovation Activity Centres.
- d) RGSTC-TIFAC-MSME Internship Programme for Engineering Students.

Under the **“TIFAC MSMEs Internship Programme for Engineering Students”** to encourage the industry-academia interaction, the council has adopted this scheme for implementation in Maharashtra on a pilot basis and is being implemented at two Engineering Collages.

1. Walchand College of Engineering, Sangli.
2. Ramdeobaba College of Engineering and Management, Nagpur.

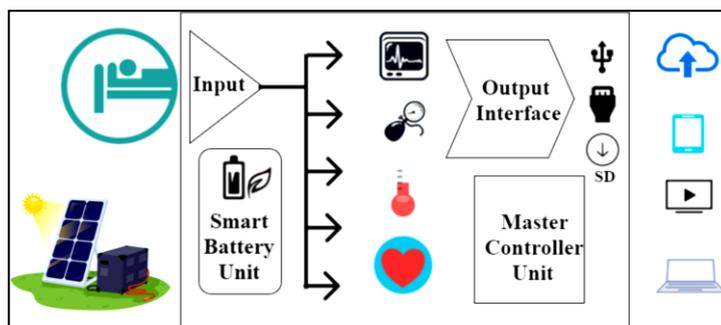
The Patent Information Centre (PIC) of RGST has established 5 IP cells in the campuses of Universities within Maharashtra and also facilitated to prior art searches for about 10 innovative projects and further published a paper in an International Journal also.

The council celebrated **National Science Day and National Mathematics Day programmes** in Maharashtra. These are the structured activities including Science Exhibitions, Students’ Competitions, Popular Lectures, Demonstrations, Slide Shows etc.

RGSTC was also involved in research and development projects, the major successful projects of the council during 2019-20 are mention below.

1. Portable Intensive Care Unit Setup for ‘Rural Health Infrastructure

This project implemented by College of Engineering, Pune, in association with RRGSTC to develop affordable and better technology. The institute has developed indigenous low cost self-standing modules for measurement of the ICU vital signs such as ECG, heart rate, respiration rate, non-invasive blood pressure, temperature, oxygen saturation, heart sound, etc. This will enable conversion of any hospital bed in rural area into an ICU bed.



This will help to develop a distributed vital sign monitoring system that will enable a specialist ICU doctor to remotely view the state of the patient and suggest action to the attending staff.

2. Quality plant production using low cost biotechnological approaches

The council in association with Sivaji University, Kolhapur, established a tissue culture lab facilities at the university in which offers a low-cost technology for multiplication of the selected plants for the end users. Elite germplasm of these two important plants were identified and large scale multiplication of these species was carried out using in vitro tissue culture technique which enable high quality plant production at low cost. Protocols were successfully developed for in-vitro regeneration of both the species. The technology developed can be used for large scale organised farming.

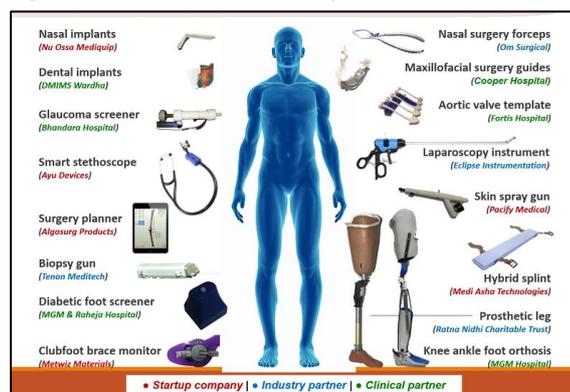


Garcinia indica (Kokum)

Atrpocarpous heterophyllus (Fanas)

3. Bio-Medical Engineering and Technology (incubation) Centre BETiC:

After extensive consultations with engineering and medical professionals, Rajiv Gandhi Science and Technology Commission approved a project to set up Bio-Medical Engineering and Technology Incubation Centre in Maharashtra at IITB, Mumbai, College of Engineering, Pune and Visvesvaraya, National Institute of Technology, Nagpur. The project started in 2014 and presently 7 more institutions from Maharashtra are involved. In this prestigious project, around 100 faculty members, researchers, students, expert doctors and consultants are working together. The project has led to the identification of 400 unmet clinical needs and development of proof of concept for 100 devices. This project has also resulted in filing of 53 patents, 16 licensed products, 8 start ups and provided some products to hospitals for clinical studies and taken forward for production and supply.



4. Feasibility study of using solar powered cool boxes to improve shelf life and hygiene of fish sold in retail markets in Mumbai:

The Council in association with Central Institute of Fisheries Education, Mumbai has developed the Solar Cooler. The solar fish cooler can hold 50 kg of fish. Powered by two solar panels, the system has a battery to store power. The cooler can achieve a temperature of -20°C. However, fish intended to be sold in retail market can be stored at 0 to 5°C, which will lower the consumption of power and prolong the storage period. Solar-powered cooler is expected to reduce the dependency on ice, prolong the shelf life and ensure the quality and hygiene of fresh fish sold in the retail markets.



5. Cold storage facility for post-harvest preservation of fruits and vegetables using solar and bio methane heat-based refrigeration:

In association with ICT, Mumbai, RGSTC sponsored a project to develop a cost effective heat based refrigeration technology for milk chilling and to setup an industrial scale demo unit of heat based cold storage facility for post-harvest preservation of fruits and vegetables in rural areas. The technology developed under this project has been successfully implemented at the Gokul dairy, Kolhapur (Borwade milk chilling centre). The same technology is being installed in rural area at village Hatmali in Aurangabad district.



6. Skill Development through Training and Demonstration of Carp Seed Production Using FRP hatchery and Carp seed rearing in Farm Ponds in Marathwada Region of Maharashtra:

Availability of quality fish seed of desired species and in required size and quantity is always considered as major constraint for development of fish culture. In order to develop reservoir fisheries, the reservoirs need to be stocked with right size of fingerlings of Catla, Rohu, Mrigal (Indian major carps) for enhancing fish production.

Demonstration unit would help the beneficiaries to develop skill for operation of these hatcheries. The project was supported at College of Fishery Science, Udgir to disseminate the technology of Carp seed production using low cost FRP carp hatchery.



FRP Hatchery set up



Farmers involved in the training

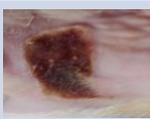
Wide Spectrum Microbial Pesticide Useful in Single Crop System: The project is being implemented at CSIR NCL, Pune for developing a wide spectrum microbial pesticide useful in single crop System. Primary objective of this project is to develop an effective multi-strain bio pesticide formulation using *Metarrhizium* fungus singly or in synergistic formulation with hydrolytic enzymes. The institute has identified the strain which showed significant mortality of the targeted insect pest for further formulation development. In case of tomato and brinjal trials the yield was found to increase by 20-30% more as compared to the regular practice on the farmer fields at Baramati. The progressive trials showed visible differences in the yield. The product will be useful to boost organic farming, reduce the use of chemical pesticides and will also address the problem of shifting of pests.



Field trial and discussion with local farmer

7. Foams and hydrogel sponge for chronic wounds of burns:

Wound healing is often associated with few external interferences like infections and inflammation generating challenges in treatment of wounds. Thus, there is an unmet need for novel breathable dressings that prolong drug release, aid in absorption of exudates, provide favourable healing environment and act as a mechanical barrier against any trauma. Bhanuben Nanavati College of Pharmacy undertook this project and used the phytoconstituents Curcumin and Asiatic acid embedded in a hydrogel sponge and a thermosensitive gel spray as novel scaffolds for effective healing and management of secondary burns. (Patent Application No. 201921009568 “Synergistic gel composition comprising Curcumin and Asiatic acid.”)

Groups	Day of induction	Day 5 (PI) Eschar formation seen	Day 15 Wound contraction observed	Day 21 Wound closure observed
Negative control				
Standard				
Placebo				
Combination hydrogel with honey				
Combination without honey				
Placebo thermosensitive gel spray				
Thermosensitive gel spray				

13) MANIPUR SCIENCE & TECHNOLOGY COUNCIL

Manipur Science and Technology Council (MASTEC) is an autonomous apex organisation of Department of Science and Technology, Government of Manipur. It is an advisory body for the state in the field of Science and Technology. The technical secretariat of the Council at the moment is supported jointly by the Department of Science and Technology, Government of India and the Government of Manipur. The Council was established in the year 1985 and got registered in 1996.

The main activities of the council are R&D projects, Science popularisation, Technology Demonstration etc. Some of the regular annual feature programmes are Observation of National Science Day, National Mathematics Day, World IP Day, Science Meet – a mega science festival, Science Communicators Award.

The patent cell: Council facilitated to file 3 trademarks, a patent and also they have assisted to get 2 granted patents in their credit. They also have strong linkages with R&D/academic Institutions including Universities, Departments – IT, Industries, Education, Public Health Engineering, Health Services, Power, Fisheries, MSME, IBSD, NEIST-CSIR, CAU, Manipur University, IGTU, ICAR, MIT, NIELIT etc.

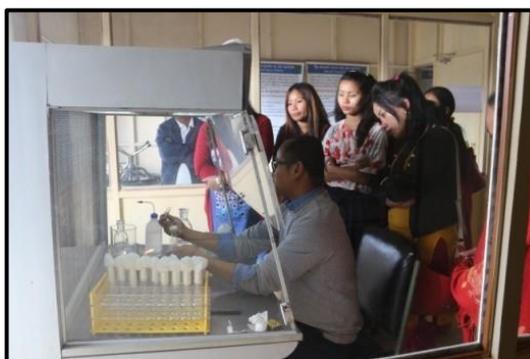
In credit to the success stories of the council the following are the major projects

1. Radio Serial on Traditional Knowledge System

Manipur Science and Technology Council, Imphal and Vigyan Prasar, Noida, Department of Science and Technology, Govt. of India has started producing and broadcasting Radio Serial through All India Radio, Imphal in Manipuri language and Thadou/Kuki dialects. The programme was taken up to sensitise people about the traditional knowledge and about the role of the government in taking up administrative reforms/planning in validating the traditional knowledge and because of its vast coverage, radio has been chosen as medium for assimilating traditional knowledge.

2. Propagation of Banana and Pineapple through Tissue Culture

The council developed and adopted tissue culture techniques for banana and pineapple plant in their regions. This tissue culture technology is utilized for conservation & multiplication (as per the requirement) of other locally important, elite, endangered and ornamental banana varieties



3. Encyclopaedia of Medicinal Plants in Manipur

There are hundreds of medicinal plants available in the forests of Manipur which need to be explored and well documented for the reason that deforestation is taking very fast threatening to a number of rare species which in turn become extinct. The State is inhabited by 29 ethnic groups of people. MASTEC has implemented a project and under this project a database of 400 medicinal plants found in Manipur have been compiled. The information is available on the web <http://medicinalplants.co.in> for the general public.



To popularise science the council celebrated and conducted many awareness and workshops the major are highlighted here.

- Observation of World Intellectual Property Day
- Observation of National Science Day
- Observation of National Technology Day
- Observation of World Environment Day
- Science Meet
- Observation of National Mathematics Day
- Dr. Ibeyaima Innovation Award
- Science Communicator Award
- North East Students' Summer Training on Basic Sciences
- Sci- Connect Level – II (Nurturing Young Talents of North East on Science)
- India International Science Festival (IISF)
- Lecture series on Earthquake
- Nomination of Entrepreneur at BARC for training on DAE Techs
- Millennium Science Lecture
- Technology based EDP on food processing
- Nomination of Trainees at BARC for training on tissue culture (Banana)
- Workshop on Intellectual Property Right (IPR)
- Vigyan Prasar Edusat Programme
- Aquarium Exhibition
- Training programme on Plant Tissue Culture Technique for local farmers
- Nomination of students at BOSE Institute, Darjeeling for summer training
- Radio Serial on Traditional Knowledge in 3 language/dialects
- Radio Serial on Climate Change & Global Warming
- Training programme on Natural Disaster with special emphasis on Earthquake



Deputy CM Manipur at Science Meet 2019



Improved dry fish fermentation



14) STATE COUNCIL OF SCIENCE TECHNOLOGY & ENVIRONMENT, (SCSTE) MEGHALAYA

State Council of Science Technology & Environment (SCSTE), Meghalaya was constituted by the Government of Meghalaya on the 30th January, 1995 and was registered under the Meghalaya Societies Registration Act, 1983. The Council was established with a mission to ensure effective utilization of science & technology for all round development of the State and its main function is to identify, formulate, execute/coordinate and follow-up programmes/schemes for the State on various aspects of science & technology.

The activity of the council can be analysed with the mentioned programmes

- Popularisation of science programmes
- Scientific r & d of appropriate technology programme
- S & T oriented entrepreneurship development programme
- Specific project programme
- Remote sensing application programme
- S & T library & documentation

The State Council is motivating science and environment (SCSTE) activities in 100 school eco clubs across the State with an objective to spread the scientific temper and environmental consciousness among the school children in the State. In the year 2019, Ms. Belinda Kharsati, founder of Eco Club at Pomlahier Secondary School, Mawryngkneng village has been conferred with the prestigious National Award under Swachh Bharat Mission (Grameen).



SCSTE, Meghalaya also organised the “**Earthian**” Programme which is the WIPRO’s Sustainability Education Programme for Schools. The objective of the programme is to empower students and teachers to take up activities and solution in their local context and environment like water and biodiversity. Recently, Mawphlang Secondary School, Meghalaya have been judged the winner for the 2019 Earthian school program under the theme “Biodiversity”.



SCSTE, Meghalaya conducted one month Crash Course Tuition on Mathematics during 6th January to 8th February, 2020 for underprivileged students who are appearing the Secondary School leaving Certificate. There were 4500 students across the 131 centers in the State who were enrolled in the tuition. This tuition had a good impact on the students and their success will be noted once the SSLC 2020 results was declared. SCSTE, Meghalaya have taken an initiative for a mass outreach programme of appropriate technologies where the technologies are taken at the door steps of villagers especially in far flung remote rural areas where road connectivity is limited. Skill training on appropriate technologies was organized in 8 districts of the state covering 20 blocks and 46 villages.



Under the MY SPACE (Meghalaya Youth – Specific Project Aimed at Creating Entrepreneurs) - Setting-up of Incubation Centre, the SCSTE, Meghalaya has come up with the innovative idea to create entrepreneurs owing to the fact the rise in unemployment especially educated youths with S&T background. These entrepreneurs would evolve from such youths trained and incubated in different technology sectors and science programmes propagated by the Council. Under the above programme, the Council had received 317 nos. of aspirants who registered through the Council’s website and are now being screened for mentoring.

Artificial Intelligence and Robotics: SCSTE, Meghalaya under DST ICPS programme 2019 has initiated an awareness programme in 100 schools within the Aspirational District of Meghalaya under the theme of Artificial Intelligence and Robotics. Within the programme, capacity building of 20 participants as Potential Master Trainers (MTs) on AI and Robotics was carried out from the 21st August to 4th September, 2019 using E-waste management. These MT’s then delivered awareness to the 100 selected schools within the aspirational district where the students made models out of E-waste.



The National Science Day & Tequip III sponsored Hackathon-2020 was held on the 27th to 28th February, 2020 in collaboration with National Institute of Technology (NIT) Meghalaya. **Livelihood Incubation Kendras (LINKS):** SCSTE, Meghalaya has come up with a plan of setting up of Livelihood Incubation Kendras (LINKS) which is a multitude upscale of these CFCs by restructuring and re- orienteering the existing CFCs so as to achieve a higher aims and objectives. These LINKS centres will act as the state of the art training centre located at the door step of the villagers at the block level and address the critical issues pertaining to the living standard of the rural masses and their social-economic mobility and to promote Action Research on innovative technologies suitable for application in the state

SCSTE, Meghalaya has taken up an action research to employ technology intervention by construction of a waste water treatment plant using locally available resources and bio-filter constructed at the vicinity of the fermentation tank so as to filter the foul-smelling water into clean odourless water. The action research was carried out at Pongtung village. Results of water analysis from the treatment plant indicated an improvement in the water quality which can be used for a lot of recreational activity like washing clothes, watering of agricultural fields etc.

Dew-fog technology: Since there is a high level of precipitation in the form of dew and fog in monsoon as well as during winter season, tapping to these source might be an alternative in increasing the water availability especially during period of shortage. SCSTE, Meghalaya have taken up an action research in Dew-fog technology to trap water and store them so that they can be used in off-season to provide micro-irrigation and support livelihood of small farmers. Action research at Sohra, Mawsynram, Skentalang and Laitlum has shown promising results and this technology is at present being upscale at Laitlum village.



Conservation and sustainable utilization of bio-resources SCSTE: Meghalaya under the G.B. Pant National Institute of Himalayan Environment & Sustainable Development funded project and has taken an initiative in creating awareness on the significance of conservation and sustainable utilization of bio-resources especially medicinal and aromatic plants and promoting community participation for conservation and sustainable use of medicinal plants. Under the project, 3 (Three) herbal gardens has been set up within the village and the community has taken initiatives to preserve and conserve local medicinal plants and build up their capacity. At present, they are able to plant 7 (Seven) varieties of herbs.

Duck Farming: The Council under a project supported by Department of Biotechnology (DBT), GoI, provided training on scientific duck farming for developing their skills and promote entrepreneurial activities. Awareness programme was held in different blocks and a 30 training programme was held on how to carry out Duck breeding using technology Intervention in the form of Low Cost Egg incubator. After training, Ducklings were distributed to different beneficiaries belonging to different Agro- climatic region to test the feasibility of the Ducks in these regions. One of the beneficiaries from Ri-Bhoi district successfully reared these incubated Ducks whereby they have grown well and adapted to the region and they have also successfully started breeding and giving rise to new generation of ducklings.



Bolmoram Technology Resource Centre (TRC): To capacity building for the community on technologies and S & T intervention, RGSTC assisted the Bolmoram Technology Resource Centre (TRC), East Garo Hills District to promote livelihood opportunities. This project is being funded by Science for Equity and Empowerment (SEED), DST, Govt. of India, with a special focus on women.

For the past one (1) year, the Bolmoram TRC has made the following achievements: i) Green technologies programme (stabilised mud block, micro hydro power, solar incubator, bamboo furniture and bamboo agarbati sticks) were being implemented to meet the objective of the project. ii) Programmes under convergence with technical agencies/line depths, etc (Functional literacy School, Solar dryer, Piggery, citrobella plantation, Food Processing, e- learning, skill training or appropriate technologies, Bee-keeping) were organised for the benefit of the villagers. Active participation by both men & women folks has created the spirit of community participation especially women folks, villagers also showed keen interest during the training programmes, for which they have even tried out and sold the products like making of pickles, jams, drying of ginger and pineapple, making of bamboo crafts and utilities



Village adults as well as children actively registered and took part in the literacy programme organised, which eventually has broaden their outlook and thinking. Of late during the review meeting (25th – 26th November, 2019) on the Project at New Delhi, SEED, DST, GOI has rated the Project as “Excellent”.



15) MIZORAM SCIENCE, TECHNOLOGY & INNOVATION COUNCIL

In order to encourage and promote science and technology activities in the States and UTs, the Mizoram Science, Technology & Innovation Council (MISTIC) was established by the Government of Mizoram in the year 1985. It is functioning under the aegis of Directorate of Science & Technology under Planning & Programme Implementation Department, Govt of Mizoram. It is supported by the State Government and Department of Science & Technology of the Central Government.

MISTIC has developed various technologies in the last two years. Some of the key projects undertaken by MISTIC are

Development of Indigenous Technology in Mizoram (DITIM) through establishment of Innovation Facility Centre and enhanced protection of Intellectual Property Rights: Under this DITIM project an Innovation Facility Centre (IFC) is constructed at Mizoram New Capital Complex, Khatla, Aizawl with an objective to provide assistance to the indigenous technological innovators in nurturing and safeguarding their skills including intangible properties, thereby promoting technological intervention in the state. The project is funded by the State Government at a total cost of Rs. 6.67 cr.

Development of Water-Based Preservation Technology of Orange at Thingsai Village: The work was implemented by MISTIC in collaboration with local innovator who has devised the protocol. This water-based preservation technique of Orange Project was set up at Thingsai Village, Lunglei District with an objective to develop simple and working water-based preservation technology for orange.

Enhancement of Livelihood Options for Rural Women in Aizawl : The main objectives of the project are to provide - technology input for production of healthier food products (dried & pickled products), enhancing skills of women in production of food products at local or domestic levels, providing technology input for improving poultry and pig farming, producing better quality and quantity outputs and creating women network or self-help groups for their skill development.

Women Scientist scheme-A (WOSA)-Investigation of the anti-cancer properties of *Mallotus roxburghianus* (Zawngtenawhlung): The effect of *Mallotus roxburghianus* on cancer are investigated in this project. Column chromatography to obtain the active fraction of MR and other experiments are currently being run. MISTIC has demonstrated various technologies in various fields.

Establishment of Digital Planetarium at Lunglei: The Council is undertaking setting up of Digital Planetarium at Zohnuai, Lunglei. The centre will serve as a place for studying, communicating and observation of astronomy related activities to the people living in southern part of Mizoram.

Community based Environment Conservation & Eco-Tourism Project at Ailawng village: The main objectives of the project are conservation of natural environment in the project area, attract tourist and create employment for the local people.

Development of Sawdust Briquetting and Charcoal Making Plant at Chhuanthar Tlangnuam (Baktawng Village) : Under this project, a building for production of briquette and charcoal is constructed at Baktawng village, Mizoram. The raw materials used are the piles of sawdust generated by various furniture workshops of the Baktawng village that were used to be thrown away as wastes.

Development and demonstration of Simple Automatic Multiple Thread Winding Machine: A working prototype of 'Simple Automatic Multiple Thread winding machine' is developed in collaboration with a local

grassroot innovator Mr. Chhuanmawia of Haulawng village, Lunglei District. The machine is currently demonstrated at the Council's office.

Development and demonstration of power hammer: A working prototype of 'Power Hammer' developed in collaboration with local grassroot innovator Mr. Jonah L. Pachuau, Ramhlun Veng, Aizawl is installed and demonstrated at a local iron and steel fabrication workshop in Aizawl. The machine is capable of forging and shaping iron materials. It uses a 2 HP, 1440 rpm single phase motor. It can stroke 350 times per minute.

Development and demonstration of rolling shutter controller machine: An indigenously innovated electro-mechanical device prototype i.e. 'Rolling shutter controller machine' that is able to lift and pull down rolling shutter doors using a simple switch was developed in collaboration with a local grassroot innovator Mr. Zoramchhana of Chhungte village in Champhai district and is demonstrated at Champhai, Champhai District, Mizoram.

Establishment of Color Web Printing Press: The objectives of the project are - Enhancing local capacity for undertaking bulk printing works by setting up a color web printing unit in the state that is able to undertake large scale printing works, bridging the gap between domestic/local demand and local capability to cater to the demand for bulk printing, and creating jobs for families working in printing related works.

MISTIC celebrates scientifically important days every year such as **National Technology Day 2019** on May 11, 2019, **National Mathematics Day** on 20th December 2019, **National Science Day** on 28th February, 2020, **Felicitation of Women PhD Holders** and **District & Institutional level NSD Celebration**. Other science popularization programmes & events are Seminar with Mizo academy of sciences on NSD theme, Organising 11th state level mathematics competition 2019, Organizing science exposure tour 2019, Organising science essay competition, participation in India international science festival 2019 and Participation in first edition of global bio India.

IPR Awareness programmes: Creating awareness on Intellectual Property Rights is one of the main function of Patent Information Centre, Mizoram. During 2019-2020 PIC-Mizoram organized and took part at 12 numbers of IPR awareness programmes. In the overall, 41 numbers of awareness programmes have been held.

During 2019-20, a total of 3 patent search, 9 patent applications filing and 2 trademarks filing were carried out. Out of which one Trademark earlier filed has received registration.

During 2019-2020 a total of 3 numbers of Copyrights were filed at the Indian Copyright office. A total number of five (5) GI applications filed during 2017-2018 received final registration during August 2019. To enhance the cause and objectives of the Patent Information Centre, seven (7) nos. of IPR cells have been created in Mizoram with the assistance of DST, New Delhi.

During the year 2019 to 2020, the Mizoram State **Climate Change Cell** has conducted awareness programmes on Climate Change in 5 districts (Kolasib, Champhai, Lunglei, Siahla and Lawngtlai) and organized two (2) capacity building and training programmes.

New innovative activities are **Development of Indigenous Technological Innovation in Mizoram through Establishment of Innovation Facility Centre and Enhanced Protection of Ownership** - The main objective of the project is to provide better scientific assistance and technological intervention by assisting indigenous & grassroot technological innovators.

Enhancement of livelihood options for Rural **Women in Mizoram**: The Council is providing the technical assistance and the NGO are arranging all the necessary logistics. A training centre is constructed at Zemabawk, Aizawl wherein selected women undergo training on poultry and pig farming, as well as manufacturing of food items.

Investigation of the Anticancer properties of Mallotus roxburghianu: Under this project, the anti-cancer properties of Mallotus roxburghianus plant (local name is Zawngtenawhlung) is studied. Mallotus roxburghianus is used as a traditional medicine in the state for treatment of several ailments.

Some of the success stories arising from the activities of the Council include - **Successful registration of five Mizo Traditional Clothes under the Geographical Indication registry**- A remarkable activity of the Council was the successful registration of five Mizo traditional puan - Puanchei, Hmaram, Tawlhlohpuan, Ngotekherh and Pawndum under the Geographical Indication Registry, Chennai. Now, all the five Mizo Puan has a GI tag.

Inauguration of Community based Environment Conservation & Eco-Tourism

Project at Ailawng village - The main objectives of the project are conservation of natural environment in the project area, attract tourist and create employment for the local people. The project was inaugurated on 8th February, 2020 by Pu Lalrintluanga Sailo, Hon'ble MLA of Dampa Assembly Constituency.



The Council is not developing State related S&T and Innovation Policy. The Directorate of Science & Technology of State Government is planning to develop such policy and the Council will provide necessary assistance. The Council has a strong linkage between other state government / departments and local industry units/associations

Biotechnology & Bioresources, Environment and Climate related area, Food processing & preservation technology, Waste management and Green energy development are the major technology area where the council can play an important role by finding convergent technological solutions.

Rajiv Gandhi National Drinking Water Mission: Phase -IV

The Council with NRSC, Dept. of Space, Govt. of India is taking up a project on Rajiv Gandhi National Drinking Water Mission (RGNDWM) for the whole State. The objective is to prepare ground water prospects maps and ground water quality maps using remote sensing and GIS technology.

Ground water prospect mapping: The mapping for ground water prospect is completed for the entire State and officially handed over the maps to the PHED Department.

Water Quality Mapping: NASTEC has been assigned with the task to generate the quality maps of Nagaland with inputs from PHED Department.

Achievement during 2019-20: The Mapping is completed and released in BHUVAN portal in June 2019. Preparation of Atlas in PDF format is completed and submitted to Ministry of Drinking Water & Sanitation, GoI.

Nagaland Science & Technology Council (NASTEC) under Science & Technology Department, Gov of Nagaland has set up a **Biotechnology Hub** with the support of Dept. of Biotechnology, Ministry of Science & Technology, GoI in the year 2011.

Nine (9) Seminars/awareness programs were conducted for host and some neighbouring Higher Secondary schools and Colleges. Twelve (12) hands on training on Biotechnology are conducted in the Hub for schools and colleges. Eight (8) Invited lectures offered at host institution and neighbouring Higher Secondary schools and Colleges. Presenting paper at National and International Conferences. Consultancy service is given to Senior Secondary Schools with science stream to set up a number of in-house research projects under Biotechnology Hub have been already initiated based on location specific problems and solution strategies. A project fellow has been awarded the DST-Women Scientist under Women Scientist Scheme (WOS-B)

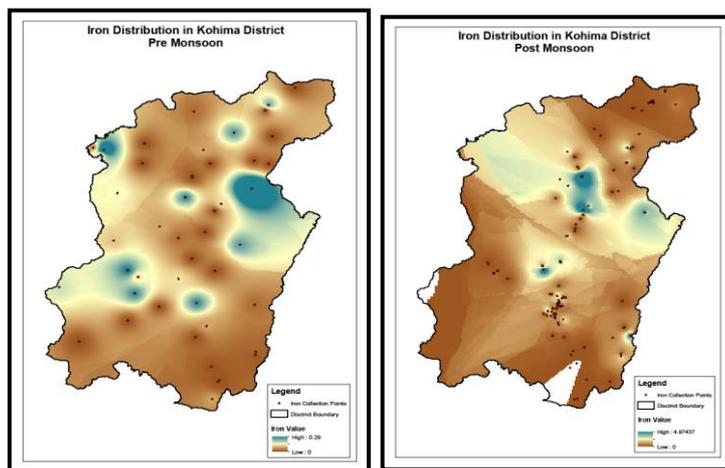


Students hands-on trainings

Patent Information Centre: PIC Nagaland is acting as Inspection body and enforcement agency for GI and other IP related issues for the state. Twelve awareness programs on “Intellectual Property Rights” have been conducted to schools, colleges and NGOs in the state. Six Patent searches were facilitated. Awareness talks on “Geographical Indication” to various tribal hohos and women societies. Publication of Information booklet on Intellectual Property Right & Released by Mmhonlumo Kikon, MLA & Advisor for Information Technology & Communication, Science & Technology, New & Renewable Energy on 4th October, 2019.

Water Referrals Laboratory: Under this facility unit, project on Rainwater Harvesting Technology was demonstrated in 6 water scare villages in the state. Currently, a project on Water Quality Mapping for Kohima and Dimapur District is in progress with funding from DST, GoI. Water Quality Testing and Consultancy services are provided to user departments and various stakeholders of the state. Various awareness and training programmes were conducted during the last Calendar year.

Chemical Ecology Programme of the North-Eastern Region (NER) of India: A collaborative programme linking NER and Bangalore Scientists. The Chemical Ecology program is funded by Department of Biotechnology (DBT), Govt of India. Under this programme, currently three projects have been taken up, namely: Chemical Ecology of Oak Borer Larva with its host and the associated organisms, Chemical Ecology of Dazo Nha: A potent Anti-rheumatic plant, Aquarium-assisted Evaluation of Fish-Poisoning Plants against Fishes followed by Piscicidal Plants Extraction, Isolation and their Neurobiological activity.



Nagaland State Climate Change Centre: Established in April 2017 under the National Mission for sustaining the Himalayan Ecosystem (NMSHE). Eleven seminars/workshops/ activities have been conducted by the NSCCC. Other works carried out so far includes paper presentation, review/revision of SAPCC and a pilot case study of Phokhungri Block, Phek district using Participatory Rural Appraisal approach and household survey method. Various workshops and awareness programs were conducted during 2019-20

State Spatial Data Infrastructure: The primary objectives are development of an interoperable geo-portal web service to support grass root planning in the State and demonstrate its utility in decentralised governance. **Activities carried out:** Data Analysis and standardization, Preparation of the data for WEBGIS, Preparation of Schema: Completed for School Layer and Health Layer and Geoportal: Nagaland SDI proto-type is hosted in the NSDI Cloud Server.

Other Activities: Covid -19 Data Model is completed and updating of data is going on. Covid19 portal for Nagaland hosted by ESRI India currently is with official data provided by Dept. of Health & Family Welfare, Govt. of Nagaland. **Current Activities:** Gathering of field data for other layers and Designing of Covid Dashboard as per Health Data model.

Value Addition of Agro-produce through Multi-disciplinary S&T inputs in Nagaland: The project is successfully completed in 2019. The solar hybrid biomass dryer was based on heat of burning biomass and heat resulting from cold storage on ice bank through heat pump, for drying vegetables which proved to be very efficient and saves drying time.

Understanding adaptive plant-pollinator Networks among the understory perennial gingers (family Zingiberaceae) using a field and molecular ecology approach: Field work in Nagaland started from 11th August To 13th September, 2019, with 2 research scientists from IISER, Bhopal. The following geographic regions were covered as part of the field work: Phek, Pfütsero, Tuensang, Kiphire, Thanamir, Saramati,

Mokokchung and Kohima (viswema). The first part of the field work was identifying the plots where the gingers are present.

Hosted One Day State Level Workshop on Geographical Indication(GI) & Intellectual Property Rights (IPR) for protecting Indigenous Traditional Knowledge on Textile & Handicrafts with the Naga Tribal Apex Organizations, Weavers and State Government Departments during 4th October, 2019 at Kohima.



Building Awareness at Schools levels and at ITI, Polytechnics and Advanced Training Institutes (ATI) on Emerging Information Technologies like Artificial Intelligence (AI), Robots, cyber crime, Internet of Things, etc.

The project aims to cover 100 schools in Kiphire district of Nagaland State. It may be mentioned that this is the first pilot project and Kiphire District being an aspirational district has been selected for the said training. All the teacher trainees and students are covered under this programme from Scheduled Tribe category.



New Initiatives for 2020-21: Crop suitability Mapping and preparation of niche model for important crops of Nagaland, Application of Indigenously Developed Biomass Fired cum Solar Hybrid Dryer & Animal Feed Crusher for Value Addition and Socio-Economic Upliftment of Rural Tribal Population of Nagaland, Implementation of Climate Change Adaptation project for rural livelihood, Geospatial technology for planning and development activities monitoring through State Spatial Data Infrastructure, Small to medium unit environmental friendly incineration for offices, community buildings, schools etc. and Liquid waste management system for both black water and gray water.

Science Popularization: NASTEC organised many state and district level science popularization programmes among them, National Science Day and National Mathematics Day celebration is the yearly affair of the Council. The target beneficiaries include Middle Elementary and Secondary level students of the state. During 2020, each district mobilized over 400 students for National Science Day celebration and a robotic & AI competition was organised, where certificates were given to the best three schools.



17) SCIENCE & TECHNOLOGY DEPARTMENT, ODISHA

Key activities under taken during the last two years

- Forwarded 13 numbers of Inventors data TIFAC for Financial Assistance regarding filing of Patent.
- Provided technical assistance for 04 numbers of applicants (Start-ups) regarding filing of their inventions.
- Organized 07 numbers of sensitization workshop at different Institution.
- Organized 01 number of training programme at Odisha Bigyan Academy for IPR Cell-in-charge and faculty members.
- Provided financial assistance to 04 numbers of Institute regarding opening of IPR Cell.
- Provide technical assistance for 01 number of Trade Mark registrations.
- Provided technical assistance for 02 numbers of Copy right Application.
- Provided technical Assistance regarding GI registration (Odisha Rasagola)

18) PUNJAB STATE COUNCIL FOR SCIENCE & TECHNOLOGY

Punjab State Council for Science & Technology was established on July 21, 1983. Since then, the Council, with the purpose of infusing scientific attitude in the public minds, has laid emphasis to disburse knowledge through various means of display and publications, about the nature of life and its physical surroundings, while signifying the usable aspects of available technologies.

Looking back over the past two decades of existence and reconnoitring as best as possible its activities for the future, the Council's impact in society is downright conspicuous, though its unfolding has been and would be quite gradual.

Punjab State Council for Science & Technology has involved in implementation of various technologies addressing the state's local problems and challenges.

Technology Development & Demonstrations

- Setting up of Demonstration Units for preparation of Green Fuel from Paddy Straw for Industrial use
- Designing of Machinery for Paddy Straw Briquetting in decentralized manner and studies for improvement of its life cycle
- Artificial Intelligence for River Water Quality Monitoring
- Big Data Analytics for Environment Improvement
- Scientific Jaggery Production
- Demonstration of Climate resilient cattle sheds

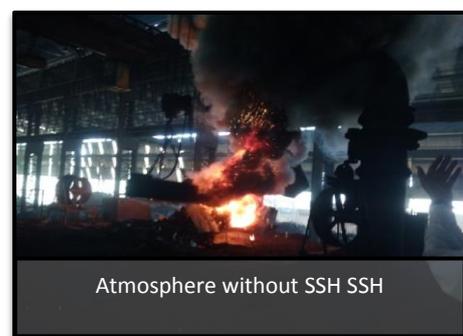
Tech-interventions for Industry:

PSCST, having provided tech-interventions to a large number of industry, has established strong linkages with industrial associations/units in the State. The key endeavours in this direction include:

- Industry-Institution Innovation Clusters
- Technological support to MSMEs for cleaner production
- Promoting Industry 4.0

Patents: PIC – PSCST has been recognized as Technology Innovation Support Centre by WIPO, UN. 4 patents have been granted and 8 patents have been filed through PFC-TIFAC. Many workshops, trainings and capacity building of IPR have been organised.

New innovative activities: PSCST is working towards consolidating and augmenting State's technological and innovation strengths, developing and accelerating knowledge intensive entrepreneurial ecosystem and spurring innovations in industry. Set-up Rural Innovation & Application Centre – a focused initiative for providing low cost tech-interventions for rural sustenance. Green Skill Development Initiative taken up for generating skilled manpower on 'Pollution Management' and 'Waste Management' in collaboration with IIT-Ropar. Developed technical report on "Enhancing Productivity in the Indian Bicycle Sector-Patent Analysis" – 2019 for United Nations Industrial Development Organization (UNIDO). Conceptualized Global Innovation Hub for supporting tech-intensive enterprises in the state. MOU signed with Plaksha University to be the technical partner for this initiative.



Some of the success stories arising from the activities of the Council include - **Green House Gas (GHG) reduction through novel Tech Intervention in critically polluted industrial town of Punjab** - Around 300 Induction furnaces are operating in the state out of which 100 units are operating in Mandi Gobindgarh and Khanna, also known as steel town of Punjab. With the augmentation of Induction Furnace units to higher capacity (5 tph to upto 25 tph) furnace in view of market demand, most of these furnaces have been using magnet & pusher for charging of raw material for achieving faster melt rate.

First of its kind unit for ex- situ management of Paddy Straw in aspirational district: PSCST under a MoEF&CC, GoI supported project “Technological Adaptation for gainful utilization of paddy straw”, has installed **first - of- its kind commercial scale paddy straw based briquetting plant in the Country**. The plant of 24 TPD (5000 TPA) capacity has been made operational in Aspirational District Moga. The briquettes manufactured have been successfully used in 100% replacement of fossil fuel in brick kilns.

Enhancing Adaptive Capacities to address Climate Change Concerns in the State: PSCST had set up Punjab State Climate Change Knowledge Centre (PSCCKC) with main objective of undertaking capacity building to enhance knowledge about climate change so as to mobilise adaptation action programmes for addressing climate change concerns and challenges in the state. The Centre has successfully achieved these objectives by holding need based capacity building and awareness programmes at different levels and for varied stakeholders. Following four projects have been taken up in the state with the efforts of PSCCKC:

- i) Towards Climate Resilient Livestock Production System in Punjab
- ii) Technological Adaptation for Gainful Utilisation of Paddy Straw (Presently Burnt On-Site) as Fuel to Replace Fossil Fuels
- iii) Climate Resilience building in rural Areas through crop diversification and residue management
- iv) Climate Change Adaptation in Rural Areas

Technology Gap Assessment and Development of Entrepreneurial Network for Secondary Agriculture Sector in Punjab:

Punjab, the granary of India, has played a momentous role in transforming India from food deficient nation to self-sufficient. With predominant agrarian economy set in, now the state is in position for next revolution for transformation as the key food processing state. Govt. of Punjab with focused initiatives on agricultural diversification has prime agenda for encouraging agro-processing industries. Taking forward the vision, Punjab State Council for Science & Technology pursued Department of Biotechnology, Government of India for setting up Secondary Agriculture/Food Processing Entrepreneurial Network in Punjab. The program supported by BIRAC-DBT-GOI was formally launched by Govt. of India and Govt of Punjab in June 2018. PSCST, given the role to play as lead agency joined hands with National Agri-Food Biotechnology Institute, Centre of Innovation & Applied Bio-processing and BioNEST- Panjab University for implementation of the program. The aim of the program is to promote and support both existing and new enterprises in the secondary agriculture sector in Punjab. PSCST has setup entrepreneurial network with multiple stakeholders’



viz State Development Departments, Industrial Associations, Industrial Clusters, and Universities/Research Institutions on board.

Forced Circulation Solar Drying: A Green S&T based Innovation for value addition of bio resources at Grass root level:

The Shivalik belt of Punjab (Kandi) is one of the most degraded rain-fed agro eco systems in the country. The agriculture income in this area is too meager to sustain the livelihoods. However, this belt is endowed with about 140 naturally growing species of medicinal & aromatic plants. There are about 255 registered herbal units and 500 unregistered



tiny & cottage units based on biological resources existing in the State with a large percentage of later occurring in the Shivalik area due to higher availability of wild medicinal plants, non-timber forest produce etc. These units provide livelihood to local population in about 300 villages. As per survey conducted by PSCST, a total of 371 Self-Help Groups (SHGs) with about 5000 members exists in 223 villages, with many of them engaged in livelihood generating activities based on local bio resources

In view of above, PSCST demonstrated a technology prototype i.e Forced Circulation Solar Dryer (FCSD) developed by School of Renewable Energy Engineering, Punjab Agricultural University for value addition of local bio-resources. The technology due to evacuated tube collectors and forced circulation drying offered distinct advantage in terms of achieving higher temperature of 50-60° rapidly within 1 hour and its prolonged maintenance compared to conventional solar drying which is based on simple green house effect. PSCST has successfully demonstrated two Forced Circulation Solar Dryers i.e. one at PSCST'S Processing Facility at village Fatehpur and second at village Dharampur, both managed by local Self Help Groups. SHGs were facilitated to dry local resources using these units for livelihood generation, which otherwise were being dried using conventional open sun drying yielding low quality produce, hence fetching less market price to the local community.

The Council has taken major steps towards bringing in policy level interventions related to S & T and Innovation. These include making 'Mission Innovate Punjab' functional with extensive engagement of 3 key pillars viz Research Institutions, Industries and Government Departments; MoUs signed with 14 Research Institutions and 6 Industrial Associations. State Action Plan on Climate Change (SAPCC) has been revised in line with INDCs and SDGs in consultation with development departments & technical support from GIZ.

Popularisation of science: Punjab State Council for Science & Technology has organized various science popularization events such as Nobel Prize Series Event, Punjab Innovation and Technology Summit, Children's Science Congress, National Science Day, National Mathematics Day, Genetic Literacy Programmes and Regional Conference on Environment –Theme: No Time Left – Act Now” during 2019-20. Engaged 5720 Schools in Science Popularization Activities including National Green Corps Program 2019-20 and WaSH Program.

Clean and Green Technologies, Pollution Control and Energy Efficiency, Climate Change and Biodiversity, Artificial Intelligence & Big Data Analytics, Industry 4.0, Resource Valorization for livelihood sustainance, Up-gradation of technologies used by industrial clusters by providing off-patent information are the major major technology area, where the council can play an important role by finding convergent technological solutions.

19) RAJASTHAN COUNCIL OF SCIENCE & TECHNOLOGY

Rajasthan Council of Science & Technology has demonstrated few technologies in various fields. Some of the key technology demonstrations are

- CEERI-CSIR, sensor based technology developed for preservation of water in irrigation is executed in collaboration with State Council.
- A grant of Rs. 9.99 Lakhs has been given to HELPS organization, and Rs. 6.785 Lakhs to Shrushti Seva Samiti, Udaipur for pilot project on Sanitary Napkin and sanitization.

Patents: Awareness and Sensitize Workshops

Rajasthan Council of Science & Technology has organized various IPR awareness and sensitize workshop for the benefit of students from various universities and engineering colleges. They also organized IPR Program for Women Researchers in collaboration with PFC, TIFAC and CIPAM during 29th – 30th November 2019 at Birla Institute of Scientific Research, Statue Circle, Jaipur and IPR Training of Trainers during 12th – 13th January 2020 at Birla Institute of Scientific Research, Statue Circle, Jaipur.

Advance Level Workshop: Organized Advance Workshop on IP, Tech Transfer & Licensing from 16th - 18th January 2020 at IIT Jodhpur.

Policy Initiatives

- State IPR Policy has approved by State Government.
- University IPR Policy drafted by PIC, Rajasthan adopted by many Universities.
- An Inter Department Committee on Geographical Indication has been constituted for promotion of GI under administrative supervision of S&T, Department.

Some of the success stories arising from the activities of the Rajasthan Council of Science & Technology include -

- **Name of the Innovator-** Dr. Sufiya Khan, **Idea-** Development of Affordable Novel Portable Rod for DE- fluoridation Process, **Start-up-** Drumlin Water Technologies Pvt. Ltd ((Applied for DPIIT) was provided an idea support under TBI program. Dr Khan was among top 30 of Women Transforming Awards 2019 of WEP-NITI, awarded with Oxford CRISP Award 2019, and received BioTech WINNER Award of INR 5 Lacs. From BIRAC and TiE Delhi.
- **Name of the Innovator-** Dr. Sarika Gupta, **Idea-** Scanning of Innovation Tool for Enzymatic in Handmade paper Industries of Rajasthan, **Start-up-** Greenathon & Company(DPIIT Registered), **Achievements-**Incubated at Atal Incubation Centre, Banasthali Vidyapith, Pilot successful with waste stationary paper of the college, the parameters of quality testing of the paper like fiber thickness, fiber strength etc. is under progress.
- **Name of the Innovator-** Ms. Aanchal Raj Srivastava, **Idea-** Taboo Shooter, **Startup-** Swachh Samadhan(MSME Registered). **Achievements-** Educated 20,000+ girls and women in rural and urban India in past 2 years, working with schools to educate kids on sex education, puberty and menstrual hygiene.
- **RTBI Incbator** at VGU University Jaipur awarded Atal Innovation Community Centre

The Council has a strong linkage between other state government / departments and local industry units/associations, State Remote Sensing application center executes projects NRSC, Ministry of Agriculture, ISRO and Ministry of Culture.

Water, clean energy, solar power, agro-technology, bio fertilizers, RS &GIS and Medical technologies are the major technology area where the council can play an important role by finding convergent technological solutions.

Rajasthan Council of Science & Technology has involved in various Science popularization activities, such as

- 05th December 2020 Solar Eclipse Workshop in collaboration with BISR, Jaipur
- National Science Day 28th February 2020 was institutionalized and celebrated the day as “**VIGYANOTSAV**” from 13th -28th Feb. 2020.
- Card making, Poetry Elocution, Nukkad-Natak, Bus Painting Competition, Science and Heritage Quiz, Best over the west activity, Canvas Paintings, Rangoli, Role Play, Gandhian Exhibition on the occasion of Birth Centenary year.
- Expert Lecture Series: Demystifying Science, Women in Science and Design, Biography of Dr. CV Raman, Forensic Science Crime Scene and Traffic Quiz etc.
- 11 catalytic grants to organize workshop/ seminar/symposium.

20) SIKKIM STATE COUNCIL OF SCIENCE TECHNOLOGY

Sikkim State Council of Science and Technology is an autonomous nonprofit, public funded research and training organization of Department of Science and Technology and Climate Change, Government of Sikkim. It is located in a beautiful place of Development Area, Gangtok. The institute has been running various scientific projects like Bioinformatics Centre, State Biotech Hub, State Tissue Culture Centre, Patent Information Centre, State GIS & Remote Sensing Centre, Technology Transfer Centre, ENVIS Centre and other projects. Sikkim State Council of Science and Technology has developed various technologies in the last two years. Some of the key projects undertaken by MISTIC are:

Long-Term Monitoring on "Glacier Dynamics of East Rathong Glacier- Sikkim Phase: People of urban areas of Sikkim, Some Parts of West Bengal, and Bangladesh are fed by the river Gangit. The Geodetic Mass Balance Estimation was done using digital Elevation Models.

The average thickness loss through the data analyzed from toposheet of 1962 and Digital Elevation Model of 2009 is around 100m in 1962-2009. Further in order to monitor this Glacier by utilization of support from European Space Agency, the monitoring of Glacier was done for the period of 1993-2019 also. The Synthetic Aperture Radar (SAR) data from Sentinel-1 and European Remote Sensing Satellite (ERS-1) have been tested for the ice thickness change and mass balance monitoring which can be used for other Himalayan glaciers too.

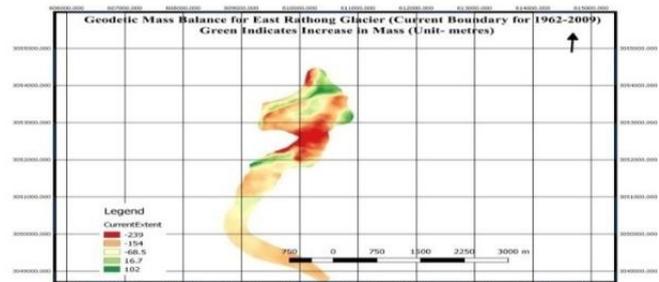
The average mass loss through the data analyzed from toposheet of 1962 and Digital Elevation Model of 2009 is around 0.8-1.5 m per annum. This is huge mass loss and one of the direct evidences of Climate Change in the State. Hence there is need to act for adaptation and mitigation.

Himalayan Aerosol Experiment: was started on august 2019 jointly by Space Physics Laboratory, VSSC, Trivandrum, North Eastern Space Application Centre (NESAC), Shillong and State Remote Sensing Application Centre & Climate Change Cell, Dept. of Science & Technology and Climate Change, Govt of Sikkim. The laboratory for monitoring the aerosol properties is set up lachung (27.6891°N, 88.7430°E, 2700m a.s.l.). The estimation of Black carbon and various other light absorbing particles over the eastern Himalayas will be useful to evaluate the implication of light absorbing aerosols in the hydrology of this region.

The higher values of BC during this time could be due to the spring time enhancement of aerosols at the high altitudes during this season as observed at other high altitudes of Himalayas. This significant amount of BC at this location can have profound implications on snow/glaciers in the near future.

Development of Insar based techniques for high resolution surface topography and ice Velocity under Microwave and Hyper Spectral Techniques for Earth Resources Application and Management

(MAHTRAM / मातरम): The project is in collaboration with Space Application Centre, ISRO. The objective of DST, Sikkim is mainly the validation of elevation and glacier velocity derived from the module in the Himalayan Glacier area. DST, Sikkim will also take the lead role in design and validation of surface elevation and ice velocity derived from satellite data along with the project team. The field work is planned on June 2020.



Geodetic Mass Balance (1962-2009)

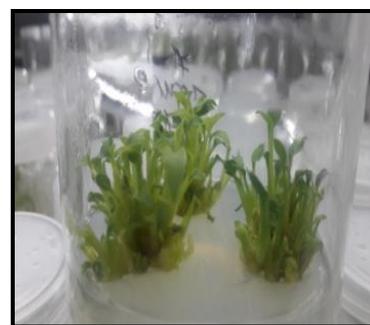
Development of Forest Fire Spread Model using Satellite Remote Sensing Computational Fluid Dynamics (CFD), and Non-CFD models in Sikkim Himalayas using High Performance Computing (HPC) System: This project is in collaboration with Indian Institute of Technology, Kharagpur and Centre for Development of Advanced Computing (C-DAC), Pune. The main objectives of Department of Science and Technology, Government of Sikkim are as follows.

- Overall logistic support to the participating teams
- Provide current and historical departmental datasets related to forest fire and other related administrative and scientific datasets
- Carrying out field investigations/field data collection related to forest fire on continuous basis
- Providing all the necessary permissions to carry out the proposed research, including the field work permission from forest department, Sikkim
- Testing the model on field and provide feedbacks for improvement

This project was sanctioned in March 2020, the activities of the project will be start in next financial year.

Micro-propagation of Large Cardamom (*Amomum subulatum* Roxb.)

The main objective is to produce elite, disease free cardamom planting material for distribution to the farmers of Sikkim. The faster micro-propagation method has been developed for production of elite planting material. It is being supported by Department of Biotechnology, Government of India under a project titled “Mass production and propagation of Large Cardamom for livelihood sustainability of rural people of Sikkim using biotechnological intervention”.



An improved method of large cardamom cultivation has been developed for faster and healthier growth. The method uses the pit digging during the drier season and filling the pit with cow dung, top soil and leaves and allowed to decompose. The filled pit is marked with stick. During the planting season during June/July the saplings are planted in the filled-in pits. It will give vigorous growth and starts giving fruiting from next year. The sprinkler system is used for irrigation during drier season for judicious use of water. The old sheaths and leaves of cardamom are converted into manure in the field itself by using polysheets and used as manure for the same plant. This decreases the disease incidence especially fungal disease.

Development of agro-technique in Ginseng: Development of agro-technique in Ginseng found in Sikkim is undertaken and is in nursery stage. The technology developed will be transferred to farmers for large scale cultivation of Ginseng in Sikkim.

Developed two new cymbidium hybrid: Two new cymbidium hybrids developed. One is hardy and long lasting type and another large flowered. In both the cases the traits of original *Cymbidium lowenium* of the region is re-expressed. Sikkim is also known for orchids. There are very few indigenously developed orchid hybrid which will have the commercial importance.

Low cost technology to clean greenhouse plastic: One of the biggest problems of greenhouse farming in the Himalayan region is the accumulation of algae, fungi and dust on the greenhouse plastic due to high humidity and rainfall. After few years of greenhouse cultivation, the plastic becomes opaque and blocks the sunlight due to which the crop grown inside will be greatly hampered. Further, the pests and disease incidence increases due to congenial environment. S&T Council of Sikkim has developed a simple and easy method of cleaning greenhouse plastic.

Development of drying of cardamom and other vegetables by using hydel power generation from local streams at final stage.

Sikkim State Council of Science and Technology has demonstrated various technologies in various fields. Some of the key technology demonstrations are –

Green Skill Development Programme: Certificate Course on Value Addition and Marketing of NTFPs (Animal Origin): wild Bee Keeping and Processing: The programme endeavors to develop green skilled workers having technical knowledge and commitment to sustainable development, which will help in the attainment of the Nationally Determined Contributions (NDCs), Sustainable Development Goals (SDGs),

Training on Wild Bee Keeping and Processing: All the trainees now have been skilled and trained on Certificate Course on Value Addition and Marketing of NTFPs (Animal Origin): wild Bee Keeping and Processing was organized at Sikkim Science Centre and the field at various places during 14th February to 17th March 2020. The training was of the level of National School Qualification Framework (NSQF) level IV. Twenty five trainees were selected and trained for the said skilling programme.



First hands on training was conducted where trainees were taught on how to make clay hive and what are the local resources they can use to make clay hive. The training contained the skilling programme on Bee keeping, Bee rearing, Queen Bee production, Clay Bee hive making which is ecofriendly and low cost bee boxes.



Valedictory of the Wild Bee Keeping and Processing under Green Skill Development Programme was organized on 7th March, 2020

Training on Egg incubators and Distribution: Egg incubator and Hatchery at Village level: Hon'ble Minister of Science and Technology Shri Karma Loday Bhutia inaugurated the training programme on Egg Incubator for hatching of Chicken at the Household level during November 5 to 9, 2019. The training was attended by identified self help groups.

After the completion of Training programme Hon'ble Minister handed over the hatcheries Machine to the beneficiaries. The programme was funded by National Innovation Foundation, an autonomous organization under Department of Science & Technology, Government of India.

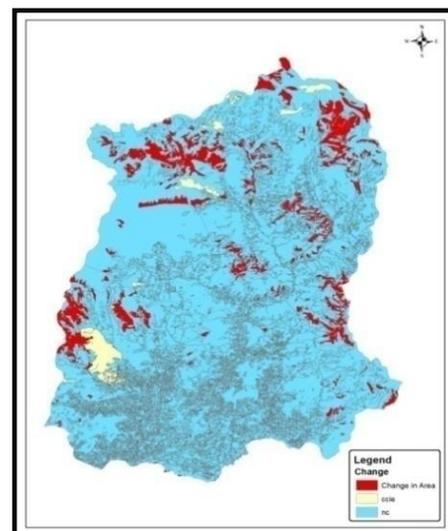
Sanitary Napkin Production Machine and training cum distribution to be given to educated unemployed women SHG for production and sale in remote villages: Training on production of low cost sanitary napkins was organized during November 2019 for a week period where the beneficiaries were trained to handle the machinery and equipments and production of sanitary napkins on a sterile environment.



Monitoring of Integrated Watershed Management Programme(IWMP):The project envisages monitoring and evaluation of IWMP projects for the state of Sikkim. It has to be monitored for five (05) years.

Space based Information Support for Decentralized Planning (SISDP) Phase II

Based on the experience gained in the execution of SISDP Phase I project activities and continuous feedback received from various stakeholders on project components on database, implementation and capacity building exercise, a strong need was felt to continue this activity. So the objectives of SISDP phase I was decided to be pursued further in the phase II as a logical extension with an emphasis on updating the last geo database using latest data sets and vigorous capacity building activities at various levels. These databases would be useful in preparing developmental plans and monitoring activity. Apart from the updated database, focus shall be on value added data products, data analytics and model based products and services. The SISDP phase II has been approved and the works for update of all thematic layers of Phase I has been started using the Cartosat imagery.



Land Use / Land Cover Change- Third Cycle: National Remote Sensing Centre, Indian Space Research Organization (ISRO), Department of Space, Government of India in collaboration with various State, Central Government Departments and Institutions has completed first and second cycle of LULC, where third cycle is still going on.

Site suitability analysis under Coordinated Horticulture Assessment and Management using geoinformatics (CHAMAN) project (Phase-II): The Site Suitability analysis and mapping of potential areas for cultivation of **Kiwi fruits in East District** of Sikkim under the guidance of Mahalanobis National Crop Forecast Centre.

Application of Remote Sensing and GIS in Sericulture Development: The main objective of this project was to identify potential areas for mulberry and non-mulberry sericulture development in west districts Sikkim and to develop Sericulture Information Linkage & Knowledge System (SILKS) for the west district.

Ice Stupa an Artificial Glacier Demonstration: The artificial Ice stupa was demonstrated this year also in Thangu Village during November 2019. Previously, Department of Science and Technology, GoS has successfully developed a prototype of Ice Stupa at Thangu, North Sikkim in the winter month of 2018-2019 with the support of UNDP. In short, the demonstration of Ice Stupa is an experiment that could be generalized for reglaciation of the glacier and the success of the project can open up the new avenue of reglaciation of selected glacier in natural condition. The principle behind the formation of ice in the selected site is the breaking of water droplets from sprinkle system to small nuclei which gets frozen when it comes in contact with open freezing environment that accumulates to give structure of the cone that resembles Ice Stupa.

National Wetland Inventory and Assessment (NWIA), Phase-II: Comprehending the significance of wetlands, the Space Application Centre (ISRO), Ahmedabad, Govt. of India, lead the project on National Wetland Inventory and Assessment (NWIA), Phase-II. The ongoing project is the continuation of the national level wetland inventory project phase I.

Our final result reported 248 wetlands (Table 1), with an estimated area of 6772.40 ha. The result further showed loss of one HAW, however the area of HAWs increased of ca. 185 ha. Whereas other wetlands such as lakes, ponds, river and streams remained unchanged.



High altitude wetland (Lhonak Lake) showing increase in area

Sikkim Himalaya has 248 large wetlands, which estimates to 6772.40 ha that makes about 0.95 % of the total geographic area of the state.

- Decadal change analysis showed an increase in area under wetlands, i.e. about 184.89 ha.
- The lakes, and rivers/streams did not show any change over the decades.
- But, the high altitude wetlands showed an increase in the wetland area, 2.8 %, however, the wetlands count decreased from 236 to 235.

The High Altitude Wetlands of the Himalayan region of Sikkim are extremely vulnerable. The melting of glaciers could be the potential cause, which could be because of Global Climate Change (increase in temperature). Since, the rapid melting of these glaciers could induce GLOFs and its associated threat, immediate wetland management project should be implemented to monitor and suggest disaster management strategies.

Training on molecular techniques State Advance Level Biotech Hub, Department of Science & Technology, Government of Sikkim organized three days hands-on training on Biotechnological techniques and tools commencing from 5.8.2019 at Molecular Biology Laboratory, Vigyan Bhawan, Deorali.



Hands-on training on molecular tools and techniques

Hands on training on molecular tools and techniques were conducted at Molecular Biology Laboratory, Vigyan Bhawan for Class XII Bioscience students and teachers of Enchey Sr. Secondary School 30-31st July, 2019. They were taught the technique of DNA isolation, quantification, Gel electrophoresis, Polymerase chain reaction



Sikkim State Council of Science and Technology has involved in various Science popularization activities, such as: **INSPIRE-Programme 2019-20**: The scheme covers students in the age group of 10-32 years and has five components. The first component, INSPIRE Award aims to motivate students, in the age group of 10-15 years and studying in classes 6 to 10, to pursue science and a career in research. Ten (10) students from Sikkim already visited JAPAN through the programme. This year DST, GOI awarded 136 students from Sikkim. The districts and State level exhibition-cum project competition has already been completed.



Sikkim Science Center, Marchak: The Sikkim Science Centre located in Marchak, Gangtok, has been added with the additional facilities for the benefit of the students and public new facilities like Digital Planetarium, 3D Theatre, Biodiversity Galery based on States Biodiversity has been added up. In addition, Innovation Hub has been functionised by Hon'ble Minister for Science & Technology, Shri Karma Loday Bhutia. All these new facilities are ready for inauguration.



52 episode - **Radio-Serial on Sustainable development** is broadcasted through All India radio; **“Udyam Samaagam-2019”** - Exploring Exports for Heritage Industries in Sikkim” event was held on 27th and 28th June at Sikkim Science Centre, Marchak, East Sikkim. In this mega event, many entrepreneurs from all over the country took part and showcase their products. The programme was inaugurated by the Hon'ble Minister Shri. Karma Loday Bhutia, Department of Science, Technology and Climate Change , Department of Forest, Environment & Wildlife Management and Department of Mines, Minerals & Geology.

Establishment of Sikkim State Climate Change Cell under NMSHE: SSCS&T is engaged in fulfilling the needs and objectives of National Mission for Sustaining the Himalayan Ecosystem in Sikkim NMSHE. Sikkim State Climate Change Cell is working in this field since its establishment as according to the mandate given by NMSHE. Awareness Generation Programme cum Training, on Climate Change was conducted by Sikkim State Council of Science and Technology, Gangtok in collaboration with Himali Vikash Sansthan (HSV), Bermiok West Sikkim for Panchayat, Progressive Farmers, NGO'S, SHG's and Youth. The one day training was conducted at Community Centre Bermiok, 13 Mile West Sikkim during march 2020.



Lecture series on Biotechnology and outreach programme: State Biotech hub organized lecture series on Biotechnology and allied subjects were organized for undergraduate students, post-graduate and research scholars. Demonstrations on biotechnology and biotechnological tools, and also their sustainable uses along with importance in our daily life was held.



Council participated in **India International Science Festival 2019 at Kolkata India International Science Festival (IISF); Global Bio-India 2019; Power to Transform Lives-Bioscience to Bioeconomy-USD 100 Bn by 2025**



Integrated farming of large cardamom, coffee and passion fruit: Multi-tier cropping system is introduced in large cardamom cultivation to increase the income of the farmer. Passion fruit, a climber plant is introduced in shade tree. In the next line is coffee plant and large cardamom.

Preparation of hand sanitizer: Hand sanitizer as per WHO recommendation is prepared in sufficient quantity for frontline worker and distributed in the wake of Covid19 pandemic.

Characterizing Patterns and Processes of Alpine Ecosystem in Indian Himalaya, Studies on Harnessing Remote Sensing for Environment and Climate (SHRESTI): The specific objective of the programme for Sikkim Himalaya is to establish the long-term ecological site in alpine ecosystem for monitoring tree-line shift, phenological changes and record changes in soil microbial community.

The period under consideration is 2019, the project focuses on identifying and creating baseline information and data for further project and is not a comprehensive report. The till date finding of the project activities is as under:

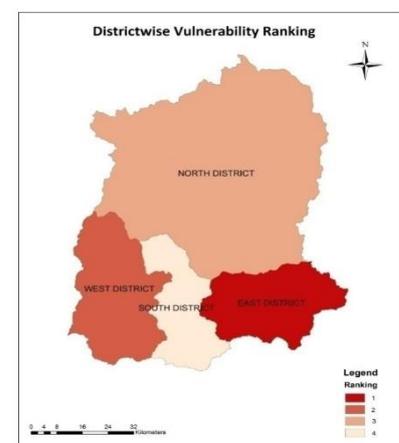
- Long term ecological monitoring sites for tree-line shift was identified and established in Kabi, which is a village in North district of Sikkim. Three summits were chosen where total 12 quadrates of 3x3m were established. In each quadrate of 3x3m, soil temperature loggers were placed for generating temperature data.
- Total 67 species of plants (including shrubs and herbaceous plants), were identified in the 12 quadrates which belongs to 29 families (Appendix I). Based on the availability of species and ecological concerns associated with the species, at present three species of trees were shortlisted for the further studies and the species were *Betula utilis*, *Abies densa* and *Acer pectinatum*.
- A study on changes in tree-line position and phenology over 37 years apart was carried out in Sikkim Himalaya using Landsat2 (MSS), Resourcesat-2 (LISS-III) and NOAA-AVHRR derived NDVI. Satellite imagery analysis of 37 years reveals that there is an upward shift in tree-line position and an increased in mean minimum temperature leading to significant changes in start and length of growing season.

Some of the success stories arising from the activities of the Sikkim State Council of Science and Technology include -

District Vulnerability Assessment in Sikkim: The vulnerability assessment will help the policy makers and planners to identify the vulnerable areas/district/ Gram Panchyat/wards based on the performance of indicators in that particular area and considered techniques. It will help in reducing the biasness in selecting the areas for the adaptation and other development plan.

Geodetic Mass Balance estimates of East Rathong Glacier

- According to the preliminary results of Geodetic Mass Balance estimates there is maximum upto 80-120m of ice thickness change. The vertical retreat in East Rathong glacier has been increased every year.
- The Microwave Remote Sensing and GIS has been tested for the study area, it has showed promising results in the thickness estimation using laminar ice flow equation and the velocity estimation. The current ice thickness has been recorded as 77.5m in 2020 which was 100.8m in 1993. The overall ice thickness loss is 23.3m in last 27 years.
- A conclusion was made for the use of Interferometric and Differential Interferometric Synthetic Aperture Radar data. They showed high standard deviations in Mass Balance Estimations due to high de-correlation.



Diffusion of grassroots innovations and documentation of innovations and outstanding traditional knowledge from Sikkim:

Understanding the potential of grassroots innovations, the Department believes if systematic scouting and documentation of grassroots innovations from the state of Sikkim is undertaken, not only it will help unearth and promote local ingenuity but also may result in establishment of grassroots enterprises.

NIF has had a long experience in promotion of grassroots innovations and valorization of outstanding traditional knowledge and a partnership between the two institutions is expected to benefit the people of Sikkim.

Area:

The state of Sikkim with focus on district(s) enlisted in Inspirational district list of NITI Aayog. The Innovation Demonstration cum Training Centre (proposed) will be setup in Gangtok.

The following activities will be undertaken during 2019-20:

- Identification of needs of the people in the districts and solution.
- Dissemination of low cost useful solutions based on need assessment.
- Diffusion of useful grassroots innovations in the districts and setting up of Innovation Demonstration cum Training Centre.
- Scouting of green grassroots innovations from the districts including from farmers, artisans, mechanics, school and ITI students for scaling up.
- Organising of ideation camps in schools for INSPIRE and Dr APJ Abdul Kalam IGNITE Awards.

India Enterprise Portal: The India Enterprise Portal has been architected for the Ministry of Micro, Small and Medium Enterprises under the Scheme for Promotion of MSME in the North East Region and Sikkim, on the basis of validated approaches in the earlier deployments of the skillyoungindia.com and indiaskillpedia/techpedia portals. The Strategic approach which guided the development and deployment of the Portal relies on presenting a unified blackboard architecture and collaboration platform, serving as a cyber eco-system, cutting across the boundaries of several Ministries, State Agencies, Industries and Institutions serving the cause of promotion and growth of entrepreneurship, start-Ups and MSME's in our nation.

The portal relies on distributed, decentralized content updating of operations, sharing of information/resources by the network of partners, state agencies as also the Enterprise Development Centers, which are proposed facilitation centers being set up across the nation on the lines of PHC/ ICDS centers and such other field offices of the governments.

The India Enterprise Portal encompasses functionality and features for online delivery of services- eServices, to entrepreneurs/ start-Ups – aligned with

- (a) Their profile and requirements as discerned from their inputs, interactions during the use of the portal, as also from
- (b) The posting of their needs by facilitators, on the basis of counseling and facilitation services offered by various field operatives and centers.



21) TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Tamilnadu State Council for Science and Technology has been implementing 16 Science and Technology Schemes for the benefit of people of Tamilnadu covering area such as Research and Development, Science and Technology Manpower Development, Science and Technology Infrastructure Development and popularisation of Science.

Science and Technology Capacity building for Industrial needs programme enables Engineering and Polytechnic students to improve their soft skills for employment and self-employment through entrepreneurship. A six days programmes was organized in two phases with a minimum of 300 students per programme.

World Intellectual Property Day - 2019: The theme as "Reach for Gold: IP and Sports" was announced by World Intellectual Property Organization (WIPO). PIC celebrated "World IP Day" on 26.04.2019.

Dr. Mylswamy Annadurai, Vice President-II, Tamil Nadu State Council for Science and Technology delivered the inaugural address. Dr. R. Srinivasan, Member Secretary, Tamil Nadu State Council for Science and Technology presided over the occasion and handled a session on Significance of Geographical Indication. Shri. A. Raja, Assistant Controller of Patents and Designs, IP Office, Chennai handled the sessions on IPR.

World Environment Day - 2019 was celebrated in association with National Green Corps, Chennai on 21.06.2019. **Workshop on "Chennai City Water Problems: Hydrologic and Metrologic perspectives of the "issue"** and & National Green Corps was held on 17.10.2019 at Anna University Campus on 17.10.2019. The 5th edition of **India-International Science Festival (IISF) -2019** was organized during 5th – 8th November, 2019 at Science City, Kolkatta. A gist of 16 schemes were implemented by the Council, Patent Information Centre's achievements such as Trademarks, Geographical indications, Patents etc. with an LED monitor.

Research and development supported/ facilitated: Technology Dissemination: Dissemination of Innovative Technology, particularly in the area of Agriculture, Fisheries and Veterinary sector and 18 programs conducted.

Technology Enhancement: Various issues in the areas of agriculture, environment, engineering and technology, water, health, energy etc., have been studied by various investigators of Higher Educational and research institutions of our State resulting in creation of valuable baseline data, suggestions / improvements to manage the issues. 24 research projects were initiated under the same. **The Student Projects Scheme** of the Council enables Under Graduate and Post Graduate students to address and solve local issues and do useful research on various topics of Science and Technology relevant to our State.



Local Problem Research: Project grant provided by DST to address state/location specific problems, specific research projects are being implemented successfully. Accordingly 25 research projects are supported.

Frontier Research: Research Fellowship to Research Scholars and S&T infrastructure development of Government Colleges provided for research activities of Government Institutions and scholars. STEM activities for School children were initiated. Apart from State supported S&T projects, Projects were initiated under the aegis of Department of Science & Technology, Govt. of India.

Accelerator research on COVID – 19: Proposals were invited from scientist and researchers of our State in the areas such as Studies on Development of methods / equipments for sanitization; Studies on Development of diagnostic methods / equipments; Studies on Development of Vaccines; Studies on Development of alternative medical system such as Siddha, Ayurvedha, Unani, Homeopathy etc.; Studies on Efficacy of available antiviral and other drugs; Any other studies in the management of COVID-19. The financial assistance upto Rs. 5.00 lakhs is provided for a period of 12 to 18 Months to scientists and faculty members.

Patents: Awareness Workshops were organized in different parts of the State in collaboration with academic institutions, associations like CODISSIA, MADISSIA and others. PIC has established 14 Intellectual Property Cells in various Universities and Educational. During 2019-2020, PIC has conducted 22 awareness programs and workshops in various parts of Tamil Nadu. **Geographical Indication:** PIC has obtained Geographical Indications (GI) of our State namely, Dindigul Lock (Application No.: 400) and Kodaikanal Malai Poundu (Application No.: 616) in association with Mother Theresa University, Kodaikanal.

Popularisation of science: Through this programme creation of scientific awareness, S&T developments have been popularized among various sections of the society. Various programmes were conducted throughout Tamilnadu.

Quality Improvement of Science Education in Rural Schools: Inservice training is provided to school science teachers every year ten districts for 50 teachers. **Young Student Scientist Programme** was organized as a residential programme in Universities and reputed Colleges of during December 2018 in 8 centres covering 16 districts. The programme gives hand information about our research activities through the scientist and resource persons. **National Mathematics Day 2019** was celebrated on 22 December 2019 and **National Science Day 2020** was celebrated on 28th February 2020 in various districts of Tamilnadu.



22) *Telangana State Council of Science & Technology*

In tune with the National Policy, the State Government established the State Council of Science & Technology in 1986 under the guidance of DST, Govt. of India. The State S&T Councils act as the focal points for formulation, planning, coordination, and promotion of S&T activities and help in preparing State S&T plans, compilation, and dissemination of S&T information and popularization of Science

The main objectives of the Council are to formulate measures to foster the spirit of Science at all levels of society especially among the youth, to evaluate scientific and technological options available to aid and improve the planning process and to improve the efficiency of investment in the State, to evolve methods of promoting applied S&T research which will stimulate the optimal utilization of State's potential including all natural, human and material resources and to serve as a liaison with the National Committee on S&T in formulating S&T policy and plan operation at the State's level.

Technology Development: Through the SSTP & PRG scheme of DST, GoI, as a part of support for R&D projects, TSCOST in association with the Scientists and Academicians of Research Institutes and Universities is identifying unique, novel and innovative S&T programs keeping in view of the problems being faced by the public in different parts of the state. About 11 programs/project were initiated and 2 programs/projects under **Technology Demonstrations** conducted.

Population of science: TSCOST is implementing a number of activities such as **National Children's Science Congress, National Science Day Celebrations, National Mathematics Day Celebrations, World Environment Day Celebrations, Support for S&T based Seminars, Workshops, Symposia, Training Programs, Skill development/ upgradation** programs etc.

TSCOST is implementing the activities and programs of Regional Science Centre (RSC), Warangal including its operation and maintenance. we are making efforts for establishment of **Innovation Hub at a cost Rs. 1.80 crores at RSC, Warangal** with the support from National Council of Science Museums (NCSM), Ministry of Culture, Govt. of India and the Govt. of Telangana. Also planning to establish **Regional Science Centre at Karimnagar** with the support from Ministry of Culture, Govt. of India and National Council of Science Museums (NCSM), Govt. of India and the Govt. of Telangana.

Patents: TSCOST is rejuvenating the **Patent Information Centre (PIC)** in the State of Telangana with support from GoI and in association with the leading establishments of the Country. In response to the proposal of TSCOST, the DST, GoI sanctioned a budget of Rs. 13.50 lakhs for the activities of Patent Information Centre in Telangana State. TSCOST organized the training program on IPRs & Southern Region PICs Meet at Hyderabad during 22-23 December 2019 with the sponsorship of TIFAC, DST, Govt. of India. PIC Coordinators and officials from Southern States and Goa along with the Chairman, Expert Group on Patent Facilitation Program of DST, GoI, Scientists from DST and TIFAC, Govt. of India and Expert Group Members of EG-PFP, DST, GoI participated in the deliberations on Patent Facilitation and training sessions. TSCOST is concentrating on (i) Waste Management Technologies, (ii) New and Renewable Energy Sources and Technologies, (iii) Development of new technologies for Sustainable Agricultural Practices, (iv) New approaches in Water Conservation and Water quality improvement, (v) Climate Change mitigation and



adaptation, (vi) Application of Radioisotopes and Radiation Technologies for societal applications, (vii) Establishment of Science Centres and (viii) Establishment of Innovation Hub in Science Centres

Special Programs Organised:

National Meet of State Science & Technology Councils at Hyderabad



Sri A. Indrakaran Reddy garu, Hon'ble Minister for EFS&T, Endowments & Law, Govt. of Telangana delivering inaugural address at the National Meet of SS&TCs.

Taking into consideration the latest developments in S&T and the emerging scenario of S&T in future, TSCOST submitted proposals to the Government seeking approval for preparing S&T Vision Document for Telangana State in association with TIFAC.

As a part of the Telangana 2024 – the First Decade Document, TSCOST organised a Consultation Meeting with various research institutions and universities at Telangana Secretariat, Hyderabad and discussed on identification of Development Indicators for preparation of Inception Report for TSCOST. These Development Indicators have a relevance to the Sustainable Development Goals (SDGs) approved by the United Nations Organisation. In accordance with the Government directions, TSCOST prepared the Baseline & Current Status Report as well as Inception Report and submitted to the Government for consideration. The following indicators have been finalized after consultations :

1. Popularisation of Science & Technology & its Applications in daily life
2. Promotion of Scientific Temper through Science Centres
3. Integrated Rural Energy Program (IREP)
4. Replication of Successful Technology models & Location Specific Research Projects (Lab to Land)
5. S&T Innovation, Entrepreneurship Development & IPR (STIED & IPR)

Programs of S&T Council are being oriented towards these Development Indicators and proposals are being submitted to the State & Central Governments accordingly.

23) Tripura State Council for Science & Technology

Tripura State Council for Science & Technology was constituted on advice of the Planning Commission and the Ministry of Science and Technology, Govt. of India on May 31, 1984. It is a constituent autonomous organization of Department of Science, Technology and Environment, Government of Tripura. The entrusted role of the organization is to popularize and promote activities in the field of Science & Technology in Tripura.

Some of the approaches of the Council include - To promote scientific literacy and coordination and orchestration of S&T popularization activities, adoption and /or utilization of the benefit of appropriate technologies for the development of the Stat, linking up SHGs with technology based micro-enterprises, utilization of the benefit of the biotechnology, to generate awareness on Patent and render services on Patent related issues, to strengthen and facilitate Micro and Macro level panning using Remote Sensing & Geographic Information Systems (GIS).

Technology Development: Scientific evaluation of water purification system in Tripura; Setting up of manufacturing unit of Liquid Disinfectant Cleaner; Revival of Tripura Water Filter Candle were the activities developed.

Technology Demonstrations: Activities such as Demonstration of rural technologies developed by CSIR (Terafil, mushroom, banana leaf fibre, low dust chalk, low cost bakery oven, hot air oven); Vermicomposting, floriculture, composite fish culture, poly culture, pig breeding/fattening, boiler farming; Demonstration of floral craft technology; Popularisation of coir technologies in Tripura; Demonstration of technologies supported by Science for Equity and Empowerment Development Division of DST, GOI; Demonstration of Bamboo and Bamboo based Composites for Engineering Application were demonstration.

Population of science: Activities such as Rejuvenation of School Science Club and College Science Forum; Annual event like Inter School Science Drama Competition, Students Science Seminar, Junior Mathematics Olympiad, Observation of National Science Day, Children's Science Congress; Workshop on Innovative activities / experiments in physics; Popular Talk; Meet the scientist programme; Special Science Communication Programme; Radio Serial Kokborok on Scientific Awareness in Tripura (VP, DST, GOI); Hand-on Science activities; Nature Camps for school students; Escalation on science communication activities by way of organizing Science Seminar, Science Drama etc. were conducted.

Patents: Workshops on IPR at different educational Institutes and More than 100 patent searching done.

New innovative activities like development of women entrepreneurship; Production of Science Communication material in Kokborok language; Adoption of CIFE Technologies; UAV based application for Precision Agriculture activity is ongoing and the crop wise statistics will be generated for Rabi, Zaid and Kharif crops.

Sci-Connect program designed by the Vigyan Prasar, DST, GOI especially for the children of North-Eastern States i.e Assam, Mizoram, Nagaland, Tripura, Manipur, Sikkim, Meghalaya and Arunachal Pradesh. The main objective of the program is to sensitize the young children of upper primary and secondary level towards the



science in day to day life. Final of Sci-Connect of 8 NE States was organized on **October 3-5, 2018**, where best 3 students of each NE states participated. Hon'ble Minister of S, T & E of Tripura was the Chief Guest in the Prize Distribution. More than 5000 students from 8 NE States participated in this event.



Workshop on Bamboo & Bamboo Based Composites for Engineering Applications: The Council organised one day workshop in collaboration with CSIR-Advanced Materials and Processes Research Institute, Bhopal on January 24, 2019. In total 60 participants attended the workshop.

The Council under a project on **'Radio serial in Kokborok on traditional knowledge of Tripura'** supported by Vigyan Prasar, DST, GOI, a brainstorming workshop with all the resource persons in presence of Scientist of Vigyan Prasar was held on February 20, 2019 at Gorkhabasti, Agartala.



Workshop on Intellectual Property Right was held on May 17, 2019 at College of Fisheries (CAU), Lembucharra. In total 64 students, 14 Faculty Members participated in the workshop. As resource Person Dr. G.Venkateshwarlu, Assistant Director General (EQA&R), ICAR delivered his speech on 'IPR and its related issues'. **Moot Court Competition, 2019** as a part of the activity of IPR Cell, 3rd Intra-College was organized at Tripura Government Law College on May 3 & 4, 2019. In total 6 teams of students were participated in the programme.



One Day Hands On Science Workshop for remaining students of Sci-Connect Programme-2018 (Level-II) Tripura was organized on **August 9, 2019** at **Tripura State Pollution Control Board**, Gorkhabasti, Agartala. Shri Animesh Das, Director, DST&E, Govt. of Tripura was the Chief Guest and selected students and teachers participated in the workshop. Hands on Science experiments were performed by the Resource Persons.



Inter School Science Drama Competition for the school students' was organized at District and State level in association with Education Department, Govt. of Tripura. Eight district level drama competitions were organized during August, 2019 and state level was organized on September 16, 2019 at Agartala. The science drama "Mera Bharat" of Dharmanagar Government Girls' HS School of North Tripura drama competition was at RSC Guwahati on 14th October, 2019.

Workshops on Intellectual Property Right (IPR): Total 4 workshops on IPR organized in recent times. Two workshops have been organized on January 16 & 17, 2020 at Tripura Govt. Law College and Tripura

Central University respectively. Another two workshops were organized on February 25 & 26, 2020 at Government College of Veterinary Sciences and at M B B University, Agartala respectively.

State Meet on use of Geo-spatial technology for Development Planning: Tripura Space Application Center under TSCST, Dept. of Science, Technology and Environment, Govt of Tripura organised the meet on “Promoting Space Technology based tools and applications in governance & development in Tripura” in collaboration with North Eastern Space Application Centre on December 03, 2019 at Pragna Bhawan, Agartala. 184 delegates from different State Government /Central organizations like NESAC, NRSC & ISRO participated and 93 proposals/ideas were undertaken for utilization of space technology for development.

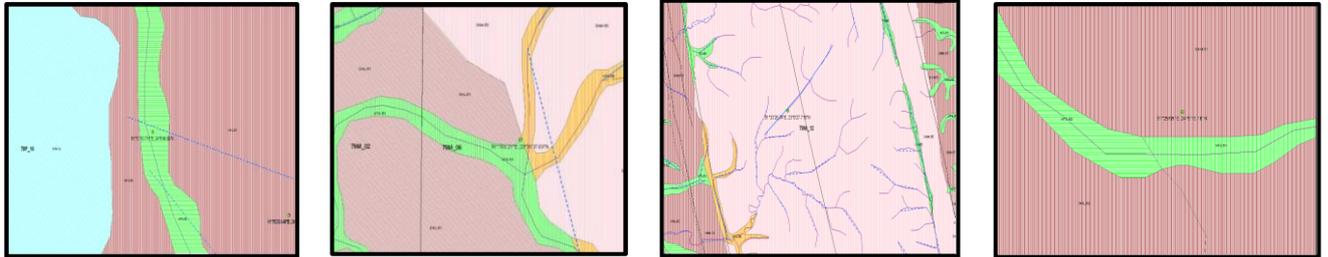
Nature Activity Camp for Children to Understand the Dynamics of Nature: Under the ST Plan of India, TSCST jointly with Vigyan Prasar, organized a 4 day nature activity camp for children to understand the dynamics of nature through hands-on activities w.e.f. February 11 to 14, 2020 at Agartala.

3rd Student Project Programme was organized on March 4-5, 2020 at Saheed Bhagat Singh Youth Hostel, Agartala, Tripura with the theme ‘Science & Technology for Sustainable Rural Development’.



Under Rajiv Gandhi Drinking Water Mission, Hydro Geomorphological Prospect Map was prepared for the entire State. The field verification against the prepared maps /hydro-geomorphological layers was carried out with DWS (PWD, Govt. of Tripura). As per field verification the layers generated by the TSAC was found to be highly accurate. Success stories of spots selected for construction of deep tubewells with reference to our hydro geomorphological prospect map and different user line departments are using these layers /maps for identification of Ground Water Prospect Zones.

Selection of Sites for Groundwater Exploration using Hydro-Geomorphological Map (HGM): To identify water bearing zones, depth of aquifer and expected yield, selection the Rig for drilling (Highpower, Mini Rig, Small Bore etc.) and also to reduce well abandoned rate, HGM map was used and the study was carried out by Tripura Space Application Centre. In total 34 locations selected for DTW out of which in 15 locations DTW constructed and 17 Rigs were placed



24) COUNCIL OF SCIENCE & TECHNOLOGY, UTTARA PRADESH

The Concept of Research and Development as projected in the "Approach to the Science and Technology Plan" prepared by the National Committee on Science and Technology was found to be very wide ranging. To cover it, one of the main recommendations of the Working group was the need for establishing a State Council of Science and Technology in 1972.

Council has taken an initiative for the establishment of 02 new Science Parks. A mini Science Park (**VIGYAN VATIKA**) is established at Shyama Prasad Mukherjee Park, Ghaziabad. There are 25 indoor & 25 outdoor science exhibits installed and 11 SCIENCE CARNIVAL were organized among school children / students of District Ghaziabad in this park.



CSTUP-Summer Research Fellowship Programme: Council of Science & Technology, U.P. started "CSTUP-Summer Research Fellowship Programme" in the year 2017-18. Under this programme, students studying in M.Sc. 1st & 2nd year are selected and provided an opportunity to work with renowned professors/scientists from premier institutes of India for 02 months with a monthly stipend of Rs. 25000.00. The fellowship is awarded to only those students who are studying in Uttar Pradesh. Approximately 100 such fellowships will be awarded in subsequent years with a monthly stipend of Rs. 25000.00. 27 Students in 2018-19, 47 Students in 2019-20 have completed the training programme and 80 students are shortlisted for summer training in 2020-21.

CST UP – Engineering Students' Project Grant Scheme: Under this scheme, B.Tech. final year students are invited to submit their innovative ideas in the form of project to find out the solution of local need based and industrial problems. Council has received 260 projects from Universities & Engineering colleges of Uttar Pradesh and 58 projects were financially supported.



View of SPP

In view of the trend of Science, Creativity and Innovation among Children, a programme entitled "Kaun Banega Nanha Kalam" is organized by Innovation Center, Council of Science and Technology, Uttar Pradesh since 2018-19.

Around 243 programs such as state level science-model exhibitions and competition among school children, science awareness activities in health, sanitation, environment, drinking water, pollution and demystification of social false believes for scientific approach were organized for the benefit of common masses with the help of Regional Science Centers and District Science Clubs. Children Creativity & Innovation Day was celebrated on 15th October, 2019. School Students, Teachers & Science Communicators participated in the event.



Patent Information Centre has facilitated the filing of 4 patents, 02 Trade Marks & 01 Copyright. established 05 Intellectual Property Cell in state universities/Institutions. Organised 14 IPR awareness programmes in the State.

25) UTTARAKHAND STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Uttarakhand State Council for Science and Technology is an autonomous body of the Government of Uttarakhand, Department of Science & Technology. UCOST started its activities from last quarter of year 2005, However it was registered under the Registration of Societies Act, 1860 in November 2002. The council extensively works in the areas of remote sensing, solid waste management and student projects and further it is redrawing its S&T strategy, realigning it with the national one and restructuring its capability set and reshaping its engagement with the society and economy.

In view of technology development and support the UCOST associated with universities and colleges sponsored more than 40 R & D projects. Major projects are enlisted here

- Hand free and sensor-based sanitizer dispenser developed in collaboration with Society of Pollution and Environmental Conservation Scientists (SPECS).
- Development of Field-Testing Kit for Water analysis (Semi-quantitative tests for Turbidity, pH, Hardness, Chloride, Iron, Nitrate, and Residual Chlorine, and Bacteriological Test).
- UCOST in collaboration with Uttarakhand Residential University (URU) and RI Instruments & Innovation, Haldwani has been working on technology development applying graphene. As a result, following six technologies have been developed and some of which under patent registration.
- Development of High valued products from nutritionally rich traditional crops. A total of 14 high value products have been developed and launched under the brand name 'Mountain Beam' at Technical Resource Centre (TRC), Kaleshwer in collaboration with Himalayan Action Research Centre (HARC).

Under Pt. Deen Dayal Upadhyay Vigyan Gram Sankul Pariyojana scheme the council developed village clusters in Uttarakhand in the villages of Bazira (Rudraprayag), Bhigun (Tehri) Kausani (Bageshwar) Gairdikhata (Haridwar) and creating few model demonstration project sites on Mushroom cultivation, Apiculture, nursery techniques etc. And trainings were also provided on the same.



UCOST in association with Himalayan Action Research Centre (HARC) promoted the project “**Enhancing livelihood of Himalayan communities through action research and transforming wild produce into high value products**”. Under this project customized techniques for product development and their safe storage

were designed and modern food processing machines like Automatic Conveyor Sealer, Cold Storage, Fruits & Vegetable dehydrator, Inkjet Batch coding machine, Nut Decorticator, Oil-Press machine, Fruits & Vegetable Washing machine and vacuum packaging machine were set up at Technical Resource Centre (TRC), Kaleshwer.



Bio-composting demonstration unit: Bio-composting demonstration unit for biodegradable solid waste has established at UCOST, Dehradun. The objective of the unit is to demonstrate the process and technology to the masses and school/college students visited in the regional Science Centre. The demonstration unit was

established in the technical support of G.B. Pant Institute of Himalayan Environment and Sustainable Development, Kosi Katarmal, Almora. The technology has aerobic decomposition process. The process of bio-composting is demonstrated to the student groups and their teachers who come to visit RSC Dehradun and invited participants of UCOST programs.

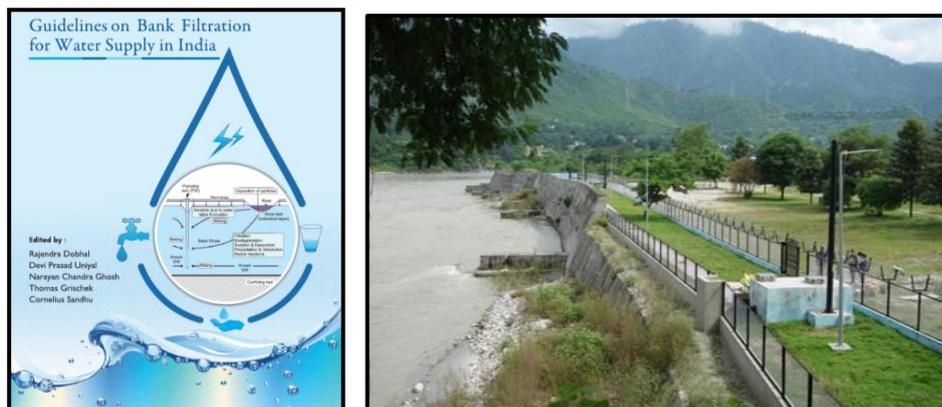


UCOST in collaboration with Uttarakhand Jal Sansthan (UJS) Dehradun & DAV PG College Dehradun has established State Level Water Quality Analyses Laboratory in premises of UJS, Dehradun. The project was funded by DST (GoI), New Delhi under WTI Program.

Entrepreneurship Development Program (EDP): Under this Science & Society and Establishment of Technology Resource Centers (TRCs), UCOST has also addressed rural areas of Uttarakhand. EDP mission is high technology driven entrepreneurship development where the council acts as a window for the region to scan and gain access to new technologies. Under this mission, the scheme of Creation of Technology Resource Centers (TRC) has been initiated. It heralds development of improved technologies based on locally available natural resources and improvement of post harvesting techniques for commercial requirements.



River Bank Filtration (RBF): The council is demonstrating River Bank Filtration (RBF) systems in Uttarakhand. RBF is a cost-effective, natural pre-treatment technology that uses Mother Nature’s geology, instead of chemicals to pretreat surface water and groundwater supplies. RBF uses the bed of a reservoir, lake or river and an adjacent sand and gravel aquifer as a natural filter.



Magnetic Waste Reduction Machine: UCOST in collaboration with Get Innovative Solution, Dehradun has installed a new innovative Magnetic Waste Reduction Machine (100kg capacity) at RSC Dehradun. The machine can destruct any organic waste collected at source without using any power/fuel for continuous destruction. This revolutionary machine works on the principle of low temperature pyrolysis process at a temp of 350 to 400 degree which is driven by magnetic technology, can be used for destruction of non-segregated rejected waste, domestic waste and specific industrial waste. It has a capacity to reduce the output of destructed waste in the ratio of 1/300 times. Magnetic Waste Reduction system is a solution for decentralized processing of Municipal Solid Waste after recovering certain amount of recyclables. The visiting students or general public are provided its demonstration during their visit.



The council organised prominent scientific events which are mentioned below:

- **Celebration of National Technology Day 2019**
- **International Biodiversity Day- 2019**
- **Celebration of World Environment Day 2019**
- **Brain Storming Session on “Climate Change”**
- **Prof V.P. Sharma Memorial Lecture**
- **Dr. R.S Tolia Memorial Lecture**
- **Day’s Training Workshop of Water Quality of PMU Project Staff**
- **Meeting of Technical Committee and Users Training of UKSDI Project.**
- **Summer Camp-2019 organized by REGIONAL SCIENCE CENTRE (RSC) DEHRADUN**
- **Awareness Program on Drinking Water Quality and Its Impact on Health Conditions in Tribes Inhabitation of Garhwal Region of Uttarakhand**
- **Uttarakhand State Children Science Congress**
- **14th Uttarakhand State Science Congress (USSTC)**



27th STATE CHILDREN'S SCIENCE CONGRESS- 2019

Focal Theme:
SCIENCE, TECHNOLOGY AND INNOVATION FOR
A CLEAN, GREEN AND HEALTHY NATION

SUB THEME	VENUE
ECOSYSTEM AND ECOSYSTEM SERVICES	DC, Meeting Hall
WASTE TO WEALTH	SDI Lab
SOCIETY, CULTURE AND LIVELIHOODS	Centre of Excellence
HEALTH, HYGIENE AND SANITATION	Bhikuni Hall
TRADITIONAL KNOWLEDGE SYSTEM	Library



In addition to awareness activities, Patent Information Center (PIC) of UCOST has facilitated a number of innovators and researchers for their IPR issues. So far the council filed 13 patent applications, a copyright application and 07 trademark applications during 2019-20.

UCOST is also working on various funded project in association with different department. Major projects are listed below.

- MoEF&CC funded Project: ‘Centre of Excellence (CoE) on Forest Based Livelihood in Uttarakhand
- NMHS-MoEF&CC funded Project: Preparation of Resource Atlas for the Himalayan state of Uttarakhand
- NMHS-MoEF&CC funded project: Enhancing livelihood of Himalayan communities through action research and transforming wild produce into high value products
- NRDMS-DST funded Project: Spatial Data Infrastructure (SDI)
- DST funded Project: Modelling for Enhancing Water Quality in Uttarakhand using Geospatial Technology

As an innovative state-of-the art resource development for science popularization, Council has recently succeeded to get approval and Sanction of its project of Establishment of Science City Dehradun by Ministry of Culture. It includes following resources: Thematic galleries (Era of Digital Electronics, Space & Astronomy, Climate Change, and Energy); large format film projection unit (with planetarium); Digital Panorama on Biodiversity; Science on Sphere and Earthquake and other Simulators; Outdoor Science Park and Theme Park/bio-dome/fossil Park and Convention facility. Besides, the civil construction of the Sub-Regional Science Center in Almora has been started by NCSM, New Delhi.



26) WEST BENGAL STATE COUNCIL OF SCIENCE AND TECHNOLOGY

Science & Technology including Biotechnology are considered amongst the most effective means to enhance growth and socio-economic development of the State. The Department of Science & Technology since its inception in 1988 has been serving as a focal point for promoting and carrying Science & Technology (S&T) activities in West Bengal as a Nodal Agency in this field. It is carrying out its activities in the areas of Agriculture, Animal Science, Biotechnology, Chemical Sciences, Earth Science, Energy & Allied Sciences, Environment, Ecology, Engineering & Technology, Mathematics, Medical Sciences including Public Health, Physical Sciences, Remote Sensing & GIS, Science Popularization and Social Science & Intellectual Property Rights (IPR) etc. with a view to reach out to the rural areas and villages as well as the privileged urban populace.

Intellectual Property Rights and Technology Business Management: WBCST has initiated new courses on “Intellectual Property Rights and Technology Business Management” jointly with Maulana Abul Kalam Azad University of Technology, WB (formerly WB University of Technology). For this a new smart classroom has been set up at Vigyan Chetana Bhavan having facility of online classes.

Model Innovative Science Laboratories: The Council has sponsored setting up Model Innovative Science Laboratories in 33 Schools (H.S.) of SC/ST dominated and other backward regions of Purulia, Bankura and Jhargram Dists. of West Bengal. This project supports with a fund of Rs. 10.00 lakh for each school (GoWB funded) each school for setting model laboratories in subjects of physics, chemistry and biology besides having all required facilities for communication and quality learning through practical experiments.

Technology Development

- RS-GIS activities: GIS based mapping of : Rural Drinking Water Supply Coverage in West Bengal (Request programme from PHED, GoWB)
- National Land Degradation Mapping Project (2nd Cycle), sponsored by NRSC, DOS, GoI.
- Natural Resources Census : Landuse/Landcover (3rd Cycle), sponsored by NRSC, DOS, GoI.
- National Wastelands Change Analysis – 3rd cycle, sponsored by NRSC, DOS, GoI.
- Empowering Panchayati Raj Institutions Spatially (EPRIS) project, sponsored by NRSC, DOS, GoI.
- Preparation of Legal Metrology unit wise map and Legal Metrology unit wise District Map (request programme of Consumer Affairs Department, GoWB)
- Multi-purpose Cyclone Shelter Mapping, sponsored by Department of Disaster Management , GoWB
- **Bengal Science Initiative:** The Council has a special programme called “Bengal Science Initiative” for popularisation of science at various levels. Special mention may be made of “Residential Science Camp” which is organized by the Council for the school students. At least 4 such camps are organized each year since yr. 2013-14.
- In this year, this type of camp was organized for high school students from backward areas of districts at Raja N L Khan Women College, Paschim Medinipur, Coochbehar College, Coochbehar Panchanan Barma University, Coochbehar and M. U. C Women college, Purba Bardhaman during December 2019 - January 2020.
- **Bengal Science Lecture series:** From this year the Council has reintroduced its flagship programme “Bengal Science Lecture series”. This is a series of lectures given by eminent scientists on different



topics of science and technology. In yr. 2020 three such programmes have been organized where about 250 participants in each programme came to interact with eminent Scientists.

- A State Level Workshop for Science Teachers working in schools on ‘**Role of Artificial Intelligence in Education**’ on 21st January, 2020 where about 250 participants were present.
- To encourage the children to pursue science activities the Council supports an important programme from the District to State level viz. **Children Science Congress**, in collaboration with “Science Communicators Forum”, an NGO. This year 34 child scientists selected from this programme were sent at National level.
- To strengthen the scientific base of the State, the Council has introduced five **Research Fellowships** (after the name of Jagadish Ch. Bose, Prafulla Ch. Ray, U. N. Bramhachari, Satyandra Nath Bose and Meghnad Saha) to support research for the student pursuing PhD degree on different subjects.

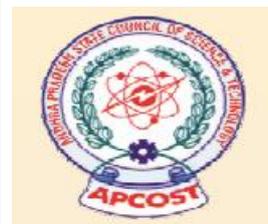


Patent information center: WBCSCT has assisted in the filing of the patents of these innovators and facilitated exhibition of their technology at different industrial fair & technology meet with the dual objective of commercialisation of existing innovations/patent and handholding and entrepreneurship development among scientists, students and grassroot innovators. Currently we are facilitating startup registration of these innovators and facilitated 17 patent filing.



Contact details of State S & T Councils

1	S&T Council	Andhra Pradesh State Council of Science & Technology (APCOST)
	DoE	2016
	Name	Sri P. Phala Chandra Rao
	Designation	Member Secretary
	Address	Andhra Pradesh State Council of Science & Technology (APCOST) Regional Science Centre Complex, Bhavanipuram, Vijayawada -520 012 (Andhra Pradesh)
	Mobile No.	+91-7032957942
	Phone	0866 – 2414161 & 68 (Gen)
	Email:	apcost_vijayawada@yahoo.com, apcost_regionalsciencecentre_vja@yahoo.com
	Website	--



2	S&T Council	AP State Council for Science & Technology
	DoE	1992
	Name	Shri C.D Mungyak
	Designation	Director
	Address	AP State Council for Science & Technology Daying Ering Colony, Ess-Sector Itanagar, Arunachal Pradesh- 791113
	Mobile No.	--
	Phone	0360-2292379
	Email:	c.dmungyak@gov.in
	Website	www.ardst.arunachal.gov.in



3	S&T Council	Assam Science Technology and Environment Council
	DoE	1987
	Name	Dr. Arup Kumar Misra
	Designation	Director
	Address	Assam Science Technology and Environment Council Bigyan Bhawan, Near IDBI Building G.S. Road, Guwahati-781005 Assam, India
	Mobile No.	--
	Phone	+91 - 361 - 2450147/ 2450646/ 2464619/ 2464621
	Email:	astec@rediffmail.com
	Website	www.astec.gov.in



4	S&T Council	Bihar Council on Science & Technology
	DoE	25th February, 1984
	Name	Sri Brajesh Mehrotra, IAS
	Designation	Additional Chief Secretary, Dept. of Science & Technology
	Name	Sri Sanjeev Kumar, IAS
	Designation	Member Secretary
	Name	Dr. Anant Kumar
	Designation	Project Director
	Address	Bihar Council on Science & Technology IGSC- Planetarium, Adalatganj Patna – 800001
	Mobile No.	--
	Phone	0612 – 2508264,0612-2546599/2546598
	Email:	pd@bcst.org.in , info@bcst.org.in
	Website	www. bcst.org.in



5	S&T Council	Goa State Council for Science & Technology
	DoE	--
	Name	Prof. Pradeep V. Morajkar
	Designation	Member Secretary
	Address	Goa State Council for Science & Technology Opposite Saligao Seminary, SaligaoBardez Goa – 403511
	Mobile No.	9822139319
	Phone	(0832) 2407189
	Email:	ms-gscst.goa@nic.in, pvmorajkar@gmail.com
	Website	---

6	S&T Council	Gujarat Council on Science and Technology
	DoE	September, 1986
	Name	Dr. Narottam Sahoo
	Designation	Member Secretary
	Address	Gujarat Council on Science and Technology Dept. of Science & Technology, Govt. of Gujarat Block: B, 7th floor, M. S. Building Sector 11, Gandhinagar: 382011
	Mobile No.	09879553960, 09426490755
	Phone	079) 232593-62-65
	Email:	adv-gujcost@gujarat.gov.in, narottam.sahoo@gmail.com
	Website	www.gujcost.gujarat.gov.in



Investing in science
Investing in the future!

7	S&T Council	Haryana State Council for Science, Innovation & Technology	
	DoE	--	
	Name	Sh. Amit Jha, IAS	
	Designation	Additional Chief Secretary to Government of Haryana Science & Technology Department	
	Name	Dr. Praveen Kumar, IAS	
	Designation	Director General	
	Address	Haryana State Council for Science, Innovation & Technology, Bays No.35-38, Sector-2, Panchkula – 134109 (Haryana)	
	Mobile No.	---	
	Phone	0172-2563439	
	Email:	dkgchd@gmail.com , dsthry@gmail.com ,	
	Website	--	

8	S&T Council	Himachal Pradesh Council For Science, Technology & Environment (HIMCOSTE)	
	DoE	03-01-1986	
	Name	Sh. Rajneesh, IAS	
	Designation	Secretary (Sc. Tech & Env.)-Cum- Chairman, HIMCOSTE, Govt. of H. P	
	Name	Sh. D.C. Rana, HPAS	
	Designation	Member Secretary	
	Name	Sh. Nishant Thakur, HPAS	
	Designation	Joint Member Secretary	
	Address	Himachal Pradesh Council for Science, Technology & Environment, B-34 SDA Complex, Kasumpti, Shimla HP-171009	
	Mobile No.	94181-84700	
	Phone	0177-2621992	
	Email:	stc-hp@nic.in	
	Website	www.himcoste.hp.gov.in	

9	S&T Council	Karnataka State Council for Science & Technology (KSCST)
	DoE	1975
	Name	Prof. Ashok M. Raichur
	Designation	Secretary
	Name	Mr. H. Hemanth Kumar
	Designation	Executive Secretary
	Address	Karnataka State Council for Science & Technology Indian Institute of Science campus, Bengaluru - 560012
	Mobile No.	9353276606
	Phone	080- 23341652, 23348848 / 23348849
	Email:	office.kscst@iisc.ac.in
	Website	www.kscst.org.in



10	S&T Council	Kerala State Council for Science, Technology & Environment (KSCSTE)
	DoE	6th November 2002
	Name	Prof. (Dr.) K. P. Sudheer
	Designation	Principal Secretary
	Name	Dr. S. Pradeep Kumar
	Designation	Member Secretary
	Address	Executive Vice President, Kerala State Council for Science, Technology & Environment (KSCSTE) Sasthra Bhavan, Pattom, Thiruvananthapuram 695004
	Mobile No.	9497541220
	Phone	0471-2548220
	Email:	mkskscste@gmail.com
	Website	www.kscste.kerala.gov.in



11	S&T Council	Madhya Pradesh Council of Science & Technology	
	DoE	26th Oct, 1981	
	Name	Dr. Anil Kothari	
	Designation	Director General	
	Address	M.P. Council of Science & Technology, Vigyan Bhawan, Nehru Nagar, Bhopal - 462 003 (Madhya Pradesh)	
	Mobile No.	9425148662	
	Phone	0755 - 2671800, 2671600	
	Email:	dg@mpcost.nic.in	
	Website	www.mpcost.gov.in	

12	S&T Council	Rajiv Gandhi Science and Technology Commission, Maharashtra	
	DoE	15th December 2004	
	Name	Shri. Anil Manekar	
	Designation	Member Secretary	
	Address	Apeejay House, 3rd Floor, Dinshaw Vachha Road, Near K.C. College, Churchgate, Mumbai-400 020(MS)	
	Mobile No.	9674022554	
	Phone	+91 22 24755/22024711	
	Email:	rgstcmaha@rediffmail.com	
	Website	www.rgstc.maharashtra.gov.in	

13	S&T Council	Manipur Science & Technology Council
	DoE	1985
	Name	M. Joy Singh, IAS
	Designation	Member Secretary
	Name	Dr. L. Dinachandra Singh
	Designation	Director
	Address	Manipur Science & Technology Council Science & Technology Complex, Takyelpat, Imphal – 795001
	Mobile No.	9862000559
	Phone	0385-2443451
	Email:	mastec@nic.in
	Website	www.mastec.nic.in



14	S&T Council	State Council of Science, Technology & Environment (SCSTE), Meghalaya
	DoE	30th January, 1995
	Name	Shri. C.V. Darlong Diengdoh
	Designation	Member Secretary
	Address	Meghalaya State Housing Financing Cooperative Society Ltd., Nongrim Hills, Behind Bethany Hospital, Shillong -793003
	Mobile No.	---
	Phone	+91 364 2522077
	Email:	scste-meg@gov.in
	Website	www.scste.org



15	S&T Council	Mizoram Science, Technology & Innovation Council	
	DoE	12.02.1985	
	Name	Dr. R.K. Lallianthanga	
	Designation	Member Secretary	
	Address	Science & Technology Building Mizoram New Capital Complex, Khatla, Aizawl, Mizoram Pin-796001	
	Mobile No.	9436140957	
	Phone	0389-2336486 / 0389-2336159 / 0389-2336787	
	Email:	cso.dst-miz@gov.in and mystic.dst@gmail.com	
	Website	www.mistic.mizoram.gov.in	

16	S&T Council	Nagaland Science and Technology Council (NASTEC)	
	DoE	6th August, 1999	
	Name	Shri. Zhiese	
	Designation	Member Secretary	
	Address	NASTEC, Science & Technology Council, Science & Technology Complex, Below New Civil Secretariat, Nagaland: Kohima-797004	
	Mobile No.	----	
	Phone	0370-2270205	
	Email:	nastecnagaland@gmail.com , nastec-ngl@nic.in	
	Website	www.dst.nagaland.gov.in/nastec.html	

17	S&T Council	Science & Technology Department, Odisha	
	DoE	---	
	Name	Mr. Laxmidhar Das, OAS	
	Designation	Director	
	Address	Science & Technology Department, Odisha Secretariat, Kharvela Bhawan, Bhubaneswar, Odisha PIN- 751001	
	Mobile No.	8249916097	
	Phone	(0674) 2536772 / 2322713	
	Email:	ps.secretaryst@gmail.com	
	Website	www.st.odisha.gov.in	

18	S&T Council	Punjab State Council for Science & Technology (PSCST)	
	DoE	1983	
	Name	Shri Alok Shekhar, IAS	
	Designation	Member Secretary & Principal Secretary to Government of Punjab	
	Name	Dr. Jatinder Kaur Arora	
	Designation	Executive Director	
	Address	MGSIPA Complex, Institutional Area, Sector 26, Chandigarh.	
	Mobile No.	9814619826	
	Phone	0172-2792325	
	Email:	jkarora@punjabmail.gov.in	
	Website	www.pscst.com	



19	S&T Council	Rajasthan Council of Science & Technology (RAJCOST)
	DoE	1986
	Name	Smt. Mugdha Sinha, IAS
	Designation	Secretary, Vice Chairman, Executive Council
	Name	Shri Abhishek Bhagotia, IAS
	Designation	Member Secretary
	Address	506,4th Floor, Mini-Secretariat, Bani-Park, Jaipur Rajasthan
	Mobile No.	9602021344
	Phone	0141-2200007, 2202041
	Email:	director-dst@rajasthan.gov.in,
	Website	---

20	S&T Council	Sikkim State Council of Science and Technology
	DoE	--
	Name	Shri K.C. Lepcha
	Designation	Secretary DST cum Member Secretary
	Address	Sikkim State Council of Science and Technology Vigyan Bhawan, P.O Deorali, Gangtok, East Sikkim 737102
	Mobile No.	---
	Phone	03592-280002
	Email:	secydst@gmail.com
	Website	www.dstsikkim.gov.in



21	S&T Council	Tamil Nadu State Council for Science and Technology	
	DoE	1984	
	Name	Dr. R. Srinivasan, M.Sc., Ph.D., F.I.C.S., M.A.C.S.(USA).,	
	Designation	Member Secretary	
	Address	Tamilnadu State Council for Science and Technology, Directorate of Technical Education Campus Chennai – 600 025	
	Mobile No.	9444455819	
	Phone	044-22301428	
	Email:	ms.tanscst@nic.in enquiry.tanscst@nic.in,	
	Website	---	

22	S&T Council	Telangana State Council of Science & Technology (TSCOST)	
	DoE	--	
	Name	Prof. Ravi Kumar Puli	
	Designation	Member Secretary	
	Address	Telangana State Council of Science & Technology (TSCOST) 4th Floor, Aranya Bhavan, Saifabad, Hyderabad – 500 004	
	Mobile No.	79016 98682	
	Phone	040 – 24619675	
	Email:	secy_tscst@telangana.gov.in	
	Website	---	

23	S&T Council	Tripura State Council for Science & Technology
	DoE	31 st May 1984
	Name	Sri Shailendra Singh, IFS
	Designation	Secretary, Science, Technology & Environment, Member-Secretary
	Name	Sri Animesh Das, IAS
	Designation	Additional Secretary & Director, Science, Technology & Environment Joint Member Secretary
	Address	Tripura State Council for Science & Technology 1st Floor, Vigyan Bhawan, Gorkhabasti, Kunjaban, Agartala, Tripura – 799006
	Mobile No.	9436120401
	Phone	0381 230 1365 / 230 7529 / 222 2012
	Email:	prsecretarydste@gmail.com , stcouncil.trp@gmail.com
	Website	www.tscst.nic.in



24	S&T Council	Council of Science & Technology, Uttara Pradesh
	DoE	
	Name	Shri Kumar Kamlesh
	Designation	Secretary, Department of Science & Technology, Govt. of UP & Director General (Ex-Officio)
	Name	Dr. Vedpati Mishra, IAS
	Designation	Special Secretary Department of Science & Technology, Govt. of UP & Director
	Name	Shri I. D. Ram
	Designation	Secretary
	Address	Council of Science & Technology, U.P., Vigyan Bhawan, 9, Nabiullah Road, Surajkund Park, Lucknow – 226018
	Mobile No.	0522 2982060
	Phone	09335902585
	Email:	cstup@nic.in , cstup1975@gmail.com
	Website	www.dstup.gov.in , www.cst.up.gov.in



25	S&T Council	Uttarakhand State Council for Science & Technology
	DoE	2005
	Name	Dr Rajendra Dobhal, FNASc
	Designation	Director General
	Address	Uttarakhand State Council for Science & Technology (UCOST) Vigyan Dham, Post- Jhajra, Dehradun, Uttarakhand- 248007
	Mobile No.	9412051556/ 57
	Phone	+91-135-2976266
	Email:	dg@ucost.in
	Website	www.ucost.in



26	S&T Council	West Bengal State Council of Science and Technology
	DoE	1988
	Name	Sri Barun Kumar Ray, IAS
	Designation	Member Secretary
	Address	Vigyan Chetana Bhavan, 26/B, DD Block, Sector- I, Salt Lake, Kolkata- 700064
	Mobile No.	--
	Phone	(033)2334-4616/2969/5809
	Email:	wbscst@gmail.com
	Website	www.wbdstbt.in