Compendium on Vision, Action Plan & Activities of
Science & Technology Councils of States / UTs of India

STATE SCIENCE & TECHNOLOGY COUNCILS

ANNUAL CONCLAVE - 2019

22-24 August, 2019 @ Hyderabad

Hosted By:
Telangana State Council of Science & Technology (TSCOST)
Government of Telangana

GOVERNMENT OF INDIA
State Science & Technology Programme (SSTP)
Department of Science & Technology,
Ministry Of Science & Technology
Technology Bhavan, New Mehrauli Road, New Delhi - 110016

सत्यमेव जयते
DST

Compendium on Vision, Action Plan & Activities of Science & Technology Councils of States/ UTs of India - 2019

Organized by

GOVERNMENT OF INDIA

STATE SCIENCE & TECHNOLOGY PROGRAMME (SSTP)

DEPARTMENT OF SCIENCE & TECHNOLOGY

MINISTRY OF SCIENCE & TECHNOLOGY

Technology Bhavan, New Mehrauli Road, New Delhi – 110 016

Hosted by

TELANGANA STATE COUNCIL OF SCIENCE & TECHNOLOGY (TSCOST)

DEPARTMENT OF ENVIRONMENT, FORESTS, SCIENCE & TECHNOLOGY

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स्वच्छ भारत
एक कदम स्वच्छता की ओर

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

FOREWORD

Science & Technology played a vital role in all the developmental efforts on this Globe right from Stone-Age and Medieval Civilisation to the Industrial Revolution and the present Industry 4.0 era. Science & Technology witnessed phenomenal progress, particularly in the context of the growing demand for new, reliable and sustainable solutions for numerous challenges in food production, healthcare, shelter, mobility and communication and has emerged as one of the main fulcrum of New India. Department of Science & Technology (DST), Government of India (GOI), New Delhi in collaboration with the respective State Governments and Union Territory Administrations through State S&T Councils (SSTCs) are significantly contributing in this endeavour.

It is indeed laudable that these SSTCs are strengthening State level Science, Technology and Innovation ecosystem through number of location specific projects and programmes for building a sustainable future. A compilation of the success stories and best practices of these projects & programmes from various States and Union Territories provide a glimpse of the achievements of this unique Centre-State S&T cooperation mechanism.

It gives me immense pleasure to mention that a similar endeavour has been made this year by Telangana State Council of Science & Technology (TSCOST), Department of Environment, Forests, Science & Technology, Government of Telangana in compiling the important activities areas of SSTCs across the S&T value chain in the country with continuous association and guidance of DST, GOI, New Delhi. I would like to convey my appreciation to the entire team of SSTCs specifically Dr Ravi Kumar Puli, Member Secretary, TSCOST, Hyderabad, and DST, New Delhi Dr. Debapriya Dutta, Head & Adviser, State S&T Programme, DST and Er. Ravinder Gaur, Scientist & Member Secretary, State Science & Technology Programme (SSTP), DST, who have taken the initiative to bring out this "Compendium of Vision, Action Plan and Activities of State Science & Technology Councils – 2019".

I am delighted that the compendium will be released by the Hon'ble Minister for Science & Technology, Govt. of India during the State S&T Ministers Conclave to be held on 6th November, 2019 in the 5th edition of India International Science Festival-2019 at Kolkata, West Bengal.

(**Prof. Ashuthosh Sharma**)

15-10-2019
New Delhi

RAJESHWAR TIWARI I.A.S.,
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MESSAGE

While the natural, human and material resources determine the wealth of any region, Science & Technology always takes the centre stage for enhancing the utility of these resources. In true sense, development of any nation is intertwined with the level of implementation of Science & Technology by its people, industry and governments.

At the same time, I am sure it is not out of place to make a mention of the growing concerns in respect of climate change, pollution effects, plastic menace, forest fires, deforestation, rising levels of sea, melting of glaciers, food security, surface water & ground water, housing needs and the increasing poverty due to population explosion.

I am sure the Scientists and Technologists have a greater role to play in bringing out fool-proof solutions to counter balance the ill effects of these situations in order to provide sustainable development and sustainable living for the future generations.

Equally important is that the youth of our Nation need to be motivated to develop scientific attitude and outlook with a view to enhance their capabilities to take decisions based on scientific perspective.

It is in this context that the Department of Science & Technology, Government of India and the State Counterparts including State S&T Councils and the Research & Development Institutions have to come together for preparing a set of working policies and actionable programmes to gradually lead our Nation towards a knowledge-driven Society.

(RAJESHWAR TIWARI)

21-10-2019
Hyderabad

सत्यमेव जयते

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D.O. No. **DST/SSTP/IISF-2019/4**

Dated ..... **October 19, 2019**

MESSAGE

"However large may be the central Government's investment of energy and resources in the scientific and technological effort, it must take the states along if developmental goals are to be attained "- Bharat Ratna Late Shri C. Subramaniam, then Minister for S&T and Chairman, National Committee for Science & Technology (NCST).

This vision led the Department of Science and Technology (DST), Government of India to take initiative in 1971 for establishing State Science & Technology Councils (SSTCs) through its State Science & Technology Programme (SSTP). Initiated in four states viz. Karnataka, Kerala, Uttar Pradesh and West Bengal, SSTCs have now been established in almost all the Indian states and Union Territories as a unique mechanism of Center- State Science & Technology cooperation.

Over the four decades DST in collaboration with the State / Union Territory Governments has nurtured the SSTCs with infrastructure, human resources and programmatic supports. Programmatic Supports are provided for Location Specific Research and Technology Development (LSR&TD), Pilot Scale Technology Demonstration and Replication of Successful Models, S&T Studies, Surveys, Information Exchange and Joint Programme development.

As a result of this sustained efforts, SSTCs have catalyzed and strengthened various components of the State level S&T ecosystem, starting from the constitution mandated Scientific temper development among masses through Science communication and popularization, technological capacity building in the states and UTs through supporting technology development, demonstration, dissemination and adaption for socio-economic development and institutional capacity augmentation through policy and organization building. Many of the SSTCs have significantly contributed to the development and strengthening of Innovation ecosystem in the state. Documenting these activities of SSTCs in the form of a compendium is necessary and has become an annual exercise.

It gives me immense pleasure to inform that this year the Telangana State Council of Science & Technology (TSCOST), Department of Environment, Forests, Science & Technology, Government of Telangana in collaboration with all the SSTCs and support of DST, Government of India is continuing the practice by bringing out this "Compendium of Vision, Action Plan and Activities of State Science & Technology Councils – 2019". This document provides glimpses of the depth and breadth of the activities of the SSTCs and highlights the best practices developed across the states. I congratulate Prof. Ravi Kumar Puli, Member Secretary, TSCOST and the 'Team SSTC" along with my colleague Er. Ravinder Gaur, Scientist & Member Secretary, State Science & Technology Programme (SSTP), DST, Govt. of India for bringing out this nationally important document.

19-10-2019
New Delhi

Debapriya Dutta.

(Dr. Debapriya Dutta)

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EDITOR'S NOTE

The Government of India, Department of Science & Technology (DST) launched a wonderful Scheme viz. State Science & Technology Programme (SSTP) through which a fabulous network of Institutions called **State Science & Technology Councils (SSTCs)** emerged in the States and Union Territories of the Country.

The State Councils of Science & Technology have been playing multi-faceted roles in the application of Science & Technology for the socio-economic development of the regions and for development of scientific attitude and outlook among various sections of society.

I am happy to inform that the First Meeting of Expert Group Meeting of SSTCs coinciding with the National Meet of SSTCs – 2019 was organised in Hyderabad by the Telangana State Council of Science & Technology (TSCOST), Environment, Forests, Science & Technology Department, Government of Telangana during 22-24 August, 2019 at the instance of DST, Govt. of India.

This **Compendium on Vision, Action Plan and Activities of Science & Technology Councils/ Departments of States/ UTs of India** was brought out as per the suggestions of the DST, Govt. 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. I make a sincere appeal to each one of the Heads of SSTCs who have participated in the Meet and inform that the information pertaining to any of the SSTC which could not be accommodated in this Compendium is due to space constraint and not for any other reason.

I extend my heartfelt gratitude to Sri Allola Indrakaran Reddy garu, Hon'ble Minister for EFS&T, Law and Endowments, Government of Telangana for his gracious presence and inaugurating the National Meet. I am grateful to Prof. Ashutosh Sharma, Secretary, Department of Science & Technology, Government of India for reposing confidence on TSCOST and for entrusting this assignment.

I am grateful to Sri Rajeshwar Tiwari, IAS, Special Chief Secretary, EFS&T Department, Government of Telangana for his continuous guidance and support in the conduct of the National Meet of SSTCs. I am thankful to Dr. Debapriya Dutta, Head, SEED and SSTP Division, DST, Govt. of India and Er. Ravinder Gaur, Scientist and Member Secretary, SSTP, DST, Govt. of India, for their excellent planning for the National Meet and for their coordination with the Chairman, Members of the Expert Group of SSTCs & SEED and also with the Heads of SSTCs.

10-10-2019
Hyderabad

(Prof. Ravi Kumar Puli)

Compendium on Vision, Action Plan & Activities of Science & Technology Councils of States/ UTs of India - 2019

INDEX

S.No.	Contents	Page No
Section I	Background note about DST - State S&T Programme:	1
Section II	Brief note on State Science & Technology Councils Annual Conclave-2019	9
Section III -	Activities of State S & T Programme during 2018 - 19	13
Section IV	Programs and Plans of SSTCs	17
1	Andhra Pradesh State Council of Science & Technology	19
2	Arunachal Pradesh State Council for Science & Technology	24
3	Assam Science Technology & Environment Council	31
4	Bihar Council on Science & Technology	42
5	Chattisgarh Council of Science and Technology	49
6	Goa State Council for Science & Technology	55
7	Gujarat Council on Science & Technology	62
8	Haryana State Council for Science & Technology	73
9	Himachal Pradesh Council for Science, Technology & Environment	81
10	Karnataka State Council for Science and Technology	92
11	Kerala State Council for Science, Technology And Environment	108
12	Lakshadweep Council for Science & Technology	118
13	Madhya Pradesh Council of Science & Technology	125
14	Maharashtra - Rajiv Gandhi Science and Technology Commission	132
15	Manipur Science & Technology Council	137
16	Meghalaya - State Council of Science, Technology & Environment	146
17	Mizoram Science, Technology & Innovation Council	151
18	Nagaland Science & Technology Council	160
19	Puducherry Council for Science & Technology	169
20	Punjab State Council for Science & Technology	176
21	Rajasthan State Council of Science & Technology	181
22	Sikkim State Council of Science & Technology	185
23	Tamilnadu State Council of Science & Technology	195
24	Telangana State Council of Science & Technology	207
25	Tripura State Council for Science & Technology	216
26	Uttar Pradesh - Council of Science & Technology, U.P.	222
27	Uttarakhand State Council for Science & Technology	229
28	West Bengal State Council of Science and Technology	240
Section V -	Recommendations of Expert Group on DST - SSTP	245

Section - I

Background note about

DST - State S&T Programme

Section I – Background note about DST - State S&T Programme:

IN RETROSPECT:

The initiative to establish State Councils for Science & Technology was first taken in 1971 under State S&T Programme of the Department of Science & Technology, when the then Minister for S&T and Chairman, National Council for Science & Technology (NCST), Shri C. Subramanium wrote to Chief Ministers of all the States stressing that irrespective of large investments of the Central Government in S&T in various sectors and institutional infrastructure, the Central S&T Agencies must take the States along if the development goals are to be attained. By the end of Fifth Five Year Plan, Karnataka, Kerala, Uttar Pradesh and West Bengal were the four States, who had established their State S&T Councils. While these few States responded to the idea of State S&T planning & promotion, it became clear that a sustained effort was needed to establish and develop the State Councils for Science & Technology.

As a result, the process of impetus for State level planning and Promotion of Science & Technology began in the Sixth Five Year Plan (1980-85) and continued through the subsequent Five Year Plans.

CURRENT STATUS:

As a result of catalytic role played by DST and support received from the Planning Commission and States/UTs, a stage has reached when State Councils have been set-up in all the States and UTs. Several States have also formed a separate Department of Science & Technology and /or S&T Secretariat. All States and Union Territories by now have established their State level S&T structures and formulated their Five Year and Annual S&T plans. These State Councils are normally chaired by Chief Ministers of respective States or by an eminent scientist. These State Councils are Govt. bodies registered in the Societies act and their activities are reviewed and recommended by the Executive Committee & General body constituted by respective Government for the purpose.

DST'S ROLE:

The Department of Science & Technology (DST), Govt. of India (GOI), played a catalytic role by facilitating the State Governments in establishing and developing the State Councils on S&T and by providing support for their technical secretariats. Concurrently DST (GOI), in collaboration with respective State Councils, organized all India conclave under which review of the activities of State Councils carried out by a expert Group constituted by the Department, whose recommendations helped identify some activity-areas for promotion by the State Councils. DST also organized periodic review meetings to discuss the status of various S&T programmes and to plan the strategy for future. Regional Meetings organized by DST facilitated review of state S&T structures and identification of areas of mutual cooperation between States.

On completion of around Four and a half decades in the year (2017-18) of this programme, a third party review of the programme was held (Sept'2017) for the approval of Standing Finance Committee on the programme to assess the strengths and weakness of this programme vis-à-vis DST's performance. This review had desired a phase change geared towards programmatic support and strengthening linkages

between State S&T Councils and Central S&T Agencies by suitably dovetailing various programmes as State S&T Councils with those of Central S&T Agencies.

It was also realized that these State Councils, since their formation have now come of age to initiate a phase where resources in terms of expertise and technology promoted and generated by the Central and State S&T Agencies be pooled together to undertake joint S&T programmes.

The Standing Finance Committee under the chairmanship Secretary, DST during the review held in the year of 2017 of the DST- State S&T Programme has decided to continue to implement the programme from 1.04.2017 to 31.03.2020 to fulfill the following objectives:

OBJECTIVES:

Core support to State S&T Councils
Addressing Location Specific Challenges through S&T intervention
Creation of Technology Demonstration Centre (TDC)
Indigenous Technology Demonstration
Demonstration of Technologies adopted from aboard
Support to Student Project Programme with matching grant of State Govt.
S&T Studies , Surveys , Information Exchange and Joint Programming

SFC APPROVAL ON CORE GRANT SUPPORT TO STATE S&T COUNCILS:

Terms and conditions defined by the SFC:

The core grant with position/post existed in different State S&T Councils will be frozen as on 1.04.2016 (2016-17 as base year). Remuneration/salary to the allocated employee will be @ stipulated by the DST. The financial implication in respect of promotion, up gradation, implementation of pay commission and their arrears, retirement benefits etc will be entirely born by State Councils themselves from sources other than core grant support.

DST will provide lump sum amount. Core grant to State S&T Councils for their manpower and contingency expenditure. Project Related Grant (PRG) to State Councils would depend on the quality of the proposal and willingness of the State to financially contribute to the proposal. Core Grant support being released by DST towards manpower must be utilized in respect of DST supported Post only.

The recruitment, transfer, posting, absorption, and extension in service etc. on DST supported post will be executed by State S&T Councils in consultation with DST. The framing of recruitment and service rule for DST supported post in entirely the responsibility of State S&T Councils. These should be carried out as per the State Govt. rules and regulations.

The DST would take on record the audited financial statement of the immediately preceding year before deciding on the sanction and release of the subsequent year. The proposal seeking core support from DST should be approved by the Executive Committee of the respective State S&T Council. The State S&T Council should hold the executive committee meeting twice a year and general body meeting once in a year.

The activity of the State S&T Councils may be reviewed at least twice a year. Department will constitute a Expert Group on Core Grant for deciding the core grant support to State S&T Councils chaired by the Non official eminent Scientist / academician . The Group will be also having the members related to various S&T fields from Institutions of national importance i.e. Central/State Laboratories, Academic and Industrial organization

NATURE OF PROGRAMMATIC SUPPORT UNDER STATE S&T PROGRAMME

(i) Location specific research & technology development :

Support for identifying/ projectising S&T programmes and for development oriented location specific research and technology development.

(ii) Pilot scale demonstration projects:

Pilot scale demonstration projects including field trials etc based on technologies developed by Central S&T Agencies/ Labs/ Institutions etc. relevant to the State needs.

(iii) Replication of success models:

Replication of successful projects/programmes in other interested States based on successful experiences of a State S&T Council/ State S&T Institute/ NGOs etc.

(iv) S&T Studies , Surveys , Information Exchange and Joint Programming :

To evolve and support certain joint programmes focusing on multi-sectoral area based approach to rural/ regional development in cooperation with multiple State & Central Institutions, NGO's and State S&T Councils. These areas should be so identified where S&T intervention could significantly improve the existing socio-economic conditions.

SFC APPROVAL ON PROGRAMMATIC SUPPORT :

Terms and conditions defined by the SFC:

The terms and conditions for the support of EMR projects on location specific challenges, S&T studies, surveys, Student Project Programme, Technology Demonstration Centers etc are as follows:

A two Tier mechanism will be adopted for the screening of the proposal under which two screening committee will be constituted with the approval of Secretary, DST

Tier 1 Screening Committee on State S&T Programme (T1SC on SSTP) will screen the proposal for its suitability to support under the programme.

The proposal recommended by T1SC on SSTP will be processed for the consideration of Tier 2 Screening Committee on State S&T Programme (T2SC on SSTP) if further recommended then process for seeking the concurrence of finance

The age of PI should not be more then 62 years in case of University/ Academic Institution and not more than 55 years in case of Non Governmental organizations (NGO's) and Central and State laboratories on the date of application submitted to this Department. The project can be supported for the maximum period of 5 years (five years).

One PI can only apply and take grant for the implementation of one project. After successful completion of the one project, he can apply for another project under the programme.

The T1SC on SSTP will be having the following constitution:

1. External (NOM) –Chairman
2. Member-ICMR
3. Member-ICAR
4. Member-IIT
5. Member-University
6. Member-Industry
7. Member Secretary-DST official coordinating the SSTP

The T2SC on SSTP will also be chaired by the Non official eminent Scientist / academician. The Committee will be having the members related to various S&T fields from Institutions of national importance i.e. Central/State Laboratories, Academic and Industrial organization and four members from State S&T Councils.

SOME OF THE MAJOR OUTCOMES OF THE PROGRAMME:

Department under the programme has been providing the core support (Grant-in-aid) for the salary of manpower 341 which include the (215 Scientific manpower, 126 Administrative manpower) through Core support to State S&T Councils

Department under the programme has been supported 134 LSR projects at a total cost of Rs.89.82 crore through Programmatic Support under the scheme to accelerate S&T activities at the State level so as to ensure integration of S&T for overall socio–economic development with special emphasis on Location Specific Research & Technology Development, Adaptation and Transfer, S&T studies/surveys and information exchange & experience sharing on specific S&T programmes.

The support provided for establishment of 3 new Technology Demonstration Centres (TDC)

Arunachal Pradesh State Council of Science & Technology (APSCST), Dept. of Science and Technology, Govt. of Arunachal Pradesh, ESS Sector, Maung- phi Complex, Itanagar-791 113.

Tamil Nadu State Council for Science and Technology, DOTE Campus, Chennai – 600025, Tamilnadu.

State Council of Science, Technology and Environment, (SCSTE), Lower Lachumiere, Shillong- 793 001, Meghalaya

Model Village establishment projects initiated Uttarakhand (6), Meghalaya (3), Arunachal Pradesh (3) and Manipur (3)

Student Project Programme (500 Final year B.Tech/ BE students) supported in each of the States of Tamilnadu, Kerala, Karnataka, Himachal Pradesh and Telangana. State Govt. also provided funds Rs.60.0 Lakhs as matching grant for three years.

The facts and figures on the core support provided to the State S&T Councils vis-à-vis Location specific challenges addressed through the programme is mentioned in the Table 1 given below:

Sl. No.	Financial year	Funds released/ New LSC Projects initiated	Core Grant released	Expenditure (in Crore of Rs.)
1	2015-16	19.84 (34)	23.67	43.51
2	2016-17*	26.98 (33)	34.34*	61.32
3	2017-18	23.60 (31)	23.03	46.63
4	2018-19	19.40 (36)	22.16	41.56
	Total	89.82(134)	103.20	193.02

CG –Core Grant Some of the States & UT's like Jharkhand, Odisha, J&K, Dadra Nagar Haveli, Lakshdweep, Ledakh Daman & Diu, Chandigarh and Delhi having S&T infrastructure but not seeking core grant.

PRG-Project Related Grant *in the F.Y. 2016-17 CG also include the PRG provided to the State S&T councils Rs. 8.65 Crore so total of Rs. 34.34 Crore

Figure in bracket indicates the location specific challenges addressed through programmatic support.

PROPOSED ACTIVITIES UNDER STATE S&T PROGRAMME (SSTP) :

Core grant support to State S&T Councils (SSTC) as per the approval of the EGCG on SSTC in consonance with guidelines of SFC given at the point 4 above of the back ground note.

Support will be remains continue to around 200 ongoing projects related to the local specific challenges of the States in the Country.

New Projects will be supported in the various States of the Country to address the local specific challenges.

Technology Demonstration Centres (TDC) will be established at various State S&T Councils.

Student Project Programme for final year BE/B.Tech students will be initiated in other States in collaboration with various State S&T Councils.

Financial support will be provided for acquiring of the technologies from the institute abroad to demonstrate the technology in addressing the challenges of the States.

Financial support for other activities such as meetings/workshops and other means of information exchange pertaining to development of the S&T in States will be provided.

The Annual Conclave of the State S&T Councils and various sensitization regional workshops will be planned/initiated.

Strengthening of S&T Councils for vertical growth and their horizontal linkages with Central Scientific Departments, Agencies and S&T Councils of other states/Union Territories.

Section - II

Brief note on State Science & Technology Councils Annual Conclave - 2019

Section II - Brief note on State Science & Technology Councils Annual Conclave - 2019

The "First Meeting of the Expert Group for the review of the progress of the State S&T Councils" was organized by Telangana State Council of Science & Technology (TSCOST), Environment, Forests, Science & Technology Department, Government of Telangana at Hyderabad, Telangana State during 22-24, August, 2019 at the instance of Department of Science & Technology, Government of India

Inauguration :

Sri Allola Indrakaran Reddy, Hon'ble Minister for Environment, Forests, Science & Technology, Endowments and Law, Government of Telangana attended as the Chief Guest and Inaugurated the National Meet on 22-8-2019 at 10.30 a.m. The Honourable Minister expressed happiness about this confluence of S&T Councils in Hyderabad and urged the participants to chalk out the best S&T plans and programs for the benefit of society and environment. He also outlined the best use of Technology in Flagship Porgrams initiated by Government of Telangana, such as Kaleswaram Irrigation Project, Mission Bhagiradha, Mission Kakatiya, Telangana Ku Haritha Haaram etc.

Prof. Satish B. Agnihotri, Professor, IIT, Mumbai & Chairman, Expert Group on SSTCs, GoI; Dr. Debapriya Dutta, Advisor and Head, SEED & SSTP Divisions, DST, GoI; Er. Ravinder Gaur, Scientist & Member Secretary, Expert Group on SSTCs, DST, GoI, Prof. Ravi Kumar Puli, Member Secretary, TSCOST, Hyderabad were present in the Inaugural session.

Sessions of the National Meet :

During 22-23 August 2014, Review by the Expert Group on SSTCs was held. The Member Secretaries, Director Generals, Directors/ Heads of S&T Councils made presentations on the activities carried put in their states.

On 24th August 2019, Interactive Session on Science for Equity, Empowerment & Development (SEED) Division Schemes and Programs between SEED Division Head, Scientists and S&T Council heads was held.

The individual reports on activities of the S&T Councils are given in **Section IV**.

Valediction :

Valedictory Session of the Meet was held on 24th August 2019 at 1.00 p.m. Sri Rajeshwar Tiwari, IAS, Special Chief Secretary to Govt., EFS & T Department, Govt. of Telangana graced the occasion as the Chief Guest and advocated for development of a strong and robust S&T eco-system at the State Level that would address the individual state-specific needs with S&T interventions for solving location specific problems. He also stressed on the need for development of technologies for the needy, downtrodden and farmers for alleviation of societal problems. He outlined several areas viz. Climate Change, Agriculture, Water Conservation, Rain Water Harvesting, Plastic Menace, Waste Disposal, Reduce, Reuse and Recycle (RRR) etc. where S&T can play a vital role with fool-proof solutions.

The National Meet ended with a vote of thanks proposed by Er. Ravinder Gaur, Scientist & Member Secretary, State Science & Technology Programme (SSTP), Department of Science & Technology, Government of India, New Delhi.

Section - III

Activities of State S & T Programme during 2018 - 19

Section III - Activities of State S & T Programme during 2018 - 19

Department is playing a proactive role and encouraging State S&T Councils to address location specific S&T related issues by liaisoning with Central/State academic institutions & laboratories through State S&T Programme. This facilitates States to achieve the specific S&T objectives at their level. Also, core support is provided to the State S&T councils for their S&T human resources and some infrastructure besides funding support for location specific research, technology development and demonstration. The programme also supports studies and surveys on local S&T related issues etc.

Summary of the activities being implemented in various States under the State S&T Programme during 2018-19:

- 28 State Councils for S&T were supported by providing grant in aid of Rs. 22.16 Crores.
- 36 new projects/ programme were supported to address the State Specific S&T challenges, S&T surveys and studies in the tune of 19.40 Crore.
- The process initiated for establishment of 3 new Technology Demonstration Centres (TDC) at:
- Arunachal Pradesh State Council of Science & Technology (APSCST), Dept. of Science and Technology, Govt. of Arunachal Pradesh, Itanagar- 791 113.
- Tamil Nadu State Council for Science and Technology, DOTE Campus, Chennai – 600025, Tamilnadu.
- Meghalaya State Council for Science and Technology, Shilong
- The Annual Conclave of the State S&T Councils was organized at State Council for Science Technology & Environment, Himachal Pradesh, Shimla-9, Himachal Pradesh during 7th-8th June, 2018 to review the progress of various State S&T Councils. 27 States participated in the Conclave and discussed the future course of actions to be taken for S&T development in States.
- A Standing Finance Committee (SFC) was constituted for the formulation of the SFC document of the State Science & Technology Programme under the chairmanship of Secretary, DST. The Committee recommended for the continuation of the programme for a period of 3 years from 01.04.2017 to 31.03.2020 with a total budget of 186.0 Crore.
- Model Village establishment projects were initiated in the States: Uttarakhand (6), Meghalaya (3), Arunachal Pradesh (3) and Manipur (3)
- Student Project Programme (500 Final year B.Tech/ BE students) supported in each of the States of Tamilnadu, Kerala, Karnataka, Himachal Pradesh and Telangana. State Govt. also contributed by funding Rs.60.00 Lakhs for three years.

Some of the major technologies developed and demonstrated in various States:

I. Development of Solar Thermal Assisted Rapid Bulk Milk Cooler implemented by MNIT, Jaipur in the State of Rajasthan.

II. Community Based Integrated Water Filter System for Clean Drinking Water demonstration at village Ruma of Kanpur, Uttar Pradesh based on the technology developed at Indian Institute of Technology, Kanpur.

III. An effort to establish decentralized seed production system for Elephant Foot Yam (EFY) with central / base micro propagation lab for six agro climatic zones by Vivekanand Institute of Biotechnology, Kolkata, in the State of West Bengal

IV. Development of Marble Dust Filled Reinforced Polymer Composite for Wind Turbine Blade implemented by Collage of Technology & Engineering, Udaipur in the State of Rajasthan.

V. Installation & Evaluation of Water Filtration units at Public Ponds in SC/ST areas in Imphal West District of State Manipur by Manipur Council for Science & Technology, Manipur

VI. Pilot village level deployment of a wireless sensor network based animal development monitoring scheme for rural/semi-rural dairy operations implemented by Indian Institute of Technology Delhi at Bhopal, Madhya Pradesh.

VII. Improving sustainable energy access among SC/ST households in Chamarajnagar district of Karnataka –a pilot study implemented by TERI, Bangaluru in the State of Karnataka.

VIII. Establishment and Demonstration of a compressed biogas (CBG) production technology developed by Indian Institute of Technology, Delhi at Sharda Vihar Jankalyan Samiti, Bhopal, Madhya Pradesh.

IX. Project entitled "Rural women empowerment and sustainable growth implemented by MNIT, Jaipur in the State of Rajasthan

X. Establishment of Tribal Resource Centre (TRC) for Chakrota Tribe in Rikhad Village, Chakrata, Dehradun, Uttarakhand State implemented by HESCO, Dehradun

XI. Project entitled "An Empirical Investigation of Ergonomic Interventions in Handicraft Industry in Rajasthan with a special reference to Gems and Jewellery Industry' has been implemented by MNIT, Jaipur in the State of Rajasthan.

Section - IV

Programs and Plans of SSTCs:

Section IV - Programs and Plans of SSTCs:

Member Secretaries, Director Generals, Directors, Heads and Officials of S&T Councils gave presentations on S&T activities carried out in their respective States/ Union Territories. The details are furnished in the following pages.

ANDHRA PRADESH STATE COUNCIL OF SCIENCE & TECHNOLOGY

Special Activities of APCOST during the year -2018-19

1 Popularization of Science (POS):

a. **Hiroshima-Nagasaki Day:** program has been conducted at 74 venues in 12 districts with the support of School Education & District Coordinators during August 2018. Nearly 22997 students / VIPs have been participated in the said programs. Competitions were conducted and winners were given prizes by the Organizers.

b. **World Ozone Day:** Program has been conducted in 12 districts with the support of District Coordinators on 16.10.2018. Nearly 21007 students/ Teachers/ VIPs have participated in the said program. The organizers conducted rallies/ Seminars, lectures followed by competitions and prizes & certificates were given to winners.

c. **Mobile Science Exhibition:** Mobile Science Exhibition in association with RSC – Tirupathi (NCSM) was organized during 2&3, Dec 2018.

d. **National Mathematics Day (NMD) Celebrations**: The National Mathematics Day (NMD) Celebrations (commemoration of the discovery of the properties of Sri A S Rama Krishna Garu (M L C) addressing the children the partition function Sri Srinivas Ramanujan for his invention in elliptic functions & number theory) sponsored by NCSTC, DST, GoI, was conducted on 22.12.2018 in 12 districts. Total 23708 participants (teachers / guests) have taken part. Mathematics kits also provided to DCs for demonstration in the schools to eradicate Mathematics Phobia among students.

e. **National Science Day Celebrations (NSDC):** India celebrates **National Science Day** on 28th February of every year to commemorate the discovery of the Raman Effect in 1928 & to honor our Nobel laureate Sir C V Raman for his inventions. The celebrations of this day include, showcasing the country's competence in the field of science. Sponsored by NCSTC, DST, was conducted during last week of February-2019 in 13 districts. Total 15540 participants (teachers / guests) have taken part.

f. **Establishment of Science Clubs:** In-order to inculcate scientific temper among students, APCOST established 64 clubs in 5 districts.

2 Seminars, Workshops, Exhibitions, R & D Programs:

a. **Exhibitions:** Two Exhibitions have been conducted viz., (1) KLU during NCSC activity and (2) During Gnana Bheri at Ongole.

b. Indian International Science Festival (IISF): APCOST has established one stall at Lucknow, UP. Nearly 7,000 visitors have visited the stall. District Coordinators from East and West Godavari along with APCOST staff have participated.

c. R & D Program: APCOST supported for two (2) R & D projects conducted in Gokula Krishna College of Engineering, Sullurpet, SPSR Nellore.

3. S & T Programs for SC & ST People:

a. Eco – Eureka: Program entitled "**Development of Eco Eureka Youth in Tribal Predominant districts of Andhra Pradesh**" sanctioned by NCSTC, GoI, for six (6) districts viz. Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, Chittoor & Kurnool.

Key strategy in this project is behaviour change communication, to ensure that sanitation as an issue is mainstreamed with the general public at large and will cover issues of open defecation, prevention of manual scavenging, hygiene practices, proper use & maintenance of toilet facilities. Massive public awareness campaigns on sanitation and establishing its link to public health, hygiene and the environment through various means including – radio, social media, documentaries, plays, workshops, etc.

So far completed in this project is:

a) Selection of Eco-Hunts teams and
b) deployed 5 days training.
c) Pre-Assessment and Post – Assessment survey is under progress in all the 6 districts.

4. Awards for Andhra Pradesh Scientist (APSA)/ Engineers:

Andhra Pradesh Scientist Awards were issued to following 9 awardees in different disciplines during 2018-19. Citation & Cash award of Rs. 25,000/- are given to each awardee. Hon'ble speaker, Andhra Pradesh Assembly, Hon'ble MLC, Chairperson, Zilla Parishad, Guntur, MS, APCOST and VC, KLU have participated.

5. Awareness program for Rural and Urban People/ Students:

APCOST arranged a technical tour for 109 students/ teachers from 14 Balayogi Gurukulam Schools and Colleges, SPSR Nellore to SHAR Centre, Sullurpet, Nellore.

6. 26th National Children Science Congress (NCSC)- 2018:

a. District Events: 26th NCSC – 2018, a program catalyzed and sponsored by NCSTC, DST, GoI has been initiated to organize in all the 13 districts during October – November – 2018. Nearly 12,963 including Child Scientists, Teachers, VIPs, Evaluators have been participated from 1851 schools in 13 districts.

b. **State Event:** State Event was organized at K. L. University, Guntur during 02 – 03 December 2018 in which Hon'ble Minister for E F S&T, Hon'ble Speaker, Hon'ble MLC, Chair Person, ZP Guntur, Dr. Geeta Swaminathan, NCSTC National Observer, MS, APCOST, University Authorities have been taken part. Nearly, 800 Child Scientists, Guide Teachers, Evaluators, DCs, DACs have participated.

c. **National Event:** A delegation of 16 Child Scientists (selected from State Event) along with 6 Escort members have participated in National Event held at Siksha 'O' Anusandhan University, Bhubaneswar, Orissa during 27 – 31 December 2018.

d. **Indian Science Congress (106th ISC) -2019:** As a 2nd part of NCSC-2018, a delegation of 4 members (Child Scientists + Escort) have participated in the 106th Indian Science Congress (ISC) – 2019 held at LPU, Punjab during 3 – 7, January 2019.

7. SRSC–Rajamahendravaram:

Civil works of Sub – Regional Science Centre (SRSC) Rajamahendravaram have been commenced during February -2019 by National Council for Science Museums (NCSM), Kolkata and assured to complete in 27 months.

8. Physical Achievements During 2018-19 :

S. No.	*Program Name*	*Achievements No. of Programs)*	*(No. of Beneficiaries*
1)	*(2)*	*(3)*	*(4)*
1	**Programs for National Days of Importance / Interaction with Experts**		
a	National Mathematic Day (NMD) Celebrations	12	23708
b	Mobile Science Exhibitions	01	6000
c	Program –Hiroshima & Nagasaki	13	3500
d	World Ozone Day Programs	10	3200
e	National Science Day (NSD) Celebrations	158	15540
f	Establishment of Science Clubs (5 Districts)	64	6400
2	**Seminars / Workshops / Exhibitions / R & D Programs, Web Printing**		
a	Exhibitions (KLU and Ongole)	02	8000
b	Exhibition (Indian International Science Festival – IISF), Lucknow	01	7000
c	Workshops	02	250
d	R & D Programs	01	10
3	**Programs for Traditional S&T. Programs for SC & ST People**		
a	Eco-Eureka – NCSTC- DST, GoI	12	240
4	**APSA / Awards for Engineers**	01	09
5	**Awareness Programs for Rural & Urban People (SHAR visit)**	01	84
6	**Popularization of Science Through GOI support**		
a	National Children's Science Congress (NCSC) District Level Events	13	12963
b	National Children's Science Congress (NCSC) State Level Event	01	800
e	Indian Science Congress (ISC), Punjab	01	04
7	**Sub-Regional Science Centre, Rajamahendravaram**	Civil works Commenced	

9. APCOST - Action Plan for future 5 years:

a) Bringing of Sub-Regional Science Centre (SRSC)–Rajamahendravaram in to function.
b) Establishment of few more SRSCs so as to cater the services to all districts.
c) Up-Gradation of existing RSC – Vijayawada with digitalized exhibits.
d) Establishment of 3D Planetarium in RSC Vijayawada with the support of GoI.
e) Establishment of Innovation Hub in Vijayawada with the support of GoI.
f) Establishment of Technology Demonstration Centre in Vizag with the support of GoI.
g) Procurement of Mobile Science Exhibition (MSEs)
h) Establishment of Irradiation Centres with support of BARC.
i) Establishment of Miniature Nuclear Gallery

ARUNACHAL PRADESH
STATE COUNCIL FOR SCIENCE & TECHNOLOGY

1. Key activities undertaken during the last two years in the areas of:

1. Technology Development:

To Initiate and strengthening Research and Development in Biotechnology, Education, Skill Development, Entrepreneurship Development for ushering sustainable development in the state through biotechnological interventions. Following broad areas are undertaken for the fulfilment of the goals.

Documentation and database preparation on the medicinally important plants available in the Arunachal Pradesh.

Exploration of the Alpine biodiversity of the state.

Exploration and characterization of the nutritional components of the wild edible food plants of the state.

Documentation and commercialization of the orchids of the state.

To develop an information based on the bioresources and biodiversity using Biotechnology System Network (BTISNet).

Exploration and characterization of the high altitude microbes.

Isolation of the beneficial microbes from the agricultural land of the state.

Formulation of the herbal products like shampoos, soaps etc from the saponin rich plants.

Formulation of the crude drugs from the important medicinal plant species of the state.

Development of food products from the famine food plants of the state by implementing the modern biotechnological tools.

The conservation and rehabilitation of the endemic and endangered species of the state.

Implementation of the Skill Development in Biotechnology programmes for Students, Researchers, Faculties and Entrepreneurs under the Skill Vigyan initiative of Department of Biotechnology, Govt. of India during the next three (3) years.

2. Technology Demonstration:

Setting up of Rural Appropriate Technology Demonstration Centre (RTDC) at Kimin, Papumpare district in Arunachal Pradesh with the following objectives;

To develop it as a people's institution for motivating and creating social awakening among the village community, build up awareness level, make them responsible for their own development and enhance their ability to accept the input of science and technology.
To introduce innovative science and technological component, ideas accessible to the village

community and enable the villages to acquire knowledge, information through training and demonstrations and develop their skills for initiating income generating activities for creating sustainable livelihood.

To adopt, demonstrate various rural technologies developed by different organizations, research institutions and to impart training to villagers using the trained manpower for their skill and technological advancement.

To help the village community and cater proper societal development avenues program by establishing linkages with various rural development agencies for socio-economic development of the villagers.

To give the necessary guidance and information, counselling to the people on the proven, innovative, cost-effective and appropriate technological options and transfers these technologies for application.

To enhance confidence and capability of the rural people by involving them in micro-level planning and providing central facilities for managing and processing of the locally available natural resources for its value addition.

Up-gradation of indigenous traditional technologies, skills for utilization of available resources for improving the quality of life of the economically weaker sections of society and providing scopes for starting entrepreneurial ventures.

3. Popularisation of Science:

The programmefor popularization and communication of science in the state has been taken up by Arunachal Pradesh State Council for Science and Technology that includes essay competition, quiz, drawing and poster making on various theme aligned with the scientific programme.

The regular programme of the council which involve students and teachers includes: Organisation of National Children's Science Congress, National Science Day and National Mathematics Day covering all the educational institution (Govt. Pvt. & NGO run) of the state. The Arunachal Pradesh State Council for Science and Technology has been encouraging students to take part in various science activities organised by the council from time to time.

Organising District and State level NCSC activities

Organising National Science Day

OrganisingSci-Connect North East

Celebration of National Mathematics Day

Workshops and Training programmes for Students and Teachers

4. Patents:

Patent Information Centre was established in the Arunachal Pradesh State Council for Science & Technology, Itanagar in the year 2011 with the support of Department of Science & Technology, Government of India.

A lot of information regarding innovation/ invention is to be provided at the time of filling the patent for making proper claims and to get protection against infringement. This makes patent information a large single source of technical information in the world today. But access to this information and other facilities related to IPR are not adequately available in the academic and other institutions in India. As a first step in this direction, to provide patent related services, particularly to the S&T community, Patent Information Centre (PIC) has been established in the Arunachal Pradesh State Council for Science & Technology, Itanagarduring2011 under the Department of Science & Technology, Government of India support and technical guidance of Patent Facilitating Centre, Technology Information Forecasting and Assessment Council (TIFAC), Department of Science & Technology, Government of India, New Delhi.

5. Any new innovation activities:

Establishment of Centre for Bioresources and Sustainable Development in Arunachal Pradesh as a Centre of Excellence (CoE)

The proposal for establishing a Centre for Bio resources and Sustainable Development in Arunachal Pradesh was taken up by Arunachal Pradesh State Council for Science & Technology (APSCS&T), Department of Science & Technology, Govt. of Arunachal Pradesh with Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India during December, 2016 with the mission for "Development of Bio-Resources and their sustainable utilization through biotechnological interventions for socio-economic growth in Arunachal Pradesh."

Potential Areas of Focus and Intervention:

(i) Medicinal and Wild Edible Plant Resources.
(ii) Orchid Resources (Ornamental, Medicinal, nutraceutical etc. value of orchids for commercialization.
(iii) Mountain and High Altitude Microbiology.
(iv) Aquatic Bio resources (Fish Genetics and Breeding).
(v) Insect Bio resources.
(vi) Bio resources Database & Bioinformatics

Land measuring an area of 29,306 Sq. Mts. has been made available by Arunachal Pradesh State Council for Science & Technology at Kimin, Papum Pare District for establishing the Centre for Bioresources and Sustainable Development.

The project has been sanctioned by Department of Biotechnology, Government of India during March, 2018 and the first instalment of grant released and received. The site development works has been completed, construction of main building of the Centre is under progress, which is being carried out by state PWD.

Setting up of Rural Appropriate Technology Demonstration Centre in Arunachal Pradesh

The proposal for Setting up of Rural Appropriate Technology Demonstration Centre in Arunachal Pradesh was taken up by Arunachal Pradesh State Council for Science & Technology (APSCS&T), Department of Science & Technology, Govt. of Arunachal Pradesh with Department of Science and Technology Ministry of Science & Technology, Government of India during December, 2016. The project has been sanctioned by DST, GoI in March, 2018.

Implementation of the project is under progress. Various CSIR institutions are providing technical support and their technologies for demonstration through the centre.

2. List 5 success stories with brief about 1 page each including photograph. If available

I. Organising of National Children's Science Congress Activities

Arunachal Pradesh State Council for Science & Technology (APSCS&T), Itanagar is the State Coordinating Agency for orgnanising and coordinating the National Children's Science Congress programmes, activities in Arunachal Pradesh. Since 1995,APSCS&T organising the districts and state level programme of National Children's Science Congress in the State by coordinating department of education in all the twenty five districts of the state as per guidelines, theme and instructions laid down by NCSTC, DST, Govt. of India. APSCS&T is collaborating with Deputy Director of School Education, Govt. of Arunachal Pradesh for conducting, organizing the districts level events of CSC.

II. Sci-connect North East Programme

Sci-Connect" Connecting Science with Young Talents is a first of its kind program designed and initiated by the VigyanPrasar (An autonomous organisation under the Department of Science and Technology, Govt. of India) especially for children in North-Eastern States of India.The objective of the programme is to sensitise young children in upper primary to secondary levels about science in daily life thereby helping the students to practice the method of science from their childhood and also showcase their talents and innovative ideas.

Arunachal Pradesh State Council for Science & Technology, Department of Science and Technology, Govt. of Arunachal Pradesh ,the Coordinating agency of the programme have carried out this programme in association with the VigyanPrasar since 2017.Under this programme, recently one day Workshop on Hands on Activity in Science" was organised at Arunachal Pradesh Science Centre, Itanagar on 24th June 2019.

III. Organisation of Wipro-Earthian Program for Schools in Arunachal Pradesh

Arunachal Pradesh State Council for Science & Technology in 2016 initiated to take the "Earthian" awards to schools in Arunachal Pradesh in collaboration with Wipro. In the first year itself the lone project submitted from Arunachal Pradesh by the group of students of King Cup School, Itanagar had made in to the top 10 schools selected and won this prestigious award.

IV. Exposure tour for meritorious students of Arunachal Pradesh.

Arunachal Pradesh State Council of Science & Technology arranged exposure tour for

meritorious students with a group of ten (10) students. During the programme the students had the opportunity to visitand interact with the scientists of important centres like ISRO–Exhibition Centre, Heritage Centre & Aerospace Museum, Hindustan Aeronautics Limited, Indian Institute of Science**.** They have the opportunity to visit places like Lalbagh-Botanical Garden, Jawaharlal Nehru Planetarium**, Visvesvaraya Industrial and Technological Museum** (VITM), Metro Station and Karnataka Vidhan Saudha (Sabha) etc. around Bangaluru city.

V. Setting up of Space Education Centre and Innovation Hub at Arunachal Pradesh.

Space Education Centre and Innovation Hub at Arunachal Pradesh Science Centre was dedicated to the people of Arunachal Pradesh and inaugurated on 8th December 2018 by Shri Nabam Rebia, former Hon'ble Minister Environment & Forest, SWETA etc. Govt. of Arunachal Pradesh in presence Mr S.M. Khened, Director Nehru Science Centre, Mumbai, Late Er.Gaken Ete, the then Secretary, Science and Technology and Shri Bamang Mangha, former Chairman, APSCS&T.

6. Has the Council developed any state specific S& T and Innovation policy? If so the details to be provided.

The Council has drafted the State Science & Technology Policy – Vision 2030 and has submitted to the State Government for consideration.

7. How strong are the links between other State Government/Departments if so provide details ?

Arunachal Pradesh State Council for Science and Technology maintains strong linkages especially with the Education department in conducting science popularization and other outreach programmes. It also maintains good linkage with agriculture department. Since the state economy is basically depend on agriculture and 66 percent of the state population engaged in agricultural and other related activities.Therefore it is necessity and council has maintaining good linkage with agriculture department for improving of the line work.

8. How strong are the links of the council with local industry units/ associations?

Since there is not much of industry in the Arunachal Pradesh, So, there is hardly any linkage of this council with local industry. However APSCS&T maintains strong linkage with R&D institution of neighbouring states and local academicians and R&D institute for socio-economic development of the state.

9. 5 Years Vision of the Council:

During the next five years Arunachal Pradesh State Council for Science and Technology envisage to initiate and continue implementation of the following programmes;

1. Master Resource Person Orientation Workshop/Training for teachers and District Coordinators
2. Organising National Children Science Congress, National Mathematics Day, National Science Day.
3. Organising exposure tour of meritorious students of Arunachal Pradesh.
4. Organising Sci-Connect programme.
5. A Primitive and Traditional form of Agriculture Practices as a Source of Livelihood Approach-An Exploration, Scientific validation of the Traditional Practices of Different tribes of Arunachal Pradesh.
6. Patent Information Centre under Arunachal Pradesh plays vital role in the IPR related issues in the state by organising IPR awareness programs and Workshops every year for the Entrepreneurs, Researchers, Scholars, Innovators, Stake holders, R&D Departments/ Institutions, etc.
7. Setting up of Rural Appropriate Technology Demonstration Centre (RTDC) at Kimin, Papumpare District in Arunachal Pradesh.

8. Development of Science & Technology Integrated Model Village in Arunachal Pradesh.
9. Exploration of Alpine Flora of Arunachal Pradesh-A Biotechnological approach.
10. Population Genetics, phytochemical characterization and mass propagation by standardization of tissue cultureprotocol of *Amentotaxusassamica* D.K.Ferguson. (An endangered gymnosperm from Arunachal Pradesh).
11. An Exploration on the Traditional Famine Food in the Realm of Food Security in remote areas of Arunachal Pradesh.
12. Documentation, Conservation and Nutritional profiling of the *Tree Ferns* for the Strategy of food Security in Arunachal Pradesh.
13. Establishment of Bioinformatics and Computational Biology Centre in Arunachal Pradesh.
14. A Systems Approach towards Understanding the Diversification of secondary metabolite clusters in collaborating with National Institute of Plant Genome Research, New Delhi and DBT-NECAB, Assam Agriculture UniversityJorhat, Assam.
15. Structural and functional genome annotation of *Labeorohita* and understanding molecular mechanism of heavy metal tolerance" by collaborating with Odisha University of Agriculture and Technology, Bhubaneswar, Odisha and ICAR-Central Institute of Fresh Water Aquaculture, Bhubaneswar, Odisha.
16. Highly multiplex genome engineering using CRISPR/Cpf1 gRNA arrays for complete resistance against panama wilt in Banana in collaborating partner with Assam Agricultural University, Jorhat, India and Washington State University,USA.

ASSAM SCIENCE TECHNOLOGY & ENVIRONMENT COUNCIL

1. Key activities undertaken during the last one year in the area of

1.1 Technology Development:

Innovation, Technology Generation and Awareness:

Aims to generate a culture of innovation and technology generation among the state innovators and the benefit there upon. It helps the state innovators to generate technology in the areas of traditional technology, agriculture, transportation, housing, education, food processing, and information technology and in other fields of science and technology. The state innovators are also encouraged to file IPR based on their innovation and technology.

During 2018-19, 17 (seventeen) nos. of innovative projects have been taken up as follows:

1. Design of smartphone platform fluorescence microscopic system for resource poor regions.

   PI: Pabitra Nath, Associate Professor, Department of Physics, Tezpur University, Napaam

2. Garbage cleaning set.

   PI: Bhabesh Ch. Das, Dadara, Hajo, Kamrup

3. Medicated skin patch to mitigate destructive pulmonary tuberculosis in six districts of Assam.

   PI: Subham Banerjee, Ph.D., Assistant Professor, Dept. of Pharmaceutics, National Institute of Pharmaceutical Education and Research (NIPER), Guwahati -781125, Assam

4. Development and construction of hull structure of boat using bamboo trunk as shell member blended with wooden/steel or bamboo framework.

   PI: Tilak Chandra Mahanta, Deputy Director (Design), Inland Water Transport Department, Govt. of Assam

5. Model Mechano - Biological process of banana pseudo-stem retting for development of handmade paper.

   PI: Mahesh Chandra Bora, Director, Elrhino Eco Industries Pvt. Ltd., Guwahati

6. An aid for curing Hemiplegia, paralysis of half of the body.

   PI: Durga Prasad Nath, Vill: Mayengia, P.O.: Charaibaahi, Morigaon, Assam 782106

7. Design and development a prototype for commercial, cost-effective, multi-product plant for "Extraction of essential oil by steam distillation for smaller farmers and entrepreneurs of Assam.

   PI: Dr. Dilip Sarma, Indigenous Assamese Women's Identity, H.No.5, Padumpukhuri, Uzanbazar, Guwahati-1

8. Design of an automated tool for verification of purity of Muga Silk.

   PI: Dr. Minakshi Gogoi, Asst. Professor, Department of Computer Science and Engineering, GIMT, Hathkhowapara, N.H. 37, Azara, Guwahati – 781017

9. Drainage problem.

   PI: Samijul Haque, C/O- SamsulHaque, Vill- Khatabari, Ward No. 1, Nalbari Town, P.O.-Nalbari, Dist-Nalbari, Assam, Pin-781335

10. Development of a battery operated paddy transplanter for small farmers.

    PI: Bhaskarjyoti Chamuah, H/N-18, College Road, Bylane-II, Bongaon, Beltola, Guwahati

11. Coherent narrow band light source based oblique incidence reflectometry for rapid meat quality assessment.

    PI: Dr. Ankur Gogoi, Assistant professor, Department of Physics, Jagannath Barooah College, Barpatra Ali, Jorhat-785001

12. Development and evaluation of herbal anti-arthritic gel.

    PI: Bapan Banik, Convenor (REDIMAP-2018, REDIMAP- 2019), Assistant Professor, Dept. of Herbal Sc. and Technology, A.D.P. College, Nagaon

13. Convert a specially designed crutch into a simple sitting chair by just adjoining the pair of crutches together.

    PI: Raja Sarkar, Ward No.8, Netaji Road, P.O.-Dhekiajuli, Dist. Sonitpur, Assam

14. Installation of Zero Head Water Turbine in open channel for generation of power for off grid electrification.

    PI: Atul Chandra Boruah, A.S.E.B. Colony, Narengi, Qtr. No Type- II/04, Guwahati-781026

15. Algae as Fish Feed — Innovation to Improve Production in Aquaculture Operations in Karbi Anglong District.

    PI: Hunmily Teronpi, Assistant Professor, Department of Botany , North Gauhati College Nagar, Guwahati

16. Study of traditionally used dyes yielding plants for staining cells and cellular components and identification thereof: An eco-friendly and non-toxic alternative method. PI : Dr. Akalesh Kumar Verma, Assistant Professor, Department of Zoology, Cotton University, Guwahati

17. Ayurvedic NimoniyaBori (Development of traditional technology).

    PI: Dhajilal Swargiary, Aryabhatta Science Centre, Howraghat, Karbi Anglong

Photographs of some successfully developed technologies :

"Pedal propelled vehicle to collect and dispose household solid waste in municipal areas"

"Vehicle Security Device"

"Design & Development of a portable thermo-electric generator, Firolite" by Kaustoov Gopal Goswami, Guwahati

1.1.2. Project Related Grant (PRG), DST, Govt. of India :

Under the scheme **"Project Related Grant (PRG)"**, DST, GOI, 8 nos. of ongoing projects sanctioned during 18-19 (fund released on September, 2018) are as follows:

SL. No.	TITLE OF THE PROJECT	INVESTIGATOR/ ORGANISATION
1.	Development of Natural Fibre Reinforced Epoxy Based Composite Material	Dr. Jyotishmoy Borah, Assistant Professor, Dept. of Chemistry, B.B. Engineering College, Kokrajhar
2.	Utilization of fly ash on geotechnical engineering applications	Mr. Pranjal Barman, Assistant Professor, Dept. of Civil, Engineering, CIT, Kokrajhar
3.	Nutritional evaluation and shelf-life study of the value-added products prepared from Ou-tenga (Elephant apple): An underutilized fruit of Assam	Prakash Kumar Nayak, Assistant Professor, Dept. of Food Engineering and Technology, Central Institute of Technology (CIT), Kokrajhar
4.	A compact-portable cost-effective solar powered waste-water treatment plant for Indian households	Dr.Dilip Sarma, Indigenous Assamese Women's Identity, Uzanbazar, Guwahati
5.	Deflouridation of water by using banana (Musa sapientum) peel	Dr. Susmita Sen Gupta, Associate Professor, Dept. of Chemistry, B.N. College, Dhubri
6.	Design and Fabrication of a portable friction stir welding machine	Manash Jyoti Borah, Assistant Professor, Dept. of Mechanical Engineering, Assam Down Town University, Guwahati
7.	Design and Development of Coir fiber modified Recycled Polypropylene Green Polymeric Composites for Injection Moulding Products	Dr. Harekrishna Deka, Technical Officer & Training In-charge, Research & Development & Testing, Department, CIPET, Guwahati
8.	A study on thunderstorm genesis processes & development of thunderstorm warning System	Dr. Hirakjyoti Goswami, Assistant Professor, Dept. of Physics, Gauhati University, Guwahati

1.2 Technology Demonstrations :

1. The technology generated out of the scheme- **"Innovation, Technology Generation and Awareness"** are being demonstrated during -
   i. State Science Festival 2019 at Tezpur University (A Central University)
   ii. India International Science Festival 2018, Lucknow
   iii. Innovation and technology based exhibition at KarbiAnglong district of the state.
2. Mobile Exhibition Van - exhibits based on school's course curriculum on science and mathematics has been demonstrated around 100 schools of the state.

1.3 Popularisation of science :

The observation of National Science Day, National Technology Day, World Environment Day are regular programmes of the council.

Aryabhatta Science Centres (Block Level):

Established 219 block level centres and are in process of setting up new 35 numbers, one in each development block of the state are serving as S&T activity hubs at the grass root level of the state with visible impact. Apart from regular activities viz. block, district and state level competitions of science based poster drawing, extempore speech and model making, other S&T activities like popular talk, seminar, demonstration program and the night sky observation with the telescope have also been carrying out by the centres.

Science and Mathematics Facilitators: Promoting the 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.

Facilitators engaged in schools also develop models, kits for students. Mobile Science Laboratory (MSL), the vehicle designed by ASTEC for RMSA 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 schools of the locality.

A programme on "Grooming and Mentoring of Students"

Illustration of various chemical reactions by Mr. Dhruba Goswami at Nakachari H.S. School, Jorhat.

Certificate Distribution to the students at Model H.S. School, Patharkandi, Karimganj on the last day of the "Grooming & Mentoring Programme".

National Children's Science Congress (NCSC) is a programme of the National Council for Science and Technology Communication, (NCSTC), Department of Science and Technology, Govt. of India. In Assam, this programme is supported and catalysed by Department of Science and Technology, Govt. of Assam, and it is organised by Assam Science Technology and Environment Council (ASTEC). It is held at three levels, District, State and National. It is a programme for the children in the age group of 10-17 years.

Activities involved in the programme:

State Level Resource Persons Training held in 3 zones ; District Level Teachers' Training ; District Level Children's Science Congress ; District Level Mentoring of projects ; State Level Children's Science Congress ; State Level Mentoring of projects National Children's Science Congress (National Level) : Participation of 26 member delegation.

No. of projects presented	3048
No. of schools participated	1496
No. of children participated	6121
No. of Guide Teachers involved	2043
No. of Evaluators involved at District Level CSC	341
No. of Guide Teachers Trained	3323

Inaugural Programme of State Level Activities of National Children's Science Congress -2018

Assam State Contingent for participation in the National Level CSC at Bhubaneswar, Odisha during 27-31st December, 2018

State Science Award: State Science award conferred in three categories as Young Scientist Award, Lifetime achievement award to Eminent Scientist and Institutional Award

ENVIS (Environmental Information System) Hub: ENVIS is a scheme of Ministry of Environment Forest & Climate Change (MoEF&CC), Govt. of India. The main objective of the scheme is to collate and dissemination of 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).

17 Schools School Plant Diversity Centres have been set up.

Under National Green Corps Programme are a programme of MoEF&CC**, 5407 Eco-Clubs in schools** are continuing their activities and another 9410 **Eco-Clubs** are in a process of setting up **during the year.**

Assam Science Festival was organized in association with Tezpur University during 23rd – 25th March, 2019 at the University campus. The Festival was inaugurated by Prof. Sourav Pal, Director, IISER, Kolkata who was the 'Chief Guest' for the programme. A large number of grass root level innovators, R&D organisations, S&T based institutions and the scientific community of the state participated in this year's Science Festival which included student participants from Aryabhatta Science Centres of all the districts of Assam, academic institutions like Assam Don Bosco University, Kaziranga University, Tezpur University etc., R&D institutions like CSIR-NEIST, NESAC, IASST etc., other organisations like Assam Science Society, Bharat Jana Vigyan Jatha, Aaranyak, Lokopriya Gopinath Bordoloi Regional Institute of Mental Health etc.

Participants of Assam Science Festival – 2019

1.4. Patents:

The Patent Information Centre (PIC) is the only facility in the public domain of the state which provides Intellectual Property Rights (IPR) services to local innovators. The PIC extends support to the inventors/ innovators in registering their Intellectual Property(IP) and also creates awareness on IPR. The Centre supports the innovators of the state of Assam and neighbouring region in matters ranging from basic IPR consultation to filing and post-filing work of Patent, Copyright, Trademark, Industrial Design, Geographical Indication etc. The PIC has filed 7 patents for the inventors of the state since its inception. Apart from rendering IPR services, the centre is also encouraging people to innovate. The activities of PIC during 2018-19 are as follows:

Sl. No.	Items	F.Y. 2018-19
1.	IPR Camps/Workshops/Seminars	26
2.	Patent filed	7
3.	Industrial Design registered	1
4.	Trademarks applied	3
5.	Trademarks registered	1
6.	Copyrights and Related Rights applied	1
7.	Copyrights and Related rights registered	1
8.	Patent filed with complete specifications	2
9.	Patent Searches conducted	21
10.	Trademark Searches conducted	10
11.	GI Authorised User registrations applied	15
12.	IPR Publications	1
13.	Total People Visits to PIC Regarding IPR Support	296
14.	Total People Sensitized From Workshops & IPR Camps	2600 (approx.)

1.5 Any new innovative activities:

1.5.1. Making of a Film on activities of established Aryabhatta Science throughout the state are in process.

1.5.2. 35 nos.of Science& Technology based talks were delivered in schools of the state.

1.5.3. Sanskar Manuhe Manuhar Babe – a Scientific Awareness Campaign against superstitions conducted 250 nos. of awareness camp where 12500 participants took part.

1.5.4. Under National Green Corps Programme are a programme of MoEF&CC, process of setting up new 9410 **Eco-Clubs during the year.**

1.5.5. Engagement of additional 164 Science & Mathematics Facilitators in schools so that all the 126 Legislative Assembly Constituency of the State could be covered.

2. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

ASTEC is in a process to prepare a State Science, Technology and Innovation Policy. A consultation involving different stakeholders have already been organised and draft policy has prepared including a broad vision, mission and policy.State Biotechnology Policy has been prepared and adopted by the State Cabinet in year 2017.

3. How strong are the links between other state government/departments? If so provide details.

The council is implementing the S&T plan schemes of Deptt. of S&T, Govt. of Assam. The Council has linkages with Deptt. of Planning and Development Deptt. of Education, Govt. of Assam , Department of Environment of Forest, RUSA, SCERT etc.

The Council also has linkages with state academic, scientific and technical institutions of the state as well as adjoining states and also has activity links with other state Governments like Meghalaya, Mizoram, Arunachal Pradesh, Nagaland through the S&T Councils of the states.

4. How strong are the links of the council with industry units/associations?

The council has linkages with local industry and associations through IPR activities. The ENVIS Centre in ASTEC collaborates with Industries for Internship training.

5. List 5 major technology areas, where the council can play an important role by finding convergent technological solutions :

In the field of Agriculture by Generation of New Technology

In the field of Education (as per course curriculum)

In the field of Energy Generation

In the Field of Medical Science

In the field of Remote Sensing Application:Application of Remote Sensing and GIS in Natural Resource Management for need based action plan for developmental activities. Moreover Mobile Application has been developed for specific governance application, such as Crime GIS on pilot basis, Asset Mapping.

6. 5 Years Vision of ASTE Council :

1. Increment of the no. of Aryabhatta Science Centres from 219 nos. to 254 nos. and to increase the coverage area of Aryabhatta Science Centre from 27 districts to 33 districts.
2. Facilitation of 50 nos. of local state specific technology generation projects from the state under the scheme 'Innovation, Technology Generation and Awareness' (ITGA).
3. Support to state specific Research and Development projects from researchers (universities, engineering colleges, colleges etc.).
4. To establish a technology demonstration centre which will act as a state-of-the-art facility for demonstration of technologies generated through various technology generation programmes of the state Council, R&D institutions and by grass root innovators of the state.
5. In the field of solar radio astronomy, activities related to research and training would be carried out.
6. Activities to be carried under Patent Information Centre (PIC) of the division – Filing of Patent and other IPRs like Copyright, Trademark, Industrial Design etc; Filing of Geographical Indications; Patent search ; IPR workshop and camps; Resolution of examination reports for IPRs filed; IPR consultation etc.
7. Setting up of 23 District Science Centres
8. Setting up of Science City Guwahati

BIHAR COUNCIL ON SCIENCE & TECHNOLOGY (BCST)

1. About the council and its programme

Bihar Council on Science & Technology, Patna, registered under Societies Registration Act 21 of 1860 was set up under the financial and administrative control of the Department of Science & Technology, Government of Bihar to act as a focal forum for popularization and promotion of science and technology in the state of Bihar.

Vision

To become facilitator and mentor for promoting R&D on one hand and to service the technological requirements of the common man through development of science and technology on the other.

Mission

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.

Council : The General Body

The Chief Minister, Bihar is the President and the Minister and the State Minister, Science & Technology, Bihar are the Vice Presidents of the Council. The Principal Secretary, Science & Technology is the Secretary of the Council. There are 26 members in the council which included representatives of various State Government Departments, reputed industries, organizations and institutions from all over the country.

Executive Committee

The Development Commissioner, Bihar is the Chairman and the Principal Secretary, Science & Technology, Bihar is the Vice Chairman of the Executive Committee. There are 12 members of the Executive Committee which include Principal Secretaries of various State Government Departments.

2. Activities performed by the Council during the year 2018-19

i. Coordinated and supported 26th State Level Children Science Congress 2018 organized by Science for Society, Bihar, Patna during 25-27 October, 2018 at Mount Litera Public School, Ulao, Begusarai Science.

ii. Participated in the 106th Indian Science Congress Pride of India Expo, 3-7 January, 2019 at Lovely Professional University, Phugwara, Punjab

iii. Sanctioned and released partial financial assistance of Rs. 60,000.00 each to Dept. of Physics, IIT, Patna and Dept. of Chemistry, G.B. College, Naugachia, TMBU, Bhagalpur for organizing International Conferences.

iv. Organized one day "Technical Bonanza" with University of Engineering & Management, Kolkata on 18.01.2019 at Patna.

v. Organized National Science Day 2019 on 28th February, 2019 at Patna and supported organizing NSD 2019 at eight institutions – two Govt. Engineering Colleges and six Govt. Polytechnics of the state

vi. Organizing Lectures on Science Communications by Shri Santosh Takale, Senior Scientist, BARC, Mumbai at various Engineering Colleges and Polytechnics all over the state

vii. Organized several workshops on exhibit design and contents regarding establishment of Dr. APJ Abdul Kalam Science City at Patna.

viii. Dept. of Science & Technology, Govt. of Bihar vide order no. 2759 dated 5.10.2018 sanctioned Student Project Scheme to Bihar Council on Science & Technology, Patna and released grant for three years 2018-19, 2019-20 and 2020-21 @ Rs. 20.00 lakh per year for a total of Rs. 60.00 lakhs.

ix. The Indian Institute of Technology, Patna has prepared a DPR for establishment of Central Instrumentation Facility cum Central Robotics Centre (CIF-CRC) under BCST. The process for setting up the centre at IGSC-Planetarium campus is under progress.

x. Financial assistance of Rs. 90,000.00 was released to Team "ASHWA" of students of Birla Institute of Technology, Patna for design and fabrication of All Terrain Vehicle in BAJA SAE INDIA 2018 competition held during 5-9 March, 2018 at IIT, Ropar, Punjab.

3. Key activities undertaken during the last two years in the area of:-

3.1 Popularization of Science

State Level Children Science Congress organized by Science for Society, Patna University, Patna sponsored by DST, GOI and coordinated by BCST

The 26th State Level Children's Science Congress was organized during 25-27 October 2018 at Mount Litera Public School, Ulao, Begusarai. The focal theme of the congress was "Science, Technology and Innovation for Clean, Green and Healthy Nation". A financial assistance of Rs. 3.00 lakh was released by BCST for the purpose. Prize money of Rs. 5,100.00 each totaling Rs. 2.55 lakhs was distributed to 51 State Awardees of the Congress.

Participation in 106th Indian Science Congress Pride of India Expo, 3-7 January, 2019 at Lovely Professional University, Phugwara, Punjab

A pavilion showing activities of Bihar Council on Science & Technology (BCST) and Bihar Remote Sensing Application Centre (BIRSAC) was put at Pride of India Expo of 106th Indian Science Congress held during 3-7 January, 2019 at Lovely Professional University, Phugwara, Punjab. BCST also sponsored five students of Nalanda College of Engineering, Chandi, Nalanda for participating in the Congress.

Partial financial assistance to academic Institutions/Departments/ Universities of the state for organizing Seminar/Symposium/workshop

In the financial year 2018-19, partials financial assistance of Rs. 60,000.00 was released to Indian Dept. of Physics, Institute of Technology, Patna for organizing "International Conference on Quantum & Atom Optics" (ICQAO-2018) held during 16-18 December, 2018 at IIT, Patna.

Partial financial assistance of Rs. 60,000.00 was also released to Dept. of Chemistry, G.B. College, Tilka Manjhi Bhagalpur University, Bhagalpur for organizing International Conference on "Recent Advances on Chemical Sciences and Allied Areas" (RACS2A-2018) held during 28-30 December, 2018 at GB College, Naugachia, Bhagalpur.

Organization of Technical Bonaza

A one day Technical Bonaza was organized in association of University of Engineering and Management, Kolkata on 18.01.2019 in the auditorium of IGSC-Planetarium, Patna. About 250 school students from Class IX to XII of various schools of Patna participated in the event. The event constituted of Quiz, Debate, Mathematics, Science Model competition and Robotics Exhibition. Prizes and citations were distributed to winners.

National Science Day 2019 Celebrations

National Science Day 2019 on the theme "Science for the People and the People for Science" was organized by BCST on 28th February, 2019 in the auditorium of IGSC-Planetarium, Patna. Financial assistance @ Rs. 25,000.00 totaling Rs. 2.00 lakh was sanctioned and released to eight institutions namely, Nalanda College of Engineering, Chandi, Nalanda, Gaya College of Engineering, Gaya, Govt. Polytechnics at Muzaffarpur, Sitamarhi, Saharsa, Bhagalpur, Vaishali and Motihari.

Lectures on Science Communications

A series of lectures starting from 30.03.2019 till 12.04.2019 on Science Communications by Shri Santosh Takale, Senior Scientist, Bhabha Atomic Research Centre, Mumbai was organized by Bihar Council on Science & Technology at various Engineering Colleges and Polytechnics all over the state (report attached).

Establishment of Science City at Patna

The State Government has sanctioned grant for establishment of Dr. APJ Science City at Patna. Several workshops on exhibit design and contents of Science City, Patna were organized.

3.2 Research and Development

Student Project Scheme

In order to develop and utilize the talents and potential of students of Bihar and to use for solving specific scientific and technological problems relevant and useful to our society, Student Project Scheme has been sanctioned by Dept. of Science & Technology, Govt. of Bihar vide order no. 2759 dated 5.10.2018 for three years 2018-19, 2019-20 and 2020-21 @ Rs. 20.00 lakh per year for a total of Rs. 60.00 lakhs to Bihar Council on Science of Technology, Patna (copy attached). A proposal budgeted at estimated cost of Rs. 155.16 lakhs for 3 years (including State Govt. share of Rs. 60.00 lakhs) was submitted to Dept. of Science & Technology, Govt. of India for sanction of Govt. of India's share of Rs. 95.16 lakhs.

Establishment of Central Instrumentation Facility cum Central Robotics Centre

The Indian Institute of Technology, Patna has prepared a DPR for establishment of Central Instrumentation Facility cum Central Robotics Centre (CIF-CRC). The process for setting up the centre at IGSC-Planetarium campus is under progress.

3.3 Technology Development

Sponsorship of Students Projects

Financial assistance of Rs. 90,000.00 was released to Team "ASHWA" of students of Birla Institute of Technology, Patna for design and fabrication of All Terrain Vehicle in BAJA SAE INDIA 2018 competition held during 5-9 March, 2018 at IIT, Ropar, Punjab.

3.4 Innovative activities

Seminar on Innovation

Dept. of Science & Technology, Govt. of India has sanctioned and released sum of Rs. 3.00 lakhs to BCST for organizing seminar on Innovation. A meeting was organized between the various state stakeholders – Jeevika, Bihar Industries Association, MSME.

4. List 5 success stories with brief about 1 page each including photograph, if available

Establishment of Indira Gandhi Science Complex – Planetarium (IGSC-P) – Popularly known as Taramandal was established and was opened for public on 1st April, 1993.

Establishment of Bihar Remote Sensing Application Centre (BIRSAC) – BIRSAC was established to fully take advantage of the satellite technology which provides a powerful and all pervading instrument of information and making it an integral input of planning process. Presently, BIRSAC is the nodal agency for procurement of hardware and software in the field of Remote Sensing and GIS in the state of Bihar.

5. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

A policy guidelines for supporting grass root innovators to convert their innovative ideas into prototype (field tried) model has been notified by no. BCST-RD-01/2013-853 dated 07.03.2019 (copy attached).

6. How strong are the links between other state government/departments if so provide details.

BIRSAC under BCST has linkages with several State and Central Govt. departments namely, DOS, NRSA, Agriculture, PWD, Irrigation, Road Construction, PHED etc.

7. How strong are the links of the council with State line Departments, local industry units/associations?

BIRSAC has linkages with several State and Central Govt. departments namely, Dept. of Space, National Remote Sensing Agency, Agriculture, Public Works Dept, Irrigation, Road Construction, Public Health & Engineering Dept etc.

BCST jointly in coordination with National Council of Science Museums, Kolkata and Ministry of Culture, Govt. of India is executing work for establishment of Dr. APJ Abdul Kalam Science City, Patna and Sub-Regional Science Centre at Bodh Gaya.

8. Proposed programmes and budget outlay for 2019-20

8.1 Proposed programme 2019-20 (State Plan)

S.No.	Programme Head
1.	Strengthening of BCST Secretariat (Non-supported GOI manpower) and Centralized activities
2.	Establishment of District Science Centre
3.	Popularization of Science
4.	Science Foresight (Grant for seminar, research paper presentation, publication of journals etc.)
5.	Establishment of Central Instrumentation Facility cum Central Robotics Centre (CIF-CRC)
6.	Establishment of Scholastic Centre (Establishment of e-Library, Science Gallery)
7.	Computerization & Networking of 13 Govt. Polytechnics
8.	Computerization & Networking of 2 Govt. Engineering Colleges
9.	Quality Improvement of Teachers Education in Govt. Polytechnic
10.	Popularization of Technical Education & Biotechnology Policy
11.	Establishment of Dr. APJ Abdul Kalam Science City, Patna
12.	Establishment of New Laboratory of BIRSAC
13.	Establishment of IIT, Bhagalpur
14.	Seminar on Innovation
15.	Student Project Scheme

9. 5 years vision of the Council

Establishment of Dr. APJ Abdul Kalam Science City, Patna

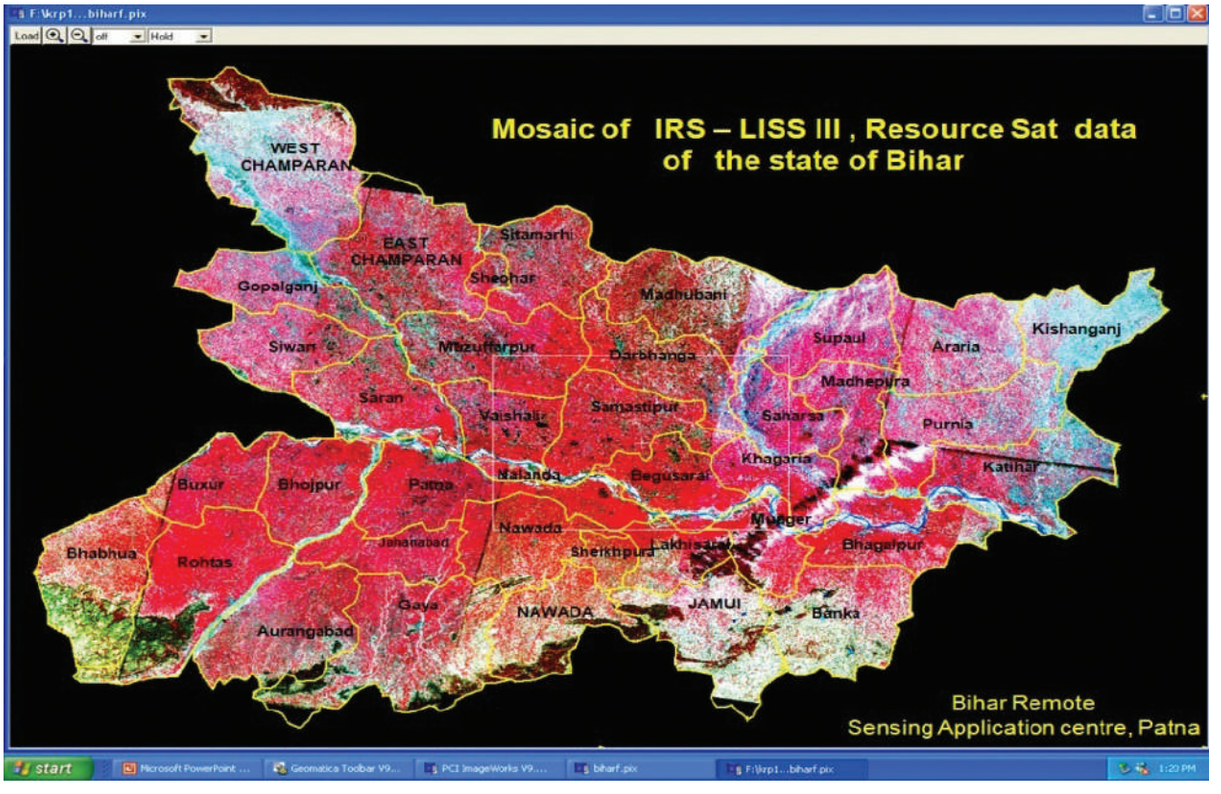
Establishment of Indian Institute of Information Technology, Bhagalpur

Establishment of Sub-Regional Science Centre cum Planetarium, Bodh Gaya

Renovation and Installation of New Digital Projection System at IGSC-Planetarium

Establishment of Central Instrumentation Facility cum Central Robotics Centre (CIF-CRC) in BCST

Workshop on Exhibit Design & Content of Dr. APJ Abdul Kalam Science City, Patna



Planning and decision making tool

CHATTISGARH COUNCIL OF SCIENCE AND TECHNOLOGY

1. About the Council and its programme:

Chhattisgarh Council of Science & Technology was established in the year 2001 with the objective to identify areas in which Science and Technology could be used for achieving socio-economic development of the State by inculcating scientific temper and outlook through popularization of science among masses in general and student community in particular. The Council is an autonomous body functions under the overall supervision and direction of General Body headed by the Chief Minister of the State and Executive Body headed by the Minister in-charge of Science & Technology. The major programmes of the Council are Popularization of Science, Research & Development Promotional, Science for Society, Technology Development/Transfer/ Demonstration, Central Laboratory Facility, Intellectual Property Right Centre (IPRC) (Patent Information Centre, GIAN Cell and Innovation Fund Programme), Chhattisgarh Space Application Centre and Coordinator Cell.

2. Activities performed by the Council's during the year 2018 – 2019:

Popularization of Science: Children Science Congress-2018 Young Scientist Congress-2019 were organised. Block, district and state level programmes of National Science Seminar, Science Quiz Competition; Science Exhibition; Mathematical Olympiad were also organized. Mobile lab facility to the remote school students was extended to Government Higher secondary Schools of various blocks of Bilaspur District for conducting demonstration of science experiments for students.

Research & Development Promotional: During current year 5 new & 19 ongoing Mini Research projects, 34 proposals for Seminar/Symposia/Conference; 6 proposals for Travel Grant and 02 Publication Grant were sanctioned.

Science for Society: This year 03 projects have been sanctioned Screening & Awareness programme on Malnutrition in women and children'; SPSS Training Programme and Application & proposal for seeking grant for IBM SPSS Statistics Base v 2.50 and additional Modules for usage in social sciences.

Technology Development/Transfer/Demonstration: Shri Shyam Rao Shirke was assisted by the Council for prototype development and testing of the proposed innovation of production of 'Methane gas from running drainage water'. Council also assisted for filing of patent through Patent Information Centre, CCOST. After the filing of the patent and the technology was transferred to RENCUT India Private Limited, Delhi. One more case of Shri Tukalal Verma which has been facilitated by the PIC, CCOST for filing of patent on 'Protective gel for tyres' is being explored for technology transfer and TVS Tyres have given orders for application of the gel in 100 tyres for testing.

Central Laboratory Facility: Council has established a state of art Central Laboratory to provide instrumentation facility to scientists, researchers, students and innovators of the state. This year a total of 57 students completed their dissertation work and 34 students are pursuing their dissertation work. 08 students are pursuing their Ph.D. work using the instrumentation facility. Further the CLF facility extended testing facility to State Forest Research Institute, Department of Forest, GOCG; Guru Ghasidas University, Bilaspur, Pt. Ravi Shankar Shukla University, Raipur, Ultimate Environatica, Raipur and ACAME Solar Power Ltd., Raipur.

Intellectual Property Right Centre (IPRC) (Patent Information Centre, GIAN Cell and Innovation Fund Programme): 09 Institutional Patents and 01 IC Layout designs applicants were forwarded to TIFAC, DST, GOI for facilitation for filing. Apart from this 09 individual patents, 08 trademarks applicants, 01 design applicant were facilitated through PIC, CCOST. 01 PCT application filed through Technology Information, Forecasting and Assessment Council (TIFAC), Department of Science and Technology, Government of India. 12 IPR lectures and 03 workshops were organised sensitizing about 2000 academicians, researchers and general masses of the state in IPR issues. To enhance the reach and provide better services to applicants a single desk counter has been created in the Council for addressal of IPR queries and other facilities of search and filing carried out by the PIC.

Chhattisgarh Space Application Centre: 15 national and state funded projects have been initiated under the Chhattisgarh Space Application Centre. The broad areas of the projects taken up are Landuse / Landcover mapping, Sericulture development, estimation of Forest biomass in the state, assessment of Tree outside forest, Minor Mineral Trigger Generation, Master Plans of 9 towns on GIS platform, Space based high resolution mapping for drought affected 154 Villages, Groundwater quality mapping, Monitoring of Integrated Watershed Management Programme and National Wetland Inventory and Assessment- (NWIA) Phase –II projects. Thus assisting technically for ease of planning to various development departments of the state like Water Resource Department, Public Health Engineering Department, Forest Department, Town and Country Planning, Agriculture Department etc.

Coordinator Cell: This Cell is established to ensure intervention of S & T for streamlining the activities of the Council with State Universities, Colleges and institutions.

3. Key activities undertaken during the last two years:

Popularization of Science: Apart from the national and state sponsored Science Popularization programmes the Council took initiative looking into the dire need of lab facilities in the government schools of the state and initiated Mobile Lab programme. 03 Mobile Science Laboratories have been indigenous created equipped with Physics, Chemistry and Biology instrumentation, chemicals and glasswares for demonstration and use by the teachers as well as students .

Technology Development/Transfer/Demonstration: Shri Shyam Rao Shirke was assisted by the Council for prototype development and testing of the proposed innovation of production of 'Methane gas from running drainage water'. Council also assisted for filing of patent through Patent Information Centre, CCOST. After the filing of the patent and the technology was transferred to RENCUT India Private Limited, Delhi. One more PIC, CCOST facilitated case of Shri Tukalal Verma for filing of patent on 'Protective gel for tyres' is being explored for technology transfer and TVS Srichakra Limited have given orders for application of the gel in 100 tyres for testing.

Intellectual Property Rights Centre (IPRC) (Patent Information Centre, GIAN Cell and Innovation Fund Programme): With the suo-moto initiative of the PIC, CCOST Institutional IPR Policy was formulated and brain storming on the Institutional IPR Policy was organised under the chairpersonship of Director General, CCOST in which leading Universities, Colleges and Institutions of the state participated. Pt. Ravishankar Shukla University, Raipur, National Institute of Technology, Raipur, Columbia College of Pharmacy, Raipur have devised their Institutional IPR Policy thereof and several other universities and colleges are in process of devising or adopting the proposed Institutional IPR policy by the Counicl. Further with the PIC, CCOST initiative 01 PCT application for Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur and Indian Council of Medical Research (ICMR) filed through Technology Information, Forecasting and Assessment Council (TIFAC), Department of Science and Technology, Government of India on Novel 5-[4-(2-Biphenyl-4-YL-2-Oxo-Ethoxy)-Benzylidene]-Thiazolidine-2,4-Diones, their synthesis and uses thereof. The Council's decision to initiated a single desk counter for addressal of IPR queries and other facilities of search and filing carried out by the PIC has been instrumental in increase footfall for the PIC, CCOST.

Technology Demonstration and Dissemination: Two Rock Bee Honey Harvesting Centres at Dantewada district were made operational to collect honey in the most scientific and sustainable manner taking adequate precaution to minimally damage honey bee colony so that after the collection same hive may produce honey in shorter time.

Chhattisgarh Space Application Centre (CgSAC): Council's extends assistance for ease of planning to various development departments of the state like Water Resource Department, Public Health Engineering Department, Forest Department, Town and Country Planning, Agriculture Department etc.

4. List of 5 success stories:

Two Rock Bee Honey Harvesting Centres at Dantewada district were made operational to collect honey in the most scientific and sustainable manner taking adequate precaution to minimally damage honey bee colony so that after the collection same hive may produce honey in shorter time. During this period more than 2000 Kg rock-bee honey was

collected, refined and commercialised by beneficiaries under the brand name 'Bastar Honey'.

Under 'Innovation fund programme' Council has provided financial assistance to Shri Om Prakash Goyal for prototype development project under his project entitled 'OPTER Two in One' bike for harvesting of water hyacinth from the ponds of Chhattisgarh. The project is being executed with the support of Department of Farm Machinery and Power Engineering, Faculty of Agricultural Engineering, IGKV, Raipur where the applicant is being provided laboratory and mentorship facility. The work under the project is complete and demonstration was scheduled in presence of the Director General, CCOST and the expert committee.

Under Minor Mineral Trigger Generation Project- Geo-referencing & Digitization of lease area completed for 11 leases of Raigarh, 8 leases of Mahasamund and 21 leases of

Bilaspur has been completed. Similar work and Satellite data is being processed for trigger generation in the state now for mining activity in the state.

Council has made conscious efforts to sensitize the revenue and land records department to create GCP network in the state which would be a landmark in modernization of land records in the state. A pilot scale implementation has been initiated in Naya Raipur area.

Under the Research and Development Promotional Activities of the Council the Mini Research Projects screened and sanctioned on state specific phytochemicals and herbal medicine domain have been selected for further research and project development by State Medicinal Plant Board (SMPB), Department of Forest, Government of Chhattisgarh. The Principal Investigators of the projects have been provided with grants by SMPB and Central Laboratory Facility by Council for product development for development of herbal medicine sector in the herbal state of Chhattisgarh.

5. Specific state related S&T and Innovation Policy:

Council has prepared state S&T policy and has been sent to the concerning department for review and notification.

Draft IPR policy for the state has been formulated and being vetted by the state concerning departments for notification.

6. Links between other State Government/Departments:

Council has linkages with State Governments and Departments of the state of Karnataka, Punjab, Madhya Pradesh, Maharashtra, Meghalaya, Telangana and Gujarat. These linkages have enabled Chhattisgarh Council of Science and Technology to propagate technologies like Honey Bee Harvesting and Processing, Menstrual Hygiene amongst rural women, ground water recharging, rain water harvesting and sericulture etc.

7. Links of the Council with local Industry Units/Associations:

The Council's official is member of the state committee of MSME. Further the Council is linked with 36inc (Startup Incubation Facility under Industry Department, GOCG), FICCI, CII state chapter for addressal of their IP issues. Council's Central Laboratory Facility has extended incubation facility for start ups of the state and also providing testing facility for the industries of the state for soil, water and phyto-chemical testing.

8. 05 years vision of the Council:

Identify and facilitate needs based Technology Transfer to Rural areas

Thrive to effectively organize S&T promotion schemes like Chhattisgarh Young Scientist Congress, National Children Science Congress, National Science Day and National

Mathematics Day, Western India science Fair, National Science Seminar, Science quiz and science exhibition at block, district, zone and state level with maximum participants of students and teachers.

Establish new Science Park in 6 districts of the state, Community Science Club and Popular Science Book Corner in Govt. Schools of the state.

Identify new schemes under science and society programme related to tribal target group.

Extend Advanced Instrumentation training to Researchers, Academicians, and Students of the state and encourage systematic research for consolidation as Dissertation and/or Ph.D.

Reach out to the Universities and colleges for IP awareness and organize IPR workshops at school and college level.

Extend financial supports to R&D activities in Universities/Colleges/S&T Institutions and provide them platform to showcase their research.

- Extend geoinformatics support to development departments of the state and also extends training support to the officers of the development departments.

Young Scientist Congress

Science Park

GOA STATE COUNCIL FOR SCIENCE & TECHNOLOGY

1. Activities performed by the State Council during 2018-19

Patent Information Centre
National Science Day Celebrations
National Mathematics Day Celebrations
Children Science Congress-2019
Swachhata Action Plan 1.ODP Awareness 2.Capacity Building Programme in Bio-diversity & Waste Management 3. Awareness on Wetland Conservation 4. Cyclothon—Awareness on Air Pollution
Meet the Scientist programme
Entrepreneurship Development Program in Biotechnology
Participation in IISF
National Green Corps

2. Key activities under taken during the last two years in the area of:-

a.Technology Development:

A.State Council with the support of State government and Goa Management Institutes devise a State feni policy and a mechanized process for feni distillation.

B. Proposed: To develop a simple practices for preparation of cashew apple jaggery and kokum butter, which will promote rural agro based small income generating activities as required resources are available in ample quantity**.**

b. Technology Demonstrations:

Demonstration of vermicomposting and composting is a common activity of the State Council, wherein State Council promotes regular programmes for farmers, SHGs and school students.

Demonstration for Water structures for both rainwater and roof water is also a routine practice of State Council as required technical expertise is available with State Council.

Proposed: Fish rearing technology for salt water fish

c. Popularization of Science: Popularization of Science is a routine activities of the State Council wherein various activities / programs were organised under the following program..

i. National Science Day

ii. National Mathematics Day

iii. Children Science Day

iv. District and Taluka level science exhibitions involving school students.

d. Patents: State Council with the support of DST, GoI, New Delhi re-established the Patent Information Centre in April, 2019. However, the revival of patent information centre was initiated by State government by sanctioning Rs. 10.00 lakhs for initiating GI registration, wherein following five GIs application were filled with GI Registry, Chennai

1. Coconut feni
2. Goa Coconut vinegar
3. Khola Chill
4. Harmal Chill
5. Goan Khaje (local sweet food item)

State government devised the scheme for supporting State PIC for acting as facilitator and providing technical support for filling various IPRs , through Directorate of Industries Trade & Commerce, Govt. of Goa.

e. Any new innovative activities 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.

3. List 5 success stories with brief about 1 page each including photograph, if available.

1. Entrepreneurship Development Programme in Bio-technology programme.

The programme is specially organized to provide an hands on training opportunity for BSc - Bio-technology students of Dhempe College of Arts &Science , 30 final year students were identified and given a 45 days hand s on training to prepare various bakery, confectionary and squash, wines and serbat items

Objectives:

To provide an opportunity for Bio-technology students hands on training in bakery and confectionary

To provide required training for students and encourage them for starting their own small business

To increases concern amongst students for bio-technology related small act

Considering the above objectives, and in order to achieve the desired goals the Goa State Council for Science and Technology, Saligao with the financial support from Department of Science & Technology, Govt. of Goa and in association with Dhempe College of Arts & Science, Miramar panaji organize 45 days entrepreneurship programme for final year BSc Bio-technology students. Following produce where considered in the EDP

The participants of the EDP programme along with their course completion certificate.

2. Patent Information Centre:

Patent Information Centre - though re-established in April, 2019 with the financial support of the DST, GoI, New Delhi, its revival was initiated in 2017-18 with the financial support of the state government, where in State government identified state council as the agency to file Geographical Indications (GIs) where in following GI applications filled as on.

Coconut feni

Goa Coconut Vinegar

Khola Chilli

Harmal Chilli

GoanKhaje

Out of the above, GI registry Notified Khola Chilli in GI journal no.121 dated 26/04/2019 where as for coconut feni registry ask for amendment in our original cashew feni application for suitable GI status.

3. Meet the Scientist Programme:

Meet the Scientist programme was organized in two colleges, one at St. Xavier College, Mapusa and second Dhempe College , Miramar wherein the Dr. R. K. Singh, Scientist & Head, Media Relation & Publicity , BARC interacted with the students and faculty w.r.to the various technologies developed by the Department of Atomic Energy, GoI, New Delhi and its importance towards societal development. The career opportunities available in DoE is also elaborated by Dr. Singh along with the safety followed in various Nuclear power plant, and importance of nuclear power plant to fulfill the growing power requirement of our fast developing country

4. Swachhata Action plan of MoEF& CC, GoI was successfully implemented by the State Council wherein following issues were addressed

i.Open Defecation: Goa State though considered as a fast developing State, is yet to achieve any Nirmal Gram puraskar or Open Defecation free village status, considering the same, four awareness program were organized covering two blocks in each districts, wherein representative of Village Development Committees and Village Drinking Water & Sanitation Committee, other development related committee and issues pertains to the harmful impacts of open defecation on health and natural resources were discussed, wheren the committee members participated were requested to play a required role in planning and executing required measures for ODF villages

ii.Air Pollution: As a part of combating air pollution, an awareness creating cycle rally was organised on 14th Feb, 2019 in the Panaji city jointly with FomentoMedia group., wherein more than 350 cyclists participated in the Rally and gave message towards minimising air pollution by opting all possible means.

iii.Bio-diversity & Waste Management: Two days Capacity Building programme was organised for teachers on Bio-diversity and waste management in association with CEE, Goa State Office.

iv.Wetland Conservation: in order to promote wetland conservation and highlight the importance of wetland ecosystem awareness lecture was organised for the students of St. Xavier College, Mapusa-Goa

5. National Green Corps

The Goa State Council for Science & Technology (GSCST), Saligao, Goa is the State Nodal Agency for Implementing the National Green Corps (NGC) programme in the State of Goa. In this direction, schools organized various environment related events during the academic year The Ministry has enhanced the Grant-in-Aid from Rs. 2500/- to Rs. 5,000/- per Eco-club, which were released to 432 schools out of 500 Eco-club.However, no GIA received for 2018-19, but school eco-club continues to implement the activities .

6. National Mathematics Day

The Goa State Council for Science and Technology celebrated (observed) Mathematics day on 20th February 2018 at Menezes Braganza Auditorium Panaji Goa. At the beginning the State Coordinator Shri.SanjeevChodankar welcomed the gathering and briefed out the importance of the days and the contribution of great mathematician SrinivasRamanujan. To give respect and tribute to a great man SrinivasRamanujan offer garland to their photos with the hands of Member Secretary, participating teachers, Students and the officials of State Council.

On this occasion a competition such as power point presentation on contribution of Indian Mathematicians was highlighted by the various Schools of Goa. The below mentioned schools were presented their PPT.

4. Has the Council developed any specific state related S & T and innovation policy? If so the details to be provided.

State Council was constituted as a body to advise the State government to framed and execute S & T policy for the State. However, Department of S & T works on issue based and accordingly act to each relevant S& T issue separately.

5. How strong are the links between other state government / departments if so provide details?

Links with other state government department is issue based State Council works on Science popularizations and environment awareness activities. However, earlier involved with various remote sensing related projects. Even as on today there is no specific workload for State Council.

However, State Council is working together with following DSTE and other State level agencies to implement various programs/ activities.

Goa State innovation Council

Goa State Remote Sensing Agency

Goa State Waste Management Corporation

Goa State Bio-diversity Board

Goa State Pollution Control Board

Goa State Wetland Authority

State Institute of Education, Research and Training

Goa Science Centre

Director of Industries ,Trade and Commerce

Association of Friends of Astronomy

6. How strong are the links of the Council with local industry units/associations?

State Council is yet to get fully associated or linked with local industries, the matter pertains to IPRs such as GIs, Patents, Trademark and Design will help the State Council to interact with industry peoples and associate with them,to implement the state council projects successfully in nearby future.

7. List 5 major technology area, where the council can play an important role by finding convergent technological solutions.

1. Water conservation through rain and roof water harvesting
2. Demonstration Technology for rearing salt/fresh water fish
3. Kitchen waste water treatment solution.
4. Igniting the young talent and rural artisans for innovative ideas .
5. Promotion of Conservation of GIs produce & enhancing its marketing potential

GUJARAT COUNCIL ON SCIENCE & TECHNOLOGY (GUJCOST)

1. Key activities under taken during the last two years in the area of:

1. Technology Development / Research and Development:

The Government of Gujarat has notified the Science Technology and Innovation (STI) Policy vide its GR dated 15-04-2018. The policy aims to provide science, technology and innovation based solution for fulfilling needs of society, community and industry for faster economy development. The STI Policy has the vision of creating a self-reliant, innovative, healthy and prosperous society living in a clean, green and sustainable environment with adequate and nutritious food, clean water and other natural resources, valuing its own and globally available knowledge base by translating science and upgrading technology for faster, inclusive and sustainable development. GUJCOST has given the responsibility as coordinating agency for operationalizing the policy.

In order to promote research, development and innovation in science-based strategic fields and technologies for the development of knowledge-based economy in the state, two key schemes have been announced under a dedicated STI fund, which are as follows:

1. Research Support Scheme for R & D in emerging fields of S & T on State Priority Areas
2. Technology Demonstration and Pilot Deployment on Innovative Solutions

Under this scheme, a maximum of Rs.50.00 lakhs will be available for conducting the research and development activities in identified state priority areas for the selected projects from universities, research centers, institutions of STEM disciplines conducted by Ph.D scholars/PG scholars and faculty. Through this plan, instead of basic research, the important issues of the state will be resolved through science, technology and innovation and contributing to the welfare of the society by applying research.

2. Technology Demonstrations

· For Technology Demonstration and Pilot Deployment, GUJCOST has announced a scheme for providing financial support with an upper limit of Rs.50.00 lakh per pilot project. The scheme for Technology Demonstration and Pilot Deployment aims to strengthen the service delivery framework and for creating new innovative models which are specific to the service delivery obligations of the Government and the local bodies, and to support innovation in fields which currently are not served.

GUJCOST has procured 10 supercomputers, 8 PARAM Shavak High Performance Supercomputer and 2 Deep Learning Supercomputer from C-DAC, Pune and established the same in selected engineering colleges including (1) Department of Botany, Bioinformatics & Climate Change Impacts Management, University School of Sciences, Gujarat University,

Ahmedabad (2) Indian Institute of Information Technology, Vadodara, IIITV Gandhinagar Campus, Block No.9, GEC, Sector-28, Gandhinagar (3) Birla Vishvakarma Mahavidyalaya, BVM Engineering College, Vallabh Vidyanagar (4) Sardar Patel University, Vallabh Vidyanagar, Anand, (5) Faculty of Technology, Dharmsinh Desai University, Nadiad (6) Leelaben Dashrathbhai Ramdas Patel (LDRP), Gandhinagar (7) Dept. of Computer Sc. & Engg., Faculty of Tech. & Engg., The M. S. University of Baroda. (8) GSFC University, Vadodara (9) Institute of Technology, Nirma University, Ahmedabad (10) Chandubhai S. Patel Institute of Technology, Anand

GUJCOST has successfully established Design Labs to provide the facilities to students and faculties with creative and innovative ideas. During 2018-19, ten Design Labshave been established at Bhuj, Modasa, Dahod, Godhra, Gandhinagar, Surat, Morbi, Vadodara, Junagadh and Ahmedabad. The Establishment of the Design Lab has been established in selected institutions. 1. Govt. Engineering College, Bhuj, 2. Govt. Engineering College, Modasa, 3. Govt. Engineering College, Dahod, 4. Govt Engineering College, Godhra, 5 Govt. Engineering College, Gandhinagar, 6 Govt Engineering College, Surat, 7. Lakhdhirji Engineering College, Morbi, 8. School of Technology, GSFC University, Vadodara. 9. Noble Engineering College, Junagadh and 10. IIT-RAM, Ahmedabad.

Providing financial support to different universities / colleges / institutions for organizing 359 Seminars / Symposia / Workshops / Training Programmes at State, National and International level with a financial support of Rs.158.26 lakh.

GUJCOST in collaboration with NITI Aayog, Govt of India, has taken as a support and mentoring role in establishing 450 Atal Tinkering Lab (ATL) in all 33 districts of the state. Each of the school has received a grant of Rs.10.00 lakh for establishing the Atal Tinkering Lab and another Rs.10.00 lakh for operation and maintenance for next five years from NITI Aayog.

To improve the level of competence and skill set amongst the students of STEM institutions of the state, GUJCOST will be organizing ROBOT making Competition ROBOFEST-19 amongst Science, Technology, Engineering, and Mathematics institutions in the state during August, 2019.

3. Popularization of Science

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 and School Science Clubs across the state to engage, educate and empower children and citizen at the interface of science, technology and society. All its programmes and outreach activities basically focused on informal community based learning and intended to enliven the imagination, foster creativity and develop a spirit of inquiry, especially in young minds.

Each year GUJCOST coordinates and organizes the Children Science Congress, Science Quiz, Student Science Seminars, Science Drama, Rural IT Quiz for Secondary & Higher Secondary students with a larger participation and broader outreach. GUJCOST has been regularly participating and putting up scientific exhibition stall in the Indian National Science Congress, India International Science Fair (IISF) and many other theme based scientific programmes and activities and showcase the success stories of the state as well as to capacity building among the different stakeholders.

Every year a series of scientific seminar/symposia/ workshop are being supported, coordinated and organized on the cutting-edge of science, technology and innovation. A year-long activity calendar has been planned and designed in collaboration with DST, NCSTC, Vigyan Prasar, NCSM, RMSA, INSA as well as United Nations Organizations and are being carried out in a very professional and meaningful manner.GUJCOST is celebrated the Science and Technology days, week, months through its Community Science Centres and GUJCOST Science Club.

GUJCOST successfully hosted 25th edition of National Children Science Congress during 2017 at Gujarat Science City Ahmedabad. About 1500 child scientists from different states of India and 45 child scientists from ASEAN countries participated in this prestigious science programme in Science City, Ahmedabad.

During 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.

4. Intellectual property Rights:

Intellectual Property Rights:

GUJCOST has carried out a series of programmes and activities on the promotion and popularization of Intellectual Property Rights (IPR) in the State. The Council has established a Centre of Excellence on IPR at Gujarat National Law University (GNLU). Financial supports have been provided to various institutions and university departments to organise national and International Seminars and workshops on Intellectual Property Rights and its updates and case studies.

During this period, the PIC Cell has successfully carried out the prior art search and submitted applications for patent and GI registrations.

Prior Art Searches:

1. A System and Process for Trapping Insects
2. Energy Efficient Cooking Pots Using Fire Flames
3. Automobile 4 Stroke Engine Modifications for Higher Mileage
4. Solar Powered Lawn Mower
5. Govt Engineering College - GN
6. 31 Project Applications for Patentability
7. Solar Powered Sandwich Grill
8. Zipper collapsible water Bottle
9. Zipper fastener for trucks carrying sand etc.
10. Vertical Axis Windmill with magnetic blades and multiple generators
11. Sewing Needle Vending Machine
12. Emergency Temporary shelter for natural disaster
13. Vertical Axis Windmill - with cone blades
14. Astroscope
15. Automatic Detachable Cycle Time and Output Calculator for Industrial Sewing Machine
16. Broken Needle Collecting Attachment for SNLS Sewing Machine
17. Packed Piece Garment Counting Machine
18. Pedal Less Attachment for SNLS Sewing Machine
19. Automatic Detachable Cycle Time and Output Calculator for Industrial Sewing Machine
20. Gas Safety Device
21. Energy Efficient Fuel Burning Apparatus or Gas Stove
22. Workmate BOT
23. Nemesis - Mobile Car Driving System
24. HExaPanels - Design Registration
25. Loose thread suction Machine for Knit Garments
26. Capture Carbon (C6) and Make Car-Burn Ink
27. Fuel Neutralizing System

Patent Drafting and filling (Provisional/Complete):

1. A complete solar based system for brewing hot beverages (Vivek Kumar, Sumitabh Tiwari)
2. A System and Process for Trapping Insects (Navin Vadaliya; Nisha Vadaliya;Jiten Sakadecha;)

3. Zipit Collapsible Water Bottle (Sajid Rathod, Sohil Khan and Mohaib Khan)

4. Wind turbine power generation enhancement utilizing magnetic repulsion (Sajid Rathod, Sohil Khan and Mohaib Khan)

5. Energy Efficient Gas Burners (Navin Vadaliya, Nisha Vadaliya)

6. Energy Efficient Cooking Vessels (Navin Vadaliya, Nisha Vadaliya)

7. Automatic Detachable Cycle Time and Output Calculator for Industrial Sewing Machine (Ankur Mahija, Meenakshi Gupta)

8. Hand assistive device for deaf and dumb people (Chauhan Darshit Sanjaybhai, Satham Vipul, Shivshankar bhai, Mistry Harshil, Mukundbhai)

9. Manufacturing of paver blocks from waste plastic and other waste (Parth Kamaleshkumar Gathiyawala, Bhut Akashay Kumar, Hansrajbhai Mistry, Meetkumar, Dineshbhai)

10. Milk fat and quantity measurement device (**:** Mahehswari Lalit K, Barot Santosh C, Jambucha Mehul A)

11. An auto-seal mechanism and device for pipes carrying fluids (Parmar Kishorbhia Dalpatbhai)

IPR Information Services:

Many startups availed free information services through physical office visits, emails and telephonic conversations. The office maintains a registry of entry of the physical visits of Inventors to the Office of PIC.

5. Any new innovative activities

GUJCOST has organized the creative learning and hands-on training workshop for Community Science Centre Coordinators / Communicators at Indian Institute of Technology (IIT), Gandhinagar

GUJCOST is organizing Robot Making Competition, "ROBOFEST - GUJARAT" for the students of STEM institutions of Gujarat State. There are nine categories and three different levels of robot making competition – (i) Level-1: Ideation / Concept, (ii) Level-2: Proof of Concept and (iii) Level-3: Prototype Submission. The last date for submission of ideation/concept is 19th August 2019.

Looking at the current trends, GUJCOST has identified nine types of robots expected to be developed by students of STEM institutions in Gujarat that includes (i) Four-legged Robot with quadrupedal motion, (ii) Chess Playing Robot, (iii) Underwater or Submarine Robot, (iv) Table Tennis Robot, (v) Robot Playing Musical Instrument (vi) Rovers (Eight

wheels, 3 to 4 feet size with the camera mounted, auto memory / GPS guided, (vii) Prosthetic Limbs and (viii) Painting Robot, and (ix) Robo Excavator – the pond digging robot.

The ROBOFEST – GUJARAT has three levels of competitions. Interested students in team along with one mentor can submit their idea and concept along with its mechanics, methodology and design on any of the eight categories of robot making as Level I competition. On evaluation, the best three ideation and concept in each category will receive an award of Rs.50,000/-.

At Level II, the selected students will be encouraged to submit their small functional prototype robot as proof of concept (POC) within the time frame of maximum 4 to 6 months. The submitted working prototypes will be evaluated and the best two proof of concept will receive Rs.1,00,000/- to 2,00,000/- as per their robot categories.

During Level III stage, the students will submit their real prototype working robot as proposed in earlier two stages. The team will be given a maximum of 6 to 8 months to work on their prototype robot with all functions and specification. The working robot will be evaluated by the team of experts and the winner team will receive Rs. 5.00 lakh each for the eight categories of robot. Prototypes will be placed permanently in Robotic Gallery in Gujarat Science City.

2. List five success stories with brief about 1 page each including photograph, if available.

1) Establishment of Regional Science Museums

GUJCOST has a scheme to design and develop Five Regional Science Museums (RSM) at Rajkot, Bhuj, Bhavnagar, Patan and Vadodara. Out of these five RSM proposed, four RSMs projects are already at the construction stage at Rajkot, Patan, Bhavnagar, and Bhuj and will be completed by 2020. Various thematic galleries of this regional science museum will be the main attraction center. The design of this regional science museum will be related to the field of Science, Technology, Engineering and Mathematics. Each gallery has been identified as per regional specialty and state priority areas in science and technology.

Each of the RSMs has been constructed over an area of 10.00 acres of land with an estimated cost of Rs.80.00 Crore which has started with the Government of Gujarat grant. Each of the RSMsis based on different theme and innovative concept and each theme and concept has been prepared by considering the demographic potential of that regions.

2) Establishment of supercomputing facilities for research and development in frontier areas of Science & Technology in the State

In order to provide for conducting high-end in-house advance computing studies and research work among the new generation learners, GUJCOST has prepared a scheme to establish supercomputing facilities in the engineering and research institutions in the state.

The GUJCOST supercomputer facility aims to provide capacity building among students and faculties with advanced technologies to perform high-end computations for scientific, engineering and academic programs to address and catalyze the research using modelling, simulation and data analysis. The facility will also help in promoting research by integrating leading-edge emerging technologies at the grass root level.

A total of 16 institutions are now working with PARAM Shavak Supercomputer equipped with latest Intel processor and high speed Nvidia GPGPU accelerator technologies on an immediate basis.

Faculties of C-DAC are visiting such institutions and also providing training on computing real life complex problems of state and national importance.

With PARAM Shavak in the fray, it is now time to harvest the talent and make the most of our skills and expertise.

3) Establishment of a Design Lab in the leading areas of science, technology and information technology in the state

In order to provide an enabling environment and ecosystem for creative thoughts and ideas of young students and researchers, and to provide an ideal platform for the Creative India - Innovative India, GUJCOST has established Design Labs in the universities, colleges and research institutions across the State.

A design lab is a platform for the young students and researchers with creative and innovative ideas. In the design lab, they can transform their idea into a tangible form. Students and researcher with innovative ideas will benefited with such Design labs, where they can easily transform their creative ideas into the deliverable form, at least on a lab scale or pilot project basis. Design labs in science, engineering, and technology disciplines work as a generator of intellectual properties like patents and industrial designs.

GUJCOST has successfully established 18 Design Labs to provide the facilities to students and faculties with creative and innovative ideas. Each of the Design Lab institutions have received a set of instrument / equipment for design lab with a cost of Rs.25.00 lakh, which has been prepared by Expert Committee members

3. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

GUJCOST has prepared the draftScience, Technology and Innovation Policy (STI) Policy of Gujarat and the same has been approved by the State Government. The STI Policy has been approved by the Government of Gujarat and the Hon'ble Chief Minister was announced the STI Policy of Gujarat on 15th April 2018.

The STI Policy of Gujarat aims to provide science, technology and innovation based solution for fulfilling needs of society, community and industry for faster economy development. To achieve the objectives of the STI policy, the policy recommends to create a dedicated STI fund to support technology developments in the priorities sectors.The STI policy prescribes that research support will be enhanced in following emerging cutting edge research and high potential technologies through a dedicated STI fund:

(i) Artificial Intelligence and Robotics
(ii) Biotechnology
(iii) Polymers and special materials
(iv) Nano Technology
(v) Internet of thing (IoT) Solutions
(vi) Energy Storage Solutions
(vii)Waste treatment and management solutions
(viii)Pollution abatement
(ix) Sustainable Habitat
(x) Nutrition sensitive research

In order to promote research, development and innovation in science-based strategic fields and technologies for the development of knowledge-based economy in the state, the state government has announced two key schemes under a dedicated STI fund (STI). which are as follows:

(i) Research Support Scheme for R & D in emerging fields of S & T on State Priority Areas

(ii) Technology Demonstration and Pilot Deployment on Innovative Solutions

Under this scheme, a maximum of Rs.50 lakhs will be available for conducting the research and development activities in identified state priority areas for the selected projects from universities, research centers, institutions of STEM disciplines conducted by Ph.D scholars/PG scholars and faculty. Through this plan, instead of basic research, the important issues of the state will be resolved through science, technology and innovation and contributing to the welfare of the society by applying research.

4. How strong are the links between other state government /departments If soprovide details.

GUJCOST has a strong network and capacity building both State and Central Government Departments.

It also established a link between local among academic institution / industries and corporate sectors.

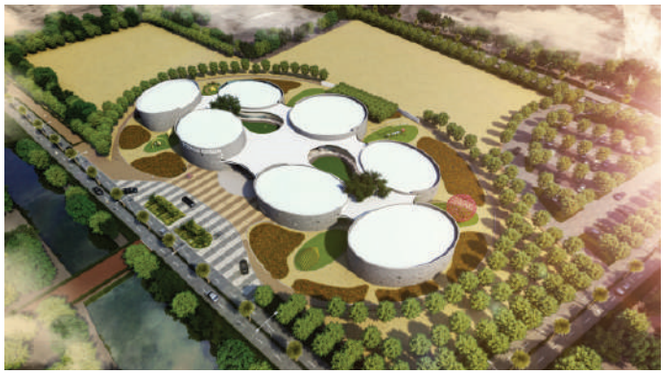
A series of programmes are being designed and developed implemented in association with DST, NCSTC, VP, TIFAC, NCSM, UNESCO, WIPO, UNICEF, UNEP, MSME.

5. How strong are the links of the council with local industry units/associations?

GUJCOST has strong link with the major industry organizations in the state and have developed a network with ASSOCHAM, GCCI, CSI, NSTA.

List 5 major technology area, where the council can play an important role by finding convergent technological solutions.

1. IOT, Artificial Intelligence and Robotics
2. Nanotechnology and Environment
3. EnergyStorage Solution
4. Desalination of sea-water to portable and drinking water
5. Waste Management



Regional Science Museums

State Event of National Children's Science Congress

Release of Science, Technology, Innovation Policy of Gujarat

Design Labs For Creativity & Innovation

HARYANA STATE COUNCIL FOR SCIENCE & TECHNOLOGY

1. About the Council & its programmes :

Haryana State Council for Science & Technology (HSCST) was established in 1986 as an autonomous body, a registered society, under Societies Registration Act 1860. HSCST was established to advise the State Government on policies and measures for promoting Science & Technology in the State and to implement the policies and plans of the State Government agencies towards promotion of Science & Technology in the State.

Programmes:

a. Large scale multiplication of Sugarcane, Sarpgandha, Banana, Bamboo, Brahmi, Gladiolus, Eucalyptus, Dahlia, Potato, Strawberry, Mehandi, Stevia and Aloe vera at Centre for Plant Biotechnology, Hisar

b. Kalpana Chawla Memorial Planetarium at Kurukshetra to create awareness about astronomy among students and general public of State.

c. Setting up of sub-regional science centre at Ambala

d. Science Quiz Contests for School & College students at District, Zonal & State level

e. Science Essay Writing Competition for School and College students.

f. Financial Assistance for attending international conference / seminar / workshop abroad

g. Grant-in-Aid to Research & Development projects

h. Grant-in-Aid for organizing conference / seminar / workshop

i. Haryana Science Talent Search Scheme for Class XI & XII students

j. Promotion of Science Education (POSE) Scholarship Scheme for B. Sc. & M. Sc. Students

k. HSCST Fellowship Programme for Ph.D. students

l. Patent Information Centre

m. Intellectual Property Facilitation Centre (IPFC) for Micro, Small & Medium Enterprises

n. Scheme on conferring Haryana VigyanRatna and Haryana YuvaVigyanRatna Awards

o. Honouring meritorious students of Haryana

p. Setting up of HSCST Science Clubs in Government Senior Secondary Schools of State.

q. Exposure visits for meritorious students

r. Organizing Science Conclaves in Universities / Institutes

s. Celebration of National Technology Day

t. Setting up of Science City for NCR in Haryana

2. Activities performed by the Councils during the year 2018-19

a. Council has developed and standardized the protocols for large scale multiplication of Sugarcane, Sarpgandha, Banana, Bamboo, Brahmi, Gladiolus, Eucalyptus, Dahlia, Potato, Strawberry, Mehandi, Stevia and Aloe vera at Centre for Plant Biotechnology, Hisar.

b. Six Research & Development projects were sanctioned to the universities of State with a total budget of Rs.100.00 Lakhs

c. Six scientists were provided financial assistance for attending international conference abroad. An amount of Rs.1,53,700/- was released for this purpose.

d. Science Quiz Contests for School & College students were conducted at District, Zonal & State level.

e. Science Essay Writing Competitions were conducted for School and College students at District and State level.

f. HSCST has participated in India International Science Festival (IISF) 2018 organized at Lucknow during 05-08 October, 2018. Exhibits of Haryana Space Application Centre (HARSAC), Centre for Plant Biotechnology (CPB) and Kalpana Chawla Memorial Planetarium (KCMP) were exhibited in IISF expo. Students and general public visited from all over the country were briefed about the activities of the Council.

g. HSCST has sanctioned an amount of Rs.30,000/- (Rupees thirty thousand only) on account of organization one day workshop on Capacity Building on Aquaculture to Department of Zoology & Aquaculture, CCS HAU, Hisar.

h. HSCST had organized two exposure visits for the meritorious students studying in Govt. Schools of the State. First visit was organized at National Science Centre, New Delhi on 24th December, 2018 and second visit was organized at PushpaGujral Science City, Kapurthala during 26th to 28th December, 2018.

i. A special program 'Tribute to Kalpana Chawla-2019' was organized at Kalpana Chawla Memorial Planetarium (KCMP) on 01.02.2019. Various educational activities were organized for invited students and teachers.

j. Patent Information Centre Haryana has facilitated the filing of 20 trademarks, 6 patents, one industrial design, one copyright and also delivered 24 lectures in various universities & institutes of State.

k. An amount of Rs.4,60,000/-(Rupees Four Lakhs Sixty Thousand only) was released to seventeen Universities/Institutes/Colleges for organizing workshops / sensitization programmes on Intellectual Property Rights.

l. HSCST had established HSCST Science Clubs in 220 Government Senior Secondary Schools of State (10 schools per district). Grant of Rs.50,000/-(Rupees Fifty Thousand only) had been released to each school for conduction month wise activities, procurement of educational kits and preparation of working models for display during state level science fair.

m. An amount of Rs.5.20 Lakhs was released to 10 polytechnics / ITI's and 21 Engineering colleges / university department of engineering & technology for celebration of National Technology Day – 2018 in their respective institutions.

n. Two science conclaves were organized at Guru Jambheshwar University of Science and Technology, Hisar during 12th – 13th February 2019 and at NIT Kurukshetra during 28th February and 1st March 2019. In these Conclaves, about 1000 students took part and popular talks on various scientific topics were given by eminent speakers. Participating students were encouraged and motivated towards opting for research in sciences as their career.

o. Hon'ble Governor of Haryana conferred two VigyanRatna Awards (cash prize of Rs.4.00 Lakhs, Citation & Trophy) and four YuvaVigyanRatna Awards (cash prize of Rs.1.00 Lakh, Citation & Trophy) to the eminent scientists selected for awards of 2017 & 2018 in an award presentation ceremony arranged at Haryana Raj Bhawan on 28th February 2019.

p. An amount of Rs.300.00 Lakhs was released to State Council of Educational Research & Training (SCERT), Gurugram for disbursement to class XI & XII students under Haryana Science Talent Search Scheme.

q. On-line applications were invited from students under HSCST Fellowship programme. An amount of Rs.39,37,185/- (Rupees Thirty Nine Lakhs Thirty Seven Thousand One Hundred Eighty Five only) had been released to the universities under HSCST Fellowship Programme for onward disbursement to the Ph. D. students.

r. An amount of Rs.300.74 Lakhs was released to B. Sc. & M. Sc. Students under Promotion of Science Education (POSE) Scholarship scheme.

s. Two students were awarded for winning silver medal in International Science Olympiad.

t. Training programmes on Plant Tissue Culture technology were conducted for graduate and post graduate students, faculty members and farmers of Haryana & adjoining states.

3. Key activities under taken during the last two years in the area of:-

(Technology Development, Technology Demonstrations, Popularization of science, Patents, Any new innovative activities)

a. Council has developed and standardized the protocols for large scale multiplication of Sugarcane, Sarpgandha, Banana, Bamboo, Brahmi, Gladiolus, Eucalyptus, Dahlia, Potato, Strawberry, Mehandi, Stevia and Aloe vera at Centre for Plant Biotechnology, Hisar.

b. Demonstration of cultivation of tissue culture plants (Sugarcane & Strawberry) in the field to farmers, students and faculty members.

c. Science Quiz Contests for School & College students were conducted at District, Zonal & State level.

d. Science Essay Writing Competitions were conducted for School and College students.

e. Patent Information Centre Haryana has facilitated the filing of 49 trademarks, 12 patents, 10 industrial designs, 7 copyrights and also delivered 42 lectures in various universities & institutes of State.

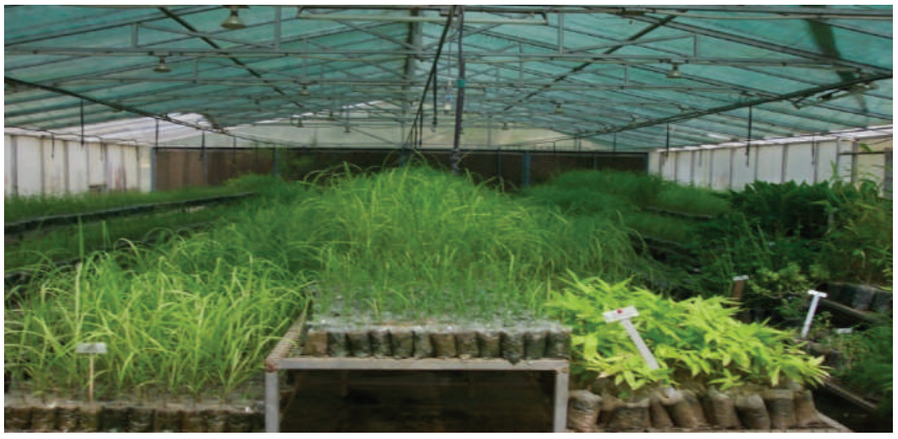
f. HSCST had established HSCST Science Clubs in 220 Government Senior Secondary Schools of State (10 schools per district). Grant of Rs.50,000/-(Rupees Fifty Thousand only) had been released to each school for conduction month wise activities, procurement of educational kits and preparation of working models for display during state level science fair.

4. List 5 success stories with brief about 1 page each including photograph, if available.

a. Ministry of Culture, Govt. of India had sanctioned 'Setting up of sub-regional Science Centre' at Ambala with a cost of Rs.15.20 Crores for execution through National Council of Science Museum (NCSM) on shared funding. State share of Rs.8.65 Crores have been transferred to NCSM and an MOU has also been signed with NCSM for execution of this project on 22nd June 2019. Foundation stone of Science Centre was also laid by Hon'ble Minister, Science & Technology in the presence of Sh. D. Rama Sarma and Sh. S. Kumar, Director, NCSM on 22.06.2019.

b. HSCST has established a Renewable Energy Test Centre (RETC) at Deenbandhu Chhotu Ram University of Science & Technology, Murthal at a cost of Rs.1.00 crore.

c. HSCST had established Centre for Plant Biotechnology at Hisar for large scale multiplication of Sugarcane, Sarpgandha, Banana, Bamboo, Brahmi, Gladiolus, Eucalyptus, Dahlia, Potato, Strawberry, Mehandi, Stevia and Aloe vera.



d. HSCST had established 'Kalpana Chawla Memorial Planetarium' at Kurukshetra to create awareness about astronomy among students and general public.

e. HSCST had set up an observatory at Panchkula for making astronomical observations and popularization of astronomy. Night sky viewing programmes are conducted for the students every month.

5. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided. - NO

6. How strong are the links between other state government /departments If so provide details?

a. Haryana State Council for Science & Technology (HSCST) has participated in India International Science Festival (IISF) 2018 organized at Lucknow during 05-08 October, 2018. Exhibits of Haryana Space Application Centre (HARSAC), Centre for Plant Biotechnology (CPB) and Kalpana Chawla Memorial Planetarium (KCMP) were exhibited in IISF expo. Students and general public visited from all over the country were briefed about the activities of the Council.

b. HSCST has sanctioned an amount of Rs.30,000/- (Rupees thirty thousand only) on account of organization of one day workshop on Capacity Building on Aquaculture to Department of Zoology & Aquaculture, CCS HAU, Hisar.

c. HSCST had organized two exposure visits for the meritorious students studying in Govt. Schools of the State. First visit was organized at National Science Centre, New Delhi on 24th December, 2018 and second visit was organized at Pushpa Gujral Science City, Kapurthala during 26th to 28th December, 2018.

7. How strong are the links of the council with local industry units/associations?

HSCST has strong links with local industry units / associations which resulted in facilitating the filing of 20 trademarks, the list of which is as under:-

S. No.	Trademark Application no.	Trademark Applied for	Filing Date	Class
1	3800737	KADSON LIFESCIENCES	09/04/2018	35
2	3816533	THE EATERS	25/04/2018	35
3	3816532	THE EATERS	25/04/2018	43
4	3852641	BAAGO BAAG	05/06/2018	41
5	3912539	DENTEASE	09/08/2018	5
6	3912538	BLOCKAGEOUT	09/08/2018	5

7	3912537	BIOMRIT	09/08/2018	5
8	3921375	OSTEOARTHROID	20/08/2018	5
9	3939532	GIVE ME A BREAK	08/09/2018	43
10	3939533	A&B ENTERPRISES	08/09/2018	43
11	3986486	EBALER	29/10/2018	5
12	4064425	LOVAANI	22/01/2019	10
13	4064424	LOVAANI	22/01/2019	9
14	4071176	FAXOQUIN	29/01/2019	5
15	4071177	CYNOGARD	29/01/2019	5
16	4124971	ZELCO	22/03/2019	31
17	4124972	ZELCO	22/03/2019	30
18	4124973	GLUCOSPOON D	22/03/2019	30
19	4131408	KLAVLENTIS	28/03/2019	5
20	4131407	KEFLENTIS	28/03/2019	5

8. Proposed programmes and budget outlay for the 2019-20

Following programmes / activities will be conducted in 2019-2020:

Large scale multiplication of Sugarcane, Banana and Strawberry through Tissue Culture technique.

Setting up of sub-regional science centre at Ambala

Science Quiz Contests for School & College students at District, Zonal & State level

Science Essay Writing Competition for School and College students.

Financial Assistance for attending international conference / seminar / workshop abroad

Grant -in-Aid to Research & Development projects

Grant -in-Aid for organizing conference / seminar / workshop

Haryana Science Talent Search Scheme for Class XI & XII students

Promotion of Science Education (POSE) Scholarship Scheme for B. Sc. & M. Sc. Students

HSCST Fellowship Programme for Ph.D. students

Activities of Patent Information Centre

Activities of Intellectual Property Facilitation Centre (IPFC) for Micro, Small & Medium Enterprises

Haryana VigyanRatna and Haryana YuvaVigyanRatna Awards

Honouring meritorious students of Haryana

Setting up of HSCST Science Clubs in Government Senior Secondary Schools of State.

Exposure visits for meritorious students

Organizing Science Conclaves in Universities / Institutes

Celebration of National Technology Day

Setting up of Science City for NCR in Haryana

Budget Outlay: State – 3640.46 Lakhs, DST, GoI – 34.10 Lakhs

9. 5 years vision of the Council

HSCST will continue to implement the programmes & activities listed above under point number 8 for the promotion & popularization of Science & Technology in the State.

In addition, HSCST is keen to set up a Science City for NCR in Haryana. In this regard, a meeting was held between Dr. Mahesh Sharma, the then Hon'ble Union Minister of State for Tourism & Culture and Shri ManoharLal, Hon'ble Chief Minister, Haryana at ShastriBhawan, New Delhi on 2nd June, 2017. The Ministry of Culture agrees in principle to the proposal of Haryana Government to set up a Science City for NCR in Haryana. As per the guidelines of the Ministry of Culture, GOI, total project cost is Rs.191.00 crores (approx.).

State Government will provide land for the Science City free of cost. Alternate sites would be suggested by State Government which would be inspected by the National Council of Science Museums to carry out feasibility study as per requirements of Ministry. The project cost will be shared between the Central Government and the State Government as per Central Government guidelines.

Following sites are identified in Gurugram for inspection by team of NCSM:-

1. Municipal Corporation Gurugram land in Biodiversity Park, Nathupur village
2. Panchayat land of village Bajghera
3. HUDA land in Sector 33, Gurugram
4. M/s Indian Drugs & Pharmaceuticals Ltd. site located on old Delhi-Gurugram Road in Dundahera village.

After inspection of above sites, team of NCSM found the site of Biodiversity Park, Nathupur feasible towards setting up of Science City. Council is in process to finalize the land.

HIMACHAL PRADESH COUNCIL FOR SCIENCE, TECHNOLOGY & ENVIRONMENT

1. Organization Structure:

The State Council for Science, Technology and Environment, H.P, Shimla was established during the year 1986 by the Department of Science & Technology, Govt. of Himachal Pradesh under the National Programme of Department of Science & Technology, Govt. of India under Societies Registration Act XVI-1860 in the State. Later the Council was renamed as H.P Council for Science Technology & Environment (HIMCOSTE) during the year 2016.

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 (HIMCOSTE).

2. Objectives:

To advise state govt. on science, technology & environment related issues & interventions

To develop, demonstrate & transfer appropriate technologies for the State

To pool and exchange scientific knowledge from national & international scientific institutions/ organizations for the development of the State

To promote, popularize and disseminate scientific & technological innovations.

To create and strengthen science & technology facilities in the State

To promote research & development studies relevant to state needs

To establish linkages with universities and R & D institutions

To provide consultancy services in successfully demonstrated/developed technologies

3. Activities of the State Council were confined to the following areas:

The H.P. Council undertakes various activities/programmes under the domain of broad divisions as under:

Aryabhatta Geo-informatics and Space Application Centre (AGiSAC)

H.P. State Biodiversity Board

H.P. State Centre on Climate Change

Technology Dissemination

Patent Information Centre

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

4. Key activities under taken during the last two years in the area of: -

4.1 Technology Development:

A. Demonstration of technologies in areas of water, energy and agriculture on the location specific challenges of the State at Pooh village, District Kinnaur, Himachal Pradesh.

B. Studies on improving livelihood generation through scientific interventions in *Pinus gerardiana* Wall. and important wild mushrooms in Himachal Pradesh.

C. Solar passive housing construction training was organized; to improve skill of JEs/Technical Assistants and rural masons for introduction of Solar passive housing construction technologies in the state, to ensure the income generating potential of trained masons, to ensure availability of trained work force in the villages for quality rural building with innovative designing.

D. Earthquake resistant houses/building training was organized for the Master Trainers from different Engg. /Polytechnic Colleges in H.P. along with CBRI Roorkee.

E. Popularization of construction of lean-to wall greenhouses to disseminate the technology of construction of low-cost greenhouses in the farmers 'fields of the state, to guide farmers in designing, fabrication and installation of greenhouses.

F. Design of low-cost solar water heating system using flat plate collector for remote area application- Eternal University, Baru Sahib, Rajgarh, Sirmour.

G. Microbial interventions for generating renewable bio-energy in Himachal Pradesh using forest pine needle litter – JUIT, Waknaghat, Solan.

H. Automation in vision testing- National Institute of Technology (NIT), Hamirpur

I. Improving compressive strength and durability properties of adobe for propagating sustainable and cost-effective mass housing especially in rural areas of different districts of Himachal Pradesh- National Institute of Technology (NIT), Hamirpur.

J. Fabrication of Solar dryer training was organized; to dry the produce hygienically for consumption, to aware the general public about the alternate option for drying of the farm or wild bio-produce for consumption.

K. Development of Technology as R&D activities for the snow harvesting at Pooh, District Kinnaur along with SASE Chandigarh

4.2 Technology Demonstration:

A. Waste water disposable system training organized by HIMCOSTE in different phases.

B. Popularizing conversion of pine needles biomass into coal (Briquettes) for use as fuel in the rural areas in the HP state.

C. Using space technology various studies is being carried on the Himalayan Cryosphere particularly the snow glaciers and moraine dammed glaciers lakes in Himachal Himalaya.

D. Impact of climate change on the agriculture, horticulture and forest for generation of district wise data base in Himachal Pradesh.

E. Impact of climate change on small hydro power projects in Himachal Pradesh.

F. Empowering rural population through dissemination of agro-technology of flower crops in H.P. - CSIR-IHBT.

G. Development of artificial diet for honeybees: an attempt to bring revolution in

beekeeping industry- Arni University, Kathgarh, Indora, Kangra.

H. Cloud based Digital Resource Centre (DRC) for remote rural area- Eternal University, Baru Sahib, Rajgarh, Sirmour.

I. Propagation of sustainable nutritional gardens and off-season vegetable cultivation for nutritional augmentation and socio-economic empowerment of farm women in low and mid hills of Himachal Pradesh- CSK HPKV, Palampur, Kangra.

J. Skill development trainings in button mushroom were conducted by HIMCOSTE with handholding support for 5 months cycle.

K. Skill development training programme on training, demonstration and installation of solar water heating systems at District Kinnaur, Himachal Pradesh.

4.3 Popularisation of Science :

A. **All India State Science & Technology Councils Conclave** under DST, SSTP programme was organized at Kufri, Shimla on 7th -8th June, 2018, in which all councils of the country participated.

B. **Conclave of Himalayan States** was organized at Hotel Peterhoff, Shimla on 5th October, 2018. In this Conclave Union Ministers, Chief Minsters, Parliamentarians, Legislators participated.

C. **3rd Himachal Pradesh Science Congress** was organized by HIMCOSTE. The theme of the congress was "**Rural Upliftment through Science & Technology Interventions**".

D. Conference on **"Artificial Intelligence: Potential applications in Himachal Pradesh"** was organized.

E. **26th HP Children's Science Congress** was organized. The theme of the congress was **"Science, Technology and innovation for Clean Green and Healthy Nation".**

F. HIMCOSTE invited eminent scientists / academicians/ environmentalists of national and international repute under Popular Lecture Series for delivering lectures in different parts of the state during 2017-18 & 2018-19.

G. "**National Science Day"** and **"National Mathematics Day"** were celebrated during 2017-18 & 2018-19.

H. Training workshop on **"Innovative Experiments in Physics" & "Teaching Mathematics through Origami"** were organized.

I. ENVIS **"Regional Evaluation & Training Workshop" for Semi-Arid and Desert Regions** and training on Grid Based Decision Support System (GRIDSS) for sustainable management of natural resources was organised.

J. Launch workshop on "**Studies on improving livelihood generation through scientific interventions in *Pinus gerardiana* Wall. and important wild mushrooms in Himachal Pradesh**" was organised.

K. **National Nature Camping Programme (NNCP)** under **NGC (National Green corps)** was organised.

L. The **Himachal Pradesh State Wetlands Authority (HPSWA)** in association with Forest Department and Education Department organized the **World Wetland Day** during 2017-18 & 2018-19.

M. **"State level World Environment Day (WED)"** was celebrated with splendor and galore during 2017-18 & 2018-19.

N. Capacity building and training activities in science and technology for members of SC category has been organized by the HIMCOSTE.

O. Training Workshops on **"Biological Diversity Act, 2002: Constitution, role & responsibilities, of Biodiversity Management Committees in conservation & sustainable use of Bio-resources and Access & Benefit Sharing (ABS) provisions"** were organized in the State by HP State Biodiversity Board, HIMCOSTE.

P. Workshops on **"Implementation of Biological Diversity Act, 2002 and Rules, 2004 in Himachal Pradesh"** were organized.

Q. Workshops on Focus Group Interactive Dialogue on **"Biological Diversity Act 2002 and its Access & Benefit Sharing (ABS) Provisions"** were organized.

R. Training workshops on **"Mainstreaming Biodiversity: Sustaining People and their Livelihoods"** in District Kullu & Sirmour were organized.

S. DST SEED Workshop: sensitization programme for the northern region: focus- science and technology for women.

T. **Himachal Pradesh 2nd Science Congress"** has been organized by the HIMCOSTE. The theme of the congress was "**Science and Technology for Sustainable Livelihood in Indian Himalayan Region**".

U. An exhibition on mini planetarium and night sky watching was organized.

V. HIMCOSTE in collaboration with H.P. Forest Department organized a nature visit to Shimla water catchment & Eco Task Force, Kufri.

W. Capacity building and training activities in science and technology for members of sc category was organized by the HIMCOSTE.

X. National Conclave of Biodiversity Management Committees (BMC) for experience sharing on Access and Benefit Sharing (ABS) and 2nd National Level Dialogue on Traditional Knowledge (TK) by State Biodiversity Board (HIMCOSTE).

Y. Organized Interactive Dialogue on **"Biological Diversity Act, 20**02 and its Access and Benefit Sharing (ABS) provisions for Bar Association and Senior Advocates of Himachal Pradesh High Court.

Z. Training workshop was organized for Forest officials on Biological Diversity Act, 2002, and its access and benefit sharing provisions.

AA. Himachal Pradesh State Biodiversity Board (HPSBB) & Biodiversity Management Committee (BMC) exposure visit to Uttrakhand State Biodiversity Board (USBB).

4.4 Patents (Facilitated by Patent Information Centre): -

S.No.	Year	Patent	Copyright	Design	Geographical Indication (GI)
1.	2017-18	5 patent searches	2 Copyrights	-	55 Authorized User applications filed
2.	2018-19	3 patent searches	-	1 design patent	2 GIs Filed (i.e. Chamba Chappal & Chilgoza) · 2GIs Granted; Himachali Kalazeera & Himachali Chulli Oil 45 Authorized User applications filed

4.4.1 IPR Awareness Workshop: -

S.No.	Year	IPR Awareness workshops
1.	2017-18	i. Workshop at Chitkara University,Baddi
		ii. Workshop at Jaypee University,Waknaghat
		iii. Workshop at Himachal Pradesh University,Shimla
		iv. Workshop at Bahara University,Solan
		v. Workshop at Eternal University, Baru Sahib
		vi. Workshop at Shoolini University,Solan
		vii. Workshop at CSK Himachal Pradesh Agriculture University
		viii. Workshop at Dr YS Parmar University of Horticulture & Forestry, Nauni
		ix. Workshop on Intellectual Property Rights in Research, Development and Academics
		x. Workshop on Kangra Tea, Geographical Indication (GI)
		xi. Workshop on Chamba Rumal, Geographical Indication (GI)
		xii. Workshop on Chamba Rumal, Geographical Indication (GI)
		xiii. One day workshop on Patent Drafting & IPR
		xiv. Workshop on IPR issues and Patent Filing
		xv. Workshop on Introduction to Intellectual Property Rights
		xvi. Workshop on Protection of Plant Variety and Farmer's Rights Act, 2001
2.	2018-19	i. Workshop at Chitkara University,Baddi
		ii. Workshop at Jaypee University,Waknaghat
		iii. Workshop at Himachal Pradesh University,Shimla
		iv. Workshop at Bahara University,Solan
		v. Workshop at Eternal University, Baru Sahib
		vi. Workshop at Shoolini University,Solan
		vii. Workshop at CSK Himachal Pradesh Agriculture University
		viii. Workshop at Dr YS Parmar University of Horticulture & Forestry, Nauni
		ix. Workshop on Geographical Indications at Bachat Bhawan, Chamba

		x.	Workshop on Geographical Indications at Reckong Peo, Kinnaur
		xi.	Prepared documentary on Kullu Shawl- CD enclosed
		xii.	State Level Workshop on 'Creating Value through Geographical Indications' at Dev Sadan,Kullu
		xiii.	Meeting on preventing falsification & Regulation of Kullu Shawl as a GI under the Chairmanship of Sh. Yunus Khan, D.C Kullu
		xiv.	Workshop on Regulation of Kullu Shawl
		xv.	Half Day Awareness workshop on GIs at BDO Office, Rajgarh, Distt. Sirmaur
		xvi.	Exhibition-cum-Sale of Geographical Indications of H.P at Shimla
		xvii.	Awareness workshop on 'Geographical Indications at Chai Bhawan, Miranda, Palampur
		xviii.	Awareness workshop on 'GIs at Conference Hall, Civil Hospital Gohar

4.5 Any new innovative activities:

4.5.1. **To understand the nature of alpine timberlines and study of likely impacts of climate change on these ecosystems, considering the socio-ecological aspects.**

4.5.2. Pilot Project on Snow-Ice Harvesting at Pooh Village, District Kinnaur, Himachal Pradesh

4.5.3 Green Skill Development Programme (GSDP)

4.5.4. Project on "Studies on improving livelihood generation through scientific interventions in *Pinus gerardiana* Wall. and important wild mushrooms in Himachal Pradesh"

4.5.5 Coffee Table Books

5. List 5 success stories with brief about 1 page each including photograph, if available.

5.1 Riverfront Cleaning Campaign: 15th May – 5th June, 2018

5.2 Green Skill Development Programme (GSDP):

During the F.Y. 2018-19 one GSDP Course on **"Para-taxonomy including Peoples Biodiversity**

Register (PBR)" was conducted by **HP ENVIS Hub, Shimla** from 17th September, 2018 to 11th January, 2019. The total sanctioned cost of the course was Rs. 20,71,200/-. A total of 11 students (Himachal Pradesh-8, Jammu & Kashmir-1, Haryana-1 and Punjab-1) underwent training for duration of four months.

GSDP students during the field visit of Himachal Pradesh Forest Research Institute, Shimla & Zoological Survey of India, Solan, H.P

5.3 Conclave of Himalayan States

5.4 Development of Web portals and Software:

AGiSAC has developed GIS based web portal for Deptt. of Industry Himachal Pradesh GoHP which is integrated with ease of doing business scheme of GoI. The information available under this portal is up to the level of individual industrial plots, this initiative of AGiSAC is the first of its kind in India.

Development of Software for surveillance of Rheumatic Heart Disease (RHD), Acute Coronary Syndrome (ACS) & Non-communicable Disease (NCD) diseases for Indira Gandhi Medical College (IGMC) Shimla.

5.5 Science & Technology Conclave: -

HIMCOSTE organized a two days Science & Technology Conclave on 7th & 8th June, 2018 at Hotel Royal Tulip, Kufri, in which Director General/ Member Secretary and other Scientists from different States/UTs of India participated.

Sh. Kunal Satyarthi, Member Secretary HIMCOSTE addressing the audience during the conclave

Sh. Ravinder Gaur, Scientist D, DST putting his thoughts during the conclave

Sh. Ravinder Gaur, Member Secretary, SSTP, DST programme made an overview of the DST programmes and urged all the dignitaries to find out new ideas which can be implemented in various States of the country as well as in the States having same geographical area. He also briefed about the establishment & objectives of the Dept. of Science & Technology and States S&T Programme. He said that State S&T Programme addresses the location specific challenges of the State to fulfil the basic needs of the society like water, energy, food & education etc. He further in his address, mentioned about the various initiatives taken by the DST for management of resources and spoke on Vision Document -2035. He also said that local institutions should be involved for combating basic need challenges. He said that this workshop would help to understand State specific challenges and generate new technologies to mitigate these challenges.

5.6 Success Stories of Biodiversity Board

Biodiversity (BD) Act in 2002, was enacted with three main objectives: conservation of biological diversity, sustainable use of its components and equitable sharing of benefits arising out of the use of biological resources i.e. Access Benefit Sharing (ABS). Under ABS there is a detailed procedure for the

determination and sharing of benefits arising out of the use of biological resources obtained from Gram Panchayats. In Himachal Pradesh HPSBB has initiated the process, Dabur India limited has deposited Rs. 71.50 lacs and Organic India Ltd. 5.0 lacs. This amount will be shared with the Gram Panchayats from where bio resources were procured for it's in -situ and ex-situ conservation and other developmental activities in the area. A project entitled "SECURE Himalaya for Sustainable livelihood generation for conservation of Biological Diversity through participatory involvement of local communities in Pangi and Lahaul region of Himachal Pradesh" has been allotted to HPSBB by UNDP and Forest Department Himachal Pradesh worth Rs.1.42 crores.

6. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

The H.P Council has drafted the Science Technology & Innovation Policy for the State of Himachal Pradesh. In order to finalize the policy, a Core team of renowned scientist of different fields was constituted and draft document was circulated to all the Core team members and Heads of different departments of Universities and other Central Government institutions. Accordingly, after compiling the comments, a Brain Storming was organized by inviting all the core members and discussions were held on 24th May 2017. The draft has been submitted to the Government for the acceptance and further action.

7. How strong are the links between other state government /departments If so, provide details?

The H.P Council for Science, Technology and Environment is playing a vital role in coordinating and catalyzing the use of science and technology for the development of the State. The Council is providing technical assistance to the State Govt. in the fields of Management of the Environment, Biodiversity conservation and Natural Resources & Disaster Management. The activities executed and initiatives taken by the State Council over the years after the establishment of the State Council are testimony to the facts stated. The State Council has now become an integral part of the strategic planning with regard to both rural and urban areas in the State. It has developed facilities and expertise to provide vital inputs for implementation of the programs at community and micro watershed level. The State Council at present is working as a link between the Govt. and the Institutions of repute at National level namely Department of Space, Ministry of Environment, Forests & Climate Change (MoEF&CC), GoI, Ministry of Science & Technology and Ministry of Non-Conventional Energy Resources etc.

The H.P Council is conceiving programmes in the areas of concerns requiring scientific interventions and thereafter putting them to successful trial for further implementation of the programmes/activities by the concerned user departments/institutions. The State Council is presently harnessing the potential of space technology, popularization of science, dissemination of appropriate technology, environment protection, and preservation and conservation of biodiversity in the State. The State Council has also worked in close association with the International Funding Agencies like SDC, GIZ and UNDP etc. Besides this the State Council is also closely working with ISRO and IISc Bangalore in the implementation of various studies using space-based inputs.

A tripartite MOA has been signed between Himachal Pradesh Forest Department (HPFD), Himalayan Forest Research Institute (HFRI) & Himachal Pradesh Council for Science & Technology (HIMCOSTE) on 23rd June, 2018 under DST sponsored Project "Studies on improving livelihood generation through scientific interventions in *Pinus gerardiana* Wall. and important wild mushrooms in Himachal Pradesh".

8. How strong are the links of the Council with local industry units/associations?

The H.P Council for Science Technology and Environment is in the process for listing / identification of industries /units/associations etc. existing in the State for establishing links with the industries / associations.

9. List 5 major technology area, where the council can play an important role by finding convergent technological solutions.

Technology Area where Council can play vital role:

Climate Change impacts on the Himalayan Cryosphere.

Use of Remote Sensing and GIS in effective decision making.

Green building Technologies.

Pine needles and other forest waste biomass conversion into briquettes.

Software development for the user departments for planning purpose

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

1. About the council & its programme

Karnataka State Council for Science and Technology (KSCST) an autonomous S&T organization under Department of Science & Technology, Government of Karnataka established in the year 1975 is one of the first State S&T Councils to be set up in the country. During the last 44 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, housing, geospatial technologies, environment and other outreach activities. KSCST is executing many projects and programmes aimed at improving living conditions of the people of the state by adopting appropriate S&T interventions. Over the years, a number of technologies have been translated, from research and demonstration phase, to the implementation and operational phase. KSCST provides support to the Central and State Governments, in formulation of S&T based policies, scientific surveys, project implementation, evaluation, co-ordination & monitoring, organization of scientific meets and awareness campaigns. The Department of Science and Technology, Government of India advocated KSCST as a model to all the states.

2. Activities performed by the Councils during the year 2018-19:

Successfully completed the mapping of over 14000 Traditional Water Harvesting Structures (TWHS) in Karnataka using geospatial technologies. The digital documentation includes location and its status, quality & quantity of water stored, restoration and rejuvenation plans. Based on this report government of Karnataka has initiated restoration and rejuvenation TWHS under MGNREGA and JALAMRUTHA programs.

Digital documentation of over 80 monuments of UNESCO heritage site at Hampi belonging to State archaeology department and 7 monuments of Archaeology Survey of India using 3D laser scanning technologies.

Support to district planning using geospatial technologies in the areas of water, sanitation, health, education, mines & geology, environment, forests, natural resources, amenities, infrastructure etc.

The RWH cell at KSCST provided technical support to implement RWH systems to more than 100 individuals and fourteen government/private institutions. Three training programs (over 80 participants) held to provide practical exposure to engineers/architects/contractors on implementing RWH systems. Awareness program to school children on RWH. KSCST organised twenty-eight awareness programs on rainwater harvesting and ground water recharge and over 25,000 persons benefitted out these programs.

KSCST supported 798 projects to 140 engineering college across the state under the 42nd series of student project programme (SPP).

Provided technical support in implementing 279 kW rooftop solar PV power plant and replaced 2200 LED light fittings in the premises of Indian Institute of Science Campus under CSR programme of Rural Electrification Corporation Limited Government of India.

Provided the technical and management support to Karnataka Residential Educational Institutions Society (KREIS) for setting up of 900 kW rooftop solar PV plants and insulating open conductors in 30 residential schools across Karnataka under the CSR programme of Rural Electrification Corporation Ltd. Government of India.

KSCST along with M/s. Mesha energy Solutions installed 876 HUC Solar PV lighting kits in 9 states namely Karnataka, Nagaland, Odisha, Assam, Himachal Pradesh, Arunachal Pradesh, Meghalaya, Uttarakhand, Sikkim States and Andaman & Nicobar Islands under the DST - GoI supported project titled "Field Testing of Hybrid Ultra Capacitors (HUC) Powered Solar Lighting Kits and Solar Street Lights for grid deprived rural areas lighting in varying climatic zones of India".

Academic and Industrial Interaction Cell organised science popularisation and outreach activities such as a) 20 workshops in science, mathematics and geoscience workshops for high school teachers across the state, b) Broadcasted 52 episodes of radio serial on "Sustainable development" in Kannada and Konkani language, c) Celebrated National Mathematics Day and National Science Day across Karnataka, d) Awareness programme on plasma research and technology for southern states in Bengaluru e) Chetana programme for PU girl students organised in Indian Institute of Science f) Teachers Enrichment Programme 2018-19 for higher primary school teachers g) Vijnana Darshana for the students of VL & VCR Government High Schools h) development of mathematical toys using bamboo i) Video streaming and interaction with high school and engineering students of Karnataka through KSCST video streaming studio by eminent scientists and resource persons.

Established virtual classrooms / e-learning centres in 10 residential Schools of Karnataka Residential Institution Society (KRIES), Department of Social Welfare, Government of Karnataka. Developed and deployed hundred 3D interactive experiments in Physics, Chemistry and Biology to 21 high schools across Karnataka.

Orientation and hands-on training programme on bio-fuels organised for students, faculty of science & engineering colleges and BRIDC (Bio-energy Research Information and demonstration centre). More than thousand students and faculty have been benefited under this program.

Established more than 10 patent cells in engineering colleges and university to create awareness, capacity building and orient students and faculty on IPR to build a knowledge society.

3. Key activities under taken during the last two years in the area of: -

I. Technology Development

a) Student Project Programme (SPP) of engineering students

1. 2017–18 (41st series): KSCST sanctioned 685 projects and after final evaluation of the project by experts, KSCST awarded 52 student projects as "Best project of the year". 27 projects have been identified for further development including prototype and commercialization.

2. 2018-19 (42nd series): KSCST invited project proposals from the final year engineering students for sponsorship, under three categories.

   Stream A: Students to submit projects from the list of "projects selected under 41st Series of Student Project Programme for further development / development of prototype".

   Stream B: Listed priority project areas for the student's project proposal for an Innovative Projects.

   Stream C: Open category where students choose their area of interest to submit their projects.

   KSCST sanctioned 798 projects out of 3800 projects proposals received including projects sanctioned under bio fuel category and further awarded 50 student projects as "Best project of the year". 40 projects have been identified for further development including prototype and commercialization. KSCST intends to call for proposal from faculty of these engineering colleges for further support for possible prototype development and commercialisation through Atal incubation centres, SEED program of DST-GoI and KSCST project grants.

Students exhibiting working model

Dignitaries Inaugurating 41st SPP

b) Karnataka – Israel Industrial Research & Development Program KIRD

Under the collaborative programme of Department of Science and Technology, Government of Karnataka and Israel Innovation Authority, Israel, Industrial R&D related projects were initiated during 2013-14. Under this programme, two industries namely M/s. Blue Neem Medical Devices Pvt. ltd., and M/s. Rangsons Schuster Technologies Pvt. Ltd. Mysore were selected and funds were given for developing innovative products benefitting society.

The product "Contisphere" developed by M/s Blue Neem prevents female urine incontinency and the product "Aviation flexible Hoses with Titanium end fittings" developed by M/s. Rangsons Schuster Technologies is meant for aircraft industries. Both the products are being tested as per industry/ISO standards and will be ready for commercialization by the end 2019.

c) Development of precipitated silica from RHA using IISc technology to meet specific product requirements of Goodyear – Sponsored R & D Project by Goodyear

The objective of the project is to develop Highly Dispersible Silica (HDS) with specifications meeting the Goodyear requirement for tyre application and so far, two products have been developed.

II. Technology Demonstrations:

a) Demonstration of GIS & Remote sensing Technologies - Natural Resources Data Management System Programme

b) Energy Efficient Buildings Workshop Series on "Low Carbon Materials and Building Systems"

c) International Symposium on Earthen Structures (ISES-2018) 22-24August 2018

d) State SDI's and their Applications and deployment of FME/ XML Spy/ EA software

e) Demonstration of high-resolution mapping technology for village level asset management - Village Information System

f) Technology demonstration on bio energy

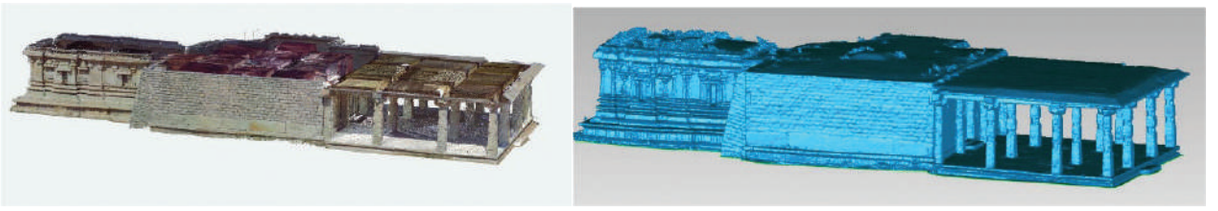
g) Rain water harvesting

h) Virtual Laboratory / Virtual Classrooms (Sir C. V. Raman E-Learning Centres) – Supported by KSTePs, GoK and REC under CSR initiative

i) Hybrid Ultra Capacitor (HUC) Technology

j) Demonstration of 3D Laser scanning Technology:

KSCST digitally documented the Hampi monuments (UNESCO – world heritage site) using 3D Laser scanning technology. In this project 3D point cloud data and 3D modelling of more than 80 monuments have already been completed to showcase glory of richness of history, tradition and culture of Vijayanagar kingdom in Hampi.



3D Point Cloud data & 3D Mesh Model of Lakshmi temple in Vittal temple Complex

III. Popularization of Science:

a) Teacher Enrichment Programme

Teachers enrichment programme is a year-long programme envisioned to enrich the teaching - learning of science and mathematics in higher primary schools of Karnataka. The Teachers' Enrichment Programme is offered in physical mode with contact sessions spread over one year. The programme has been organised at Magadi taluk, Ramanagar district for government and aided higher primary school teachers. During the workshop, KSCST provided Physics and Chemistry experimental kits designed for higher primary schools.

b) Training workshop on Mathematics syllabus

KSCST organized workshop on mathematics syllabus for high school teachers, pre-university lecturers and students in 13 different locations of Karnataka with the assistance of district science centres.

View of participants during the programme

c) Science in magic

To develop a scientific attitude among high school students, KSCST organised interaction of students with IISc research scholars on science topics.

d) Awareness-Cum-Training Program on Plasma Science & Technology and Energy from Nuclear Fusion

KSCST organised awareness program on "Plasma Science & Technology and Energy" in collaboration with Institute for Plasma Research, Gandhinagar, Gujarat for high school teachers and PU lecturers. Teachers were invited from Karnataka, Kerala, Tamilnadu, Telangana and Andhra Pradesh.

Demonstrating view of Plasma

e) Vijnana Darshana

KSCST oragnised "Vijnana Darshan" programme by enrolling students on a science study tour to leading R & D institutions in and around Bengaluru to spur the scientific interest among the students during January, 2019. 84 government high school students and 21 faculty members from elearning established by KSCST particapted.

f) Streaming of Live Lectures from Multimedia Studio cum Video Conferencing Facility at KSCST

Multi-media studio cum video conferencing centre established by KSCST is being used (i) to stream and record lectures of eminent scientists for access by students in schools/ colleges all over the state and beyond (ii) for interactive meets (iii) video conferencing (iv) for interim evaluation of Student Project Programme projects in different nodal centers / institutions and interaction with NRDMS Officials in the districts, and (v) to deliver technical lectures and experiments to the VL schools, etc.

g) Teachers training workshop on Physics

Two-day teacher training workshop on Physics was organized for government high school teachers of Bengaluru and Tumakuru. During the workshop, experiments on physics were demonstrated using the science kits.

h) Chetana Programme

KSCST in colloboration with IISc organized "Chetana – Empowering Girls with Technology" programme. PU Science stream girl students selected based on their performance in their SSLC exams were invited to interact with IISc faculty to better understanding of science. This program was held to encourage the students to take up science. Students from Belagavi, Dakshina Kannada, Chikkamagaluru, Shivamogga and Ballari participated.

i) National Mathematics Day 2018

KSCST celebrated National Mathematics Day on 22nd December to commemorate the achievement of the great Indian mathematician, Srinivasa Ramanujan at Prof. Satish Dhawan auditorium, Indian Institute of Science, Bengaluru. Around 350 students from Bruhat Bengaluru Mahanagara Palike (BBMP) high schools participated in this event.

21 mathematical models made up of bamboo were exhibited during the programme. A book "Ganithanda Chatuvatikegalu" in Kannada was distributed to all the student participants. Technical talks were also organised on this occasion.


Students visiting various mathematics exhibits

j) National Science Day 2019

National Science Day is celebrated in the honour of Sir C V Raman's invention popularly called the Raman Effect. The theme for 2019 National Science day is "Science for the People and the People for Science".

As a pre cursor, KSCST organised on-the-spot painting competition on 9th February 2019 (Saturday) at IISc campus. Around 700 higher primary and high school students participated in the competition. The paintings were adjudged by the faculty members of Chitrakala Parishanth and 46 paintings were awarded. KSCST also organised essay writing competition in several government high schools in and around Bengaluru.

KSCST celebrated National Science Day 2019 on 28th February 2019 at J. N. Tata Auditorium, IISc, Bengaluru. Around 750 students from BBMP, Government and aided high schools participated. The programme included special lectures by eminent scientists and students – scientists interaction. Prizes were distributed on this occasion to the winners of on-the-spot painting competition and essay writing competitions.


View of students during On-the-spot painting competition and on main function of NSD 2019

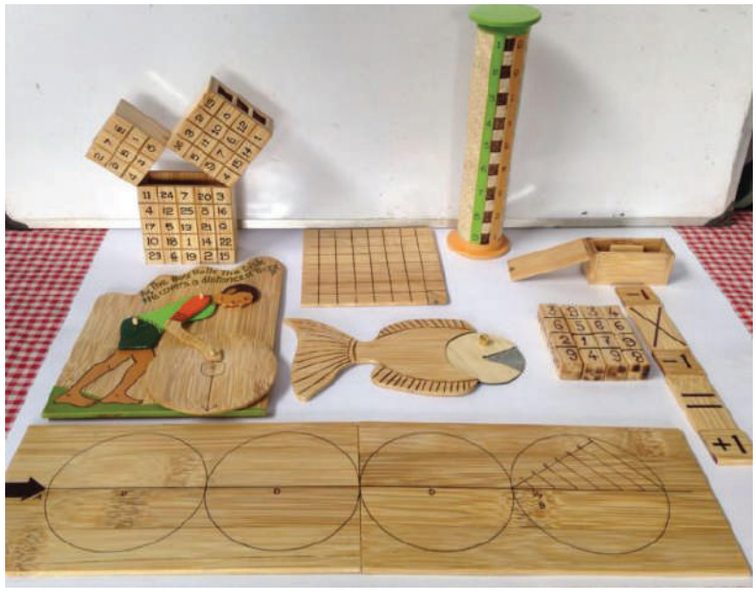
k) Radio serial on "Sustainable Development"

KSCST, Vigyan Prasar, Department of Science & Technology, Government of India, and All India Radio, Bengaluru in fulfilment of its science popularisation mandate and with the aim of creating awareness about sustainable environment among general public broadcasted 52 episode radio serial on "Sustainable Development" in Kannada and Konkani language.

The episodes were on sustainability and industrial revolution; consumption of natural resources; India ethos & practices on SD; sustainable development goal 2030; Energy; sustainable cities; disaster mitigation; protecting and managing natural resources; agriculture & food security; education & skill; ocean & marine ecosystem; fossil fuel & environment. More than 20,000 listeners have sent their reply and feedback through letters, emails and smses. 260 lucky listeners have been selected through lucky dip and ditsributed science kit developed by Vigyan Prasar.

l) Design, Development and Prototype making of Mathematical toys

To solve and understand both simple & advanced mathematical design, development and prototype making of mathematical toys using Bamboo.



m) H- Cube (Hearts-on, Heads on and Hands-on) Summer camp

To spur scientific temper and encourage scientific thinking among students, KSCST in collaboration with a start up "Seed 2 Sapling" organised H-Cube summer camp for higher primary and high school students of Kendriya Vidyalaya, IISc for 10 days.

View of students during H-Cube Summer Camp

IV. Patents:

Patent Information Centre during 2017-18, assisted inventors in filing 3 Provisional applications, 1 complete application and 1 design registration. PIC had 45 visitors requesting for IPR related information.

During 2018-19, the centre assisted inventors and MSME in filing of 6 Trade Mark and 11 patents through identified / empanelled patent attorneys. The applicants include individual innovators, students and faculty members from engineering and science colleges.

KSCST organised 30 workshops at various engineering colleges and Universities across Karnataka state to create awareness and capacity build students and faculty. Around 2500 participants benefited out of these workshops.

KSCST is interacting with Universities and Engineering Institutions to set up IP cell and so far, has established around 10 IP cells.

V. Any new Innovative activities:

a) Utilization of crude glycerol obtained in biodiesel production as an alternate to glycogenic feed supplement for dairy cows

In the experimental work carried out at NDRI, crude glycerol obtained from various sources and purified at different levels of purity and used for invitro experiments. Trans-esterification Unit (TU) and the Atomic Absorption Spectrometer (AAS) have been procured, installed and commissioned at ICAR-NDRI, Bengaluru. Both the equipment's are in use for the experimental work. More than 50 invitro studies have been carried out and the results were compiled for further analysis.

b) Commercialization of SPP projects:

KSCST has identified 50 projects as "Best Project of the Year" and 40 projects for further development. These projects are expected to be supported under Atal innovation centre, Science for Equity, and Empowerment & Development (SEED) division of DST–GoI.

c) Filling Patent through KSCST:

KSCST is facilitating the filling of patents & trademarks through its identified / empanelled patent attorneys to assist/support innovators, entrepreneurs, students and faculty members of educational institutions.

4. List 5 success stories with brief about 1 page each including photograph, if available.

a) Rejuvenation of Traditional Water Harvesting systems – a Success story of Rejuvenation of Sri Rama temple Kalyani in Bengaluru Urban district

Kalyanis are the Traditional Water Harvesting Systems which were constructed to store water for various needs of rural communities such as drinking, washing, cattle drinking, irrigation and temple purposes including recharging of ground water. At present, most of these ancient water bodies have become dump yards and became dry resulting into the decline in their potentials. Keeping this importance in view, KSCST has taken up a project on assessing the hydrological and physical status of ancient water harvesting structure such as Kalyanis, Gokatte, Katte and Kunte etc., of the state for suggesting scientific interventions for rejuvenation. The council has completed the assessment of around 14,000 ancient water bodies and submitted the technical report to the concerned authorities for taking up rejuvenation of these structures.

Before Rejuvenation

After rejuvenation

b) "Field testing of Hybrid Ultra Capacitor (HUC) Powered Solar PV Lighting Kits and Street Lights for Grid Deprived Rural area for Lighting in Varying Climatic Zones of India" to KSCST, for field testing the performance of the HUC Technology.

Hybrid Ultra-capacitor (HUC) technology developed at Indian Institute of Science is being promoted by KSCST to serve society deprived of electricity with the Department of Science and Technology, Government of India. M/s Mesha Energy Solutions private limited is involved in manufacturing these HUC solar powered home lighting kits.

Under this project, KSCST is field testing the performance of the HUC Technology in different climatic zones across India. This project is also partially supported by M/s MESHA Energy Solutions Private Limited, Bengaluru.

c) Karnataka Natural Resources Data Management System (NRDMS)

Since last two and half decades, NRDMS programme of KSCST has been creating data, information and applications for the Zilla Panchayath, DC Office and all the line department of the districts using geospatial technologies. Several important applications have been developed to assist and aid decision makers and planners. One such exercise under the NRDMS programme is the demarcation and digitization of newly identified gram panchayaths and their villages after the state government reorganised and created 40 new talukas in the state. The NRDMS centres using the geospatial data demarcated and created new taluka boundaries. With these new maps it has become easy for the planners to implement their schemes successfully. A comprehensive report on this exercise has been submitted to the state government.

Department of Planning programme, Monitoring and Statistics initiated the preparation of action plan using geospatial technologies. All the line departments at district level now have to prepare district geospatial action plan in consultation with district NRDMS centre. KSCST in association with State Remote Sensing centre is organising district and taluka level workshops on "Geospatial Technologies on decision making". Action plan are also being generated.

d) Village Information System

The Village Information System project is envisaged to comprise of spatial data on demography, natural resources, climate, land use land cover patterns and socio-economic aspects etc. to aid and support the decision makers and planners to make informed decision-making at village level. The Council is a partner in DST - GOI funded innovative programme on the development, validation and standardization of data structure and the optimum data requirements for providing village information system at cadastral level.

e) Student Project Programme

The council has initiated and strengthened the culture of research in university departments and engineering colleges in the state through its flagship programme the Student Project Programme

(SPP). Under this programme, KSCST has been providing technical and financial support to final year engineering college and university students in executing R & D projects. KSCST sponsorship of the project has now become a benchmark of quality for engineering projects, carried out by students and are accepted as mark of excellence by academic and industrial communities. This programme has been in operation for the last 42 years and more than 10,000 projects have been sponsored by KSCST.

5. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

a) Intellectual Property Policy of KSCST

The KSCST's mission of generating and transmitting knowledge and providing service to the public is creating an environment that is conducive to the conception and development of many forms of intellectual property. Considering the new intellectual property regime, KSCST has undertaken an initiative to promote inventions and innovations, and facilitate protection of intellectual property generated within KSCST, by framing suitable policy & establishing the Intellectual Property Management (IPM) Cell.

This policy is called the Intellectual Property Rights & Consultancy Policy of KSCST & takes effect from 1-9-2016.

The Intellectual Property Rights & Consultancy Policy shall apply to all persons employed by KSCST.

b) Consultancy Policy of KSCST

Important work assignments undertaken at KSCST are:

Consultancy & Contract Services.

Orientation programs/Workshops/Seminars.

Sponsored Projects.

R&D Projects leading to Research results & Intellectual Property.

c) Policy on Rejuvenation of Traditional water bodies under JALAMRUTHA programme of RDPR department of GOK

KSCST supported the Department of Rural Development and Panchayath Raj, Government of Karnataka in formulating policy for restoration & rejuvenation of traditional water harvesting structures using S&T interventions under JALAMARUTHA, a new programme of RDPR, Government of Karnataka. Policies and guidelines have been prepared and circulated among concerned Government departments to apply and use the specific S & T interventions in conservation of water bodies.

6. How strong are the links between other state government /departments If so provide details?

KSCST located in IISc campus has strong linkages with both Government and R&D Institutions within and outside the State. The KSCST has regular interactions with the State Government Secretariat for various projects and programmes. Through its NRDMS centres located in all the district of the State, it has the strong network with all the line Departments and District Election offices. Further through the project and programmes sponsored by Department of Science and Technology, Government of India, KSCST has been able to build good network with other State Councils and State Governments.

The Centre of Excellence (CoE) in Cyber Security (CS) was formed in 2017 by the Government of Karnataka (GoK), as part of the Technology Innovation Strategy, to promote the cyber-safe and conducive environment for industry collaboration, address the skill gaps, build awareness and facilitate innovation in this emerging technology field of Cyber Security. GoK has nominated KSCST as the Implementing Agency and Indian Institute of Science as the Anchor Institution for setting up and operationalizing of the CoE since December 2018. The CoE also facilitates standardization and best practices for information security across industry domains, foster innovation, research & development and conduct some of the high-end-in-house-training programs within Cyber Security Technologies.

KSCST is currently working Department of Social Welfare, Department of Planning and Statistics, Karnataka Residential Educational Institutions Society, Karnataka State Bio energy Development Board, Department of Archaeology, Rural Development and Panchayati Raj (RDPR), Bangalore Water Supply and Sewerage Board (BWSSB), Department of Public Education, Department of State Educational Research and Training, KITS and many more.

7. How strong are the links of the council with local industry units/associations?

KSCST has also established good linkages with industry sector and industries. Council has set up the Patent Information Cell (PIC) which not duly provides information /awareness an IPR but also interacts with industrial agencies such as Karnataka Council for Technological Upgradation (KCTU), Cell for IPR Promotion and Management (CIPAM), Karnataka German Technical Training Institute (KGTTI), Karnataka Association for Small Scale Industries Association (KASSIA) for attracting MSME towards R&D based projects.

Under Karnataka (India) - Israel Program for Industrial R&D (KIRD), KSCST is facilitating industries to work on high-end products. M/s. Blue Neem Medical Devices Private Limited and M/s. Rangsons Schuster Technologies Pvt. Ltd. Mysore are involved in this program. They also have Israel counterpart to collaborate with them to achieve the proposed deliverables.

The Rural Electrification Corporation Limited, Government of India is supporting educational activities of KSCST through the project "Establishment of Virtual Classroom in Government

High Schools located in Backward Talukas of Karnataka" under CSR Initiative.

KSCST is providing technical inputs to establish virtual classrooms and to install solar energy panels to generate energy for residential high schools of Karnataka Residential Educational Institutions Society (KREIS).

M/s Mesha Energy Solutions Pvt. Ltd. has developed solar PV home lighting kits using HUC technology. The same kits have been successfully installed in 10 states across the country.

8. Proposed programmes and budget outlay for the 2019-20

SlNo.	TITLE OF THE PROJECT
1.	Assessing the status of reject water of RO purification plants in different contaminated villages and measures for reuse in Karnataka state - **DST, GoI.**
2.	Digital Documentation of Heritage Monuments of Karnataka State using 3D Laser Scanning and Geo-Spatial Technologies - **Government of Karnataka**
3.	National Data Registry (patterning with NSDI, DST – GoI)
4.	Geospatial Applications for Urban/Rural Local Bodies (ULB/RLB) - **DST, GoI.**
5.	Transformation of village through S & T interventions (Smart Village) - **DST, GoI.**
6.	National Conference on Biofuels - **Government of Karnataka**
7.	Study the activities of Bioenergy in other State(Study on Biodiesel Developmental Activities in Other states of India) - **Government of Karnataka**
8.	National Mathematics Day 2019 and National Science Day 2020
9.	Workshop on Augmenting Writing Skills for Articulating Research (AWSAR) in Bengaluru
10.	Brainstorming cum review meeting of the radio serial

9. Five years vision of the Council

To treat domestic waste water and reuse.

Support to state government in IoT, cyber security and artificial intelligence for societal good

Rejuvenation of traditional water bodies with the support of GoK (Jalamrutha and MGNREGA)

Digital documentation of heritage monuments of Karnataka using 3D laser scanning and geospatial technologies

Geo-ICT for developing all plan preparation by line departments.

Centralized data registry for access, discover, share and retrieval of analysis geospatial information through NDR.

Technical support in the field of water, energy, education and Geo-ICT

Cell for energy efficient building materials and sustainable housing.

Field testing of technologies developed by R&D institutions

Development of digital contents for high school and PU (Science) syllabus

Proto type development and commercialization of SPP projects in collaboration of industries

Creation of IPR cells in all the universities of Karnataka to promote industrial development specifically in the industrial backward areas.

KERALA STATE COUNCIL FOR SCIENCE, TECHNOLOGY AND ENVIRONMENT (KSCSTE)

1. About the Council & its programme (MS word not more than half page):

The 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. The apex body of KSCSTE is called the State Council with Chief Minister of Kerala as its President. The Executive Vice President (EVP) is the Chief Executive Officer of the Council who is vested with the powers of the Council. The EVP is also the Chairman of the Executive Committee of KSCSTE. The other members of the staff constitute the Member Secretary, Director, Scientists, Scientific Assistants and administrative staffs.

There are seven R& D centres under the umbrella of the Council which does research work in specific identified domains. They are

(a) Centre for Water Resources Development and Management (CWRDM)

(b) Jawaharlal Nehru Tropical Botanic Garden & Research Institute (JNTBGRI)

(c) Kerala Forest Research Institute (KFRI)

(d) Kerala School of Mathematics (KSOM)

(e) National Transportation Planning and Research Centre (NATPAC)

(f) Malabar Botanical Garden & Institute of Plant Sciences (MBGIPS)

(g) SrinivasaRamanujan Institute of Basic Sciences (SRIBS)

(h) Institute of Advanced Virology (IAV)

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

a. Integrated Rural Technology Centre (IRTC):

b. Sophisticated Test and Instrumentation Centre (STIC)

c. M.S. Swaminathan Research Foundation (CABS-MSSRF)

The Council has its headquarts in the SasthraBhavan, Pattom, Thiruvananthapuram. The decisions of the Council and its Executive Committee are implemented by the Council Headquarters (CHQ). There are 6 scientific divisions in the Headquarters for implementing various schemes and programmes related to the Science & Technology activities of the Council.

The various divisions in the CouncilHeadquarters are

Basic Science Division

Coastal and Environment Division

Science and Technology Promotion Division

Special Programmes and Project Management Division

Science Education Division

Women Scientist Division

Wetland Technical Unit

Kerala Biotechnology Commission is also functioning at Council Headquarters for implementing and co-ordinating biotechnology programmes in the State.

The Council has implemented 37 Schemes & Programmes through the 7 divisions and the Biotechnology Commission supporting 8 Schemes & Programmes at Council Headquarters.

2. 5 years vision of the Council (MS word not more than half page):

Encouraging high quality research and development to take Kerala to much higher levels of original research and cutting edge technologies.

Facilitating science and technology-based industries by effectively showcasing national and global technology development success stories. Providing platforms and enhance industry-academia collaboration.

Continuing the promotional activities for the spread of scientific temper amongst all sections of the society and creating everybody scientifically literate.

Building a critical mass of scientists and technologists in Kerala for collaborative work in specific disciplines.

Identifying thrust area programmes looking at the natural resources of Kerala, particularly the diverse plant resources and specific mineral resources

Attracting externally funded projects for doing 'big science' from national and international funding agencies and from the corporate sector.

Creating science talent among children to motivate them for taking up science as a career

Promoting Centre-State participation in deploying developed technologies in the areas of agriculture, fisheries, forestry and veterinary science on an S & T based approach

Connecting the Science, Research and innovation system with the inclusive economic growth agenda of the state& creating science and Technology- based start-up for young entrepreneurs and student entrepreneurs.

Promoting conversion of R&D inputs into societal and commercial applications&providing an enabling environment for gradual introduction of private sector

Providing opportunities for women in science and technology and for reducing the gender disparity in doing and managing science

Promoting participation of researchers in climate change studies, water management, coastal mineral resources, integrated river action plan

Promoting Kerala as a prominent research centre for select knowledge-based industries

Promoting research inputs for high –end / technology enhanced manufacturing activity

Creating an Industry interface in research area selection

3. Activities performed by the Councils during the last one year (most probably you want to have success story- not more half page in MS word):

KSCSTE has sanctioned financial assistance to all the 37 Schemes & Programmes during 2018-19 and successfully implemented the programmes through the students, researchers & scientists. Major highlights of the programmes is as follows:

41 research projects were sanctioned out of 115 proposals processed

176 projects to School students under SPYTiS

214 projects to Post Graduates under Student Project Scheme.

Patents filed through projects -7

Patents filed through IPR cell- 10

Papers Published in Peer reviewed Journals – 384

Papers presented in Conferences- 362]

Ph.D. produced through projects -41

Other Manpower trained – 80

	Technologies Developed
1.	Hybrid Microgrid for Enhanced Utilization of Renewable Energy
2.	Arduino based smart irrigation system using IoT
3.	Automatic helmet detection
4.	Heavy metal and Pesticides removal using Electrically Mediated Phytoremediation and Nano-Phytoremediation Techniques
5.	Design & Development of an air blast sprayer for Arecanut
6.	Design and Fabrication of a Head Phantom for Dosimetric Evaluation of Radiotherapy Treatment Plans
7.	A Multi-wavelength Integrating Nephelometer for Characterizing Tropospheric Aerosol

8.	Trans-esterification of *Jatropha curcas* oil over silica-based catalysis for the preparation of biodiesel
9.	A comparative study on the properties of reinforcing phenol formaldehyde nanocomposites with Carbon Nano tube (CNT)and Cellulose Nano fibre (CNF)
10.	Bioremediation of Chlorpyrifos by autochthonous bacterial consortia
11.	Developed technology for production of antifungal chitinase:
12.	Ofets with Natural Rubber: Toward Green and Sustainable Electronics
13.	Sparse Signal Processing for Undersea Acoustic Links
	Technologies Demonstrated
1	Adaptive Approaches to Land, Soil Nutrient and Water Management – developed a tool to identify the depletion of nutrients and will help to suggest the management options using a systematic approach
2	Farmer participatory demonstration and evaluation of drip fertigation technique in Kerala
3	New technique for the strain free growth of crystals and synthesis of certain organic crystals
4	Bioprocess for dual production of bioplastics (PHAs) and Exopolysaccharides (EPS)
5	Anaerobic extraction of Plant fibres, product development from Natural fibres, biowaste treatment systems
6	Development of an activity based travel demand forecasting model for Thiruvananthapuram City
7	Development of a recombinant *Sphingomonaspaucimobilis* for gellan gum production: Characterization and application of recombinant gellan gum in nano particle drug delivery system
8	Standardization of market oriented production technology of Aloe, (*Aloe vera*Burm.f.) and promotion of micro-entrepreneurship through value addition
9	Mechanistic evaluation and in vivo validation of the anticancer principle isolated from Chromolaenaodorata against cervical cancer
10	Dynamic traffic signalling system using IoT and data mining
11	Semi automatedIoT based garbage collecting system

12	A smart eye controlled assistant for paralyzed persons
13	Hybrid water pumping system for irrigation purpose using BLDC motor
14	Tissue Culture for *In vitro* clonal propagation of medicinal plants through low cost method
15	Fermentation technology for Value addition
16	Value Addition and Product Diversification of Matured Coconut Water
17	Low cost Raman spectrometer device and exploit their utility in the field of sensing and diagnostics.
	Success Stories
1	Bulk nano junctions for photovoltaic device applications
2	Development of a drug for anti Chikungunya virus activity based on traditional knowledge
3	BisIndolyl Methane (BIM) Conjugates of Biaryls: Role in Apoptosis, Cell Cycle Regulation and PI3K/AKT/mTOR Signaling Pathway in Human Breast and Cervical Cancer Cells
4	Pharmacological properties of small molecular weight leads and polysaccharides from green seaweeds (phylum Chlorophyta)
5	Advanced Phytoplankton Cultivation method for Hatchery feed with special emphasis on Mussel seed Production
6	Detailed State model of CaMKII activation and autophosphorylation in the presenceof NR2B and its behavior in Epileptic Conditions
7	Strength improvement of locally available soft clays in construction of highways using lime-enzymatic formulations

4. List 5 success stories with brief about 1 page each including photograph, if available

1. Bulk nano junctions for photovoltaic device applications
2. Development of a drug for anti Chikungunya virus activity based on traditional knowledge
3. BisIndolyl Methane (BIM) Conjugates of Biaryls: Role in Apoptosis, Cell Cycle Regulation and PI3K/AKT/mTOR Signaling Pathway in Human Breast and Cervical Cancer Cells
4. Pharmacological properties of small molecular weight leads and polysaccharides from green seaweeds (Phylum Chlorophyta)
5. Advanced Phytoplankton Cultivation method for Hatchery feed with special emphasis on Mussel seed Production

6. Detailed State model of CaMKII activation and autophosphorylation in the presenceof NR2B and its behavior in Epileptic Conditions
7. Strength improvement of locally available soft clays in construction of highways using lime-enzymatic formulations.

5. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

The committee appointed by the Govt. of Kerala to frame the New Science Policy of the state submitted the draft policy and the cabinet approved the New Science Policy of the State vide Order No. 08/2017/S&TD; dtd. 27.11.2017. The policy highlighted the present scenario in the state and a vision for the next 20 years is depicted in the policy. The committee was chaired by Dr. A. D. Damodaran former Chairman, STEC and Director, CSIR-NIIST.

6. **How strong are the links between other State Government/ Departments. If so provide details.**

KSCSTE is instrumental to implement S&T activities of the State and has been maintaining a strong link with the Industries Department, Education Department and the Kerala State Planning Board. The aim is to promote technology development especially from the rural sector in case of to Rural Innovators Meet and to inculcate scientific temper among the students of Model Residential Schools through SasthraBodhiniprogramme. Rural Innovators Meet is an annual event of KSCSTE in which new technologies/products developed by the unorganized rural innovators were exhibited/ demonstrated and the best innovations among them were rewarded with prizes.

Also, awareness on the various topics including marketing techniques, Intellectual Property Rights, Financing options, etc, were given to the innovators. SasthraBodhiniprogramme provides opportunity to talented students to conduct science projects to address socially relevant local problems.

7. **How strong are the links of the council with State are line Departments, Local Industry Units/Associations?**

KSCSTE has been maintaining a strong link with the Industries Department, Education Department, Environment Department, Kerala Biodiversity Board and the Kerala State Planning Board in formulating and implementing S&T activities of the State.

Technical expertise has been provided to Department of Environment and Climate Change for dealing Coastal Zone Management issues, Wetland Management and other environmental problems and issues. Work with all educational institutions in the State including DPI, universities, colleges, schools, Institution of Engineers, Centre for Disability Studies and KUFOS. Similarly, with Western Ghats Cell and State Planning Board, Departments of Tourism, Fisheries, Agriculture, Soil Survey and National and State level R&D Centers of the Council.

The scheme Sastraposhini in schools is being implemented in government schools with the help of Education department, Govt. of Kerala.

The KSCSTE has strong linkage with line departments. The R&D institutions of KSCSTE working in various Sectors are having direct linkage with the concerned Departments. Example: CWRDM with Water Resource Department, Local Self Government Department and Environment Department, KFRI with Forest and Environment Department. NATPAC with transport Department etc...

The KSCSTE has strong linkage with universities of Kerala viz. CUSAT, University of Calicut, University of Kerala, Mahatma Gandhi University, Kerala Agricultural University and Kerala University of Fisheries & Ocean Studies.

KSCSTE provided technical support to the Kerala State Planning Board and a few R&D centres under KSCSTE to migrate their library collections to KOHA, an Open source library management software.

8. **List 5 major technology area, where the council can play an important role by finding convergent technological solutions.**

1. Water Quality Management

1. Hydrologic and hydraulic modeling
2. Rain water harvesting methods and Groundwater augmentation/ recharge
3. Application of advanced isotope techniques for finding explicit solutions to field as well as theoretical hydrological problems.
4. Drinking water treatment using nanomaterials
5. Climate resilient agricultural technologies for soil and water conservation.

2. Plant resources & Health Care

I. Herbal Technology: Sustainable utilization of plant resources through development of value added products in the fields of drugs, perfumes, cosmetics etc.

II. Biotechnology: Understanding the genetic and biosynthetic pathways of high value compounds and bioengineering to develop high yielding elite lines of medicinal and aromatic plant varieties

III. Horticulture: Development of hybrid plants of horticultural importance. Mass multiplication and popularization of medicinal/aromatic plants.

IV. Development of herbal medicines: Scientific evaluation of traditional herbal medicines and development of effective remedies for emerging diseases.

V. Inventorisation and Bioprospecting of Microbiome: Discovery of antibacterial and anti-biofilm molecules from microbiome.

3.Transport & Road Safety Management

1. Intelligent Transportation System
2. Urban mobility
3. Electric mobility
4. Public Transportation System & logistics
5. Marginal Materials for Road Construction

4. Biotechnology Development

1. Nano-biotechnology and health
2. Environmental pollution control and bioremediation
3. Disease Diagnostics and Vaccine production

4. Translation Research and incubation programmes
5. Finishing School for Skill development

5. Ecological dynamics & Biodiversity

1. Restoration of natural vegetation in flood affected and degraded areas.
2. Management of Human-Wildlife Conflict.
3. Management of bird hazard in airports.
4. Large scale cultivation of medicinal plants.
5. Management of Alien Invasive Species.

9. Proposed Programme and Budget Outlay for 2019-20

The Kerala State Council for Science, Technology and Environment (KSCSTE) was constituted as an autonomous body of the Govt. of Kerala by restructuring the erstwhile State Committee on Science, Technology and Environment in 2002 (Vide G.O.(Rt)No.76/2002/STED dated 06.11.2002). Council became administratively and financially operational since April 2003 (i.e. financial year 2003-04 onwards). The primary objective of the Council is to implement science and technology programmes to enhance the socio- economic development as well as quality of life and environment of the state. The setting up of the Council is a significant pro-active step taken by the government to revamp and streamline the science and technology programmes to make them more responsive to the development needs of the state, and to help in the process of transformation of Kerala as a knowledge driven economy. R&D Centres functioning under the umbrella of the Council are: Kerala Forest Research Institute (KFRI), Kerala School of Mathematics (KSoM), Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), Centre for Water Resource Development and Management (CWRDM), National Transportation Planning and Research Centre (NATPAC), Srinivasa Ramanujan Institute of Basic Sciences (SRIBS), Malabar Botanic Garden and Institute for Plant Sciences (MBGIPS)and Kerala State Centre for Assistive Technologies (KSCAT).

Besides these, the Council provides grant-in-aid support to institutions, which include Sophisticated Test and Instrumentation Centre (STIC) and the Integrated Rural Technology Centre (IRTC).

The Council provides financial assistance as block grants under both Plan and Non Plan provisions to the R&D Centres which are constituent units of the Council and also to the grant-in-aid institutions, to implement programmes and projects relevant to the need of the State. In addition, the Council is implementing a large number of programmes for promoting Science and Technology in the State which are coordinated from the Council Headquarters. To establish a strong Science and Technology base for economic and social prosperity, it is necessary for the Government to provide continued support and increased financial support as was done in the past. In this context, it is imperative to mention that the Non Plan allocation, which is meant for meeting the expenses on salary, establishment and other administrative expenses, is grossly insufficient to meet the aforesaid expenses of the Council, particularly the R&D Centres.

The total budget estimate proposed during the annual plan 2019-20 from KSCSTE is Rs. 15258 Lakhs. This is reflective of the new initiative of KSCSTE in the 13th plan programme which includes Institute of Advanced Virology.

Bulk nano junctions for photovoltaic device applications

LAKSHADWEEP COUNCIL FOR SCIENCE & TECHNOLOGY

1. About the council & its Programme of Council/DST.

Science & Technology cell was established in 1984, which was subsequently upgraded as Department of Science &Technology. Lakshadweep Council for Science & Technology (LCST): Established in 1984 under the Chairmanship of Hon. Administrator, Lakshadweep and subsequently reconstituted in 1988, 1990, 2003 and 2010.The executive committee of the council consist of seven members and is vested with all powers for proper running, management and governing of the council including financial prudence and administration of all institutions comes under the councilregistered as a society under societies registration act, 1860 (21 of 1860) on 25thfeb 2011. No separate manpower/ establishment to LCST. LCST is attached to Department of Science & Technology.

Programmes :

Science awareness Programme:

Science Exhibition, Strengthening of Science Club / Green Crops, National Children's Science Congress / Indian Science Congress

Science Tour, Sponsoring Students Team to Capital Island for Museum, Planetarium, etc.,Teacher's Orientation Programme, Astronomic Club Activities, Musuemand Planetarium, Scientific Data Centre / Scientific Extension Centre, Award to Local Scheduled Tribe Students and Public, Celebration of National Science Day.

Research and development programme:

Installation of Bio-Toilets, Strengthening of Microbiology, Molecular and Taxonomy Research Laboratory, Strengthening of Fishery Biology Lab, Satellite Data on Potential Fishing Zone, Installation of Bio Gas Unit,Other Scientific studies relevant for UTL Administration, Research Centre.

Special Research and development programme:

Bibilography on Island Studies, Monitoring of Important Meteorological / Environmental / Oceanographic Parameters / Tide GageTraining in Scuba Diving for officers and staff of the Department, Assessment and Documentation of Marine Bio-Diversity of Lakshadweep Archipelago, Reef Restoration Technology Development ,Financial Assistance to Lakshadweep Council for Science & Technology for organization set upWater Conservation &Management,Assessment of Marine Fishery Resources in Lakshadweep .

2. Activities performed by the Council during the year 2018-19

- Assessment and Documentation of Marine Biodiversity of Lakshadweep Archipelago

- Reef Restoration on Technology Development
- Assessment on Marine Fishery Resources in Lakshadweep
- Water Conservation and Management Programme
- Indigenous Knowledge Systems of Lakshadweep Islands.

3. Key activities under taken during the last two years in the area of:-

(Technology Development, Technology Demonstrations, Population of science, Patents, Any new innovative activities)

Every year the Department of Science & Technology is presenting science awards to the best local students of Lakshadweep belonging to scheduled tribe community of Lakshadweep, who have undergone their studies in Lakshadweep schools from 1st standard to plus two level and secured highest marks in science subjects in standard XII examination 2019, and for graduation and post graduation examination conducted by recognized universities/educational boards in India during the year 2018. This year also the Department Science & Technology is presenting science awards on Independence Day celebration. Apart from this department also carry out awareness programs like celebration of important science events, National Science Congress, Science exhibitions, Science club actives for students, teachers and other Island stakeholders to build their interest in science communication and popularization, installation of biogas plants at Minicoy and Kalpeni.

4. List 5 success stories with brief about 1 page each including photograph, if any.

Installation of Bio – Gas Plants in Lakshadweep

Department of Science & Technology has taken up the project for the installation of Bio-gas plants in Lakshadweep Islands with the aim to develop hygienic eco-friendly, economically viable alternative solution for the disposal of organic / bio-degradable waste in a decentralized manner. The aim is to install biogas to households, institutions thereby reduce dependence on LPG and other conventional fuels as well as to provide organic fertilizers to the community from the biodegradable waste after biogas generation. In first phase of the implementation of the project on experimental basis, department had installed 3 nos of fixed Dome Deenbandhuferocement model bio-gas plants (one 2m3 and 2 nos of 1 m3) on 2.06.2016 at Minicoy Island. Based on the successful trial in Minicoy Island, department was installed 24 Nos biogas plants at Kalpeniisland under SaansadAdharsh Gram Yojana (SAGY). Also decided to install 3 nos portable biogas plants at Kavaratti. In future department is also planning to implement installation of Biogas plant to the reaming islands of Lakshadweep to fulfill the above objectives.

Museum and Planetarium:

The Department of Science and Technology established Museum & Planetarium at Kavaratti on 26th January 2011. It is the first Optical Planetarium in India. Now we are about to completed Ten years successfully. This is one of the most versatile scientific unit setup by the U T administration, to serve as a dynamic medium of science communication for the public and for inculcating a sense of inquiry and scientific temperament in the minds of the students.

Lakshadweep Astronomical Club:

To serve as a dynamic medium of science communication for the public and to inculcating a sense of inquiry and scientific temper in the minds of the young in Lakshadweep islands also promote the hobby in Astronomy & Sky watching, Department of Science & Technology has established an Astronomy club under Museum & Planetarium Kavaratti 28 February 2018. We also conduct field activities like observing Transits of Venus, Super Moon, Moon & Sun Eclipses, Watching Astronomical

bodies, Night Sky Watching, Star Navigations and adaptive way education and awareness programme on astronomy and performing night sky observation through Telescope. Also Hon'ble Administrator approved the following activities.

a. Telescope Making Work shop and Introduction Class

b. Day Time Astro Activity

c. Basic Astronomy & show programme

d. Star Watching Classes

e. Moon Watching Programme

f. Planet Fun Hunt

g. Missis Catalog study class

h. Deep sky watching

i. Astro tech & Prediction Classes

j. Field Trip.

Reef Restoration Technology Development- a remarkable achievement :

Department of Science & Technology, Lakshadweep implemented the coral transplantation research experimental basis since 2008, to generate a unique opportunity for a comprehensive assessment of corals most favorable niches by means of survivorship and growth rates. During 2011 from the lesson learned Department intensified the technique under Reef Restoration Programme. Now a remarkable achievement has been made by the Department of Science & Technology in the field of innovation and technology development. The reef restoration technique developed by the Department was presented during International Conference on Coastal Zone Management 2019, Chennai. The technology developed by the department is considered as one of the national important initiative, it was also recommended that UTL need to support other coastal state/UTs based on their felt need to develop the Reef restoration Technology for better coral reef ecosystem restoration.

Bio Toilet

Disposal of solid waste is a serious environmental problem in Lakshadweep Island, where the soil being porous, discharge from the soak pits and septic tanks can contaminate the ground water. The islands being of small size and undulating in nature, conventional systems of sewage disposal is not practical. The Planning Commission in the year 2010 took a notice of this problem and directed officials of DRDE, Gwalior to visit Lakshadweep Island after which 21 Bio digesters were installed in three Islands on a Pilot basis.

DRDE developed bio digester is a special type of eco-friendly sanitary system. The bio digester will be connected to existing toilets. The bio digester has two important components: a multi chambered tank and microbial consortium. The bio digester is divided into several chambers for biodegradation of human waste under stationery conditions. The human waste enters the bio digester through toilet inlet and flows through different chambers and in this process gets degraded by the microbial consortium present in the bio digester. The tank is seeded with the anaerobic, microbial consortium only one time for biodegradation for human waste. Generally, half of the tank capacity is filled with the microbial consortium to start the biodegradation process. After the success of these initial trials by DRDE Gwalior, the Lakshadweep Island Administrator decided to install 12000 Bio digesters in 10 different Islands of Lakshadweep.

The UTL Administration has installed 1618 Biotoilet at Kavaratti, Androth and Bitra Islands. UTL Administration has initiated to install the Biotoilet all the households of Lakshadweep in the next year onwards.

5. Has the council developed any specific state related S&T and innovation policy?

No

6. How strong are the links between other state government/department If so provide details?

- Established Cal- Val Site Development in association with Space Application Centre, Ahmedabad, National Institute of Oceanography, Goa, National Physical Laboratory, New Delhi and National Institute of Ocean Technology, Chennai
- Indian Regional Navigation Satellite System Range and Integrity Monitoring Station in association with ISRO, Bangalore
- Established 2 tide gauges one each at Kavaratti & Minicoy in association of survey of India, Dehradun
- Lakshadweep Administration has approved the Research collaboration and establishment of a Research Centre for Ocean studies in partnership with Kerala University for Fisheries and Ocean Science (KUFOS).

7. How strong are the links of the council with local industry units/associations?

No industrial units/associations in Lakshadweep.

8. Proposed Programmes and budget outlay for the 2019-20

Science Exhibition, Strengthening of Science Club / Green Crops,National Children's Science Congress / Indian Science Congress, Science Tour,Sponsoring Students Team to Capital Island for Museum, Planetarium, etc.,Teacher's Orientation ProgrammeAstronomic Club Activities,Cost of Specimen for Museum / Planetarium / AMC of Planetarium,Scientific Data Centre / Scientific Extension Centre,Celebration of National Science Day,Installation of Bio-Toilets,Strengthening of Microbiology, Molecular and Taxonomy Research Laboratory,Strengthening of Fishery Biology Lab,Satellite Data on Potential Fishing Zone,Installation of Bio Gas Unit ,Research Centre,Bibilography on Island Studies,Monitoring of Important Meteorological / Environmental / Oceanographic Parameters / Tide Gage,Assessment and Documentation of Marine Bio-Diversity of Lakshadweep Archipelago (LCST),Reef Restoration Technology Development (LCST),Financial Assistance to Lakshadweep Council for Science & Technology (LCST) for organization set up and Water Conservation & Management (LCST), and Assessment of Marine Fishery Resources in Lakshadweep (LCST).

MADHYA PRADESH COUNCIL OF SCIENCE & TECHNOLOGY

1. About the Council & its programme

The Council was established in the year 1981 under the Society Registration Act, 1973 with the prime objective to cater to the scientific & technological needs of the State and to advise Government on policies and measures necessary to promote utilization of Science & Technology for achieving the socio-economic objectives of the State.

The Council has categorized all its activities into following broad areas:

Remote Sensing Applications Centre

Rural Technology Applications Centre

Climate Change Research Centre

Advance Research & Instrumentation Facility (CEBT, QAL, Field Station)

Science & Technology Popularization

Research & Development Facilitation

Science for Socio Economic Development

M.P. Mission Excellence Programme

M.P. Science Network

Patent & Innovation Promotion

Ujjain- Dongla Planetarium-Observatory Complex

Establishment of Science Park in Jabalpur

Madhya Pradesh Resource Atlas Program

M.P. Library of Science & Technology

Publication and Public Relation

Regional Extension Centres

The Council has trained and experienced human resources specialized in various fields of Science & Technology. Apart from the regular manpower, the Council has more than 100 project based staff working in various projects.

2. Activities (selective) Performed by the Council During the Year 2018-19

Preparation of GIS database & providing technical support for Dial 100 program and City Surveillance system of MP Police

Provided Technical Support to Atal Bihari Vajpayee Institute of Good Governance and Policy Analysis for 'Identification of Locations for Establishing New Sub-Health Centers in MP'

Study of Chandrayaan-1, HYSI data to understand the spectral signature of lunar rocks.

Preparation of Ground water quality maps for entire Madhya Pradesh

GIS based State Disaster Command, Response and Monitoring System

Forecasting Agricultural output (Cotton, Paddy, Mustard, Wheat and Pulses) using Space, Agro-meteorology and Land based observations (FASAL)- Operational

Soil Moisture Change using ScatSat data

Empowering Panchayati Raj Institutions Spatially: Capacity building of elected Panchayat representatives, their support functionaries and facilitators on database prepared through Space based Information Support for Decentralized Planning activities and utilization of Bhuvan Panchayat Portal, asset mapping task and activity planning task have been taken up. 1807 Panchayats were covered and 157480 assets have been mapped in Sagar, Betul, Raisen districts. 3 district level workshops and 28 block level workshops have been conducted under this program.

Master Plan mapping - Formulation of Master Plan as per AMRUT Guidelines

Application of Remote Sensing and GIS in Sericulture Development : Mapping of suitable area for Mulberry plantation, identification of potential wastelands that can be utilized for conventional/non conventional silk production practices through remote sensing and GIS.

Monitoring & Evaluation of IWMP watersheds : Land cover change analysis for monitoring of watersheds for 5 years have been taken up and 210, 66, 26 reports for IWMP watersheds of 2009-10, 2010-11, 2011-12, respectively submitted to the sponsoring agency.

Change Detection Study & Demarcation of settlement boundaries (Rural/Urban), sacred places, Tourist Spots, Mining areas & Tribal areas, using GIS & Remote Sensing Techniques for Panna & Amarkantak-Achanakmar Biosphere Reserve.

Remote Sensing & GIS based Planning for Watershed Development Activities in Madhya Pradesh

Study of Vicarious Calibration of Resourcesat-2/2A AWiFS, LISS III, and LISS IV sensors and Validation of Satellite sensor

Development of PoISAR based model for biomass estimation

Computation of Gross Primary Productivity for Wheat, Paddy and Soyabean crops under GISAT utilization Science Program.

Validation of surface reflectance and Albedo with in-situ reflectance under GISAT utilization Science Program

Inventory of horticulture crops in selected districts of MP under CHAMAN Phase-II

Crop discrimination techniques development for kharif crops under SUFALAM project

Development for bio-physical products and GPP using optical satellite data.

Preparation of Investment region Development and Management scheme- Pithampur

Madhya Pradesh Resource Atlas Programme : 07 District Resource Atlases of Dindori, Gwalior, Damoh, Indore, Chhattarpur and Panna districts prepared.

Under Technology Demonstration ; S&T based programs were supported for rural areas and trainings have been imparted on available technologies such as briquette technology, agri-technology, eco-friendly technology, eco-friendly technologies, lac cultivation technology, Waste Management (Technologies for conversion of biowaste into compost). To promote use of Non Conventional energy resources, 05 training programmes were organized in 05 tribal villages of Raisen district on Briquette Technology and the use of advance chullah. 152 tribal participants were benefited. 02 days training was also provided in CIAE (Central Institute of Agricultural Engineering), Bhopal for technology demonstration

Various training programs for women supported for societal /income generation such as scientific ways to reduce malnutrition

Setting up a Papermache mould bank for rural artisans under Cluster development programme

Two months residential skill & entrepreneurship development program on leather shoe designing & making conducted . 20 young artisans were trained.

15 days skill development training program on bamboo product development was organized which was attended by 25 bamboo craft workers

8th M.P. Karigar Vigyan Congress 2019 was organized. This was addressed by 25 nation level experts and attended by 180 craft workers of Leather, Bamboo, Metal and Pottery crafts.

25 days Skill and Entrepreneurship development training program on Black smith Product Making was conducted which was attended by 28 iron craft workers (AGARIYAS & VISHKARMAS communities) trained in making and designing latest and marketable iron products

240 Students Participated in the State Level Children Science Congress

M.P.Vigyan Pratibha Samman Samaroh was organises for students and teachers.

Various workshops on IPR awareness organized which were attended by 1850 participants

Sponsored 42 Research Projects, 76 Seminar/Symposium/Workshop and 60 International Travel Grant to researchers of the State.

3. Success stories

A) Vigyan Mantha Yatra of students under Mission Excellence Programme :

This ambitious programme has been taken up since 2007 to develop and create awareness about science and develop excellence amongst the students. The 12th Vigyan Mantha Yatra was organized in October 2018 which was participated by 625 selected students of Class 8 to 12th standard. They visited various national laboratories in the country and interacted with senior scientist of various scientific organisations. 100 students were awarded scholarship to be continued for next 5 years. Since inception of this programme about 7000 students have been benefitted by the participating in Vigyan Manthan Yatra and about 1200 students were awarded scholarship.

B) Madhya Pradesh Young Scientist Congress (MPYSC) :

The Scheme aims at identifying budding scientists and providing encouragement to their research plans and programs. This programme has attracted consideration attention and achieve appreciable success since its inception in the year 1986. The Council has organized 34 MPYSC so far in different part of the state. All the participants identified for presenting research papers are awarded fellowship for training in any national institutions and the awardees are given cash prize and the certificate of recognition.34th MPYSC was organized at Rajiv Gandhi Produigiki Vishwavidyalaya, Bhopal during 28 Feb & 01 March 2019. 207 young researchers have presented their research papers in 17 disciplines. Total 28 researchers conferred with M.P. Young Scientist Award.

C) Ground Water Quality Mapping of Madhya Pradesh

The ground water quality related data in the State are available only in tabular form whichare being collected by various organization such as Public Health Engineering Department, Water Resource Department, Ground Water Board etc. This provides only the point information on quality parameters of ground water. MPCST has completed preparation of seamless layers in GIS env ironment for all the important quality

parameters viz., pH, total hardness, iron, chloride, TDS, nitrate, fluoride and total alkalinity based on the integration of various thematic layers ground water quality maps for all the districts of Madhya Pradesh on 1:50,000 scale have been prepared. It has been observed that Balaghat, Barwani, Chhindwara, Damoh, Dhar, Dindori, Jhabua, Mandla, Raisen, Rajgarh, Ratlam, Sehore and Shajapur districts are affected by Fluoride contamination, Gwalior, Morena, Neemuch, Sehore, Shajapur and Ujjain are affected by Total Hardness, Alirajpur, Balaghat, Chhindwara, Dhar and Shahdol are affected by Iron (Fe) contamination and Chhindwara, Mandla, Raisen, and Vidisha are affected by pH.

D) Skill Development / Skill Upgradation and Entrepreneurship Development :

A few tribal districts in Madhya Pradesh are famous for their traditional knowledge of black smith product making. The Council has organized 25 days' training programme for skill development/ skill upgradation and entrepreneurship development. This training was attended by 28 iron craft workers mainly drawn from Agariyas & Vishkarma communities of Anuppur and Shahdol districts. They are capable of preparing world class steel.

48 trainings for farmers on low cost technologies for preparation of compost from biowaste (vermi composting technology, waste decomposer bio dung method, biodynamic method, cpet pit) were organized in the villages of 11 districts located in adjacency to Narmada River. 1570 rural participants were benefited. 06 Training Programmes on **"Scientific cultivation of lac"** were organized in 06 villages of Anuppur district

4. 5 Years Vision of the Council

Remote Sensing and GIS based input for development of Smart Cities in M.P.

Documentation and promotion of local/ancient and indigenous technologies in the field of house construction, water conservation, agriculture, irrigation etc.

Remote Sensing and GIS based support to State Disaster Response Force.

All the water resources of the State will be mapped for quality and quantity using high resolution satellite data and ground input to take stock of existing scenario and suggesting long term action plan.

Cluster development for executing science for socio-economic development of unorganized sector.

Livelihood and income generation programme for women and girls especially in the areas of health, hygiene and sanitation. Enhancement of participation of women component in R&D activities

Extend better environment to innovators for promotion of IPR, linkage of innovation and entrepreneurship etc.

Climate Change Research site selection for dating of archeological and geo-archeological artifacts and sediments.

Promoting organic farming and food fortification.

Extend support for research activities in the field of astrophysics and astronomy.

Natural Resources Mapping, desertification status mapping, land degradation mapping and landuse landcover monitoring using spatial technologies.

Science promotion and popularization programmes in tribal and rural areas of MP.

Promotion of paperless procedures and use of energy efficient devices in the Council.

Enhancement of University Cell Network

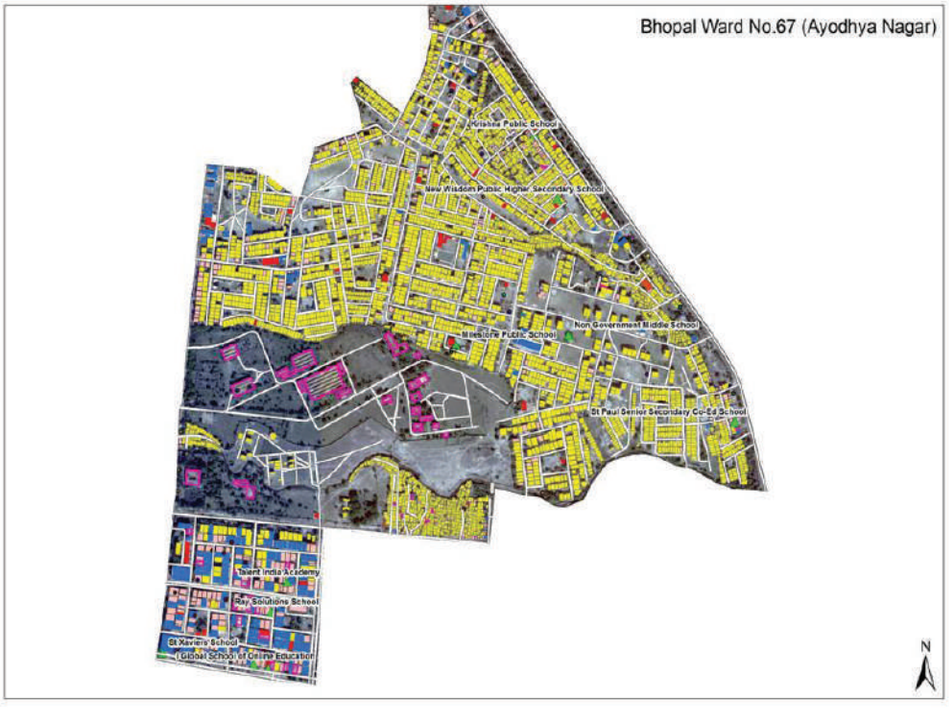
Recruitment of Scientific and Technical manpower as per sanction by Government.

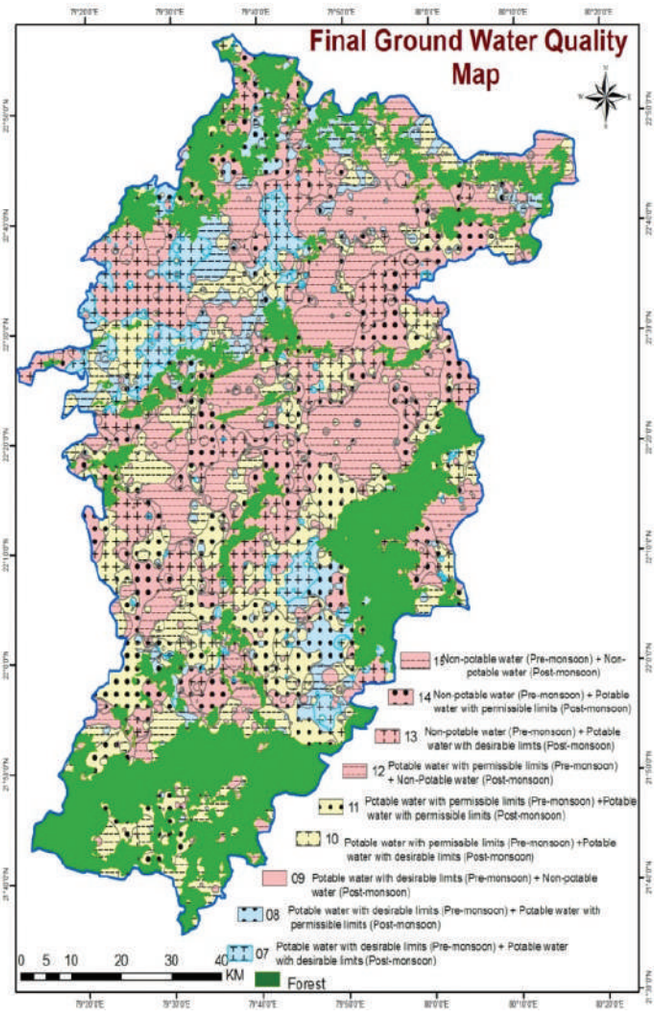
Upgradation of the Council infrastructure for accommodating new labs and centre.

Capacity building of human resources of the Council.

Establishment of Science Centers and Science Cities in identified area.

Formulation of GIS Based Master Plan for AMRUT Cities of M.P.





Ground Water Quality Mapping Project

MAHARASHTRA

RAJIV GANDHI SCIENCE AND TECHNOLOGY COMMISSION

Rajiv Gandhi Science and Technology Commission has been set up under the Act of the State Legislature (Maharashtra Act No. XV of 2004) 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. Help is being taken from research institutions as well as field agencies to implement its projects and programmes.The schemes cater to scientists, teachers, engineering students and school and college students. Supporting innovative S&T activities is the broad objective of the Commission. The main source of funding for the Commission is Government of Maharashtra, while resources are also mobilized from other sources including Department of Science and Technology, Government of India.

The Commission undertakes programmes and projects related to Science and Technology and its utilization for the benefit of the people.

Commission activities broadly aimed at the following

Development oriented scientific research & development

Technology translation & deployment

Demonstration of science based sustainable development

Nurturing culture of innovation

Scientific data generation

Leveraging technology for enriching education and livelihood

Facilitate national program outreach

Schemes of the Commission

1. Assistance for S&T Applications.

The Commission has been operating a scheme "Assistance for S&T Applications" since 2007 to invite proposals on innovative applications of science and technology for socio-economic development. The projects are to be relevant to Maharashtra. The proposals received under the scheme are scrutinized on a Peer Review Basis and necessary financial support is provided to the selected projects. Efforts are being made to reach out to potential end-users and utilize technologies developed under the sponsored projects by the Commission. The technologies generated under some of the projects have been transferred to interested entrepreneurs on non-exclusive basis. So far 105 projects have been sanctioned out of which 58 are completed and 47 are presently going on. New projects are processed round the year.

2. Assistance for S&T Applications through University System.

To spread project activity and extend research culture to smaller institutions, the Commission is implementing a scheme through the university network. Projects of short duration and linked to local resources, skills, problems and development needs are implemented at science and engineering colleges and even polytechnics. Presently three universities are implementing the scheme and it is proposed to extend the scheme to six more Universities during the year 2019-20.

3. Setting up Science and Innovation Activity Centres.

In order to promote activity based learning at school level and to encourage innovative activity, the Commission has launched a scheme to set up Science and Innovation Activity Centres at institutional campuses with secondary school. The projects are implemented with the help of National Council of Science Museums (NCSM), Govt. of India. Two SIACs are operational, two are ready to be opened and two more are sanctioned.

4. RGSTC-TIFAC Internship Programme for Engineering Students.

Technology Information, Forecasting and Assessment Council (TIFAC), Department of Science and Technology, Govt. of India, has launched a scheme "TIFAC MSMEs Internship Programme for Engineering Students" to encourage the industry-academia interaction and to utilize capabilities of faculty and students at engineering institutions to tackle specific problems of industries. The Commission has adopted this scheme for implementation in Maharashtra on a pilot basis and is being implemented at two Engineering Collages.

Implementation of National Programs

I. Establishment of Patent Information Centre in Maharashtra State.

RGSTC with the help of Dept. of Science and Technology, Government of India has setup a Patent Information Centre (PIC) to help the researchers working at universities, colleges and research institutions of Maharashtra. IPR Cells are being set up in the campuses of Universities within Maharashtra. Five such IPR cells are already operational.

II. Implementation of National Programmes: NSD & NMD

National Science Day and National Mathematics Day programmes are being implemented in Maharashtra with substantial financial support from Department of Science and Technology, Govt. of India. These are the structured activities including Science Exhibitions, Students Competitions, Popular Lectures, Slide Shows etc. which are implemented in the State with the help of various institutions.

III. India International Science Festival (IISF)

India International Science Festival (IISF) is being held each year since 2015 sponsored by Ministry of Science and Technology, Govt. of India. Rajiv Gandhi Science and Technology Commission is participating every year in the exhibitionsof IISFsince 2015.

IV. Innovation Hub at Solapur Science Centre, Solapur

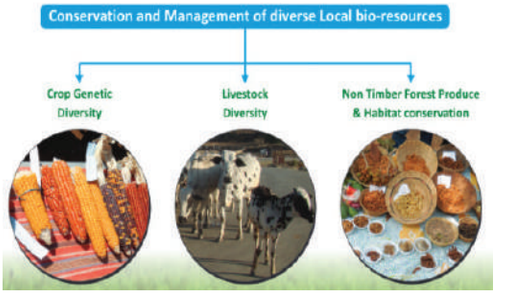
The Commission has set up Solapur Science Centre in collaboration with National Council for Science Museums (NCSM) on a cost sharing basis. Under a new scheme of NCSM, to strengthen the Centre, an Innovation Hub is also being set up on cost sharing basis. The Hub would have core laboratory facilities where school students could try out their innovative ideas.

Success Stories:

a) BETiC (Biomedical Engineering and Technology Incubation Centre):

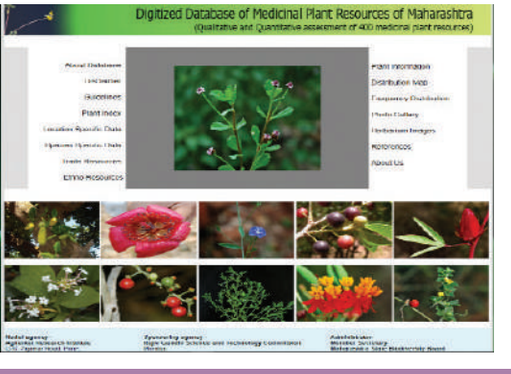
This project was undertaken for rapid translation of Innovative ideas from the clinicians and engineers into high quality low cost medical devices suitable for the local ambiance. The project has resulted in filing of 53 patents, 16 licensed products, 8 start ups and given some products to hospitals for clinical studies and taken forward for production and supply. This 5 year project is nearing completion and is being implemented jointly at IITB Mumbai, VNIT Nagpur and COE Pune.

b) Maharashtra Gene Bank Programme



This project aims at biodiversity conservation using both in-situ and ex-situ methods. The topics covered include grassland, fish and shellfish, crop genetic diversity, livestock genetic diversity, conservation & management of local resources and are complimentary to the national efforts on biodiversity. The project is anchored by IISER Pune and 20 other institutions including NGOs in Maharashtra. This 5 year project is nearing completion and the activities are expected to be continued under State Biodiversity Board after the project is completed.

c) Digitized database of Medicinal Plant Resources of Maharashtra



This project led to development of aDigitized Inventory of Medicinal Plant Resources (about 400 medicinal plants) of Maharashtra State. The database was developed on actual field observations and quantitative assessment of the species. This inventory will provide a useful data to guide the government agencies in policy making particularly to ensure protection of endangered species, prevent overexploitation

of naturally available resources and sustainable usage. The data is now available in open domain and also in the form of a book. The project was implemented by Agharkar Research Institute Pune along with the participation of 14 institutions in Maharashtra to cover all districts of Maharashtra.

d) MAHANETRA-Network for technology and innovation in rural areas

The project was implemented in four hubs covering 60 villages in Maharashtra. It aimed at dissemination of appropriate technologies linked to raising agricultural productivity, improved animal biotechnology applications, better access to water, efficient water usage, greater usage of renewable energy sources etc. This three year project was implemented by BAIF Pune and the activities are continuing on self-sustainable basis.

e) Pilot scale demonstration of value added products from Surimi

The main objective of the project wasto develop technology to produce value added fishery based products like fish cutlet, fish sev, fish wada and fish kheema etc.Training was conducted for fisherman and women self-help groups in Konkan area. Over 1600 people benefitted from this training. The idea is to encourage the fisher folks, unemployed youths and other small businessmen to take-up production of value added fish products as a business.

Innovation Policy

The state S & T policy is clearly brought out in the act that set up Rajiv Gandhi Science and Technology Commission. The focus is on innovative S & T applications. Schemes of the Commission are also linked to encouraging innovations and technology transfer. The schemes also cover encouragement for innovation at the level of school students, college students as also researchers.

Links between other state government / departments

Profiles of technologies developed under RGSTC projects are put on the website. Also information on sector wise technologies developed under the projects is provided to the concerned departments of the state government.

Links of the Commission with local industry units/ Associations

1) Commission has set up a Technology Transfer Cell at Mahratta Chamber of Commerce, Industries and Agriculture' (MCCIA), Pune, for interacting and creating a link with the industry partners.

Under the RGSTC-TIFAC-MSME internship scheme two selected engineering institutions have established formal linkages with the industries associations in the neighbourhood. During the last three years around 100 preparatory projects have been prepared by the students at the industries level. Out of these 24 selected projects have been actually implemented. Out of these 2 technologies have been adopted byindustries.

Five years vision of the Commission.

1) Application oriented projected funding activity would be further strengthened reaching out to more institutions in the state to take up innovative projects of technology development and deployment.

2) Ten new SIACs to be initiated to cover more districts in Maharashtra.

3) Greater efforts would be made to effect transfer of technologies developed under the projects supported by Commission. This would consist of involving industries association, project consultants, field agencies, financial institutions and NGOs. Efforts would also be made to mobilize CSR funds for this purpose.

MANIPUR SCIENCE & TECHNOLOGY COUNCIL

1. About the council & its programme:

The 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 Council has the following compositions:

Chief Minister, Manipur – Chairman

Minister (S&T), Manipur — Vice-Chairman

Commissioner/Secretary (S&T), Govt. of Manipur — Member Secretary

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.

2. Activities performed by the Councils during 2018-19 :

The Manipur Science and Technology Council (MASTEC) organised the following state and centrally sponsored programmes/workshops/trainings relevant to the state including science popularisation to fulfil the objectives for establishment of the Council.

1. Continuing programme of National Mathematics Day celebration 2017
2. World Intellectual Property (IP)Day 2018
3. Science Meet 2018
4. Dr. Ibeyaima Innovation Award 2018
5. Science Communicator Award 2018
6. North East Students' Summer Training on Basic Sciences
7. Sci- Connect 2018 Level –1, II (Nurturing Young Talents of North East on Science)
8. Sci-Connect Level – III
9. India International Science Festival - 2018
10. Awareness Programme on DAE-BARC Technologies
11. Demonstration of registered IPR
12. Brain Storming Session on Climate Change Issues in Manipur
13. Brain Storming Session on Traditional Knowledge System of Manipur
14. Millennium Science Lecture
15. Technology based EDP on Food Processing

16. National Mathematics Day 2018
17. Observation of one day National Science Day 2018
18. Interaction Meeting of BARC Officials with Progressive farmers on DAE – BARC Technology
19. One day workshop on Intellectual Property Right (IPR)

Projects:

1. Installation & Evaluation of Water Filtration units at Public Ponds in SC/ST areas in Imphal West District of Manipur
2. Common Facility cum Demonstration Centre for Food Processing
3. DAE Technologies Display and Dissemination Facility (DTDDF) Centre in MASTEC Complex, Takyelpat, Imphal, Manipur.
4. Patent Information Centre (PIC)
5. Manipur Science Aquarium.

3. Key activities under taken during the last two years in the areas of :

1) Technology Development

i) Improved Mridanga (Meitei Pung)

ii) Charcoal based Smokeless Fish Dryer

iii) Dholak made of chicken wire mess FRP

2) Technology Demonstration

i) BARC-DAE Technologies

Banana Tissue Culture Facility

Soil Organic Carbon Detection Kit

Foldable Solar Dryer

Vibro Thermal Disinfestor

On-line Domestic Water Purifier based on Ultrafiltration Polysulfone Membrane

Fluoride Detection Kit for Ground Water

ii) BARC-UF Water Filtration

iii) Improved Mridanga (Meitei Pung)

iv) Dholak made of chicken wire mesh FRP

v) Food technology

a) Soymilk

b) Traditional Food (Singju, Pakora, Chakhao etc.)

c) Traditional Fermented Food (Ngari, Soybum, Hawaichar etc.)

3) Popularisation of Science

1. Observation of World Intellectual Property Day
2. Observation of National Science Day
3. Science Meet
4. Observation of National Mathematics Day
5. Dr. Ibeyaima Innovation Award 2018
6. Science Communicator Award
7. North East Students' Summer Training on Basic Sciences
8. Sci- Connect 2018 Level – I and II (*Nurturing Young Talents of North East on Science)*
9. Sci-Connect Level – III
10. India International Science Expo
11. Demonstration of registered IPR
12. Awareness Programme on DAE-BARC Technologies
13. Brain Storming Session on Climate Change Issues in Manipur
14. Brain Storming Session on Traditional Knowledge System of Manipur
15. Millennium Science Lecture
16. Technology based EDP on food processing
17. Interaction Meeting of BARC Officials with Progressive farmers on DAE – BARC Technology
18. Workshop on Intellectual Property Right (IPR)
19. Vigyan Prasar Edusat Programme
20. Aquarium Exhibition
21. Summer Training on Basic Sciences at Bose Institute, Darjeeling
22. Two Contact Programmes for talented school students (boys & girls)
23. Hands on Science for school teachers of hill districts
24. Indian Science Congress
25. Training Programme on Sustainable Aqua-culture
26. Training Programme on Quality Fish Seed Production
27. Teachers' Exposure Training for Olympiad at Homi Bhabha, Mumbai

4) Patents

A percussion instrument (Manipuri Mridanga)

Patent Application No.201731028511 dated 10/08/2017

A percussion instrument (Dholak made up of wire mesh FRP)

Patent Application No.201831038883 dated 12-10-2018

Journal Publication:

A percussion instrument (Manipuri Mridanga), Application No.201731028511

Publication Date : 15/02/2019

Trade Mark Registered:

IMA CHENGHI: Trade Mark No. 3609480 in class 3 on 20/06/2018

MAHAO: Trade Mark No. 3692769 in class 30 on 01/07/2018

HB: Trade Mark No. 2685914 in class 32 on 03/08/2018

CHANU: Trade Mark No. 3922392 in class 16 on 18/02/2019

MACHANG: Trade Mark No. 3948890 in class 30 on 16/03/2019

Design Granted :

Biomass grinder – Registration No. 300090 granted on13/12/2018

Multiple Fuel household cook stove – Registration No. 301374 granted on 22/01/2019

Hydrolic briquate moulder – Registration No. 301872 granted on11/12/2018

Opening of IPR Cell:

PIC Manipur has established two more IPR Cells – one at National Institute of Electronics & Information Technology, Imphal and another one at Jawaharlal Nehru Institute of Medical Sciences, Imphal.

5) Any new innovative activities

i) Dr. Ibeyaima Innovation Award

ii) State Science Communicator Award

4. List 5 success stories with brief about 1 page each including photograph, if available

i) Encyclopedia of Medicinal Plants in Manipur, a web-based data of medicinal plants of Manipur - http://medicinalplants.co.in - ANNEXURE – A

ii) A percussion instrument (Meitei Pung) - ANNEXURE – B

iii) A percussion instrument(Dholak made up of wire mesh FRP)ANNEXURE – C

5. Has the Council developed any specific state related S&T and Innovation Policy? If so, details to be provided.

No

6. How strong are the links between other state government/departments? If so, provide details.

Strong linkages with R&D/academic Institutions including Universities, Departments – IT, Industries, Education, Public Health Engineering, Health Services, Power, Fisheries etc.

7. How strong are the links of the council with local industry units/associations?

i) All Manipur Entrepreneurs Associations (AMEA)

ii) Association of Food Scientists & Technologists (India), Manipur Chapter

8. List 5 major technology areas, where the council can play an important role by finding convergent technological solutions.

i) Technology Demonstration Centre in Manipur
ii) Improvement of the traditional technologies of Manipur
iii) Fishery - Conservation of indigenous food and ornamental fishes of Manipur
iv) Banana & Pineapple Tissue Culture for large scale propagation
v) Rain Water Harvesting
vi) Medicinal and Aromatic Plants – Preservation & Conservation
vii) S & T Interventions for local fruits and vegetables
viii) Floriculture
ix) Traditional Food

9. 5 years Vision of the Council :

1. Science Popularisations

i) Awareness programmes
ii) Workshop/Seminars
iii) Training Programmes

2. Continuing Projects

i) BARC-DAE Technologies Display and Dissemination Facility Centre
ii) Development of Integrated Model Villages (3 nos) in Manipur
iii) Common Facility–cum–Demonstration Centre for Food Processing
iv) Patent Information Centre
v) Manipur Science Aquarium

3. Project Thrust Areas

i) Technology Demonstration Centre in Manipur
ii) Improvement of the traditional technologies of Manipur
iii) Fishery - Conservation of indigenous food and ornamental fishes of Manipur
iv) Banana & Pineapple Tissue Culture for large scale propagation
v) Rain Water Harvesting
vi) Medicinal and Aromatic Plants – Preservation & Conservation
vii) S & T Interventions for local fruits and vegetables
viii) Floriculture
ix) Traditional Food

ANNEXURE – A

Encyclopedia of Medicinal Plants in Manipur

MASTEC has implemented a project and under this project a database of 400 medicinal plants found in Manipur have been compiled. The information are available on the web http://medicinalplants.co.in for the general public.

ANNEXURE – B

A Percussion Instrument (Meitei Pung)

Patent No. : 201731028511 dated 10/08/2017

Inventor : Thingujam Surendranath Singh

Director, MASTEC

Co-Inventor : Chanam Sarat Singh

Scientific Officer (Engg), MASTEC

The improved Manipuri Mridanga consists of a mridanga body fabricated using Bamboo Reinforced Polymer.

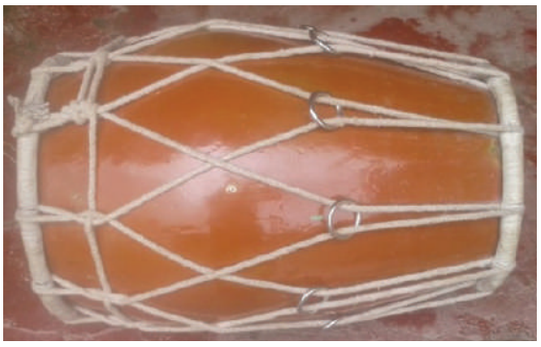
The shape, size and other material remains the same as the traditional Mridanga.

Traditional wooden Mridanga Body

Cross sectional view of the Bamboo-reinforced Polymer Mridanga Body

ANNEXURE – C

A percussion instrument (Dholak made up of wire mesh FRP)



Patent No.201831038883 dated 12-10-2018

Inventor : Thingujam Surendranath Singh
Director, MASTEC

Co-Inventor : Chanam Sarat Singh
Scientific Officer (Engg), MASTEC

Dholak is a musical percussion instrument and is a South Asian barrel-shaped, two-headed hand drum. Dholak is used in various Manipuri traditional Tribal Dances in India especially during Holi Festival.

PHOTOGRAPHS OF VARIOUS PROGRAMMES

Deputy Chief Minister Manipur at the National Mathematics Day

Celebration of National Science Day 2018

Science Meet 2018

National Mathematics Day Celebration 2018

PHOTOGRAPH OF VARIOUS PROGRAMME

Science Meet 2018

Mapu Ahum Hair Oil (TM No. 3567569)

Aquarium Exhibition

Biomass grinder (Design Rgd. No. 300090)

Water Filtration Unit installed at
Phayeng Schedule Caste Village

Food items prepared by trainees
during EDP training

PHOTOGRAPH OF VARIOUS PROGRAMME

Scenes of Science Short Play Competition

Finalist of the science quiz

Students' Spot Painting Competition

Sci-Connect Phase II

Awareness-cum-Training Workshops on DAE-BARC Technologies in progress

One Day Workshop on IPR

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

1. About the Council & it's Programme

The Council was registered on 15th July,1997 under the Meghalaya Societies Registration Act, 1983 with a mission to ensure effective utilization of science & technology for all round development of the State.

2. Activities performed by the Councils during the year 2018-19

The following are the activities taken up by the Council during the year 2018-19 :

(i) Popularisation of Science and Technology :-

(a) Award for Meritorious Students

(b) State-level workshop on Mathematics

(c) 5 Day Nature Study Camp

(d) National Children Science Congress (NCSC)

(e) National Science Day Celebration-cum-State Innovators Meet

(f) Popularisation of Science at the Community level through Block & District level Science & Technology Committees

(g) World Environment Day Celebration.

(ii) Scientific Research and Development of Appropriate Technologies (SRDAT):

(a) Skill Training Programme on Appropriate Technology in collaboration with MBDA and ETC - SIRD, Nongsder.

(b) Sustainable Water Management Centre for Rainwater Harvesting (RWH) and Decentralised Wastewater Treatment.

(iii) Remote Sensing Application Programme (RSAP):

(a) Capacity Building of Student and Unemployed Professional in the Application of Technologies in GIS.

(iv) Sponsored Project Programme (SPP)

(v) Specific Project Programme (SPP) :

(a) Action Research on Developing a fuel efficient Bakery Unit for Red Rice of Mawpharkhrew village, South West Khasi Hills.

(b) Action Research on Making of Ropes/Paving Stones using Plastic waste and Oil based waste.

(c) Action Research on Making Sanitary Pads from Garo Hills Cotton

(d) Action Research on Recycling and Reuse of Grey Water.

3. Key activities under taken during the last two years in the area of:-

(Technology Development, Technology Demonstrations, Population of science, Patents, Any new innovative activities)

Technology Development: Two major activities undertaken under this component are (i) Bio-Engineering - Arecanut fermentation ponds and (ii) Using of waste plastic for making bamboo boards.

Technology Demonstrations: Technologies Demonstrated under this component :

(i) Rain water harvesting, (ii) Improved Chulha, (iii) Low-Cost toilet, (iv) Low cost cold storage,(v) Bamboo technology, (vi) Pedal pump technology, (vii) Water filtration,(viii) Stabilised mud block, etc.

Popularization of Science: Under Science Popularisation programme the Council undertook (i) National Children Science Congress (NCSC) (ii) National Science Day (NSD) (iii)World Environment Day (iv) Season Watch (v) Nature camps (vi) Sci-Connect (vii) Workshops on innovative Physics & Chemistry experiments (viii) Eco Clubs and (ix) Adoption of 100 school as model school.

Patents: The Council recently initiated setting up of PIC in the State. Awareness programme at university level and capacity building of staff is being undertaken.

Any new innovative activities : MY-SPACE – MEGHALAYA YOUTH-SPECIFIC PROJECT AIM AT CREATING ENTREPRENEURS this project aims at creating entrepreneurs from amongst the registered unemployed qualified youth through the process of internship.

4. List 5 success stories with brief about 1 page each including photograph, if available.

(i) Bolmoram Technology Resource Centre (TRC) funded by SEED,DST,GOI:

Located in the remote area of East Garo Hills , the Bolmoram TRC has been a centre of learning and knowledge for Garo Hills region .The S &T inputs intervened in the centre in convergence with other technical agencies of the country are in the areas of green innovative technologies , E- Learning , Spoken English and functional literacy classes for village children.These technologies demonstrated at the centre have benefitted the rural folks especially women groups who took active participation during the programmes

.The centre aims to improve the livelihood of the 5 targetted villages and other villages as well.

(ii) Rain Water Harvesting Programme :

It is worth mentioning that Meghalaya is one of the few State in the Country which has a State Water Policy and SCSTE, Meghalaya in it's part had made a lot of intervention with regard to water related issues. The Councils focus on tapping of Rain Water using appropriate construction technique that are affordable and easily accessible by the community has been its main strength. The technologies that has been developed by the Council has been used extensively by NGOs such as Bethany Society, North East Slow Food Agro biodiversity Society, Bharat Scout and Guide, Traditional Institution, Schools, PHE,etc.

(iii) Skill Training on Bamboo Products :

Technology oriented Entrepreneurship Development Programme has been one of the thrust areas of SCSTE, Meghalaya, by using locally available resources (bamboo being one of the main focus) and skills. Skill training on Bamboo products was organised for women groups and youth organisations wherein Hands-on training on a varieties of bamboo products such mobile stand, mugs pen stands, pens, water bottles, key chains, hair clips jewels boxes and a number of artefact were imparted by Zogam Bamboo Works, Manipur. Today some of the trained personnel have started getting orders for these items.

(iv) National Innovation Foundation Partnership Award :

The State of Meghalaya is very rich in indigenous traditional knowledge in herbal practices, technical and engineering skills which are innovative in itself. These innovative knowledge has been going on unnoticed due to lack of understanding and awareness. The State Council of Science, Technology & Environment, Meghalaya has taken the initiative to give awareness on innovation and also to scout these grassroot innovators in the whole State. Recognising the initiative of the State Council of Science Technology & Environment, Meghalaya in furthering the cause of the grassroots innovation movement in the State, it is being awarded the NIF-India Partnership Award during the "10th

National Grassroots Innovations & Traditional Knowledge Award Function" held at Gandhinagar, Gujarat during the 15th March, 2019.

(v) Crash Course Tuition on Mathematics for weak and less privilege students:

The pass percentage of the students of Meghalaya in Mathematics in the Secondary School Leaving Certificate in the last two years was a dismal 39%. The State Council of Science, Technology & Environment, Meghalaya had conducted a one month Crash Course Tuition on Mathematics during 7th January to 8th February, 2019 for poor students who are appearing the Secondary School leaving Certificate. There were 1300 students across the 37 centres in the State who enrolled in the tuition . This tuition had a good impact to students' performance where 70% passed the examination and the higher score by 97 marks.

5. Has the Council developed any specific state related S&T and innovation policy? If so the details to be provided.

The State Innovation Council was notified on the 2nd September, 2011 with the Project Director, S&T Cell, Planning Deptt. as the Member Secretary of the State Innovation Council and accordingly the Council has developed a Road Map on Innovation for the State.

6. How strong are the links between other state government /departments If so provide details?

The main partners are as follows :- (i)Directorate of Education & Literacy (ii) State Institute of Rural Development (iii)Meghalaya Basin Development Authority (iv)Bio-Resource Development Centre (v)Information Technology Deptt. (vi)Cooperation Department (vii)All India Radio (viii)National Informatics Centre (ix)North Eastern Council (x)NESAC (xi)Planning Deptt.(xii) North Eastern Hills University (xiii) Martin Luther Christian University

7. How strong are the links of the council with local industry units/associations?

The Council has taken a lot of initiative in partnering with local association NGO, Village Institution and Entrepreneurs. The main partners are as follows :

(i) NSS units of NEHU and colleges (ii) Meghalaya science society (iii) Shillong college academic society (iv) Local durbars/ NGO'S / SHG'S/ youth organisations etc (v) HP NET (vi) Vigyan Prasar (vii) WIPRO (viii) Khmih Creative Society (ix) International Institute of Waste Management, Bangalore (x) Institute of Livelihood and Research Training , Bhopal (xi) SELCO (xii)Action Aid for rural literacy programme (xiii) Clean Energy Access Network, Delhi (xiv) Rukmini Energy Pvt. Ltd. Kolkata (xv) Life way Solar Devices, Kerala. (xvi) Tripura Bamboo and

Cane Centre (TRIBAC) (xvii) Sauramandela, Bangalore.(xviii) Sunbird Trust, Bangalore.(xix) PLUSS Advanced Technologies, Haryana

8. 5 years vision of the Council :

The Council would like to achieve the following targets within this period

(i) Setting of Livelihood Incubation Kendras (LINKs) in 45 blocks

(ii) Establish 3 model villages in the 3 region of the Khasi, Jainta and Garo

(iii) Establish 100 models school in the State.

(iv) Establish a Regional Office at Tura to cater the needs of the Garo Hills

(v) Establish 3 Technology Resource Centres that are self sustaining.

(vi) Establish Coaching Classes for Maths and Science in the State to be run by educated unemployed graduate.

(vii) Conduct 5 action research that will address issues of water, energy , climate change, health, education and livelihood.

MIZORAM SCIENCE, TECHNOLOGY & INNOVATION COUNCIL (MISTIC)

1. Details of State S&T Council

a) Name of the Member Secretary

Dr. R.K. Lallianthanga

b) Address, E-mail, phone/Mob, fax

Science & Technology Building
Mizoram Secretariat Complex,
Khatla, Aizawl, Mizoram Pin-796001
Email : cso.dst-miz@gov.in and mistic.dst@gmail.com
Website : https://mistic.mizoram.gov.in
Phone : 0389-2336486 / 0389-2336159 / 0389-2336787 (Fax)
Mobile No. : 9436140957 (Member Secretary)

2. Structure of the Council

a) Date of Establishment - 12.2.1985

The Mizoram Science, Technology & Innovation Council (MISTIC) is an autonomous Government body working under the aegis of Directorate of Science & Technology, Planning & Programme Implementation Department. It was established in the year 1985 in the name of Mizoram Council of Science, Technology & Environment (vide Planning Dept. Notification No. T.13013/1/84-Sc&Tec dated 12.02.1985). MISTIC is now also registered under the Mizoram Society Registration Act 2005 (Reg.No.MSR-630 of 1.5.2015) to enable it to work more smoothly and more accountable.

MISTIC plays an advisory role and implements various science and technology promotion activities in the state. It is undertaking various activities like science promotion and popularization, technological innovation development and promotion, facilitation of various forms of intellectual property rights, technology demonstration and replication, and other research & development works and programmes. At present, the Council is administering four cells viz. Patent Information Centre, State Climate Change Cell, Research & Development Cell and Innovation Cell. It has also recently established Innovation Facility Centre. The Council acts as a nodal partner of the Department of Science & Technology (DST), Government of India in the state and it receives yearly Grant-in-aid from DST for salary of limited scientific/technical employees as Secretarial support as well as fund for implementing various projects. The State Government also supports the Council for salary of administrative staff and for non-salary in the form of GIA.

MISTIC is governed by two committees, the Governing Body and the Executive Committee. In the Governing Body, Hon'ble Chief Minister is the chairman and Hon'ble Planning Minister is the Vice-Chairman. In the Executive Committee, Secretary, Planning (Science & Technology) Department is the Chairman. Chief Scientific Officer is the Member Secretary in both the Committees.

3. Key Activities undertaken during the last two years in the area of –

a) Technology Development

i. A prototype of 'hand pressing phone charger' is developed in collaboration with local grassroot innovator Mr. C. Vanlalawmpuia of Champhai town, Champhai District.

ii. A working prototype of 'power hammer' is developed in collaboration with local grassroot innovator Mr. Jonah L. Pachuau, Ramhlun Veng, Aizawl.

iii. A working prototype of 'torsion design machine' is under development in collaboration with local grassroot innovator Mr. Jonah L. Pachuau, Ramhlun Veng, Aizawl.

iv. A working prototype of 'rolling shutter controller machine' is developed in collaboration with a local grassroot innovator Mr. Zoramchhana, Chhungte, Champhai, Champhai District.

v. A working prototype of 'automatic multiple spindle' (or thread winding machine) is developed in collaboration with a local grassroot innovator Mr. Chhuanmawia, Haulawng village, Lunglei District.

vi. A major project i.e. 'Development of Indigenous Technological Innovation in Mizoram' is initiated. Under this project, an Innovation Facility Centre is constructed at Mizoram New Capital Complex, Khatla, Aizawl which is due to be inaugurated. The centre will start functioning during 2019-2020.

b) Technology Demonstration

i. An indigenous innovation 'Novel Sacramental Wine dispenser' was demonstrated. The innovator is Mr. F. Lalhmangaiha. Patent was filed for him by Patent Information Centre, Mizoram under MISTIC. The inauguration function was held at Synod Conference Hall, Aizawl and the machine/device was inaugurated by Dr. R.K. Lallianthanga, Chief Scientific Officer & Member Secretary, MISTIC.

ii. An indigenous innovation 'Automatic Water pump controller' innovated by Mr. F. Lalhmangaiha was demonstrated. Patent was filed for him by Patent Information Centre, Mizoram under MISTIC. The inauguration function was held at Synod

Conference Hall and the machine/device was inaugurated by Dr. R.K. Lallianthanga, Chief Scientific Officer & Member Secretary, MISTIC.

iii. A working prototype of 'power hammer' developed in collaboration with local grassroot innovator Mr. Jonah L. Pachuau, Ramhlun Veng, Aizawl is installed and demonstrated.

iv. An indigenously innovated electro-mechanical device prototype i.e.

'Rolling shutter controller machine' that is able to lift and pull down rolling shutter using a simple on/off switch was demonstrated and installed at Champhai, Champhai District, Mizoram.

v. An indigenously built turbine prototype for pumping water at elevated heights using power of flowing water/river developed by a local grassroot innovator Mr. Darrothuama, Hnahlan with the fund provided by MISTIC was conducted at Tiau river near Hnahlan, Champhai District of Mizoram.

vi. Demonstration of an equipment viz. self-water pumping system using force of running water developed by Stephen Sangluaia, local innovator was held on 23rd March, 2018 at Tuirial river.

vii. The project "Development of Sawdust Briquetting and Charcoal

Making Plant at Chhuanthar Tlangnuam (Baktawng)" under New Economic Development Policy (NEDP) of the State Government is launched and implemented. Under this project, briquetting machine and charcoal kiln are the main machineries that are demonstrated for production of charcoal and briquettes.

c) Popularization of Science

i. Celebration of National Mathematics Day 2018:

ii. Organizing of 10th State Level Mathematics Competition, 2018:

iii. Organizing of Mathematics Summer Camp 2019:

iv. Celebration of National Science Day 2019:

v. Organizing Seminars on National Science Day 2019 Theme with Science based NGOs:

vi. Organizing of Innovation & Science Exhibition at Aizawl:

vii. Organizing of Science Exposure Tour:

viii. Observation of National Technology Day:

ix. Organising of Mizoram Science Congress 2018 :

x. Participation in India International Science Festival 2018:

xi. Science Demonstration Programme:

xii. Seminar cum Science Demonstration:

xiii. Sci-Connect of North East – Science Quiz & Hands on Training:

d) Patents

1. **Number of IPR Awareness programmes organized :** 5 nos. of awareness programme/ workshop organized in 2018-2019. A special programme i.e. Grassroot Innovators Meet cum IPR Awareness programme was organized at Mizoram Science Centre on 14th March, 2019.

2. **Number of patents filed :** A total of 9 numbers of patents have been filed by Patent Information Centre, Mizoram since its inception.

3. **Number of Geographical Indication filed :** A total number of five (5) GI applications was filed in 2017-2018. The Patent Information Centre, Mizoram pursued these GI applications during 2018-2019 and had done a commendable job on research activities of the GI goods including attending queries, formality check reports and hearings conducted by GI Registry, Chennai.

4. **Number of Trade Marks filed :** 1 no. application filed in 2018-2019.

5. **Number of Trade Marks registered/granted :** 3 nos. granted in 2018-2019. In the overall, a total of 7 numbers of Trade Mark have been registered now through PIC, Mizoram.

6. **Number of Copyrights filed :** 1 no. (2018-2019)

7. **Number of Intellectual Property Rights (IPR) Cells created** :

   Six (6) nos. of IPR cells have been created in Mizoram. They are:-

   a) Mizoram University IPR Cell
   b) Pachhunga University College IPR Cell
   c) Govt. Zirtiri Residential Science College IPR Cell
   d) Lunglei Government College IPR Cell
   e) National Institute of Electronics and Information Technology (NIELIT) IPR Cell
   f) ICFAI University Mizoram IPR Cell

8. **Logo for GI:** Five (5) nos. of logo were designed for five GI applications. These were approved by the Art & Culture Department of the State Government and they are used as logo for five GI applications propagated by Patent Information Centre, Mizoram

Any new Innovative Activities

1. The project 'Development of Indigenous Technological Innovation in Mizoram through Establishment of Innovation Facility Centre and Enhanced Protection of Ownership' was started. Under this project, Innovation Facility Centre is constructed at Mizoram

New capital Complex, Aizawl, at a plot given by the State Government to the State Council. The Centre is now nearly ready for inauguration.

2. An Innovation Hub & Space Science Education Centre is created at Mizoram Science Centre with the support of National Council of Science Museums. The Hub is a place of innovative activities where young students are mentored by experts. The Centre was inauguration during 2018-2019.

3. The project 'Construction of Digital Planetarium at Lunglei' is under implementation now at Lunglei town in Lunglei District with the support of North Eastern Council and the State Government.

4. The Mizoram Council's project 'Development of Sawdust Briquetting and Charcoal Making Plant at Chhuanthar Tlangnuam (Baktawng)' in Mizoram was inaugurated during 2018-2019 and is implemented now. The village Baktawng is a carpentry-based village where many activities such as manufacturing of home furnitures, utensils, etc. are undertaken.

5. The project 'Community Based Environment Conservation and Ecotourism Project at Ailawng Village, Mizoram' was started by MISTIC during 2018-2019 with the financial assistance received from the State Government. Construction components of the project is under implementation now.

6. A new innovative project i.e. 'Development of Water Based Preservation Technology of Orange at Thingsai Village' was started by MISTIC during 2018-2019. The project is located at Thingsai village, Lunglei District on the southern part of Mizoram.

7. The Mizoram S&T Council (MISTIC) started a new project viz. 'Enhancement of livelihood options for Rural Women in Mizoram' during 2018-2019. The project is funded by SEED Division, DST, GOI.

8. The Mizoram S&T Council (MISTIC) is implementing a new project viz. 'Investigation of the Anticancer properties of *Mallotus roxburghianus.*' This project is funded by KIRAN Division, DST, Govt. of India under Women Scientist Scheme A (WOS-A) during 2018-2019. The project duration is 3 years.

4. List 5 success stories with brief about 1 page each including photographs, if available.

1) Development of Sawdust Briquetting and Charcoal Making Plant at Chhuanthar Tlangnuam (Baktawng)'

Mizoram Science, Technology & Innovation Council (MISTIC) has successfully set up a pilot-scale demonstration project viz. 'Development of Sawdust Briquetting and Charcoal Making Plant at Chhuanthar Tlangnuam (Baktawng)' in Mizoram. The construction of the plant was

completed and inaugurated during 2018-2019. The village Baktawng is a carpentry-based village located at about 80 kms from the state capital where many activities such as manufacturing of home furnitures, utensils, etc. are undertaken.

5. Has the Council developed any specific State related S&T and Innovation Policy? If so, the details to be provided.

- State S&T and Innovation Policy for the state is being prepared by the Directorate of Science & Technology, Govt. of Mizoram. The Council has provided necessary assistance in preparation of the policy.

6. How strong are the links between other State Govt./Department? If so provide details.

- The Council and the Directorate of Science & Technology, Govt. of Mizoram works together in implementing many schemes and projects.
- The Council has good linkage with line Departments, Colleges and Universities of the state. Most of the science popularization programs and workshops are organized in collaboration with them.
- It has created six (6) Intellectual Property Right (IPR) Cells in six institutions in collaboration. Most of these institutions are under the Higher & Technical Education Department of the state.
- It is collaborating with the Art & Culture Department of the State Government in processing of Geographical Indications applications of five items/goods.
- It works together with Forest Department and other line departments such as Horticulture and Agriculture Department in Climate Change Mitigation and Adaptation programs.
- It has signed an MOU with Administrative Training Institute of the State Government for conducting training in climate change related areas.
- It works with School Education Department in implementing S&T mass awareness programmes in the state. Moreover, the School Education Department has provided a land to the Council for construction of Digital Planetarium at Lunglei.

7. How strong are the links of the Council with local Industry Units / Associations?

- Linkage has been established with the local Industries, associations and societies in the State. It has collaboratively organized programmes with Confederation of Indian Industries (Mizoram) and Mizoram Chamber of Industries. S&T Need Assessment workshop was organized with the Mizoram Science Society. It has established good linkages with all the Science-based NGOs of

the state such as Mizoram Science Society (MSS), Mizoram Mathematics Society (MMS), Mizo Academy of Sciences (MAS), Science Teachers' Association Mizoram (STAM), Biodiversity & Nature Conservation Network (BIOCONE) and Geological Society of Mizoram (GSM). It has also jointly organized Mizoram Science Congress 2018 with these societies.

8. List 5 major Technology Area, where the Council can play an important role by finding convergent Technological Solutions.

1) Environment and Climate related area
2) Food processing & preservation technology
3) Waste management
4) Energy development
5) Water & Irrigation technology

9. 5 years vision of the Council (MS word not more than half page):

1. MISTIC is planning to implement the project 'Establishment of Technology Demonstration Centre (TDC) in Mizoram' with DST, New Delhi.

2. MISTIC is implementing the project **'**Enhancement of Livelihood option for Rural Women in Mizoram' and it is expected to be completed by 2022.

3. MISTIC is implementing the project 'Community Based Environment Conservation and Ecotourism Project at Ailawng Village, Mizoram' and construction of various components is expected to be completed by 2019-2020.

4. MISTIC is implementing the project **'**Development of Indigenous Technological Innovations in Mizoram through establishment of Innovation Facility Centre and enhanced protection of ownership (DITIM)'. It is planned to innovate and promote at least 25 grass-root innovations and safeguard the IP that may arise.

5. MISTIC is implementing the project 'Establishment of Colour Web-Offset.' Colour web-offset machines will be installed at the centre that will cater the printing of annual school textbooks of the state, etc.

6. MISTIC is planning to establish Mizoram Bioresource Development Centre in Mizoram with the objective of exploring and utilising the rich bioresources of the state. The Hon'ble Union Minister for Science & Technology, Dr. Harsh Vardhan had also laid the foundation for the Centre at Mizoram University in 14.2.2017.

7. MISTIC is planning to establish Biotech Park in Mizoram.

8. MISTIC is planning to make improvement of intellectual property rights management in the state through strengthening of Patent Information Centre.

9. MISTIC is planning to delve further deeper into Strategic Knowledge Mission on Climate Change through strengthening of State Climate Change Cell.

10. MISTIC is planning to make a study viz. Mapping of Science & Technology Needs of the state to locate the specific problems faced by the state and thereby identify where specific S&T interventions can be made.

11. MISTIC is planning to take up Science & Technology Study & Surveys to bring up S&T related resource database of the state.

12. MISTIC has a vision to take up project for Promotion of Science and Mathematics Education at Secondary Schools in Mizoram through Formation of Science Club Network.

13. MISTIC has a vision to take up project for Science and Technology Intervention in Schools and Colleges in Science and Mathematics Education through Installation of Digital Classrooms.

14. MISTIC has a vision to take up project for setting up Virtual Lab Project for Secondary/ Higher Secondary School Students in Mizoram with the assistance of DST, New Delhi.

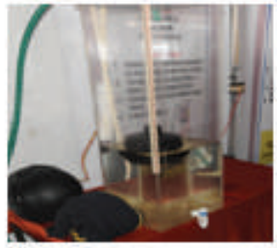
15. MISTIC is establishing a Digital Planetarium at Lunglei with the assistance of NEC. The project is expected to be completed in 3 years time.

16. MISTIC has a vision to take up project for Communicating Science through organising of various Scientific programmes and Events. This includes State level Science Congress Science Fair, Students Science Seminar, Science Drama Competition, Science Quiz contest, science camp, etc.

Technology Demonstration

With Local Grassroot Innovators

Sacramental Wine Dispenser



Automatic water pump controller

Power Hammer

Rolling shutter controller machine

Water turbine for pumping water at elevated heights using power of flowing water (prototype)

HNAHLAN RIVER TUIRIAL

Mizoram Science Congress 2018

NAGALAND SCIENCE & TECHNOLOGY COUNCIL

1. About the Council and its Programs :

Nagaland Science & Technology Council (NASTEC) is established as an autonomous body under the Department of Science & Technology, Government of Nagaland. It is a registered society under Societies Registration Act on 6th August, 1999.

Divisions:

1. Science popularization
2. Engineering Division
3. Analytical division: Nagaland State Referral Laboratory for Water Quality Testing & Monitoring
4. Life Sciences / Biotechnology
5. Remote Sensing and Space Application Centre
6. Nagaland State Climate Change Cell

Scientific facility units:

1. Biotechnology lab
2. Microbiology Lab
3. Analytical Chemistry Lab
4. Molecular Biology Lab
5. Chemical Ecology Lab
6. State Referral Laboratory for Water Quality Testing
7. Patent Information Centre
8. Remote Sensing & GIS Lab

2. Key activities under taken during the last two years in the area of:-

1. Technology Development

Sl. No.	PROJECT NAME
1.	Development of Electronic Load Controller
2.	Water mill Based Animal feed crusher Production Unit
3.	Screening and characterization of soil microbial diversity in Alder-based farming system.
4.	Investigation of the antioxidant capacity and antimicrobial activity of some Medicinal Plants used by Naga people
5.	Mass Spectrometry analysis of bioactive constituents of extract of *P. molle*
6	Biopesticides & Biofertilizers Production
7	Study of in-vitro enzymatic inhibitory activities of selected indigenous plant extract
8	Study the protein content of "Kholar" beans of Nagaland

2. Technology Demonstrations

Sl. No	PROJECT NAME
1.	Popularization & Dissemination of Technology of Bio-Pesticide formulations among the farmers of weaker sections in NE region
2.	Value Addition of Agro Produce through use of Solar Air Heaters and Heat pump in Nagaland
3.	Pilot Scale Optimization for standardization of processing & Agro techniques of selected high value aromatic & Medicinal plants including technology demonstration & extension for socio economic upliftment
4.	Testing of HUC Solar Lantern
3.	Testing of HUC Solar Lantern

3. Population of science

i. National Science Day 2019 was celebrated in all the districts on the theme **"Science for people and people for science" on** 28th February. In each district, programmes was conducted through coordinators and supervision under the given theme. The main activities of the programmes includes- debate, quiz, exhibition and talks on popular science. During the current academic year 2019, each district could mobilize over 300 students for National Science Day celebration.

ii. National Mathematics Day 2018 was celebrated across the state in enthusiastic celebrations on 22nd December. As part of celebrations, Mathematics Model exhibition, Mathematics quiz was conducted to commemorate the day. Over thousands of students from the state joined the celebration and a talk on "Importance of Mathematics" was organized with resource person expertized in the field of mathematics from reputed institution.

iii. "Sci-Connect-Nurturing young talents of North-East on science", a science quiz competition for the students of class 8 & 9 of the North East states, India. Organized by Vigyan Prasar in collaboration with the Nagaland Science & Technology Council (NASTEC) is held annually. Sci-Connect Hands on Training was held on 26th April, 2019 at Nagaland Science Centre, Dimapur. Altogether 15 students from various schools of Dimapur, Kohima and Phek District along with one teacher attended the program. Welcoming the participants, Mr. Richard Rikhio, Curator, Nagaland Science Centre, Dimapur highlighted various aspects of science, facilities available at the centre and other activities carried out by the Nagaland Science Centre to promote, encourage and motivate students across the states towards science not just as a subject but as our daily activities. The program was a day long activity, out of the classroom learning where students were briefed about the subject and further discussion were carried out after showing videos, covering three topics i.e. Biodiversity, Earthquake and Astronomy.

Resource persons with the participants

Talk on Astronomy delivered by Mr. Sosangtemjen

Mr. Richard Rikhio interacting with students on Biodiversity

3D Movie on Biodiversity

iv. Biotechnology Awareness & Promotion programmes conducted across the selected districts of the state.

v. A research paper entitled "Elucidating the Biochemical Properties of an Underutilized Green Leafy Vegetable of Nagaland" was presented at the UGC Sponsored National Conference on Contemporary Excitement in New Biology (CENB- 2018).

vi. The council gave a talk on "How to secure and protect indigenous Tribal textiles and Handicrafts through GI & IPR" at "The International LionLoom Festival" organized by the Exotic Echo Society conducted on 6th December, 2018 at Diezephe Village, Dimapur.

vii. Presented a talk on 'Plastic Free Destination Village' programme, a workshop at Khonoma and Dzüleke under the aegis of Directorate of Science & Technology and Nagaland Science & Technology Council (NASTEC).


THE MORUNG EXPRESS

HOME NAGALAND NORTH-EAST INDIA BUSINESS WORLD ENTERTAINMENT SPORTS LIFE & STYLE

EDITORIAL INFOCUS PERSPECTIVE PUBLIC SPACE FEATURED NEWS FAITHLEAF MORUNG LEARNING PHOTOS E-PAPER

'Plastic free destination village' workshop held

April 25, 2019

Dr. Merino Vica addressing the plastic free workshop held at Khonoma on April 25.

viii. A talk on Documentation, Research & Development was delivered at Nagaland State Biodiversity Board, Dept of Environment, Forest & Climate Change, GoN, where the interns as well as the officials participated in the program.

ix. Intellectual Property Rights (IPR) Awareness programmes conducted across the state.

x. A no. of online/blended lecture series on Chemical Ecology has been conducted to research fellows and scientists in the institute.

4. Patents

G.I on traditional "Chakhesang Shawls" has been registered under G.I no 542 with the Certification No. 301 as on 31st October, 2017 at Chennai.


Chakhesang Shawl gets Geographical Indication tag

October 26, 2017

Chakhesang Shawls

Third product from Nagaland to get GI tag after Naga King Chilli & Tree Tomato

Morung Express News

Awareness programs on "Intellectual Property Rights" have been conducted to schools, colleges, Universities and NGOs and tribal Organisations in the state.

PIC Nagaland is acting as Inspection body and enforcement agency for GI and other IP related issues for the state.

A talk on Documentation, Research & Development was delivered at Nagaland State Biodiversity Board, Dept. of Environment, Forest & Climate Change, GoN, where the interns as well as the officials participated in the program.

Patent Search facilities are outsourced to the public through the Indian Patent database and Ekaswa 'A', 'B' and 'C.

5. Any new innovative activities

Partners with the research community to create a culture of high achievement

To create a repository for Rhododendron species in North East

3. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

NA

4. How strong are the links between other state government /departments, If so provide details?

The Council has been working in linkage with various Departments and Agencies across the country. Following are the present collaborators in various projects.

At State level:

PHE Department
Land resources Department
Agriculture Department
Sericulture Department
Horticulture Department
Forest Department
Soil & Water Conservation Department
NEPED

At National level:

- IIT Bombay,
- IISc, Bangalore
- IIHR, Bangalore
- University of Agricultural Sciences (UAS), GKVK
- NRSC, Hyderabad
- NESAC, Department of Space
- IIIM, Jammu

- CSIR-NEIST, Jorhat.
- NCBS, Bangalore
- MoEF, New Delhi
- IBSD, Imphal
- Rajiv Gandhi University, Itanagar
- NEHU, Shillong
- Manipal University, Sikkim

5. How strong are the links of the council with local industry units/associations?

The council being the nodal agency for catalyzing and co-ordination of S&T activities in the state it has the direct linkage with the line departments, NGOs, Industries, etc., upto the village council level.

Given below are some of the current collaborators for execution of various activities in the state.

- NRC on Mithun, Jharnapani
- Nagaland University, Lumami
- Kohima Science College (an autonomous institution of NU), Jotsoma
- PHED
- Soil and Water Conservation Department.
- Department of Forest, Environment and Climate Change, Govt. of Nagaland
- All State Line Departments

NGOs/Partners:

- Hill Innovation Lead Organisation (HILO) Kohima.
- Turbo Engineering, Kohima.
- SARDAM, Khuzami, Phek.
- Chakhesang Women Welfare Society
- North-East Network (NEN)
- Sustainable Development Forum of Nagaland (SDFN)
  Village Councils/Panchayats/Village Development Boards
- SHGs
- NBCC
- Other relevant NGOs in the state

6. List 5 major technology area, where the council can play an important role by finding convergent technological solutions.

i) Development of Hill Specific Technology in Agriculture

ii) Geospatial Technology for developmental policy guidelines in the state.

iii) Application of Biotechnology for harnessing of the state's rich bioresources.

iv) Intervention of S&T in Indigenous Traditional Knowledge System in Nagaland.

v) Development of indigenous wild foods for socioeconomic upliftment of the rural population

7. Proposed programme and budget outlay for the 2019-20

A. Ongoing Projects :

Sl. No.	**Name of Activity**
1	Science Popularization
2	State Spatial Data Infrastructure
3	Establishment of Climate Change Cell under NMSKCC/NMSHE
4	Water Quality Mapping for Kohima and Dimapur District
5	Chemical Ecology of the North-Eastern Region (NER) of India: A collaborative programme linking NER and Bangalore Scientists: a) Chemical Ecology of Oak Borer Larva with its host and the associated organisms b) Chemical Ecology of Dazo Nha: A potent Anti-rheumatic plant c) Aquarium-assisted Evaluation of Fish-Poisoning Plants against Fishes followed by Piscicidal Plants Extraction, Isolation and their Neurobiological Activity
6	Biotechnology Hub
7	Patent Information Centre
8	CHAMAN
9	Understanding adaptive plant-pollinator networks among the understory perennial gingers (family Zingiberaceae) using a field and molecular ecology approach
10	Pilot Scale Optimization for standardization of processing & Agro techniques of selected High Value Aromatic & Medicinal Plants including Technology Demonstration & Extension for Socio Economic Uplifment
11	Development of Hill Agri Tools and Equipment
12	IWMP Monitoring project
13	Wetland mapping – 2nd Phase

Total

B. New Proposed Activities for 2019-20 under Local Specific Research.

Sl.No.	**Local Specific Research Thematic Area**
1	Load Utilization of Micro & Pico Hydel Power

2	Local Medicinal herbs
3	Indigenous Microbial Resources
4	Development of wild fruits and vegetables of Nagaland as health food
5	Research and development on fermented foods of Nagaland
6	Brine Water Processing Unit for Salt Production
7	Documentation of ITKS of Nagaland
8	Study of in-vitro enzymatic inhibitory activities of selected indigenous plant extract
9	Study the protein content of "Kholar" beans of Nagaland
10	Building awareness at Schools, ITI's & Polytechnics onEmerging Information Technologies like Cyber security, Artificial Intelligence (AI), Internet of Things, etc

Total (Rs. In Lakhs)

8. 5 years vision of the Council :

A. Drinking Water Resource Development and Management :

i. Drinking water quality analysis for both surface and ground water sources and monitoring for all the 12 Districts of Nagaland.

ii. Promotion and development of ground water source recharge for the water scarce areas of the State and water harvesting structures in water scare areas of the state.

B. Poverty Alleviation and Livelihood Enhancement with special emphasis to rural tribal population of Nagaland:

i. Development of appropriate technologies and implement it for rural livelihood upliftment

ii. Implementation of location specific feasible technologies for rural areas

C. Envisage Food Security and promotion of health Food through development of Organic Farming

i. Promotion and Development of Organic agriculture in the state

ii. Implementation of appropriate technology for value addition of the agricultural produce

iii. Facilitation of market chains for the rural areas in the state

D. Comprehensive Study of Cross-cutting issues on Environment and Climate Change to formulate appropriate climate change adaptation strategies for the state

i. To conduct Participatory Rural Appraisal (PRA) on Climate change upto village level for the entire state of Nagaland

ii. To take up such projects that promotes climate change adaptation and livelihood enhancement in vulnerable sectors and locations.

E. Application of Remote Sensing & GIS Technology for the development of the State:

i. Biodiversity Mapping of rich and vulnerable bioresource areas of the state.

ii. Crop suitability Mapping and preparation of niche model for important crops of Nagaland

iii. To continue working in all national networking projects that involves RS &GIS for the state of Nagaland

F. Application of Biotechnology for the Development of the State:

i. To provide technical and logistic support to establish at least 3-5 units for Biofertilizers&Biopesticides production

ii. To train 500 prospective youth for fostering entrepreneurship and self reliance livelihood

iii. To implement research projects for taping the rich Natural Bioresources of the state for promotion of sustainable livelihood

iv. To develop food products through application of fermentation technology.

v. To establish state-of-the-art tissue culture laboratory for *in-vitro* production and propagation of rare and high commercial value plants of the state.

vi. To conduct research and development studies for sustainable livelihood enhancement.

vii. To create a standard conservation strategy in situ (on-farm or wild) and ex situ (gene or field bank) approaches for conservation of medicinal plants in Nagaland

G. EngineeringApplication:

i. Small to medium unit environmental friendly incineration for offices,community buildings,schools etc.

ii. Liquid waste management system for both black water and guy water.

H. Intellectual Property Rights:

i. To register GI for all the tribal attires of Nagaland

ii. To promote and protect indigenous products and high value resources of the state through Intellectual Property Rights.

I. Science Awareness creation, Human Capacity Development and Trainings

The council carry out regular activities such as Science popularisation, human capacity building and conduct hands-on activities on annual basis. The Council will continue to conduct all these programmes on regular basis even in the next five years.

PUDUCHERRY COUNCIL FOR SCIENCE & TECHNOLOGY

1. On-going Activities :

I. Release of partial financial assistance for the conduct of conference / Seminar / Workshop by various educational / Academics institution funded by PCS&T

II. Travel Grant to Academicians for presenting paper at International place funded in PCS&T

III. Participation of staff's of PCS&T in various training program

IV. Sky Watching Activities organized by PCS&T

V. Financial Assistance released by PCS&T for conduct of other programs

VI. Events organized / conducted at Dr. Abdul Kalam Science Centre & Planetarium

VII. Mobile Science Exhibition Bus Shows and Science Exhibition Participation

VIII. General (other events)

2. Construction of Space Exposition Centre, Innovation Hub and Digital Planetarium at Thirunallar, Karaikal

Site inspection for Construction of Space Exposition Centre, Innovation Hub and Digital Planetarium at a cost of Rs.10.00 crores in 5 acres of land at Thirunallar, karaikal was done on 21.11.2017 under the Chairmanship of Collector-Karaikal, Director/M.S. (PCS&T) and Director (Visvesvarya Industrial and Technological Museum), Bengaluru. Now sand filing work was done and it is proposed to construct compound wall covering the entire premises by PWD, Puducherry.

Free Sapling Distribution For Public

Dr. Abdul Kalam Science Centre and Planetarium has also started functioning as free sapling distribution centre. Nearly 20,000 tree sapling was disbursed to the public under this scheme

3. List 5 success stories with brief about 1 page including photographs, if available.

Dr. ABDUL KALAM SCIENCE CENTRE AND PLANETARIUM

Dr. Abdul Kalam Science Centre and Planetarium, Puducherry has been set up by the National Council of Science Museums (NCSM), an autonomous body under the Ministry of Culture, Govt. of India, with active support of Puducherry Council for Science and Technology & Environment. The Centre is established in a built – up area of 1.5 acres of land and houses 2 permanent exhibition galleries namely "Marine Gallery" and a "Fun Science Gallery". It also has a Science Park, Planetarium, Science Demonstration Lecture Corner, Children's Activity Corner, Air Conditioned Auditorium, a Mini Conference Lecture Corner, Children's Activity Corner, Air Conditioned Auditorium, a Mini Conference Hall and other public facilities. Dr. Abdul Kalam Science Centre and Planetarium Science Centre is situated in the Airport road in Lawspet, Puducherry. This is an ideal place to engage the young and the old alike with the process of discovering science through a fun filled experience. The facilities available are as follows:

National Science Day Celebration 2019

Sky Watching Program:

Conducted mass awareness programme on Total Lunar Eclipse at Dr. Abdul Kalam Science centre and Planetarium on 28.07.2018 by staffs of PCS&T in which nearly 500 general public and students witnessed the event through astronomical telescope.

புதுச்சேரி லாஸ்பேட்டை குறிஞ்சி நகர் அப்துல் கலாம் அறிவியல் மைய கோளரங்கில், சந்திரகிரகணத்தை காண்பதற்கு திரண்டிருந்த பொதுமக்கள். **அடுத்த படம்:** புதுச்சேரியில் தெரிந்த சந்திர கிரகணம்.

Dr. Madhu, Retired Deputy Director, CECRI, Karaikudi delivering lecture to the students at the Summer Vacation Science Camp on 09.05.2018.

Presentation of Best Science Students Awards with cash and citation by Hon'ble Minister for Science, Technology & Environment on 25.01.2019.

4. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

No specific state related S & T policy has been framed. Puducherry being a Union Territory, the policy and guidelines of DST are being followed and implemented.

5. How strong are the links between other state government/ departments if so provide details?

The PCS&T in the U.T. of Puducherry is functioning in the Department of Science, Technology & Environment since 1998. From its constitution, the Council is functioning in the Administrative Department of Science, Technology & Environment.

Hon'ble Minister for S&T is the Chairman and Chief Secretary is the Vice Chairman of the Council. Besides, the other members include Secretaries to Govt. and Heads of the academic / research institutes, each one nominee of Planning Commission and Department of Science & Technology (DST), GOI and Pondicherry University. Further the Executive Committee of the Council is headed by the Secretary (Sci., Tech. &Envt.) and Director (DSTE) is Member Secretary for both the Council and Executive Committee.

6. How strong are the links of the council with local industry Units/associations?

Puducherry Council for Science & Technology has very good relationship with industries and NGO's. Many activities/ awareness programmes are being sponsored by different industrial units existing in the U.T. of Puducherry. Activities like Summer vacation science camp, Awareness programme on Ozone day, plastic ban, World Environment day are sponsored the Industries. Apart from above under corporate social responsibility scheme, repairing and maintenance of exhibits in Dr.Abdul Kalam Science Centre and Planetarium is being carried out M/s EATON, Puducherry. Similarly, the garden of the Science Centre is being maintained by M/s MRF Ltd, Puducherry

7. List 5 major technology area, where the Council can play an important role by finding convergent technological solutions.

1. Real time Student Science Projects.
2. Setting up of Digital classrooms with virtual science laboratory for school students.
3. Supporting the conduct of Science Fair in school and college levels.
4. Encouraging Women Science Programme.
5. Solution to Location Specific Problem by both financial and technically.
6. S&T entrepreneurship training programme.
7. Administrative approval for Patent support was obtained
8. Establishment of Innovation Hub at a cost of Rs. 2.25 crore. Civil construction has been commenced and the project is expected to be completed within 6 months.

8. Proposed programme and budget outlay for the year 2019-20.

Apart from the regular activities of the council, the following programmes are proposed to be implemented with financial support of DST.

I. Real Time Student Project Programme

Puducherry Council for Science and Technology aims to develop and utilize the tremendous talent and potential of students available in our U.T. of Puducherry and to use them for solving specific Scientific and Technological problems relevant and useful to our society. Under this Scheme financial support is provided to encourage the students of U.G (Professional) /P.G (Professional and Sciences) courses in Engineering/ Biology/ Physics/ Chemistry/ Medicine/ Agriculture/ Veterinary/ Environment / Social Sciences at the regular colleges and Universities (including Deemed to be Universities) to take up useful minor research projects to complete the dissertation work. A selected student is provided with a maximum grant of Rs. 10,000/-. About 100 projects in science and technology related to the selected disciplines are proposed to be sanctioned every year. After completion of the projects the grantees present their findings before the peer group in a seminar cum exihibition. Prizes are given to selected projects and models. Proposal seek financial assistance for an amount of Rs. 1.10 crores from DST, GoI has been submitted during the month of March 2018.

II. Setting up of Digital classrooms with virtual science laboratory for school students.

Tele teaching to school students with Interactive terminal provisions. It is proposed to start with 10 schools on pilot bases with one central studio at Pondicherry. In Collaboration with the Directorate of School Education, Puducherry it is proposed to set up Digital Classrooms for enhancement of quality of education in schools with the supply of Teaching Learning Equipment (TLE). This Proposal may be implemented with technical and financial support from DST, GoI.

III. Solution to Location Specific Problem by both financial and technically.

IV. Patent support.

A patent information centre shall be established with support of DST. Administrative approval for establishment of Patent Information Centre (PIC) has been obtained.

* * *

PUNJAB STATE COUNCIL FOR SCIENCE & TECHNOLOGY

1. About the Council & its programs:

i) Punjab State Council for Science & Technology, under the aegis of Department of Science Technology & Environment, Punjab has transformed itself from a project driven S&T organization to facilitating Science, Technology, Research and Innovation in the State.

ii) The Council has three key pillars of its strategy namely the Administrative Departments of the State, Universities and Research Institutions and Industry. The Council, in a unique initiative in the country, will facilitate the three different cultures namely the government, the academia and the industry to come together and forge partnerships towards developing a vibrant ecosystem of research and innovation in the State towards enhancing the competitiveness, boosting the growth and creating quality jobs.

iii) The Council has further strengthened its mandate in the areas of Air, Water, Waste and Public health with increased focus of the State in protecting the environment and human health.

iv) The Council is accordingly embarking on an exciting journey with host of programs and initiatives towards accelerating the social and economic growth of the State in a sustainable manner with focus on research and innovation.

2. Activities performed by the Council during the year 2018-19

i) Transforming from project based approach to facilitation of S&T

The key responsibility of the council to formulate the S&T plans and secure their execution has been undertaken in real earnest during 2018-19. The Council has forged partnerships with various universities and research institutions to facilitate the research projects being undertaken by them and more importantly towards connecting them to the administrative departments, industry and startups. It has secured mandate for promoting research and innovation in the state and also provide technical support for the implementation of action plans for control of air and water pollution in the State as well as waste management.

ii) Enabling eco-system for tech based startups:

A focused initiative has been undertaken to pool the infrastructure and expertise available in the State for supporting tech based startups. Under this initiative, incubation & instrumentation facilities available with various institutions of Punjab as well as mentorship and IPR support will be made available to the startups.

iii) Industry-institution innovation Clusters:

The Council has identified 10 major industrial clusters for enhancement of their competitiveness through technological interventions. For this, a unique interface model is being created to link a specific industrial cluster with the institution having relevant domain expertise in its vicinity. The work is already underway in one of the sector viz 'Food Processing' wherein 5 institutions have been linked with industry to identify and address their unmet technological needs.

iv) Technical Support to Address State's Grand Challenges:

The Council engaged extensively with the State Govt. departments to identify grand challenges in the key development sectors. The research institutions and industries have been involved in this pursuit so that they could align their research priorities with the identified grand challenges.

v) Initiatives for Enhancing Adaptive Capacities to Address Climate Concerns:

To address the climate change vulnerability in livestock and agriculture sectors, projects have been taken up under National Adaptation Funds on Climate Change. These projects focus on building adaptive capacities of small and marginal farmers through various interventions such as climate resilient cattle sheds, improvement in climate hardy native germplasm, promotion of C4 crops for crop diversification and gainful utilization of paddy straw.

3. Key activities undertaken during the last two years in the area of:-

(Technology Development, Technology Demonstration, Popularization of Science,Patents, Any new innovative activities)

Technology Development/Demonstration:

i) Pollution abatement in critically polluted cities/towns through technological support to industries for containment of emissions.

ii) Introducing IoT/Artificial Intelligence based solutions for real time monitoring of environmental parameters.

iii) Low cost sensor based technologies for Air & Water quality monitoring,

iv) Providing solutions for agri-residue management to curb open burning in fields.

Popularization of Science

Launched a new initiative 'Mission Popularization of Science' Punjab to invigorate initiatives for inculcating scientific temper in the State. Under this, PSCST &PushpaGujral Science City have entered into an MoU wherein PSCST will provide guidance and policy support to PGSC to take up Pan-state initiatives for popularizing science.

Patent Facilitation

The Council supported innovators by providing facilities for patent search (151 nos.) and filing (processed 61 applications, out of which 8 patents stands granted). Further, it also trained 4 Women Scientists for 11 months period to empower them to take up careers in IP protection who were provided fellowship by TIFAC for the entire training period. Also organized workshops and expert lectures (25 nos.) on IPR issues.

Any new innovative activities

The following two major new initiatives have been undertaken:

i) 'Punjab Research & Innovation', the focused endeavour of State Govt. for promoting Research & Innovation has been made functional out of PSCST.

ii) PSCST is providing technical support to 'Mission Tandrust Punjab' an overarching mission launched by Department of Science Technology & Environment, Punjab to promote holistic health and overall wellbeing in the State. Under the Mission, the tech interventions are being explored with involvement of research institutions for deployment in its 10 sub-missions.

4. List 5 success stories with brief about 1 page each including photograph, if available.

i) Technological interventions for air quality improvement in the State

ii) Paddy straw management to curb open burning

iii) Leveraging institutional strengths for IoT based solutions for water quality improvement

iv) Improvement in quality of life through emulation of best practices in solid waste management

v) Promoting public health through institutional partnerships

5. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

i) The Council has taken major steps towards bringing in policy level interventions related to S & Tand Innovation. These include making 'Punjab Research & Innovation' functional with extensive engagement of 3 key pillars viz Research Institutions, Industries and Government Departments; consolidation of biotech initiatives under 'Mission Biotech Punjab' and Science Popularization Initiatives under 'Mission Popular Science Punjab'

ii) Supported 7 universities/institutions of Punjab for formulation of their IPR policies.

6. How strong are the links between other State Government/departments. If so provide details:

i) The Council is deeply engaging with all departments of the state for identification of theirgrand challenges. These challenges are being thrown open for solution finding to

Research Institutions and Industries thus providing them opportunity to align their investment and expertise with real time issues.

ii) PSCST is also providing support to Department of Science Technology& Environment, Punjab for 'Mission Tandrust Punjab', the unique endeavour aimed at transforming the state by bringing in policy and programme level changes. This being an overarching initiative, involves all the key development departments of the state as well as the non-government organizations.

7. How strong are the links of the Council with local industry units/associations?

i) The Council has been providing technological support to industry and hence has strong links with industrial units as well as industrial associations.

ii) It is serving as interface to industry for engaging with the development departments to deeply understand the grand challenges of the State and devise innovative solutions for the same. This endeavour is of immense significance as it is envisioned to provide boost to tech based companies.

iii) The Council also interacts regularly with industrial associations to enable them to articulate their unmet needs and connect them with institutions to get the same addressed.

iv) Further, the Council provides support to industry for IPR protection .

8. Proposed programmes and budget outlay for 2019-20

Programs:

i) Development of following Centres of Excellence in partnership with IIT Ropar:

   a) Centre of Excellence for Manufacturing including Industry 4.0

   b) Centre of Excellence for Water & Environment

ii) Technical support for effective implementation of Air, Water & Solid Waste Management plans of the State.

iii) Connecting two industrial clusters with institutions.

iv) Capacity building of institutions on Tech Licensing, IPR Protection and Grant Writing.

v) Organizing Innovation Summit by involving premier institutions, industry and development departments.

vi) Organizing Heckathon to generate innovative ideas for addressing grand challenges.

vii) Implementation of following initiatives under Mission Biotech Punjab through Punjab State Biotech Corporation:

   a) Setting up of Life Science Finishing Schools in 10 Institutions.

   b) Secondary Agriculture Entrepreneurial Network.

   c) Biotechnology and Innovation Application Centre for rural areas.

viii) Providing IPR support to innovators.

9. 5 years vision of the Council

Punjab State Council for Science & Technology envisions totake holistic initiatives for promoting research & innovation for economic growth of the State by steering 'Mission Innovate Punjab'. For this, Punjab Research & Innovation has already been made functional. It will aim at developing a robust ecosystem for Research and Innovation in the State, which will enhance competitiveness, boost growth and create jobs. It will function in partnership with administrative departments, universities & institutions and industries. The key functions would be to:

i) Champion Research and Innovation across sectors and departments.

ii) Facilitate International collaborations between universities in Punjab and leading Global Research Universities.

iii) Developed enabling eco-system for translation of research into knowledge led enterprises.

iv) Facilitate Universities in adopting the Global Standards of Research

v) Facilitate setting up of Incubation Centres for translating new Research into Commercial Enterprises and promote startups.

vi) Facilitate Universities in adopting Industry Collaborations.

vii) Draw up State Grand Challenges to provide opportunities to universities and research institutions to collaborate on research and innovations to solve problems of critical importance.

The focus areas would include Life Sciences, Environment and Climate Change, Advanced Manufacturing,industry 4.0 and Public Health.

10% reduction in area under paddy straw burning

RAJASTHAN STATE COUNCIL OF SCIENCE & TECHNOLOGY

Activities / Programs :

Research and Development

Patent Information Centre

State Remote Sensing Application Centre

Science and Society

Science Communication and Popularization – Science Centres

Entrepreneurship Development Program

Biotechnology

Biotechnology Research Centre

Patent Information Centre (PIC)

Mandate:

- To strengthen IP ecosystem in Rajasthan through support mechanism and policy measures

Collaboration:

- TIFAC (IP filing support, programme support, deputation of KIRAN-IPR interns)
- Cell for IPR Promotion And Management (CIPAM), Department for Promotion of Industry and Internal Trade (DPIIT), GoI (Programme & technical support)
- Patent Facilitation Programme (PFP), Department of Science and Technology, GoI (Programme & technical support)
- Ministry of Micro, Small & Medium Enterprises (MSME), GoI (IPFC support)

Services And Support:

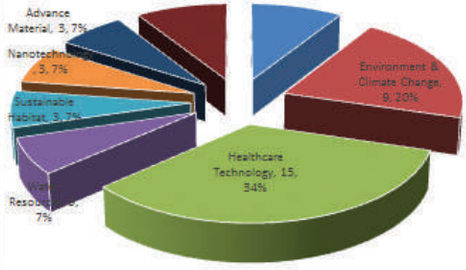
- Prior Art Search
- Patent Application Drafting
- IPR Cells in 05 Universities (2018-19)
- IPR Cells in 28 Govt. Colleges (2018-19)
- Technical Programmes (2017-2019)
- IP Awareness : Outreach & Promotion (10)
- Human Capital Development (3)
- Enforcement & Adjudication (2)
- Grant In Aid Support (2017-2019)
- Patent Workshop (12) 0.70 L per workshop
- Geographical Indications Workshop (11) 0.50 L per workshop
- IPR Camps by Regional Offices(32) 0.16 L per workshop at schools

New Science Centres

New Projects and Cost	Status
Science Centre Ajmer 15.20 Cr (State Share 8.65 Cr + GoI Share 6.55 Cr)	In-Principle approved by Ministry of Culture (MoC). State share of Rs. 8.65 Cr to be borne by Ajmer Smart City Ltd (ASCL)
Science Centre Bikaner 15.20 Cr	Final approval awaited from MoC
Science Centre Bharatpur 15.20 Cr	Technical observation (road construction, and levelling of land) of MoC team to be fulfilled by UIT Bharatpur

Research & Development Projects supported from 2015-16 to 2018-19

S.No	Thrust Areas	No of R&D Project
1	Energy Security	4
2	Environment & Climate Change	9
3	Healthcare Technology	15
4	Water Resources	3
5	Sustainable Habitat	3
6	Nanotechnology	3
7	Advance Material	3
8	Artificial Intelligence	4
	Total	44



Major Projects - GoR

- **Georeferencing & mosaicing of digitized cadastral maps using high resolution satellite imagery**

  Project Cost: Rs 100 L | **Study Area:** Entire Rajasthan | **Sponsoring Agency:** Settlement Department, GoR

- **Generation of village maps for Soil Health Card Scheme using Remote Sensing and GIS Technology**

  Project Cost: Rs 74.20 L | **Study Area:** Entire Rajasthan | **Sponsoring Agency:** Agriculture Department, GoR

- **Monitoring of crop residue burning in Bundi District of Rajasthan using remote sensing and GIS technology**

  Wheat and Paddy residual burning areas were delineated for 2016, 2017 and 2018.

  Project Cost: Rs 6.50 L | **Study Area:** Bundi District | **Sponsoring Agency:** Agriculture Department, GoR

  ★ *Upcoming for 3 more Districts: Alwar, Bharatpur & Kota*

- **Digitization and georeferencing of National Park / Sanctuaries and Forest Blocks**

  Study Area: Entire Rajasthan | **Sponsoring Agency:** Forest Deparment, GoR

Other Major Projects

- **Land Use Land Cover Analysis of 10 Km radius area of Barsingsar (Bikaner) Matasukh (Nagaur) and Kayad (Ajmer) Mines using RS/GIS**

  Aiming for environmental monitoring due to mining activity

  Study Area: 10 km radius area of mines | **Sponsoring Agency:** Respective Agencies

- **Updation of Parliamentary & Assembly Constituency Maps**

  Updated election maps were used during Parliamentary and Assembly Elections of 2019 and 2018 respectively

  Study Area: Entire Rajasthan | **Sponsoring Agency:** Election Commission

- **Forecasting Agricultural outputs using Space Agro-meteorology and Land based observations (FASAL)**

  District wise acreage estimation and production forecast for Wheat (26 District), Mustard (25 District) and Cotton (2 District)

  Study Area: Selected Districts | **Sponsoring Agency:** Ministry of Agriculture, GOI

- **National Wetland Inventory and Assessment - 2nd Cycle**

  Change analysis between wetland inventory of 2017-18 and 2006-07 using HRSI

  Project Cost: Rs 30.40 L | **Study Area:** Entire Rajasthan | **Sponsoring Agency:** SAC/ISRO - Ahmedabad

5 Years Vision of the Council :

- Creation of IP-Ecosystem in Rajasthan through State IP Policy spinoffs
- Science Popularization with strengthening STEM in schools
- Development of structural Mechanism & Models based on scientific intervention in water, green technologies, medical & health, food and nutrition and priority areas in line with SDGs

SATCOM RAJASTHAN

Studio

Students at Remote sites

SIKKIM STATE COUNCIL OF SCIENCE & TECHNOLOGY

1. Key activities under taken during the last two years in the area of:-

1. Technology Development:

a. Demonstration of Ice Stupa in Sikkim

Himalaya is one of the vulnerable areas in terms of climate change. 'Ice Stupa' is an artificial glacier build in natural environment which resemble the Stupa, a cone shape structure named as 'Ice Stupa'. The massive melting of glacier and ice field throughout the world is one of the major impacts of climate change and global warming. This technique of artificial glaciations proves to be useful for re-glaciation if we put some more efforts in it.

Glaciers are one of the important sources of water for drinking and irrigation purpose in the Himalayas. The techniques can make water availability possible during dry for irrigation.

b. New Agro technology for Hilly region of Sikkim introduced.

Integrated fish farming, vermicomposting and azolla cultivation has been developed. Multilayered cropping system of cardamom cultivation with passion fruit and other fruit trees developed

c. 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.

d. 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.

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

f. Successfully developed the protocol for tissue culture of large cardamom for propagation of elite quality planting material:

The protocol for tissue culture of large cardamom for propagation of elite quality planting material is successfully developed for all the popular cultivars. In the next phase, large scale production will be made and distributed to the farmers under a project funded by DBT, GOI.

2. Technology Demonstrations:

a. Demonstration of Ice Stupa for storage of water resources for lean season and reglaciation efforts in Sikkim

b. Demonstration of Tissue Culture techniques and transfer of technology

c. Demonstration of modified cultivation practices of large cardamom for shortening gestation for fruiting from three years to two years.

d. Rain Water Harvesting for drinking purpose at Suldung Kamling GPU funded by UNDP

e. Development of dryer for Cardamom, Ginger, Mushroom and ether herbs and vegetables energized by Nano Hydel Power generated by Local Water Streams of Sikkim

f. Micro Solar Dome for rural households for 24 x 7 solar lighting

g. Azolla is found to have multiple use such as cow feed, pig, chiken, fish feed. They are also used in rice field to control weed and enrich the soil. The use and method of azolla cultivation is demonstrated to the farmers of the locality.

3. Popularization of science:

i. Awareness programme on Organic Farming to farmers / NGOS and Panchayat Members in all four districts of Sikkim

ii. Awareness workshop on Climate Change Adaptation in 15 senior Secondary Schools on all four districts of Sikkim

iii. Awareness programme on Biodiversity and its preservation and sustainable utilization

iv. Master Trainers Workshop on Low Cost Teaching Aid for teaching Physics and Chemistry to 100 science teachers at Sikkim Science Centre, Marchak

v. Training to the College student on the Remote Sensing and GIS application, Geoinformatics and Climate change.

vi. Awareness workshop on Traditional Knowledge with respect to medicinal plants of Sikkim to College Science Students and NGOs

vii. 15 days workshop on tools and techniques of Animation to students at Vigyan Bhawan

viii. Training on tools and techniques of Biotechnology to Research Scholars and College Students of Sikkim at Biotechnology laboratory at Vigyan Bhawan, Deorali, Gangtok

ix. Biotechnology outreach and awareness programmes in 30 school in all four districts of Sikkim

x. Awareness lecture series on Intellectual Property Rights in Colleges, University and students and public

xi. Training on Bioinformatics to Research Scholars and College faculty

xii. Laboratory exposure of science students of various schools of Sikkim.

xiii. National Science Day 2016-2017 at State Level

xiv. National Children Science Congress 2017: organisation of District and State level competitions

xv. INSPIRE scheme 2016-17: Organization of District and State level competition

xvi. Radio Serials in Science in collaboration with All India Radio and Vigyan Prasar

xvii. Innovatin Hub developed in collaboration with National Innovation Foundation and BITM, Kolkata

4. Patents:

State PIC has filed for Patent in Agriculture Tool

Applied for GI in six item viz: Sikkim Mandarin, Sikkim Temi Tea, Lepcha Hat Copyright filed for two film stories by PIC Protection of Plant Variety and Farmers Right (PPV&FR) for one local rice variety

5. Any new innovative activities

Siphoning of Excess lake water at high altitude South Lhonark lake to prevent Glacial Lake Outburst Flood

Networking programme with Agriculture department on GIS and Remote Sensing for Micro planning on Agriculture scector

Netrworking with Water Resource and River Development Department for preparation of DPR on River Training Works

Collaborative programme with Land Revenue & Disaster Management Department for GLOF mitigation of South Lhonark Lake

Forest Environment and Wildlife Management Department for Integrated Watershed Development Programme,

UNDP and Rural Management Development Department for Spring shed Development under National Adaptation Fund for Climate Change

Networking with the GIZ for Technical cooperation on Climate Change Study

Networking with UNDP on Climate Change Adaptation Programme and Wet land Mapping

Collaborative pogrammes with Swiss Development Cooperation for CCA

Networking with UNDP for Rain water Harvesting at Rain shadow Area in West Sikkim

Collaboration with NB Institute of Rural Technology for Promoting Micro Solar Dome Technology in Tribal Pockets of Sikkim in Different Agro Climatic Condition and Varied Type of Housing.

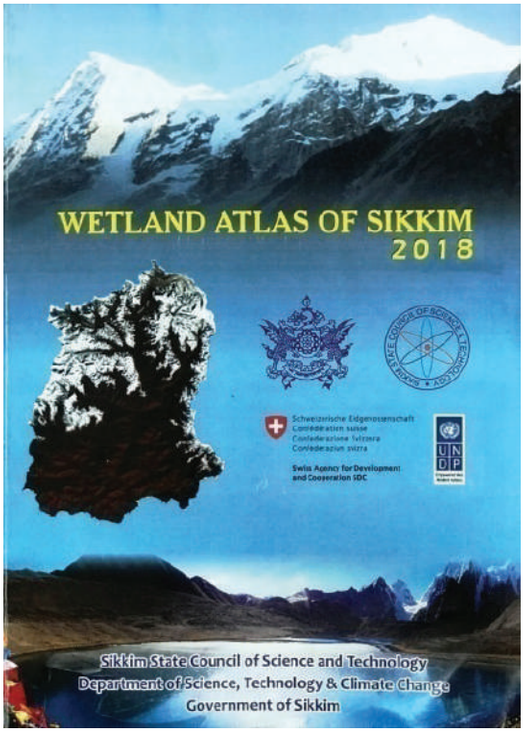
Innovatin Hub developed in collaboration with National Innovation Foundation and BITM, Kolkata

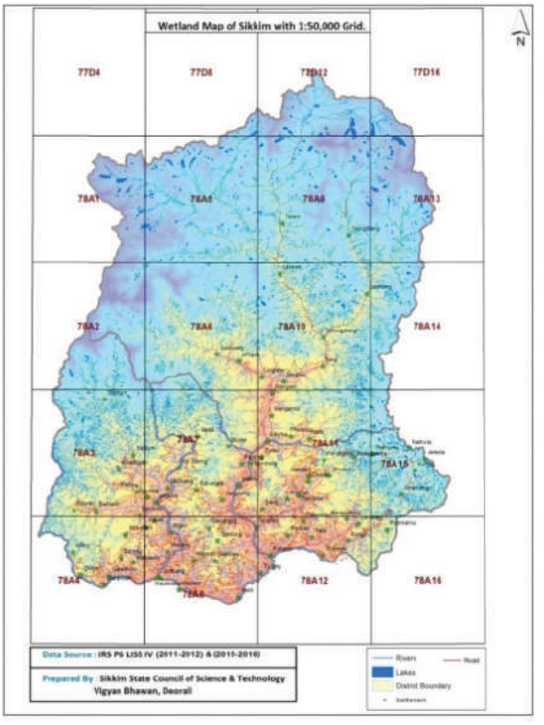
Automatic realtime online monitoring of the flood levels of a specific area, based on such remote cyber surveillance systems and image processing methods, will help to obtain instant flooding and water level rising event alerts. The method can better meet the practical needs of disaster prevention and help evacuate human habitation areas that would to be affected on account of flooding.

The system relies on dynamic detection of floods and overflow/ inundation is considered an intrusion object in the video surveillance image. A surveillance video from a small-scale field of view is used as the input source in order to monitor the water flow and water flow level trends in the image features are discerned. An image segmentation technique is used for removing the surrounding objects, such as building and the geographical background, and separating the intrusive objects for a subsequent risk analysis.

A region- based image segmentation method and flood-level classifiers are used to identify the on-site variation of the rivers water levels in the identified flow terrain area to determine and calibrate the corresponding risk levels.

Development of Empirical equation for Glacial Lake Volume and area Early Warning Flood Detection And Monitoring SystemCoordination with GIZ & UNDP Partners in different line Department Preparation of Wetland Atlas of Sikkim Using Remote Sensing and GIS





5. SUCCESS STORIES:

Mitigation of GLOF at South Lhonak Glacial Lake through siphoning:

After the scientific interventions, Sikkim State Climate Change Cell together with the support of Disaster and land Revenue Department, Government of Sikkim initiated the second mitigation works for GLOF in during 2018 at South Lhonak Lake. Siphoning of lake was done by using High Density Polyethylene (HDPE) quick clamp pipes during the expedition. The diameter of the pipe was 8 inches. A total of 140 pipes were used for the siphoning of lake for siphoning of water from three sets of pipelines. The team first measured the discharge of lake (say discharge after the peak melting season) by area velocity method. The approximate discharge measured near the outlet was about 4.5 m^3/s(160 cusec). The discharge from single pipeline is measured approximately 50 litres/second which ultimately gives a total of 150 -180 lit/s in three sets of pipelines. It is expected that lake would be lowered by about 2 meters at the end of winter season. This is the first of its kind, that HDPE pipes were used for siphoning the glacial lake in India and first approach towards the siphoning of such glacial lake in Indian Himalayan region

Sikkim State Remote Sensing Applications Centre under Sikkim State Council of Science and Technology has been monitoring the South Lhonak glacial lake from the past few years. South Lhonak glacial lake, located in the extreme North-western parts of Sikkim, is one of the fastest growing lakes in Sikkim. The lake formed right at the snout of the glacier is located in the geographical coordinates of N 27^0 54' 56.7" and E 088^0 12' 33.7" at an altitude of 5201m. The analysis of satellite imagery revealed

that the lake is growing at alarming rate. The lake is dammed by loose moraines debris brought down by the glacier. The lake was a small glacial lake in 1960s, which grows to more than 2.10 km in length and 0.6 km in width within a span of 45 years. With this figure, the lake became one of the longest and largest lake within the territory of Sikkim. This enormous growth of lake on the loose moraines debris of the glacier, within a short period of time makes it one of the vulnerable lakes in Sikkim in terms of glacial hazard, in the form of glacial lake outburst flood (GLOF). The lake has increased from 18 ha in 1976 to 109 ha in 2011.

I. Photograph showing the stream draining to the South Lhonak lake & II.

Biotechnology Research Application Centre

Implementation of Large cardamom project:

The major work of large cardamom project is undertaken at Sajong centre which includes tissue culture of elite large cardamom, hardening, transfer to nursery, germlasm collection and maintenance, construction of shade houses, field plantation etc. The following works are undertaken:

a. Standardization of protocol for *in vitro* propagation and *in vitro* mass production:

Protocols for micropropagation of three important commercial cultivars of large cardamom, viz., *Seremna*, *Dzongu Golsai* and *Varlangey* have been standardized. The plants are being mass multiplied *in vitro* using the standardized protocols and hardening of *in vitro* plants.

b. Maintenance of Large Cardamom Germplasm

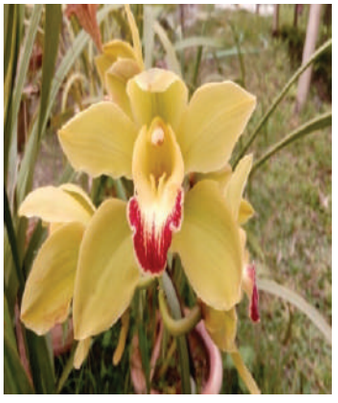
Maintained five to seven (5 to 7) cultivars of large cardamom germplasm in the field of Sikkim State Biotechnology Research and Application Centre under S&T Council, Sajong, Rumtek There are more than 15 cultivars of large cardamom are reported in Sikkim. Therefore, Survey and field tour was proposed at the department for the collection of large cardamom cultivars from farmers field and for maintenance of germplasm in the office field.



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. Most of the hybrids are developed in advance countries like Australia, New Zealand. The parents are mostly collected from the Himalayan region of our state and its corridor. There are very few indigenously developed orchid hybrid which will have the commercial importance.





Newly developed cymbidium hybrids

c. Developed and demonstrated integrated method of azolla cultivation and System Rice Intensification(SRI):

In this method, low requirement of water and rice seedling is demonstrated during rice cultivation. The integration of azolla in the SRI method of rice cultivation helped in considerable weed control in the rice field and enrichment of nutrients.

d. Successfully developed the protocol for tissue culture of large cardamom for propagation of elite quality planting material:

The protocol for tissue culture of large cardamom for propagation of elite quality planting material is successfully developed for all the popular cultivars. In the next phase, large scale production will be made and distributed to the farmers under a project funded by DBT, GOI.

(IV) Study of Glacier Dynamics of East Rathong Glacier- Sikkim

Summary of Progress: The long term monitoring of " study on glacier dynamics of East Rathong Glacier" was sanctioned by SERB, DST-GoI with the approved objectives viz. temperature indexed modeling, geodetic mass balance using DEMs, glacier hydrology, ablation measurements and vertical thinning, glacier surface velocity, snout monitoring etc. In this context, the study team have visited East Rathong glacier since 2017.

The major objectives of the expedition included Stakes installation for the vertical melting studies and glacier velocity study, Initiation of Hydrological study comprising discharge measurement and suspended sediment study, Snout monitoring of the glacier, Retrieving of Automatic Weather Station Data. The discharge has been calculated and sediment data are in the processed in the lab and data analysis has completed and included in the progress report and monitoring report too. The post processing of data pertaining to DGPS measurements of stakes for glacial movement has been processed. The sanctioned instruments are procured.

(V) Technology Transfers

Innovation Demonstration cum Training Centre:

a. Egg incubator and Hatchery at Village level

b. Sanitary Napkin Production Machine and training to be given to educated unemployed women SHG for production and sale in remote villages

c. Pulverizer

d. Napkin Press Machine:

e. Napkin Sealing Machine:

f. Gumming Set:

g. UV Treated Sterilizer

6. **Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.**

NA

7. **How strong are the links between other state government / departments if so provide details.**

Sikkim State council of Science & Technology works in close coordination with the line departments as well as the state government

Sikkim State Council of Science & Technology is the Nodal Institution in the State for Climate Change initiatives. Second Phase of State Action Plan for Climate Change has been under preparation with the support of GIZ All government departments are involved as the member of the steering committee for Climate Change.

Linkages with UNDP, Swiss Development Cooperation and GIZ on Climate Change adaptation programmes.

INSPIRE Programme of DST; Govt. of India has been taken up in coordination with Human Resource Development Department. State Nodal Office is the Council while District Joint Directors of HRDD are the district Coordinators.

Support to the user departments/ agencies: S&T Council being nodal for Remote Sensing and GIS applications in Sikkim, has contributed technical support to many user department and agencies in Sikkim. Some of the support includes-

Preparation of various GIS map for General Election 2014 and 2018

GPS data collection and mapping of the polling station of Sikkim for the Election Department

Catchment area mapping for the various projects of Irrigation and Flood Control Department.

GIS maps provided for Agriculture Department, Govt. of Sikkim.

Council is responsible for all patent work related to intellectual property in the state.

8. **How strong are the links of the council with local industry units/associations?**

Sikkim being a hilly landlocked state, there is not many local industries except for cottage industries and handicraft. The council is striving to have linkages with such local industries by formulating projects in the areas of handicraft.

S&T Council with the support of GIZ organized one training on weaving of fine handlooms during 2017-18

9. **List 5 major technology area, where the council can play an important role by finding convergent technological solutions.**

(i) Biotechnology and tissue culture

(ii) Climate Change Adaptation and Mitigation

(iii) Remote sensing

(iv) Non renewable energy

(v) Post harvest technology

10. Proposed Programmes:

Establishment of Science Center in South Sikkim

Establishment of Technology Demonstration Centre at Marchak, East Sikkim

Establishment of Technology Incubation Centre in Sikkim

Development of INSAR based technique for high resolution surface topography and ice velocity under microwave and hyper spectral techniques for earth resources application and management.

Development of Forest Fire Spread Model using Satellite RS

Climate Change Risk reduction for potentially Dangerous Glacial Lakes in Sikkim.

Sikkim State Centre for Glaciology

Experimental Study on Reglaciation of Deglaciated Valley in Sikkim through Artificial Glaciation

Study on Wild Edible fruits of Sikkim Himnalayas

TAMILNADU STATE COUNCIL FOR SCIENCE & TECHNOLOGY

1. ABOUT THE COUNCIL AND ITS PROGRAMMES :

Tamil Nadu State Council for Science and Technology was formed in 1984 by Government of Tamil Nadu as an autonomous apex body of our State for the development of Science and Technology sector. The Council is implementing many Science and Technology schemes related to research and development, extension and outreach programmes to fulfill its mandate.

The Council is implementing various programmes, which will benefit researchers in Universities and Colleges, students at higher education level and school level and the people of Tamilnadu, particularly, those living in rural areas and those in poor socio economic conditions. Research projects in various sectors such as agriculture, animal husbandry and energy will examine location specific problems and offer required remedial measures. Specific programmes for encouraging school students to take interest in basic sciences and college level students to take interest in research projects are implemented.

2. ACTIVITIES PERFORMED BY THE COUNCIL DURING 2018-19

Sl.No.	Name of the Schemes
1.	Student Project Scheme
2.	Science and Technology Project
3.	Adoption of Young Student Scientist Programme
4.	Young Scientist Fellowship
5.	Seminar and Workshop
6.	Popularisation of Science
7.	Travel Grant
8.	Science and Technology Publication
9.	TANSA Award
10.	Creation of Scientific Awareness Programme
11.	Quality improvement of Science education in Rural schools
12.	Dissemination of Innovative Technology
13.	Application of Science and Technology in rural areas
14.	Science and Technology capacity building for industrial needs
15.	Programme for bridging the gap in research funding for research scholars in colleges
16.	Improvement of S&T Infrastructure
17.	India International Science Festival 2018

2.1 Student Project Scheme

The scheme is aimed at utilizing the tremendous student talent for the development. Final year students of UG(Engineering), PG course's of Agriculture/ Biological Science / Engineering/ Medicine/ Veterinary Sciences are provided with financial assistance of maximum Rs.10,000 to carry out socially relevant projects.

The Department of Science and Technology, Government of India has sanctioned a sum of Rs.89.76 lakh for three years from 2017-18 onwards. A sum of Rs.29 lakhs has been allocated for the year 2018-19. Through this financial support the scheme is effectively implemented and supported to publish the research work and to file patent of young students of our state.

1772 final year students are benefitted under this scheme.

Glimpses of Student Project Seminar-cum-exhibition at Kalasalingam University, Srivilliputhur – July 19-20, 2019

2.2 Science and Technology Projects

Under this scheme major areas of research and development projects in sectors such as Agriculture, Biology, Medicine, Environment, Engg. & Technology and social sciences are supported with a grant of Rs.3.00 to 5.00 lakhs. Financial assistance is provided to encourage the researchers and scientists to undertake Research works having social relevance and usefulness to our State.

14 research scientists are supported in various institutions.

2.3 Young Student Scientist Programme

Through this programme talented young students with interest in Science are exposed to Science and research so that they are motivated to take up Science and Technology career in future. A Total of 40 students in their IX standard are selected based on their performance in Science from each district and 15 days intensive residential programme is conducted for them in a nearby University / College during summer vacation.

640 students from 10 districts are benefitted.

2.4 Young Scientist Fellowship Scheme (YSFS)

Young Scientists in Tamilnadu below 40 years of age are enabled to acquire latest techniques in research through a fellowship of Rs.10000/- per month for a period of 2-6 month in addition to their regular salaries provided by their parent institutions. They are to visit institutions in other States for this purpose.

11 scientists are benefitted.

2.5 Partial Financial Assistance for Seminar / Symposia / Workshop

The objective is to foster exchange of scientific knowledge and facilitate interaction between various stakeholders of science and research such as researchers, teachers, industrialists and others. Partial Assistance for this purpose is provided to higher education of research institutions in Tamilnadu.

9500 people are benefitted through 50 programmes.

2.6 Popularisation of Science

The objective of this scheme is to popularise the Science and Technology among students, farmers, self help group members and the public. Financial assistance is provided to conduct science exhibitions, Training Programmes Awareness Programmes, special lectures through Colleges, Universities research, Institutions and Non Government Organisations (NGO's).

7500 people are benefitted.

2.7 Travel Grant to Young Scientists

Young and budding scientists are encouraged under this scheme to present their research findings in International Conferences / Seminar. Those below 40 years of age and working in higher education and research institutions in Tamilnadu are provided with 50% air fare for international and 100% train fare (First Class) for national conferences respectively.

10 scientists are benefitted.

2.8 Science and Technology Publications

The objective of this scheme is to bring out scientific publications in Tamil especially useful to children, researchers and general public. Financial assistance is provided to organizations publishing such magazines/books. These publications will help to spread science and technology among children and the mass.

14 publications are supported.

2.9 Tamilnadu Scientist Award (TANSA)

Scientist and researchers who have made significant contribution in their field through skill / research are encouraged and honoured with TANSA. Selected Scientist get Rs.50000/- cash award and a citation. A total of 10 Awards are given in disciplines such as 1. Agricultural Sciences 2. Biological Sciences 3. Chemical Sciences 4. Engineering & Technology 5. Environmental Sciences 6. Mathematical Sciences 7. Medical Sciences 8. Physical Sciences 9. Social Sciences and 10. Veterinary Sciences.

10 scientists are awarded.

2.10 Creation of Scientific Awareness

Promoting the outcome of the research work carried out at Universities, Colleges and research institutions to the beneficiaries is the main objective of this programme. Students, farmers and the self-help group members are benefitted. This programme conducted in well established Arts and Science Colleges, in 10 districts.

2000 people are benefitted in 10 districts.

2.11 Quality improvement of Science education in Rural Schools

Inservice training to Secondary Grade Science teachers working in rural schools is organised for improving quality of science education particularly to benefit rural school students. Every year about 500 teachers in 10 districts are trained with the assistance of Arts & Science colleges located in the respective districts.

500 teachers are benefitted in 10 districts.

2.12 Dissemination of Innovative Technology (DIT)

Under this Programme suitable technologies for deployment in the field such as Agriculture, Veterinary, Environment, Fisheries and other sectors already developed are disseminated to the target population through training / Workshop/ Orientation programme. Scientists, researchers and teachers are involved in this process utilising the facilities and infrastructure of educational & research institutions of our State.

500 people are benefitted through 18 programmes.

2.13 Application of Science and Technology in Rural Areas

The scheme envisages the transfer of Science and Technology techniques and findings to rural mass in order to uplift the economic status of the people. In the process the viability of technologies may be ascertained.

4000 people are benefitted in 10 districts.

2.14 Science and Technology Capacity building for Industrial needs

The scheme is to enable graduates to acquire skill sets relevant to industries and motivate them to opt for employment. This programme would act as a bridge course reinforcing institute - industry interaction and provide them with skill sets that would make them more employable.

4500 students are benefitted in 10 districts.

2.15 Programme for bridging the Gap in Research Funding for Research Scholars in Colleges

The research funding is not available to research scholars particularly at Colleges. If the gap in research funding is addressed, it will pave way for many innovative ideas to be tested and it would yield not only research data but also result in development of scientific manpower. Therefore, through this scheme research proposals from research scholars of colleges are supported after evaluation.

10 Research Scholars are benefitted for doing their Ph.D

2.16 Improvement of S&T infrastructural facilities in Government Colleges

The Science and Technology infrastructure available in our Government Colleges in terms of laboratory equipments and facilities will be improved in select Government Colleges so that the research output improves particularly in terms of its quality.

3 colleges are supported for improving their infrastructure facilities.

2.17 India International Science Festival-2018 (IISF-2018)

The 4th edition of festival of IISF-2018 was organized at Lucknow during 5th – 8th October, 2018 at Indira Gandhi Pratishthan, Lucknow. The Tamilnadu State Council for Science and Technology displayed the following in the form of posters:

a. An LED monitor displaying 16 schemes implemented by the Council.

b. Display on Patent Information Centre's achievements such as Trademarks, Geographical indications, Patents etc.

c. Display on MSME achievements

5000 visitors including students, teachers, research scholars, NGOs and general public visited the Council Stall.

Students in the TNSCST stall at Lucknow

Apart from implementing the above science and technology schemes in the state of Tamilnadu, the Council has shown keen interest on the following:

2.18 Hands-on- training for paper bag making

A one day paper bag making hands-on-production workshop was organized in the Council's premises for 60 widows belonging to various slums in Chennai sub-urbans.on 28.10.2018

Participants during the hands on training

2.19 Workshop on Global Warming and Climate Change

The Council along with Tamilnadu Science Forum, Chennai, a renowned NGO organized a Workshop on Global Warming and Climate Change on 18.11.2018, at the Conference Hall of the Council. It was a state level workshop. Around 48 people from various districts have participated.

2.20 Celebration of National Science Day & National Mathematics Day

The National Science Day and National Mathematics Day have been celebrated in the following institutions of Tamil Nadu.

Sl.No.	Institutions	Place	Date
1	Sri S.Ramasamy Naidu Memorial College, Sattur	Sattur	5 - 6 Dec. 2018
2	Nadar Saraswati College of arts and sciecne	Theni	7 - 8 Dec. 2018
3	PRIST University	Thanjavur	8 - 10 Jan 2019
4	Thanappa Gounder Mat. Hr. Sec. School	Dharmapuri	26 - 27 Feb 2019

Glimpses of Celebration of National Science Day & National Mathematics Day at Theni

Participants during valedictory session at Thanjavur

3 IPR Awareness Programmes

Invited Special Guest from Patent Office, Chennai explaining the fundamentals of IPR

4 IPR cells established in 13 universities

Sl.No	Name	Place
1	Madurai Kamaraj University	Madurai
2	Madras University	Chennai
3	Bharathidasan University	Trichy
4	Bharathiar University	Coimbatore
5	Manonmaniam Sundranar University	Tirunelveli
6	Government College of Technology	Coimbatore
7	Mother Teresa Womens University	Kodaikanal
8	Periyar University	Salem
9	Tamil Nadu Agricultural University (TNAU)	Coimbatore
10	Tamil Nadu Veterinary and Animal Sciences University	Chennai
11	Sacred Heart College (Autonomous)	Vellore
12	Sri Ramakrishna College Of Arts And Science	Coimbatore
13	Francis Xavier Engineering College	Tirunelveli

IPR Study - Technology Scan Study using Patent Analysis on 3D Food Printing
Author: Ms. S. Gomati Padma Thilaga

5 5th Meeting of Expert Group Committee on State S&T Programme Tier – 2 Screening Committee on State S&T Programme was organized during 13th and 14th February 2019 for Dept. of Science and Technology, Govt. of India.

4. SUCCESS STORIES

4.1 Tamilnadu Scientist Award (TANSA)

The Tamilnadu State is the first in instituting a State Level Award in recognition of outstanding contribution to research and development to the scientist of our State. Through this scheme TANSA Award is given in 10 categories such as Agricultural Sciences, Biological Sciences, Chemical Sciences, Environmental Sciences, Engineering and Technology, Mathematical Sciences, Medical Sciences, Physical Sciences, Social Sciences and Veterinary Sciences. A Sum of Rs. 50,000/- Cash Award with citation is given to the selected Scientist. Hon'ble Chief Minister of Tamilnadu Thiru Edappadi Palanichamy gave away the Tamilnadu Scientist Award for the selected scientists of TANSA 2015, 2016 and 2017 at his Chamber in Secretariat, Fort St. George, Chennai 600 009 on 28.12.2018

4.2 Young Student Scientist Programme

To encourage and attract Young minds to select Science and Research carrier, Young Student Scientist Programme is being organized as a residential programme in Universities and reputed

Colleges of our State during the month of December 2018 in 8 centres covering 16 districts of our state. This scheme gives exposure about students to the research institutions and they get first hand information about our research activities through the scientist and resource persons.

4.3 Student Project Scheme

Student Projects Scheme of the Council enables Under Graduate and Post Graduate students to do useful research on various topics of Science and Technology relevant to our State. The results of this research are presented in a Seminar cum exhibition by the students. The abstract of the research is also brought out in the form of seminar proceedings. This scheme was initiated in the year 1992-93 in a small way with a total of 13 projects. Now, due to its success and popularity about 200 to 250 Student Projects are given every year in different discipline such as Agriculture, Biology, Environment, Engineering and Technology, Medicine, Social Sciences and Veterinary Sciences. A maximum sum of Rs.10,000/- is provided for each project.

4.4 Science and Technology Capacity building for Industrial needs

Capacity building for the industrial needs programme enables students of Engineering and Polytechnic institutions of our State to improve their soft skills for employment and also promote self employment through entrepreneurship. Organisations such as District industries centre and industry resource persons are involved in the successful conduct of this programme. Every year this programme is organized in 10 districts of our State. Six days programmes are organized in two phases with a minimum of 300 students per programme.

4.5 Quality Improvement of Science Education In Rural Schools

Inservice training is provided to school science teachers who are handling the Science subjects of 6^{th} to 8^{th} standard. This will help to update their knowledge on the current syllabus and new developments in science and technology, which enable them to teach well. This programme is being conducted for a period of five days. During the training equal importance is given to practical's to learn and understand effectively, so that they will understand the concepts very well. Every year this programme being conducted in ten districts for 50 teachers and with a budget of Rs.9 lakh benefitting 500 teachers.

4.6 Geographical Indication for Kodaikanal Malaipoondu

Patent Information Centre of Tamil Nadu State Council for Science and Technology, Chennai and Department Of Biotechnology of Mother Teresa Women's University, Kodaikanal have taken initiatives to protect this hill garlic and register as a Geographical Indication of the State. The application was filed in 01.06.2018 before the GI registry (Application No: 616). This registration is now boosting the Hill garlic cultivation at Kodaikanal and also negate the false variety from entering into the market in the name of Kodaikanal Malai Poondu.

4.7 Research Fellowship for Research Scholars in Govt. Colleges and Improvement of Science and Technology Infrastructure in Govt. Colleges

The Research and Development Assistance to the weaker sections of the society is enabled successfully through schemes such as Research Fellowships to Research Scholars in Colleges and Science and Technology Infrastructure Development of Government Colleges. Under these programmes a monthly stipend of Rs.10,000/- per month is given as fellowship of Rs.30,000/- per year towards contingency for a total period of 2 years. Those research students who have enrolled already for Ph.D., and successfully published at least 2 research papers in indexed journals are considered for grant. In Govt. Colleges, Laboratory facilities are developed and Laboratory equipments are purchased through Council's scheme which enable M.Phil., and Ph.D., students access to better facilities for the research.

All the schemes of the Council are need based, very well received and highly successful. Therefore, the Council is striving to get higher allocation for all the S&T Schemes of the Council. Any additional funding from Department of Science and Technology, Govt. of India for the schemes of the Council will be very useful in taking Science and Technology benefits to the people.

5. STATE RELATED S&T AND INNOVATION POLICY

Science and Technology Policy for the State of Tamilnadu is being planned and will be submitted to the Government during the forthcoming year.

6. LINKS BETWEEN OTHER STATE GOVERNMENT/ DEPARTMENTS

The Tamilnadu State Council for Science and Technology is having good rapport with all other state Councils. Under the aegis of DST, Government of India, this council is conducting PIC Meet programmes, TIER II Screening Committee meetings in Chennai/ Tamilnadu involving

all State S&T Councils. This Council also participates programmes invited by southern state councils in Kerala, Andhra, Karnataka and Telengana.

7. LINKAGE WITH INDUSTRY UNITS / ASSOCIATION

The Council also involved in association such as PSG – STEP in promoting science, technology and entrepreneurship. Organisation such as District Industries Centre and many experts from industries are involved in the successful conduct of the Council programme viz Capacity Building for Industrial Needs.

The Department of School Education is involved in successful conduct of the Council Programme Inservice Training to School Teachers which enable our School teachers to update their knowledge particularly with respect to the revised syllabus covering various science topics. This Programme is conducted through Universities and Colleges were excellent infrastructure and expertise is available. The Department of School Education deputes teachers to this training through CEO / DEO. The Council is also playing an advisory role to Tamilnadu Watershed Development Agency in implementing various programmes related to Agriculture, irrigation and Watershed Development.

8. PROPOSED PROGRAMME & BUDGET OUTLAY FOR THE YEAR 2019-20

Sl.No.	Name of the Schemes
1.	Student Project Scheme
2.	Science and Technology Project
3.	Adoption of Young Student Scientist Programme
4.	Young Scientist Fellowship
5.	Seminar and Workshop
6.	Popularisation of Science
7.	Travel Grant
8.	S& T Publication
9.	TANSA Award
10.	Creation of Scientific Awareness Programme
11.	Quality improvement of Science education in Rural schools
12.	Dissemination of Innovative Technology
13.	Application of Science and Technology in rural areas
14.	S&T Capacity building for industrial needs
15.	Programme for bridging the gap in research funding for research scholars in colleges
16.	Improvement of S&T Infrastructure
17.	India International Science Festival 2019

10. 5 YEARS VISION OF THE COUNCIL

The State of Tamilnadu consists 35 districts with 8 Crores population. The literacy percentage is approximately 80%. Lot of Engineering colleges, Arts and Science colleges and Polytechnics are available and it increases year by year. The Tamilnadu State Council for Science and Technology is having a great responsibility to spread Science and Technology by interacting with these institutions.

Council could create a saturated laboratory facility for Technology Development and Demonstration for the use of rural students, those who do not have such facilities in their premises, to develop their research skill.

Council envisages all round development of scientific man power and infrastructural facilities.

The Council has formulated many schemes and programmes which will aim at development of science and technology infrastructure, manpower and research & development in the state.

In order to realize the above, the Council is in need of its own building on its own premises. For that, It has approached the State Government for 2 acre of land among the institutional areas of Chennai.

A proposal for the construction of building with all the facilities is being submitted to the Government. The support is expected from both State and Central Government to fulfill its aim.

It is envisaged that Science and Technology programmes conducted by the Council in its premises by fetching grants from Central Government Departments will really contribute more to the people of Tamilnadu in terms of research, developing scientific manpower and taking the results to its end user so that, in general, the quality of life of the people is improved.

Students from the remote areas where there is no facilities could be brought to the city and provide them scientific exposure every now and then. This will be the great vision for the next 5 years.

It is planned that the budget outlay for Council could be increased in the order of about Rs.100 to 200 crores by next five years so that the fruits of science and technology are made available to every citizen of our state.

TELANGANA STATE COUNCIL OF SCIENCE & TECHNOLOGY (TSCOST)

1. About the Council & it's Programmes

TSCOST functions under the aegis of the Department of Environment, Forests, Science & Technology, Govt. of Telangana. TSCOST acts as the focal point 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.

2. Activities performed by the Councils during the year 2018-19

TSCOST has implemented the following science & technology programs/ projects/ schemes targeting a wide cross section of society i.e. child scientists, students, research scholars, artisans, youth, women, farmers, teachers, academicians, innovators and scientists., etc.

A. Popularisation of Science & Technology and Applications in daily life :

26th Edition of National Children's Science Congress 2018

National Science Day Celebrations – 2019

National Mathematics Day Celebrations – 2018

51st Engineer's Day Celebrations

B. Promotion of Scientific Temper through Science Centres :

TSCOST implemented several activities for the benefit of students in the Regional Science Centre, Warangal towards this direction.

Regional Science Centre, Warangal Activities :

TSCOST arranged the demonstration of basic concepts of science and its applications to the students and general public through operations of science exhibits installed at Regional Science Centre, Warangal and **benefited around 13931** students, teachers and general public and also organized several programs by celebrating Days of Scientific Importance.

TSCOST has prepared and submitted a proposal for establishment of **Innovation Hub** at a cost of Rs. 1.80 crores at Regional Science Centre, Warangal and also submitted a proposal to the Govt. of Telangana for **Modernisation/ Upgradation of Regional Science Centre, Warangal** with budget estimates of Rs. 2.50 crores.

TSCOST Coordination for establishment of Science Centre at Karimnagar :

TSCOST submitted the proposal to the Government of Telangana for issue of administrative approval for allotment of budget (State share), Land and Manpower for the **establishment of Science Centre**

at Karimnagar in accordance with the receipt of approval from Govt. of India. The total project cost is to the tune of Rs. 15.20 crores with Govt. of India share of Rs. 6.55 crores and Govt. of Telangana share of Rs. 8.65 crores.

C. Integrated Rural Energy Program (IREP) :

Installation of Kitchen waste based Bio-Gas Plants (Geo-membrane balloon technology) in Organisations/ Residential Educational Institutions :

TSCOST is implementing the **Project "Kitchen Waste Operated Bio-Gas Plants (a safe, clean and wealth generation & Swatch Bharat initiative)** costing Rs. 1.60 crore sanctioned by Department of Science & Technology, Govt. of India for establishment of 20 Bio-Gas plants in the state of Telangana over a period of 3 years.

D. Replication of Successful Technology models & Location Specific Research Projects (Lab to Land) :

Implementation of Science & Technology Interventions for providing solutions to location specific problems is very important and TSCOST plays a vital role in this important function.

TSCOST is implementing a number of projects towards technology demonstration, development and transfer for the benefit of a wide cross section of society and for continuance of eco-friendly nature of environment.

TSCOST is implementing the **DST sanctioned Location Specific Research Projects** with the budget of Rs. 50 lakh and supported 10 research projects to Scientists and Academicians for undertaking research on specific issues and for providing solutions.

TSCOST is implementing the project **"Proactive mitigation of gray mold (*Botryotinia ricini*) disease of castor (*Ricinus communis* L.) crop in Telangana State using dynamical disease forecast"** costing Rs. 1.04 crore sanctioned by Department of Science & Technology, Govt. of India in association with Indian Institute of Oilseeds Research (IIOR), Govt. of India and Agro-Climatic Research Centre, PJTS Agricultural University, Govt. of Telangana.

TSCOST is also formulating several projects in association with the relevant academic, research and development institutions with support from Department of Science & Technology (DST), Department of Bio-Technology (DBT), Ministry of Culture, Department of Atomic Energy (DAE), GoI etc.

E. Science & Technology based Innovation, Entrepreneurship Development & Intellectual Property Rights (STIED & IPR)

TSCOST is rejuvenating the **Patent Information Centre (PIC)** in the State of Telangana with support from Department of Science & Technology, Government of India and in association with the leading Research & Development Establishments of the Country.

F. S&T Coordination :

a) TSCOST coordinated the Consultation Meetings organized at Karimnagar, Warangal and at Telangana State Secretariat to prepare the Action Plan for implementation of Department of Atomic Energy (DAE) / Bhabha Atomic Research Centre (BARC) Technologies in Telangana State under the Chairmanship of Sri Ajay Misra, IAS, Special Chief Secretary (FAC) to Govt., EFS&T Department.

b) TSCOST organised Consultation Meetings under the Chairmanship of Sri Ajay Misra, IAS, Special Chief Secretary (FAC) to Govt., EFS&T Department with line departments, R&D Institutes and Universities etc. and prepared a comprehensive proposal and furnished the proposal with a budget of Rs. **36,09,48,000 /-** (**Rupees Thirty Six Crores Nine Lakhs and Forty Eight Thousand Only**) towards developing skills connected to Biotechnology in the State pf Telangana.

c) TSCOST is coordinating with Indian Institute of Oilseeds Research (IIOR), Govt. of India and Agro-Climatic Research Centre, PJTS Agricultural University, Govt. of Telangana for implementing the project "Proactive mitigation of gray mold (*Botryotinia ricini*) disease of castor (*Ricinus communis* L.) crop in Telangana State using dynamical disease forecast" costing Rs. 1.04 crore sanctioned by Department of Science & Technology, Govt. of India.

d) Telangana State Council of Science & Technology (TSCOST) has entered into a **Memorandum of Understanding** with the prestigious National Institute of Technology (NIT), Warangal and with Engineering Colleges for promotion of R&D.

e) TSCOST represented the DST- National Institute of Advanced Studies (NIAS) Program on Science & Technology – Global Developments and Perspectives organized by National Institute of Advanced Studies, Bengaluru from 21-1-2019 to 1-2-2019.

3. Key activities under taken during the last two years in the area of:-

a. Technology Development

As a part of support for R&D projects, the Scientists and Academicians of Research Institutes and Universities were requested to identify unique, novel and innovative S&T programs keeping in view of the problems being faced by the public in different parts of the state. This resulted in formulation of a number of novel S&T programs. Some of them are mentioned here.

Thalassemia Disease burden and mutation , micro profiling in populations of Telangana

Assessment of Plasma Metabolites in Patients on Maintenance Hemodialysis

Synthesis of some novel quinolone derivatives as aromatase inhibitors in breast cancer therapy

Characterization of Circulating Cancer Cells (CCCs) from Clinical Blood Samples of Ovarian Cancer for the Development of Prognostic Biomarkers

A novel approach for reduction of fluoride concentration in Fluoride affected village with Geo-Textile as filter and direct recharge of surplus runoff into aquifers

Studies on environmental radiation level in the dwellings constructed under double bedroom scheme at Erravalli and Narasannapet model villages of Telangana

A cost effectiveness analysis of Rosuvastatin against Atorvastatin in primary & secondary prevention of CVD & stroke

e-Measurement book for road accident analytics in Differential GIS architectures

Design and Fabrication of Lipo-Drug-in-Adhesive patch for transdermal delivery of sumatriptan succinate in the pain management of migraine.

Design, Synthesis and evaluation of novel dithiocarbamate analogues as potent anticancer agents

Proactive mitigation of gray mold (*Botryotinia ricini*) disease of castor (*Ricinus communis* L.) crop in Telangana State using dynamical disease forecast

a. Technology Demonstrations

Replication of successful technologies for generation wealth from waste – Implementation of Bio-digestor (15 cu.mt)

Societal Applications of Radiation Technologies of Department of Atomic Energy (DAE)

b. Popularisation of science

Visits of students, teachers, general public to RSC, Warangal

World Environment Day Celebrations , International Yoga Day, Total Lunar Eclipse, Workshop on Teaching Methodologies in Mathematics, National Science Day Celebrations

Engineeer's Day Celebrations on 15-9-2019

National Science Day Celebrations

National Mathematics Day Celebrations

National Children's Science Congress

c. Patents

As a part of this, Intellectual Property Rights (IPR) Cells were established in 3 universities in Telangana State.

d. Any new innovative activities

TSCOST is concentrating on

i) Waste Management Technologies

ii) New and Renewable Energy Sources and Technologies

iii) Developmnt 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

4. List 5 success stories with brief about 1 page each including photograph, if available.

Project – 1: ***A novel approach for reduction of fluoride concentration in Fluoride affected village with Geo-Textile as filter and direct recharge of surplus runoff into aquifers***

TSCOST, in association with, JNTU, Hyderabad developed a system for reduction of fluoride concentration in ground water with Geo-Textile as membrane. Such plants are installed in fluoride affected areas of Nalgonda district in Telangana State.

Project – 2 : Installation of Kitchen-waste Operated Biogas plants - A Safe, Clean and Wealth Generation Initiative

TSCOST established 15 cu. mt capacity Bio-digestor plants (technology which is eco-friendly and provides scope for generation of wealth from waste) for conversion of kitchen waste into combustible gas at Centre for Cellular & Molecular Biology (CCMB), Hyderabad and at National Institute of Rural Development & Panchayat Raj. TSCOST is planning to establish such plants in National Institute of Technology, Warangal and certain institutions of Govt. of Telangana during the current year.

Project - 3 : Proactive mitigation of gray mold (*Botryotinia ricini*) disease of castor (*Ricinus communis* L.) crop in Telangana State using dynamical disease forecast

TSCOST is coordinating the project "Proactive mitigation of gray mold (*Botryotinia ricini*) disease of castor (*Ricinus communis* L.) crop in Telangana State using dynamical disease forecast" costing Rs. 1.04 crore sanctioned by Department of Science & Technology, Govt. of India in association with Indian Institute of Oilseeds Research (IIOR), Govt. of India and Agro-Climatic Research Centre, PJTS Agricultural University, Govt. of Telangana.

Deployment of Wireless Sensor Networks (WSN) in identified farms

5. Has the Council developed any specific state related S&T and innovation policy? If so the details to be provided.

As a part of the Telangana 2024 – the First Decade Document, TSCOST organised a Consultation Meeting with the Scientists, Academicians and Experts from various research institutions and universities at Telangana Secretariat, Hyderabad and held discussions 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.

6. How strong are the links between other state government /departments If so provide details?

As such, the Council works in coordination with the Departments of Education (School, Technical, Higher), Energy, Forests, Environment, Social / Tribal Welfare departments etc. and Universities and associates itself with the programs organized by these Departments/ involves them in the programs of the Council.

Linkages with Scientists of Bhabha Atomic Research Centre (BARC), Department of Atomic Energy (DAE), Govt. of India and Department of Bio Technology, Govt. of India have been established and TSCOST coordinated interaction sessions between the scientists and several state government departments with regard to technology transfer/ Skill Development.

TSCOST is also actively associated with a number of R&D establishments and Institutions for promotion of industry/ technology/ research such as CCMB, NIRD, NIT- Warangal, IICT, HCU, JNTU, OU, Genome Foundation etc.

Recently the delegation led by Jogu Ramanna garu, Hon'ble Minister for Forests, Environment & BC Welfare, Govt. of Telangana visited Gujarat State and visited several facilities of S&T / interacted with the officials of S&T on schemes and programs and exchanged information.

One member from the other State S&T Councils has been included as a member of the Executive Committee of TSCOST.

Interaction with other State S&T Councils in the country is also being strengthened.

TSCOST is entering into MoUs with State / National / International Level public and private institutions in order to widen the scope of S&T Programs/ Projects.

7. How strong are the links of the council with local industry units/associations?

An Industrialist is representing as a Member from Industry category in the General Council and Executive Committee of the Council.

Several programs on Innovation, Technology Transfer and Entrepreneurship Development are held for the benefit of Industrialists / Start Ups etc. through NIMSME, Institution of Engineers and Universities.

Programs are being chalked out for the association of CRTDH with the Pharma / Chemical and Drug industries.

8. Proposed programmes for the year 2019-20

GOVERNMENT OF INDIA – PROPOSALS FOR 2019-20

S.No.	Activity details
1	National Science Day / National Mathematic Day Celebrations (DST)
2	National Children's Science Congress (DST)
3	Science Centre at Karimnagar (Min. of Culture)
4	Innovation Hub at Regional Science Centre, Warangal (Min. of Culture)(Joint program of State and Centre on 50:50 basis)
5	Location Specific Demonstration projects/ SEED/ NRDMS etc. (DST)
6	Transfer of Technologies / Implementation of BARC Technologies (DST, DAE, DBT, MOFPI, MoEF, Swatch Bharat Abhiyan)
7	DBT – State Skill Vigyan Initiative – Proposals for Skill Development Programs
8	Patent Information Centre, Telangana

STATE GOVERNMENT – PROPOSALS FOR 2019-20

S.No.	Activity details
1	POS, NCSC, NSD, NMD, IPR related activities, Scientist awards, fellowships, seminars, workshops, exhibitions etc.
2	Regional Science Centre, Warangal
3	IREP
4	Transfer of Technologies / BARC Technologies

10. 5 years vision of the Council :

The Vision of the Council is aligned on the lines of Sustainable Development Goals (SDGs) prescribed by the United Nations (UN) with a view to make best use of Science & Technology to achieve the desired outcomes in the respective areas.

To implement/ support research and development initiatives and S&T interventions in Agriculture / Horticulture/ Fisheries / Non-farm Sectors in accordance with the United Nations (UN) declared Sustainable Development Goals (SDGs) bearing **code numbers 2.3** and **2.4.**

To implement/ support Science & Technology based Entrepreneurship Development programs, Entrepreneurship Awareness Camps, Skill development training programs and to Provide escort services to youth for establishment of technology related industrial / self employment units in accordance with the United Nations (UN) declared Sustainable Development Goals (SDGs) bearing **code number 4.4.**

To implement eco-friendly technologies and to promote environment protection measures with S&T interventions in accordance with the United Nations (UN) declared Sustainable Development Goals (SDGs) bearing **code number 11.6.**

To implement programs based on technology upgradation, value addition, employment generation and productivity improvement in accordance with the United Nations (UN) declared Sustainable Development Goals (SDGs) bearing **code number 8.2.**

To implement programs for conservation of energy and to promote alternate and renewable sources of energy in accordance with the United Nations (UN) declared Sustainable Development Goals (SDGs) bearing **code number 7.2.**

To create facilities for popularisation of science and effective communication of science and to initiate Science Centres, Workshops, Seminars, Training Programs, Workshops etc. in order to promote scientific literacy and scientific attitude with a view to add value to primary and secondary education of children and to build the capacity in Science, Technology & Innovation at the State Level in accordance with the United Nations (UN) declared Sustainable Development Goals (SDGs) bearing **code number 4.1.**

To establish Centres of Excellence in niche areas of S&T, Technology Business Incubation, Innovation Promotion and to increase the number of Scientific personnel i.e. Scientists, Research Scholars etc. in consonance with the United Nations (UN) declared Sustainable Development Goals (SDGs) bearing **code number 9.5**.

Meeting Chaired by Sri Ajay Misra, IAS, Spl. Chief Secretary to Govt., EFS&T Dept, Govt. of Telangana – Consultation between BARC Scientists, MS, TSCOST and Line Departments at Secretariat on 19-5-2018

Sri Ajay Misra, IAS, Special Chief Secretary to Govt., EFS&T Dept, Govt. of Telangana chairing the Consultation meet for the DBT Skill Vigyan Initiative with Universities, Research Institutions & Industry Experts on 4-7-2018 organised by TSCOST at Aranya Bhavan, Hyderabad.

TRIPURA STATE COUNCIL FOR SCIENCE & TECHNOLOGY

1. Key activities under taken during the last two years in the area of:-

a. Technology Development

Computerized Examination Data Processing System

Development of Pabda Hatchery & Improvement of reproductive and larval performance of Pabda

Setting up of Hand Made Paper Unit

Scientific evaluation of water purification system in Tripura

Setting up of manufacturing unit of Liquid Disinfectant Cleaner

b. Technology Demonstrations

Demonstration of rural technologies developed by CSIR (Terafil, mushroom, banana leaf fibre, low dust chalk, low cost backery oven, hot air oven)

Vermicomposting, floriculture, composite fish culture, polyculture, 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.

c. Population of science

Rejuvenation of School Science Club and College Science Forum

Annual event : 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 for class room teaching in Tripura (VP, DST, GOI)

Popular Talk

Meet the scientist programme

Special Science Communication Programme

Radio Serial Kokborok on Scientific Awareness in Tripura (VP, DST, GOI)

d. Patents

Workshops on IPR at different educational Institutes

Formation of IPR Cell at 8 Institutes

2 Patent Applications filed

Application processed for 1 Trademark Registration

More than 100 patent searching done

e. Any new innovative activities

Revival of Tripura Water Filter Candle

Project developed for development of women entrepreneurship

Radio serial in Kokborok

Production of Science Communication material in Kokborok language

Adoption of CIEF Technologies

2. List 5 success stories with brief about 1 page each including photograph, if available.

Sci-Connect

"Sci-Connect" is a program devised by the Vigyan Prasar 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. The children should practice method of science from childhood. This will help the child for improved decision making. Vigyan Prasar decided to devise the program with all science and technology councils of North-Eastern states of India. Last year, students of Tripura got the 1st position among the North-eastern states.

This year, Final of Sci-Connect 2018 organized on **October 3-5, 2018** at Agartala where best 3 students of each NE states participated. Shri Sudip Roy Barman, Hon'ble Minister of S, T & E of Tripura was present as Chief Guest in the Prize Distribution & Valedictory Programme on

October 5, 2018. Students of Assam, Mizoram and Tripura got the 1ST, 2ND & 3RD positions during Final among the other NE states.

Workshop on Bamboo and Bamboo Based Composites for Engineering Applications

Tripura State Council for Science & Technology organised one day workshop on 'Bamboo and Bamboo Based Composites for Engineering Applications' in collaboration with CSIR-Advanced Materials and Processes Research Institute, Bhopal on January 24, 2019 at Conference Hall, Sahid Bhagat Singh Young Hostel, Agartala. The main objective of the workshop was to make aware about the different applications of bamboo composites and the manufacturing process of bamboo wood among the participants. In total 60 participants attended the workshop including Entrepreneurs & Industrial Partners in general, related with Bamboo industry in particular. Officials of Forest Department, Industries Department associated with Bamboo Sector and also from Bamboo Mission were also present.

Brainstorming Workshop regarding Kokborok Radio Serial on 'Traditional Knowledge of Tripura'

With an aim to produce and broadcast 26 numbers radio serials/episodes in Kokborok language regarding the traditional knowledge of indigenous knowledge need scientific documentation/intervention Tripura State Council for Science & Technology has undertaken a project on 'Radio serial in Kokborok on traditional knowledge of Tripura' supported by Vigyan Prasar, DST, GOI. In this regard a brainstorming workshop with all the Resource Persons in presence of Scientist of Vigyan Prasar was held on February 20, 2019 at 12 Noon as Pragna Bhawan, Hall No. 3, Gorkhabasti, Agartala which was inaugurated by Shri Sudip Roy Barman, Hon'ble Minister of S, T & E of Tripura.

Special Science Communication Campaign against Superstition

A project on 'Special Science Communication Campaign at selected KGBV/Girl's Hostel, Ganganagar under Dhalai District in Tripura to eradicate superstition/misbelief'was sanctioned by Samagra Siksha Abhiyaan (SmSA), Department of School Education, Government of Tripura to Tripura State Council for Science & Technology. To finalise the modus operandi/activities of the project a team comprising of officials of Tripura State Council for Science & Technology, School Education Department and Science/Social Activist visited Kasturba Gandhi Balika Vidyalaya (KGBV) Hostel of Ganganagar High School on February 27, 2019.

Liquid Disinfectant Cleaner

Tripura State Council for Science & Technology supported M/S. SAPMG (Small and Productive Manufacturing group) for adopting a technology for manufacturing of Liquid Disinfectant Cleaner developed by NEIST, Jorhat. The entrepreneur are selling the product in the brand name 'CLEANO'.

Hand Made Paper

One hand made paper unit has been set up in Kasturba Gandhi National Memorial Trust, R.K. Nagar, Jirania. Technology has been adopted from TARA Machines & Tech Services Private Limited, New Delhi.

3. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

Draft of the State S&T Policy has been prepared but not yet approved.

4. How strong are the links between other state government /departments If so provide details?

The Council is maintaining a strong link with other State Government Departments like School Education and Higher Education. Maximum numbers of the Science Communication activities are being implemented in collaboration with the School Education and Higher Education Departments with an objective to enhance the scientific temper among school and college students. In association with the Industries & Commerce Departments, Council is taking initiative to protect the Intellectual Property Rights of various stakeholders. Apart from the various science & technology related projects have been implemented in collaboration with Agriculture Department, Fisheries Departments etc. Council has completed a project in collaboration with Tripura Tribal Areas Autonomous District Council (TTAADC). Council has also organized R&D workshops, Brainstorming workshops and other programmes involving various line Departments of the State and Higher Educational Institutes of the State.

5. How strong are the links of the council with local industry units/associations?

Apart from maintaining strong link with the various State Government Departments, the Council has implemented some projects in collaboration with local industrial units/NGOs/SHGs like Pabda Hatchery, Iron Removal Plants, Hand Made Paper Units, Herbal Incense Stick, Bamboo and Bamboo based Composites for Engineering Application etc. An initiative has also been

taken to link up with Industry Association for registration of Geographical Indication (GI) Item.

6. List 5 major technology area, where the council can play an important role by finding convergent technological solutions.

1. Scientific standardization of water filter candle traditionally produced in Tripura.
2. Productivity enhancement of women SHGs of Tripura through science and technology intervention.
3. Science Film Festival.
4. Improvement of Science Education.
5. Adoption of CIEF Technologies.
6. Safe drinking water straight from the air.
7. Rain Water Harvesting.
8. Exposure on appropriate rural technological development and its future prospects in Tripura.

UTTAR PRADESH
COUNCIL OF SCIENCE & TECHNOLOGY, U.P.

1. About the Council & its programmes :

Council of Science and Technology, U.P. was established on 1st of May, 1975 by Govt. of U.P. as an autonomous body registered under Societies Registration Act 1860 by restructuring U.P. State Council of Scientific and Industrial Research; the origin of which lies in Scientific Research Committee constituted under University Grant Commission in the year 1947.

The main aim of the Council is to promote overall development of S&T in the State andthe main activities of the Council are as following:

i.	Research & Development as per need of the state	ii.	Technology Transfer & Development
iii.	Biotechnology Development& Promotion	iv.	Innovation Promotion
v.	Science Popularization	vi.	Planetarium and Science Parks
vii.	Intellectual Property Right protection Programme & Technology	viii.	Training in frontier areas of science

2. Activities performed by the Council during the year 2018-19

Research & Development as per need of the state

i. Around 134 research projects, financially supported by CST UP were monitored and continued in the area of health & pharmaceutical sciences, chemical sciences, physical sciences, environmental sciences and agriculture & allied sciences under the program R&D as per need of the state.

ii. 27 M.Sc. students studying in Uttar Pradesh were sent for summer research training for 02 months in prestigious institutions with fellowship of Rs.25000.00 p.m. under CST UP-Summer research fellowship Program.

Technology Transfer & Development

i. 09 research projects pertaining to technology transfer were financially supported, monitored and continued.

ii. 60 engineering projects were selected and provided financial support under Engineering Students' Project Grant Scheme.

Biotechnology Development & Promotion

i. In the area of Biotechnology 16 research projects are financially supported.

ii. Plant Tissue Culture Laboratory has been established at Biotech Networking Facility Centre, BakshiKaTalab, Lucknow and it is producing approximately 18 lacs of banana plantlets per annum.

iii. Vermi Compost and Blue Green Algae are also produced at the centre and 04 farmer's training programme has been conducted where 407 farmers were trained. 605 kg. of Blue Green Algae were distributed free of cost to 121 farmers. 711 kg. of Azolla was distributed free of cost to 53 farmers as cattle fodder.

iv. Biodiesel unit and Seed Processing unit to provide benefits to the farmers are also established at the center.

Innovation Promotion

i. Around 95 programs such as Tod-Fod-Jod, children creativity and workshop, innovation awareness programs, brain storming workshops, project exhibition competitions etc. were organized targeting grass-root level innovators and students.

ii. Innovation Incubation Centers were established at IIT, BHU Varanasi and MMMUT, Gorakhpur and 03 innovators have been sent to these centers for the value addition and prototype development of their innovation.

iii. Council supported and guided in organization of state level Innovators Startup Summit at Banda district. Around 10000 participants were benefited in this summit.

iv. A program entitled "KaunBanegaNanhaKalam" at Unnao district supported by Innovation Cell was organized in which around 30000 students from secondary schools took part.

v. Innovators identified by innovation Cell, CST UP have participated and demonstrated their innovations in various events such as Rural Innovators Startup Conclave-2018 organized at Hyderabad and IISF 2018 organized at Lucknow.

Science Popularization

i. Around 325 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.

ii. Science Award program 2014-15 and 2015-16 has been successfully organized on 25-10-2018 under the Chairmanship of Hon'ble Chief Minister, Uttar Pradesh. 21 and 20 eminent scientists have been awarded different awards for the year 2014-15 and 2015-16 respectively.

iii. NCSTC, DST, GoI, New Delhi and CST UP jointly organized State Level Children Science Congress 2018. The Theme of the program was Science, Technology and Innovation for clean, Green and Healthy Nation. 150 projects (02 students in each project) from 75 districts of UP were presented and approximately 30,000 Children participated in this mega event.

iv. CST U.P. has participated and demonstrated its activities in various events such as IISF- 2018, KumbhMela, Prayagraj, Gorakhpur Festival-2019, Deoria Festival-2019 and Mouni Baba Mela in District-Banda.

Planetarium and Science Parks

i. Indira Gandhi Planetarium, Lucknow, Veer Bahadur Singh Planetarium, Gorakhpur, Aryabhatt Planetarium, Rampur and 02 mobile planetariums are operated by Council of Science & Technology, U.P. More than 2 Lakh visitors have visited the planetariums in 2018-19. Around 50-night sky watching programmes have been organizedto popularize astronomy and to create awareness and interest among masses with the help of U.P. Amateur Astronomers Club constituted by Indira Gandhi Planetarium Lucknow.

ii. A mini science park (VIGYAN VATIKA) is established at Shyama Prasad Mukherjee Park, Ghaziabad. There are 25 indoor and 25 outdoor science exhibits installed and around 24 SCIENCE CARNIVAL were organized among school children / students of District Ghaziabad in this park.

iii. A Science Bus jointly developed by IIT Kanpur and CSTUP was launched by Hon'ble Deputy Chief Minister, Uttar Pradesh on the occasion of Gandhi Jayanti.

Intellectual Property Right protection Programme

i. 05 patents were filed and registration of 02 Trade Marks, 01 Industrial Design and 01 Copyright was facilitated under this program.

ii. Intellectual Property Cell were also established in 05 universities in the state.

Training in frontier areas of science & Technology

i. Around 300 personals from 08 districts were trained in frontier areas of Science & Technology for self-employment generation.

3. List 5 success stories with brief about 1 page each including photograph, if available

i. Development of Science Bus

ii. Development of Science Park

iii. Plant Tissue Culture Laboratory

iv. CST UP – Summer Research Fellowship Programme

v. CST UP – Engineering Student Project Grant Scheme

4. Has the Council developed any specific state related S&T and innovation policy? If so the details to be provided.

i. Biotech Policy 2014

ii. Innovation guidelines 2015

5. **How strong are the links between other state government/ departments If so provide details?**

Council has established strong links between various departments and bodies. Details are as following:

For Research & Development	National Institutes CSIR, ICAR, ICMR, DRDOAll State and central universities, IITs, NITs, PRL Ahmedabad, IUCAA Pune, NII New Delhi, TIFR Mumbai, BARC, WII Dehradun etc.
For Technology Development & Biotechnology	Technical Institutions, DBT (GoI), Biotech park, UdyogBandhu, Industrial Development, NIC, UP Electronics Corporation, Dept. of Horticulture/Health/ Industries.
For Agriculture	UPAAS Lucknow, UPCAR Lucknow, ICAR Institutions, Agriculture Universities, Department of Agriculture & Horticulture
For IPR & Innovation Programme	PHD Chamber of Commerce, CII, IIA, FICCI, UP Sugar Mill Association, District Industry Centres, MSME, UdyogBandhu, Dept. of Technical Education, Dept. of Planning and universities/institutions.
Science Popularization	Department of Basic, Secondary and Higher Education, Regional Science City, VigyanPrasar, NCSTC (DST GoI) and Ministry of Earth Sciences
Core Support	DST, Govt. of India
Convergent Support	NCSTC, DST, Govt. of India

6. How strong are the links of the council with local industry units/associations?

For Technology Development & Biotechnology	Technical Institutions, DBT (GoI), Biotech park, UdyogBandhu, Industrial Development, NIC, UP Electronics Corporation, Dept. of Horticulture/Health/ Industries.

For IPR & Innovation Programme	PHD Chamber of Commerce, CII, IIA, FICCI, UP Sugar Mill Association, District Industry Centres, MSME, UdyogBandhu, Dept. of Technical Education, Dept. of Planning and universities/institutions.
Local Industry Unit	Hindustan Bioenergy Limited

7. Proposed programs and budget outlay for the year 2019-20

S. No.	Scheme/Programme
1.	Research & Development as per need of the state
2.	Technology Transfer & Development
3.	Biotechnology Development & Promotion
4.	Innovation Promotion
5.	Science Popularization
6.	Planetarium and Science Parks
7.	Intellectual Property Right protection Programme
8.	Training in frontier areas of science & Technology
9.	S&T mapping as per need of the state
10.	Science Scholarship Scheme
11.	Infrastructural support to Council

8. 5 years' vision of the Council

Council of Science & Technology, U.P.,along with present schemes/activities, aims to focus on following activities:

i. Establishments of 03 Science Parks

ii. Establishment of Centre of Excellence for quality orchard plants

iii. Upgradation of Science Laboratories in 18 Science PG Colleges of U.P. under STAR College scheme of DBT, GoI.

iv. Upgradation of 02 Planetaria

v. Establishment of Astronomy Laboratory and Science Laboratory

vi. Facilitation for the establishment of National Bio-design Translational Research Institute (NBTRI) by DBT, Govt. of India.

vii. Operation & maintenance of Plant Tissue Culture Laboratory, Seed Processing Unit, Biodiesel Unit at Biotech Networking Facility Centre, BKT Lucknow.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INDIA

UTTARAKHAND STATE COUNCIL FOR SCIENCE & TECHNOLOGY (UCOST)

1. About the Council and its Programs :

UCOST incepted its activities in the year 2005 as an autonomous body of the Science & Technology Department, Government of Uttarakhand, under the Registration of Societies Act, 1860. The General Body is chaired by the Chief Secretary, Govt. of Uttarakhand, which comprises of the Secretaries from various Govt. departments, Vice Chancellors, eminent scientists, representatives from Industries and NGO's.

The programs of the Council include promotion of S&T in the state, extension, technology transfer and field demonstration of location specific technologies and popularization of science. Specifically, Council run following programs: Research Development and Demonstration; Science Popularization and Science CityS&T Based Entrepreneurship Development Program; Science & Society Program for Women & Weaker Section; and Himalayan System Science.

2. Activities performed by the Councils during the year 2018-19

S.No.	Name of the Division/Program	Program Organized
Research Development and Demonstration		
1.	State Science Congress	13th Uttarakhand State Science & Technology Congress (13thUSSTC), and 26th State Level Children Science Congress (26th SCSC)
2.	Research & Development Projects	New R&D Projects Sanctioned – 16PRG/PEG meeting organized – 02Running R&D Projects – 51
3.	Seminar/Symposium/Workshop/ Conference/ International Travel Grant	Total No. of program sanctioned - 49International Travel Grant- 24
Science popularization andScience City		
4.	Science City	Proposal for Science City Dehradun has been approved by Ministry of Culture, GoI with total cost Rs 173 Cr on 26 Acre of landSub Regional Science Center is under Development at AlmoraRegional Science Center (RSC) is operational, visitedby51738 visitors in 2018-19
5.	Popular Lecture Series	Lectures on Global Climate Change & Science of 3D movie for visiting school groups at RSC

		Dehradun-323 for a total of 22,361 studentsPopular Lectures on IPR- 11 for a total of 1344 studentsLecture on "Homeostasis of Mother Earth& Human Evolution"- 06 fora total of 875 studentsPopular Lectures at UCOST- 09
6.	Science Education & Communication	Science camps organized- 02No. of Science Demonstration Lectures (SDL)- 323 for a total of 22,361 students
7.	Science Popularization Events	Total No of Events organized by UCOST-17Total No of Events organized by RSC - 133D science film show on Global Warming and Taramandal show at RSC - 31,642 visitors
8.	State Level Awards	Science and Technology Excellence Award - 02NASI Best Science Teacher award-01Young Scientist Award- 46 (16M & 30F)Innovator of the Year Award-01
9.	Uttarakhand Chapter NASI Allahabad	Workshops organized-02
Himalayan System Science		
10.	Natural Resource management/ Biodiversity Conservation/ Glaciology & Protection of Lakes	Biodiversity Park developed at VigyanDham premises in 7,450 sqm area with more than 200 species of plantsHimalayan Sustainable Development Summit with IMI-01Round-table meet on Climate Change with SDFU & IMI-01
S&T Based Entrepreneurship Development Program		
11.	Technology Management/Creation of Technology Resources Centers (TRC)	Skill development training under EDP-04New TRC established at Huddu, Rudraprayag
12.	IPR Management Center	Patents filed – 06Copyright filed- 02IPR Awareness program - 11

Science and Society Program for Women and Weaker Section		
13.	Science & Society Program for Women & Weaker Section	Workshops- 02 at Chakrata&Lata (Joshimath) among Jaunsari&BhotiyaTribes
Externally Funded Projects		
14.	1.	Preparation of Resource Atlas for Himalayan State of Uttarakhand (NMHS-MoEF&CC)
	2.	Centre of Excellence on Forest Based Livelihood in Uttarakhand (MoEF&CC)
	3.	Pt. DeenDayalUpadhyayVigyan Gram SankulPariyojana (SEED-DST) 4.
	4.	Enhancing livelihood of Himalayan communities through action research and transforming wild produces into high value products (NMHS-MoEF&CC)
	5.	Spatial Data Infrastructure (NRDMS-DST)
	6.	Modelling for Enhancing Water Quality in Uttarakhand using Geospatial Technology (DST)
	7.	Project Management Unit (PMU) for Water Quality Monitoring and Surveillance (WQM&S) Program (World Bank)
	8.	Patent Information Center 'PIC', (DST)

3. Key activities under taken during the last two years in the area of:

3.1 Technology Development

1. UCOST in collaboration with Uttarakhand Residential University (URU) and RI Instruments & Innovation, Haldwani has developed following six technologies which are under patent registration:
    i. Graphene Alcohol Sensor
    ii. Graphene Li ion Battery
    iii. Synthesis of Graphene along with the biofuel from polymer based processed with *Anaphalisbusua*&*Lantanacamara* in a closed group reactor
    iv. Graphene based solar tiles for maintaining consistent home temperature
    v. Multi stage water filter made of Graphene aerogel, TiO2, Rice husk with *Ocimumtenuiflorum* (Tulsi), treated with Al(OH)3 and *Azadirachtaindica* (Neem)
    vi. Air filter made from bamboo, plastic waste & graphene aerogel.
2. Field Testing Kit for Water analysis (Semi-quantitative testsfor Turbidity, pH, Hardness, Chloride, Iron, Nitrate, and Residual Chlorine, and Bacteriological Test)
3. Development of 14 High valued products from nutritionally rich traditional crops at Technical Resource Centre (TRC), Kaleshwer in collaboration with Himalayan Action Research Centre (HARC)

4. Fish feed for commercial fish production by traditionally grown nutritional rich grain.
5. Utilization of glass waste for the degradation of waste plastic.
6. Eco-friendly cow urine based formulations for honey bee disease management.
7. Bioconversion of lignocellulosic biomass to bioethanol.

3.2 Technology Demonstration

1. A total of 04 Mist Chamber, 08 Net House and 08 Polyhouse have been established at 04 clusters underDST GoI funded project, "Pt. DeenDayalUpadhyayVigyan Gram SankulPariyojana". Training on Apiculture to 15 beneficiaries; Milk processing to 50 beneficiaries and exposure visits of Institutions to 35 beneficiaries have been carried out under the project.

2. Under NMHS-MoEF&CC funded project, "Enhancing livelihood of Himalayan communities through action research and transforming wild produce into high value products", a total of 19 products were developed from 9 wild fruits and nuts, 16 Cooperatives of total of 56 villages were covered which includes 4674 beneficiaries having 25.0 Lakh annual earning. The total project budget was 2.49 Crore, while the annual turnover achieved by the project is about 5.0 Crore. 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.
3. Council has developed a Bio-composting demonstration unit with technical support of G.B. Pant Institute of Himalayan Environment and Sustainable Development, Kosi-Katarmal, Almora. The process of bio-composting is demonstrated to the student groups and their teachers who comes to visit RSC Dehradun and invited participants of UCOST programs.

4. Council has developed a full-fledged tissue culture lab atNaugaon, Uttarkashi district with the financial support of DST, GoI. It aims at improving the quality of fruits, flowers and other products, diffusion of advanced technologies among the local farmers. It has established healthy and disease free germplasm of carnation, Lilium and strawberry.

5. Council in collaboration with Uttarakhand JalSansthan(UJS) Dehradun & DAV PG College Dehradun has established State Level Water Quality Analyses Laboratory in premises of UJS, Dehradun under WTI program of DST (GoI). The lab is equipped withstate-of-the artequipments such as UV spectrophotometer, Atomic Absorption Spectrophotometer, TDS meter, Turbidity meter, Digital titrator, pH meter, Leminar Airflow cabinet and incubators etc.More than 1100 beneficiaries/ human resource from training/awareness/ capacity building of water quality testing.

6. Under the Entrepreneurship Development Program (EDP), Science & Society and Establishment of Technology Resource Centers (TRCs), UCOST has also addressed rural areas of Uttarakhand. EDP mission is technology driven entrepreneurship development. A total of 7 TRCs arefunctional in six districts and are managed by pre-appointed NGO's.More than 10128 beneficiaries have been facilitated with technology demonstrations on horticulture, food processing and agriculture.

7. Already adopted in the Europe, this innovative RBF technology has been introduced atsix different sites in Satpuli, Srinagar, Karnaprayag and Agastyamuni along the rivers East Nayar, Alaknanda and Mandakini. UCOST is planning for more sites for development of RBF technology. The RBF technology is demonstrated to local people, school and college students of nearby areas.

8. 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 product 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, specific industrial waste. The visiting students or general public are provided its demonstration during their visit.

3.3 Popularization of Science

Council has financially supported a total of 49 Science Popularization Programs in 2018-19and 32 programs in 2017-18. Council has funded 24 International travel grant in 2018-19 and 12 in 2017-18 for attending international conference/symposia. Besides, 340 popular science lectures and 357 various other events of science popularization have been organized at Council and RSC Dehradun.

3.4 Patents

In addition to awareness activities, Patent Information Center (PIC) has facilitated a number of innovators and researchers for their IPR issues. The PIC has facilitated registration of 11 patents and 07 Copyright applications.

3.5 Any New Innovative Activities

As an innovative state-of-the art resource development for science popularization, Council has recently succeeded to get approval of its project of Establishment of Science City Dehradun by Ministry of Culture. It includesfollowing 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.

4. List 5 success stories with brief about 1 page each including photograph, if available.

4.1 Science City Dehradun: Ministry of Culture, Government of India has approved development of Science City Dehradun in March 2018. State-of-art resources and facilities will be developed with approved cost of Rs 173 Cr in 25 Acre of land. Besides, Sub-regional science centre at Almora and Science Park at Chamoli are under development phase.

4.2 Uttarakhand Biotech Policy 2018-23: Council drafted the Uttarakhand Biotech Policy 2018-23, which was approved by the Cabinet in October, 2018. It will be instrumental to create an effective ecosystem for innovation and investment in Biotech sector through Rs 5 Cr corpus and various fiscal incentives.

4.3 Externally Funded Projects: Council is relentlessly working onsome of the ambitious externally funded projects, such as Preparation of Resource Atlas for Himalayan State of

Uttarakhand (NMHS-MoEF&CC); Centre of Excellence on Forest Based Livelihood in Uttarakhand (MoEF&CC); Pt. DeenDayalUpadhyayVigyan Gram SankulPariyojana (SEED-DST); Enhancing livelihood of Himalayan communities through action research and transforming wild produces into high value products (NMHS-MoEF&CC); Spatial Data Infrastructure (NRDMS-DST); Modelling for Enhancing Water Quality in Uttarakhand using Geospatial Technology (DST); Project Management Unit (PMU) for Water Quality Monitoring and Surveillance (WQM&S) Program (World Bank), and PIC (DST).

4.4 Science Congress: Council organized **13th Uttarakhand State Science & Technology Congress (USSTC)** from 26-28 February, 2019, in which out of 483 papers presented in 17 disciplines, 46 researchers were selected for Young Scientist Award including one Innovator of the Year Award. During the ceremony, the Uttarakhand S&T Excellence Award-2019 were presented to Dr Dalip Kumar Upreti, CSIR-NBRI, Lucknow and Prof PreetiGangola Joshi, NIMHNS, Bangalore. Dr Mamta, LT Science Teacher, Inter College Uttrauda, Kapkot, Distt- Bageshwar was awarded NASI Best Science Teacher award. Parallel sessions of **Biotech Conclave-2019, National Mathematics Day-2019,**Panel discussion on 'Climate Change with reference to Himalayan Ecosystem, Impacts & Mitigation' and Brainstorming Session on 'Potential Issues in Livelihood generation through NTFP in Uttarakhand' were also organized during the congress.

In addition, the **26thState Level Children Science Congress-2018** on focal theme, "Science, Technology & Innovation for a Clean, Green and Healthy Nation" and 5 sub-themeswas organized at VigyanDham on 15th December, 2018. A total of 144 students (94 girls & 50 boys) belonging all the 13 districts participated in the congress. Selected16 students participated in National Children Science Congress at Bhuvneshwar,Odisha.

4.5 Biodiversity Park: Biodiversity Park has been established in Council premises in an area of 7,450 sqm with road and walking trail, irrigation system, horticulture & landscaping along with green house facility. The project was financially supported by SatlujJalVidyut Nigam, Shimla and developed by Forest Research Institute, Dehradun. Park harbours more than 700 plants belonging 200 species. Biodiversity Park was inaugurated by *Padma Vibhushan* Sri SundarlalBahuguna and Dr KK Paul, Hon. Governor of Uttarakhand on 3rd February, 2018.

5. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided

Council drafted **Uttarakhand S&T Vision 2022** under committee of Vision Group (VGM) under the chairmanship of renowned physicist Prof M.G.K. Menon, FRS, former DG CSIR and formerminister of state for S&T and Education, GoI and 24 experts from various fields.

Council drafted the **Uttarakhand Biotech Policy 2018-23**, which was approved by the Cabinet in October, 2018. It will be instrumental to create an effective ecosystem for innovation and investment in Biotech sector through Rs 5 Cr corpus and various fiscal incentives.

Council has provided crucial inputs for **National IPR Policy 2016**. In doing so, Council raised various Himalayan issue like, traditional knowledge system and benefit sharing.

6. How strong are the links between other state government/departments? If so, provide details?

The Council through its own programs and externally funded projects has developed very strong links with various line departments of the State such as, JalSansthan; Department of Health; Department of School Education; Uttarakhand Environment & pollution control Board; Forest Department; Agriculture Department; Horticulture Department; Department of Higher Education; Uttarakhand Renewable Energy Development Authority; Department of Medical Education; Department of Higher Education

7. How strong are the links of the council with local industry units/associations?

The Council has been taking the initiative of forming a collaborative network with the industry associations specifically with the local associations- Industry association of Uttarakhand (IAU) and CII Uttarakhand Chapter focusing on the MSME sector. Council has organized Industry-academia meet.

8. Five years vision of the Council

Apart from pursuance of regular activities of the Council, following special task will be achieved in five years:

9. Establishment of Science City Dehradun/ Science Center/ Science Park:

a. Establishment of Science CityDehradun in sprawling 25 acre of land with estimated cost of Rs 173 Cr, which include resources like,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.

b. **Establishment of Sub-Regional Science Center Almora**with an area of 5.0 acre and total estimated cost of Rs 12 Cr.

c. **Establishment of District Science Park Chamoli**in collaboration withDistrict Administration on provided land.

Establishment of TISC: In order to ensure effective Intellectual Property protection & technology management, a Technology Innovation and Support Center (TISC) will be established in collaboration with World Intellectual Property Organization (WIPO) and Department for Promotion of Industry & Internal Trade (DPIIT), Govt of India.

Skill Development Program in different disciplines: As the Council has identified as the Nodal agency for protection of IP, EDP and Start-up promotion with effective networking support of national institutions, it has prioritized skill & capacity development training to PG and research students onvarious disciplines such as, Industrial catalyst, Bioreactors, downstream processing of protein & enzymes, rDNA Technology, Computational Biology, Testing petroleum products and analytical chemistry.

Sustainable Development Goals (SDGs) for S&T: Under coordination of State Governmentfor SDG Vision 2030, fulfilling SDGs and their effective implementation as described in their indicators for S&T (SDG No. 9; SDGs Sub Goal No. 9.5 and indicators 9.5.1, 9.5.2 & 9.5.3).

Strengthening Geospatial Governance (g-Governance) system: In order to strategically shift e-Governance to g-Governance, the Council has distinct plan for coordination with line departments under its Uttarakhand Geo-portal Spatial Data Infrastructure (SDI), supported by DST, Govt of India and Planning Commission, Govt of Uttarakhand. This system will help in environmental conservation, real-time disaster management, watershed management, forest based livelihood management etc.

Water Science and Technology: Mapping of water springs, water quality, isotope hydrology, wetlands of the state for ensuring adequate drinking water availability. River Bank Filtration (RBF) Technology will be extended to other areas of the state.

Extension of Successful MoEF&CC funded Programs: Council has already taken a lead through NMHS-MoEF&CC funded project, "Enhancing livelihood of Himalayan communities through action research and transforming wild produces into high value products", in which 19 products have been developed using 9 wild fruits and nuts. A total of 56 villages were covered which includes 4674 beneficiaries of Chamoli and Rudraprayag district having Rs 25.0 Lakh annual earning. The total project budget was Rs 2.49 Cr, while the annual turnover achieved by the project was about Rs 5.0 Cr till date. The project will be extended to other hilly regions.

Bio-prospecting: Council has a distinct vision on bio-prospecting under which innovation promotion on Himalayan medicinal herbs, vaccines, hybrid seeds, bio-fertilizers, bio-pesticides

and enzymes. Besides, Council has planned to work on Ayurvedic drugs with modern scientific tools and techniques for its evidence based promotion.

Establishment of Center of Excellence (CoE) on Climate Change: In addition to the CoE on Forest Based Livelihood in Uttarakhand supported by MoEF&CC, efforts will be made to establish CoE on Climate Change.

Effective Implementation of other Externally Funded Projects: Council is working on various externally funded projects such as,Preparation of Resource Atlas for Himalayan State of Uttarakhand (NMHS-MoEF&CC); Centre of Excellence on Forest Based Livelihood in Uttarakhand (MoEF&CC); Pt. DeenDayalUpadhyayVigyan Gram SankulPariyojana (SEED-DST); Enhancing livelihood of Himalayan communities through action research and transforming wild produces into high value products (NMHS-MoEF&CC); Spatial Data Infrastructure (NRDMS-DST); Modelling for Enhancing Water Quality in Uttarakhand using Geospatial Technology (DST); Project Management Unit (PMU) for Water Quality Monitoring and Surveillance (WQM&S) Program (World Bank). In order to ensure successful implementation of such projects, Council is committed to ensure time bound targeted achievements of objectives.

WEST BENGAL STATE COUNCIL OF SCIENCE AND TECHNOLOGY

1. About the council and its programme :

The West Bengal State Council of Science & Technology (WBSCST) is a major implementing agency functioning under the administrative control of the Department of Science and Technology and Biotechnology, Government of West Bengal. The Council since its establishment in the year 1988 has been playing a critical role in the popularization and promotional activities in the field of Science & Technology for the advancement and socio - economic development of the State. The basic objectives of WBSCST are as below.

To coordinate schemes on popularization of science, intellectual property rights awareness, geo-informatics, facilitation for introduction of new technology and other S&T related projects/ programmes of the State

To identify priority areas of Science and Technology needed for long-term development of the State

Promotion of scientific research and awareness in areas appropriate for fulfilment of socio-economic objectives of the Government including the objectives of tackling the problems of backwardness, unemployment and poverty particularly in the rural areas, through S&T programmes;

To interact with other State and National Science and Technology bodies/ organisations/ academic institutes having similar objectives and get involved in collaborative projects. Holding periodical discussions of the S&T plans of the State of West Bengal and other major issues on S&T policies

To take any other steps which are relevant to the promotion of Science and Technology and its application to the developmental need of the State.

2. Activities performed by the Council during the last one year :

a) **RS-GIS activities:** projects for generation of spatial database using RS & GIS technology for developmental planning activities of the state.

Empowering Panchayati Raj Institutions Spatially (EPRIS), NRC 50K : Natural Resources Census : Landuse/ Landcover, Monitoring of Integrated Watershed Programme (IWMP) Watersheds using Geospatial Technologies, Vulnerability Assessment under National Mission for Sustaining the Himalayan Ecosystem, Impact Assessment of Industrial Waste-Water Effluent on surrounding land & Water Bodies using High Resolution Satellite Data – A Cadastral level Pilot Scale study over parts of Hooghly Industrial Belt, Generation of Cadastral database of West Bengal on GIS Platform for entire state of West Bengal and GIS Mapping of cities

covered under the National Urban Health Mission (NUHM)-Phase II.

b) Conducted 3 Nos. training courses on RS & GIS and for giving training to students, teachers of Universities, officials of line Departments of Govt. organizations and other willing professionals and 1 course un PG Diploma in Geo-informatics only for postgraduate students

c) IPR & G.I. activities: 44 novelty search, 25 patent filing, 6 trademark, 2 design, 4 documentation, 3 G.I. renewal and formulation of a new course on IPR & Technology Business Management in collaboration with Maulana Abul Kalam Azad University of Technology, WB

d) Assistance for setting up of **Model Innovative Science Laboratories** in the **SC & ST dominated** district schools of West Bengal.

A grant of Rs. 10.00 lakhs to each of the selected schools have been given (Govt. of WB funded project) to develop three model innovative science laboratories (Physics, Chemistry & Biology) having modern facilities.

e) To strengthen the scientific base of the State, the Council is supporting **five Research Fellowships** and to promote scientific research for the benefit of the rural people the Council is also supporting **two Research Grants** for the college &University teachers.

f) Every year DST, Govt. of India organises National Children Science Congress where child representatives from all the state participates with their innovative ideas on science. Likewise in 2018 a batch of talented students were identified through Dist. level and State level Science Congresses held in West Bengal and were sent for participation at the national level in the month of December, 2018.

These students initially take up projects on any science discipline as per their interest and do a survey work, collect data, analyse those data before finally portraying their findings on posters for presentation at the completion. The topics on which the students presented their posters were as : projects on Focal Theme - Science, Technology and Innovation for green and healthy nation; Sub Themes - Ecosystem & ecosystem services, Health, hygiene & sanitation, Society, culture & livelihoods, Traditional knowledge system, Waste to wealth.

This year during the State S&T Congress an interactive workshop – "Workshop on Scientific Creativity" was organised on Physics, Chemistry and Biology where the selected students were mentored in individual small groups for having better experience of hands - on science experiments.

3. Key activities under taken during the last two years in the area of:

a) **Technology Development:**

RS-GIS activities:

Map/database on Land resources

Map/database on Surface & Ground Water resources

Disaster Management - Disseminating Near Real Time information of flood to State administrations based radar data from NRSC, DOS.

Map/database for Environmental Planning, Urban planning & Rural planning

Drought Mitigation Programme - Field level implementation in drought prone districts

R&D projects on Medicinal & Aromatic Plants

b) **Technology Demonstrations:**

Prototype development facilitation and Grass-root Innovation protection: Carbon filter, thermal cooling jacket, cost effective lift technology, jute ribboner.

Research Fellowship Award and **Research Grant Awards** which are provided to the Students and Teachers respectively, have strict guideline to demonstrate its practical S&T applicability for the benefit of the society

c) **Popularisation of science:**

The Council has a special District Level programme called **"Residential Science Camp"** which is organized by the Council itself, targeted persons being the school students. At least 4 such camps are organized each year.

Observation of National Mathematics Day, 2018 (funded by NCSTC, DST, GoI)

For popularization of science among children a section has been introduced within the WB State Science & Technology Congress viz. **Children Science Session** and the events under this programme include presentation of papers, lectures on popular topics, interactive sessions like "meet the scientists", workshop on hands on science activities etc.

d) **Intellectual Property Rights:**

PIC, WBSCST has assisted in the filing of the patents of local innovators and facilitated exhibition of their technology at different industrial fair & technology meet with the duel objective of commercialisation of existing innovations/ patent and handholding and entrepreneurship awareness among scientists, students and grassroot innovators.

e) **New Human Resource Development programme:**

WBSCST has signed MOU with Maulana Abul Kalam Azad University of Technology, WB to commence two new courses on "IPR & Technology Business Management" and "M. Tech. In Geoinformatics" to train manpower/ professionals in these two emerging fields of Technology

4. Has the council developed any specific state related S&T and innovation policy? If so the details to be provided.

WBSCST has developed 6 IPR cells in 6 Universities of the State to promote entrepreneurship and IPR awareness among the students/ researchers and rural innovators

5. How strong are the links between other state government / Departments. If so, provide details.

Linkage Developed with other line Departments of the State:

i. West Bengal Biodiversity Board
ii. West Bengal Pollution Control Board
iii. Department of Disaster Management, GoWB
iv. Department of Land and Land Reforms, GoWB
v. Directorate of Food Processing, GoWB
vi. District Headquarters, Officer and Gram Panchayats, GoWB
vii. Directorate of MSME, GoWB
viii. University of Kalyani
ix. Maulana Aabul Kalam Azad University of Technology, WB

6. How strong are the links of the council with State line Departments, local industry units/associations?

The RS & GIS wing of the Council has been conducting certificate training courses of different durations for interested students and working professionals of various other Departments and industry sector

8 Week Certificate Course in Remote Sensing & GIS

2 Week Short Term Course in Remote Sensing & GIS

1 Week Short Term Course, Advanced Level

1 Year PG Diploma in Geo-informatics

Patent Information Centre under West Bengal State Council is trying to develop strong linkages in respect of G.I., Innovation mapping and Technology Transfer with local industries through MSME Directorate and other line Departments.

7. 5 years vision of the Council :

In the next 5 years the Council wishes to establish a stronger and deeper footage in the field of Science & Technology for the advancement and socio- economic benefit of the people in West Bengal as per the following roadmap –

To establish a robust scheme of popularising science & technology among the masses

upto the grassroot level covering the remotest corner of the State, to track the performance of the students and thus strengthen and encourage the future generation to take science as a career option (introduction of digital platform)

To build a state of the art facility in providing all kind of necessary service in the field of Geoinformatics and Remote Sensing to other Govt. Departments, institutes and organisations and training quality manpower and professionals

To rejuvenate the Plant Tissue Culture unit in a state of the art form to address the necessity of the State and to serve for the conservation of natural plant resources at state and national level

To spread awareness about Intellectual Property Rights among the common public and train quality manpower in this field to protect the rights if individual and the State (trough filing of G.I. for the indigenous items). To identify and give technological support to innovative technologies/ processes/ concepts and facilitate IPR protection.

Section V

Recommendations of Expert Group on DST - SSTP

Section V - Recommendations of Expert Group on DST - SSTP

The Expert Group on State S&T Councils reviewed activities. After detailed delibrations and discussions held during 22nd to 24th August'2019, the Expert Group recommended the following:

Recommendations of the Expert Group are as follows:

1. State S&T Councils (SSTC) should add the following objectives in their mandate :

   Catalysing Science Technology Innovation (STI) ecosystem in the States

   Strengthening S&T based delivery system in State Government

2. S&T Councils have been implementing Popularisation of Science activities for the past 30 years or so, thus reaching out to the masses at the bottom of the knowledge pyramid. They have to strengthen the upper two tier of the pyramid namely S&T application and S&T innovation. State S&T Councils should concentrate more on systemic study from the DST support

3. The Expert Group recommended for relase of Rs. 10.0 Lakhs as seed money to each Council for the mapping of the S&T need of the States. What type of S&T intervention needed for the development of S&T in the States. Mapping of Location Specific Problems with the S&T Solutions/ Interventions of the society is to be done on a continuing basis by the S&T Councils. A report in this regard will be submitted by the Councils within 6 months of the receipt of grant.

4. S&T Councils common portal should be developed for showcasing best practices, success stories and the portal should be updated by all the councils on a regular basis. The Committee in principal recommended the proposal for the creation of the portal on the activities of the State S&T Councils. The Committee also authorized the DST secretarait to assign the above task to CDAC for the creation of the portal as per the need.

5. The S&T Councils portal should display all the S&T interventions deployed on the field together with details of the Problem, S&T Intervention (Technology/ Process/ Method) and its provider, places where implemented, benefits & improvements observed with the introduction of S&T intervention, initial cost of implementation and recurring expenditure per annum and the year of implementation etc.

6. The output and outcome of S&T councils should be quantified in terms of the indicators relevant to their mandate addressing State Specific S&T needs, National priorirties & SDGs.

7. The Expert Group further recommended that to strengthen the systemic role of SSTC, ST cell, SC cell, Women cell should be constituted in the Councils to assess the requirement of S&T intervention for various section of the societies.Thes cells should be supported through SEED division of the DST.

8. The Expert Group members noted that, based on their activities the State S&T Councils (SSTC) could be divided in to three categories e.g. (a) Well performing (b) Medium performing (c) Poor performing. The Group suggested that different strategies should be formulated for evolving of the various categories SSTC for the purpose. It was also suggested that the meeting should be organized between Central-DST & State-DST to sort out pending issue and bottlenecks. The Group also recommended for organization of the regional meeting of the Councils.

9. All the S&T Councils were requested to participate in the S&T Councils Conclave to be held as a part of India International Science Festival (IISF) scheduled in Kolkata during 5th -8th November 2019.

10. DST will be inviting the Honourable Ministers and Principal Secretaries (State-S&T) for the India International Science Festival (IISF) along with the DGs/ Member Secretaries.

11. The Expert Group also advised the State S&T Councils for make use of the various schemes of DST, DBT, DAE, ICAR and ICMR specifically DST-SEED divison programme for over all development of the S&T activities in the States and country.

12. The Expert Group also recommended for an increase in the release of the Project Related Grant (PRG), to Rs. 1.0 crore to some of the State Councils who have earlier also been provided such grant. The Group also recommended that State S&T Councils getting the PRG for the sanctioning of the project to the Institutions/Organizations in the States should give call for the proposal on the State Specific challenges, Constitute the Expert Group in States (EG in State) chaired by the renowned academician of the State in suggestion with DST. EG in State should have DST representiativeas member, Proposal should be screened and recommended by the EG in State may be further send to the DST for seeking the approval DST Tier 2 Screening Committee on SSTP by inviting the concerned Project Investigator. DST Secretariat will finally convey the approval of the proposal to the State S&T Councils for the relase of the grant to the concernd PI's.

13. The Expert Group recommended for the release of core grant for the financial year 2019-20 to State S&T Councils with grant of 2018-19 and 8% increase include (DA increase of one year 5 % + 3 % increase of increment).

14. A proposal "Transformation of Village through S&T Interventions" was presented by Dr Hemant Kumar, Executive Director, Karnataka State Council for Science & Technology (KSCST), Bangaluru. Keeping in view that the project was addressing the limited needs of the village of Aspirational District as declared by the Govt. Of India, the pilot scale proposal was in principle recommended by expert group for financial support. However, it was suggested that a Expert Committee may be constituted by the Department of S&T, Govt. Of India for the monitoring the progress of the project while the project being implemented by the KSCST, B'luru