

Annual Report

2017 - 2018



Manipur Science & Technology Council
Science & Technology Complex, Takyelpat, Imphal-795001

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MANIPUR SCIENCE & TECHNOLOGY COUNCIL

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1.0 Background

The Manipur Science & Technology Council (MASTEC) formerly, State Council of Science, Technology and Environment, Manipur was set up in the year 1985 with the initiatives from the Department of Science and Technology, Government of Manipur. The Council got registered as an autonomous organisation of the Department of Science & Technology, Government of Manipur in January 1996 under the Manipur Societies Registration Act, 1989.

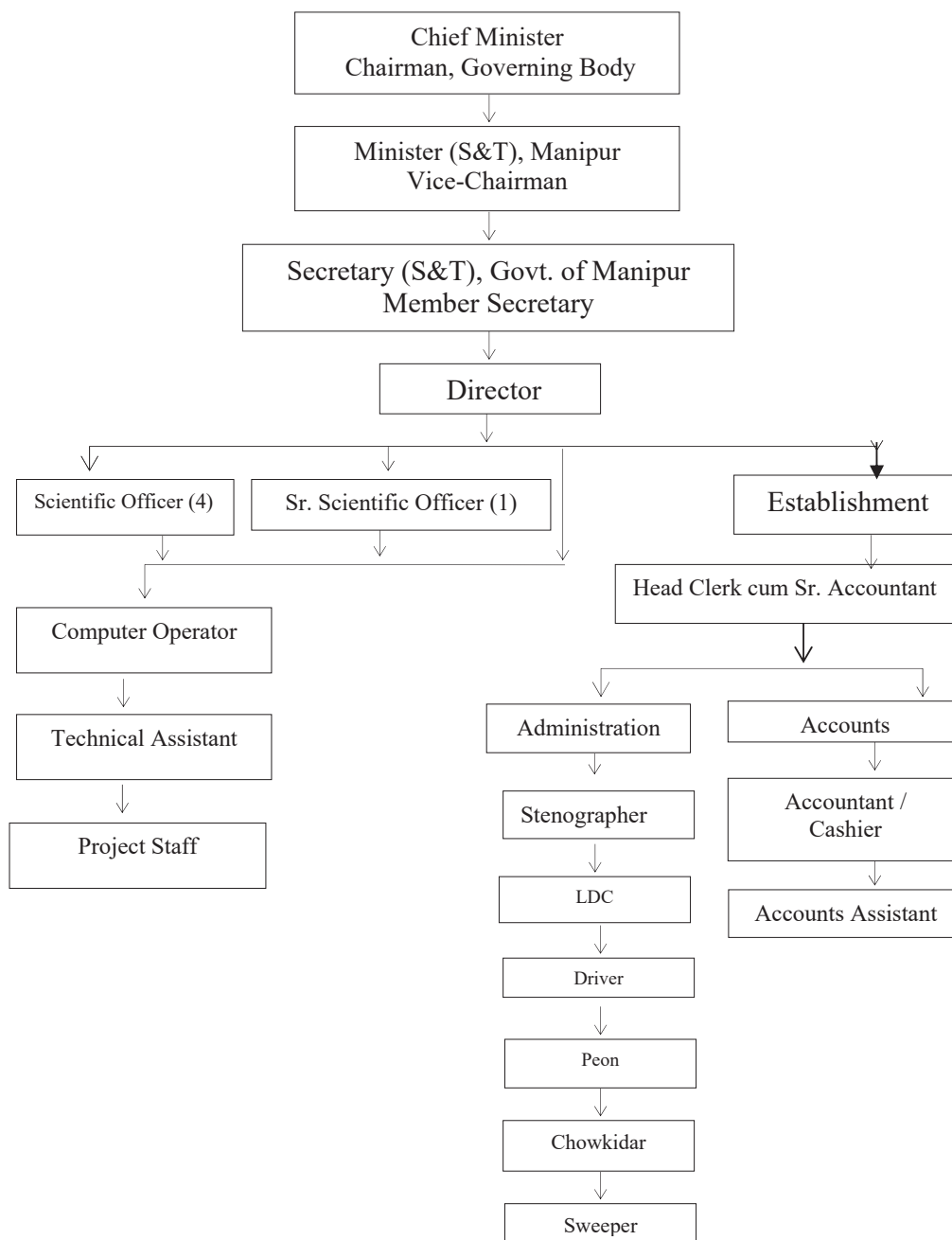
The autonomous Council is served by its own Secretariat of twenty man powers supported by the Department of Science and Technology(DST), Government of India. The Council Secretariat operates with the grants received from DST, Government of India, DST, Government of Manipur and the funds received from various agencies through projects and programmes. The Council works in co-ordination with the State Directorate of S&T in various areas of activities.

1.1 Objectives of the Council

- To identify areas in which Science, Technology and Environment can be utilised for the achievement of the Socio-economic objectives of the State and in particular, tackling the problems of backwardness and underprivileged sections of Society;
- To advise on policies and measures necessary to promote Science, Technology and Environment and their utilisation for achievement of socio-economic objectives;
- To initiate, support, promote and co-ordinate Research Design and Development projects and programmes, including demonstration projects which are likely to be relevant to the problems, surveys and optimum utilisation of natural resources of the State;
- To promote and undertake activities for the popularisation of Science and Technology and the spread of a Scientific Temper and attitude among the people of the State;
- To supplement and complement the ongoing technical efforts of the State Government;
- To interact with other State, National and International S & T bodies having similar or related objectives;
- To identify priority areas of Science & Technology for long term development of the State;
- To promote, support and undertake the application of renewable sources of energy for the benefit of the people;
- To accept donations and receive grants, and subsidies from Government of India, Government of Manipur and other supportive agencies and to invest the resources towards the achievement of the objectives of the Council.
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1.2 Organisation

The Council has a Governing Body which consists of a wide distribution of membership having expertise in various fields, with the Chief Minister as the Chairman, and the Minister in charge, S&T, Manipur as the Vice Chairman. At present there are 25 employees (including project staff) in the Council. The Council has an Executive Committee to assist the activities towards achieving the objectives of the Council. The Vice-Chairman of the Governing Body of the Council heads the Executive Committee as its Chairman. The Secretary/Commissioner (S&T), Government of Manipur is the Member Secretary of the Council. The Member Secretary is the Chief Executive of the Council Secretariat. The organisation chart is shown below.



1.3 Existing Staff

Scientific Staff:

Sl. No	Name	Qualification	Designation
1.	Th. Surendranath Singh	M.Sc., PGDCA, LLB	Director
2.	Dr. L. Dinachandra Singh	M.Sc., PGDRS, Ph.D.	Sr. Scientific Officer
3.	Dr. L. Minaketan Singh	M.Sc., PGDRS, Ph.D., Foundation Training of Scientists/Technologists (DST, GoI. Sponsored)	Scientific Officer
4.	Kh. Rakesh	M.Sc. Ph.D.	Scientific Officer
5.	Er. Ch. Sarat Singh	B.Tech, M.Tech.(Civil)	Scientific Officer
6.	Dr. R.K. Pritamjit Singh	M.Sc., Ph.D.	Scientific Officer

Technical Staff :

7.	Dr. Ch. Shivaji	M.Sc., PGDCA, Ph.D.	Computer Operator
8.	Mrs H. Binodini Devi	B.Sc.	Technical Assistant
9.	Y. Shyamsunder Singh	B.Sc., LLB	Technical Assistant

Ministerial Staff:

10.	K. Nara Singh	B.A.	Sr. Accountant cum Head clerk
11.	R.K. Bhanisana Devi	B.Sc.	Accountant
12.	H. Thangthianmang	B.A	L.D.C.
13.	A. Tombi Devi	B.A.	Stenographer
14.	L. Ronel Singh	M.Com.	Accounts Assistant
15.	L. Boyai Singh	VIII Passed	Driver
16.	L. Open Singh	X Passed	Peon
17.	S. Deven Singh	X Passed	Peon
18.	Jamkhanmuan	VIII Passed	Peon (Dak Runner)
19.	Chingthanching	VIII Passed	Chowkidar
20.	Kh. Leidou Maring	VIII Passed	Sweeper

Project Staff :

21.	L. Surjit Singh	M.Sc. PGDCA	J.R.F. (PIC)
22.	L.Nilkumar Singh	B.Sc. (Fishery)	Fishery Officer
23.	S. Sanjay Singh	XII -Sc.	Attendant cum watchman
24.	H. Sanjay Singh	X	Attendant cum watchman
25.	T Siampu	VIII	Attendant cum watchman

2.0 Short-term Activities including Science Popularisation

The Manipur Science and Technology Council (MASTEC) organised various centrally sponsored programmes/ workshops / trainings relevant to the state including science popularisation to fulfil the objectives for establishment of the Council. The following were the short term programmes implemented by the Council .

2.1 Sci- Connect (Nurturing Young Talents of North East on Science) Stage – I

Sci- Connect is a science quiz programme initiated by Vigyan Prasar, DST, Govt. of India for the students of North eastern region and implemented by the State Councils of Science & Technology of the north eastern states.. The programme consists of three stages namely stage I, stage-II and stage – III.

A state level written science quiz competition (stage-I) of Sci- Connect was organised on April 9, 2017 at the Maharaja Bodhchandra College, Imphal. Altogether 314 students from different schools covering nine districts in Manipur registered for participation in the competition. However, 225 students (71.6%) appeared in the examination. Out of the 225 students who sit in the examination, on the basis of performance, 15 students were selected for participation in the stage – II examination of Sci-Connect of Vigyan Prasar. Dr. Sachin C Narwadiya, Scientist, Vigyan Prasar, DST Govt. of India monitored the examination held at Imphal.



A section of Students appearing the written quiz

2.2 Observation of World Intellectual Property Day 2017

World Intellectual Property Day was observed on 26th April 2017 at Imphal college under the theme “**Innovation – Improving Lives**” with the objectives of creating awareness about IPRs among the intellectuals, entrepreneurs, individuals etc. Prof. N. Rajmuhon Singh, Dean of Physical and Mathematical Sciences, Manipur University, delivered a lecture and interacted with the audience. About 100 participants including teachers, students of the college and interested individuals attended the programme.



World Intellectual Property Day 2017 observation

Opening of IPR Cell

The patent information centre (PIC) of the Council has made arrangement to establish two more IPR Cells – one at National Institute of Electronics & Information Technology (NIELIT), Imphal and another one at Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Imphal. However, it has been planned to start the functions of the two IPR cells in reality during 2018 -2019.

2.3 Continuing Programme of Celebration of National Mathematics Day 2016

The 4-day long continuing programme of Celebration of National Mathematics Day 2016 supported by NCSTC, DST, Govt. of India was organised during April 17-20, 2017 at Oriental College, Imphal. The programme was inaugurated by Shri Y. Joykumar Singh, Deputy Chief Minister, Manipur and Shri Th. Satyabrata Singh, Parliamentary Secretary (S&T), Manipur presided over the inaugural function of the mathematics day celebration.



Invitees, Students and Guide Teachers attending the Inaugural Function of Celebration of National Mathematics Day 2016

Activities

The activities of Celebration of National Mathematics Day included Competitions, Exhibitions, Popular Mathematics Show, Mathematics Lecture-cum-Demonstration etc. The competitions included Mathematics Model (Class VIII–XII), Mathematics Quiz (Class IX–X), Mathematics Competition for Class VI, Class VII and Class VIII. The Exhibitions included Mathematics Model, Hands on Experiment (Origami) etc. The Popular Mathematics Show covered Mathematics Puzzle, Maths Magic (Miracle), Maths Edutainment programme, Scientific Film shows etc.

Mathematics Model Competition & Exhibition

The competition was organised for students reading in Class VIII – XII. A single student or a team of two students from the same school were allowed to participate and display an Exhibit Model. Altogether seventy Mathematics Models were exhibited by 120 students from different schools of the State. The result of the Science Model Competition of Observation of National Mathematics Day 2016 was as given below:



Students displaying their Mathematics Models

Position	Name	Class	School	Title of Model
1 st	Dhananjoy Laishram	X	J.N.V., Khumbong	Area Finder
2 nd	Arish Aribam	IX	K.M. Blooming Hr. Sec. School, Khangabok	Archimedes Principle
	Sadananda Moirangthem	IX		

3 rd	Konjengbam Saturn Meetei	IX	Praja High School, Lamsang	Scale Pentagraph
	Moirangthem Bishorjit Meetei	IX		
Consolations				
1 st	Bibiloni Loitongbam	VIII	St. George High School, Imphal	To find the area of circle
	Kheroda Amom	VIII		
2 nd	Thongam Oasis Devi	IX	Halleey English School, Imphal	Height measurement using Clinometer
	Takhellambam Nishi	IX		
3 rd	Velory Koijam	X	Mega Manipur School, Yaralpat	Visualisation of Pascal's Triangle
4 th	Lamabam Elvis Singh	X	St. Dominic Savio High School, Imphal	Trigonometry Mathematics Model
	Atal Saikhom	X		
5 th	Khumanthem Sanamacha Meitei	X	K.M. Blooming Hr. Sec. School, Khangabok	Kit to demonstrate place value and face value of Indian System and International System
	Khullakpam Anish	X		

Mathematics Quiz Competition

The competition was organised in for Class IX-X. One hundred and eighty teams from 130 schools registered for the competition. Each team comprised two students from the same school. Three finalist Teams were selected for the final round through a preliminary round - Written Contest. The Mathematics Quiz Competition comprises of 10 rounds including Audio-Visual, Rapid Fire and Buzzer Rounds. The following were the winners of the final round of Mathematics Quiz competition.



Mathematics Quiz Competition

Position	Names of students	Class	School
1 st	Patel Lairenjam	X	Little Flower School, Imphal
	Suchitra Nepam	X	
2 nd	Rohen Sinam	X	Brighter Academy, Khumbong
	Munisana Thongbam	IX	
3 rd	Ronniey Wahengbam	X	Nirmalabas High School, Imphal
	Lelina Laishram	X	

Mathematics Competition

The Mathematics Competition was organized for students of three different classes viz., i) Class VI ii) Class VII and iii) Class VIII. Altogether 350 students from 290 schools, 290 students from 250 schools and 280 students from 220 schools participated in the Mathematics competition for Class V, Class VII and Class VIII respectively. The following were the winners of the competition.



Mathematics Competition in progress

Class VI

Position	Name of the Students	Name of the School
1 st	Kshetrimayum Hillyson	Laishram Mani Memorial English Academy
2 nd	Arnajit Ningthouja	New Public Hr. Sec. School, Khangabok
3 rd	Bikas Waikhom	Jawahar Navodaya Vidyalaya, Yarpalpat
4 th	Thoithoiba Khundrakpam	The K.M. Blooming Hr. Sec. School, Khangabok
5 th	Kh. Sakilur Rahaman	Jawahar Navodaya Vidyalaya, Yarpalpat
6 th	Robertson Wairokpam	Amutombi Divine Life English School, Wabagai
7 th	Khangembam Jayenta Singh	Jawahar Navodaya Vidyalaya, Yarpalpat
8 th	Bidyarani Thokchom	K.M. Blooming Hr. Sec. School, Khangabok
9 th	Naorem Kenison Singh	Jawahar Navodaya Vidyalaya, Khumbong
10 th	Justin Wahengbam	Sainik School, Imphal

Class VII

Position	Name of the Students	Name of the School
1 st	Jennifer Heisnam	Little Flower School, Imphal
2 nd	Enarick Chanambam	C.T. Higher Sec. School, Mayang Imphal
3 rd	Nandeibam Reshmi Devi	Pitambara English School, Kwakeithel, Imphal
4 th	Kalpana Ningombam	Pitambara English School, Kwakeithel, Imphal
5 th	Sagolsem Irungnganba	Jawahar Navodaya Vidyalaya, Yarpalpat
6 th	Hidam Lipun	St. George High School, Imphal
7 th	Paikhomba Wahengbam	Amutombi Divine Life English School, Wabagai
8 th	Thokchom Nungshithoi Devi	New Public Hr. Sec. School, Khangabok
9 th	Takhellambam Nirchita	Nirmalabas High School, Imphal
10 th	S. Chanchan Devi	Jawahar Navodaya Vidyalaya, Umathel, Thoubal

Class VIII

Position	Name of the Students	Name of the School
1 st	Usham Adhitya Luwang	Tiny Tots' Unique School, Imphal
2 nd	Wangkheimayum Ningthem Meetei	Tiny Tots' Unique School, Imphal
3 rd	R.K. Sutan Singh	Tiny Tots' Unique School, Imphal
4 th	Lairenjam Clinton	Paree Imom Sindam Sang, Langjing
5 th	Yumkhaibam Taibanganba Luwang	Emmanuel English Academy, Yaingangpokpi
6 th	Konjengbam Bikash Singh	New Model Public School, Moirang
7 th	Koijam Alish Meitei	Emmanuel English Academy, Yaingangpokpi
	Arjun Mairembam	New Model Public School, Moirang
8 th	Anjali Laipubam	Jawahar Navodaya Vidyalaya, Khumbong
	Tompok Khundrakpam	K.M. Blooming Hr. Sec. School, Khangabok
9 th	Babyna Thounaojam	Smart Universal Academy, Sekmai Khunou
10 th	Ricky Thoudam	UNACCO School, Imphal

Science Film Shows

During the 4-day Celebration of National Mathematics Day 2015, Science films were shown for one hour duration on all 4 days. These science films were the collections of MASTEC and Vigyan Prasar, New Delhi. A few scientific films screened during the Meet were A Brief History of Time, Time Travels, Animal Kingdom, Medicinal Plants of Manipur, X-ray, Waterworks, Oyster Mushroom, Earthquake Disaster & its Management, Rain Water Harvesting, Transit of Venus etc.

Mathematics Puzzle

Demonstration and explaining Mathematics Puzzles was one of the popular shows of the Celebration of National Mathematics Day 2016. Experts/Artists performed/demonstrated various Mathematics puzzle items which the students were not aware of and explained the reason behind every Mathematics puzzle. One of the most interesting part of the Mathematics Puzzle was that three popular Actors of Manipuri Cinema demonstrated some of the Mathematics Magic supported by joyful dialogues/comedies. The Resource Persons also demonstrated various techniques of Mathematics which can find Mathematical solutions in very easy and fast manner. Mathematics Puzzle was performed for 4 (four) days of 2(two) hours duration each.



Resource Persons showing mathematics puzzle

Mathematics Lecture-cum-Demonstration

Mathematics lecture-cum-demonstration was one of the important activities of Observation of National Mathematics Day 2016. Altogether there were 3 lecture-cum-demonstrations of 2 hours duration each during the Observation. The most interesting part of the programme was more demonstration and less lecture. The following speakers conducted lecture-cum-demonstrations on the topics given against their respective names.



Lecture-cum-demonstration session

Shri H. Jayenta Kumar Singh, Former. Head of Dept. of Mathematics, D.M. College of Science, Imphal delivered a lecture on the topic “ Applications of Mathematics in the Society. Dr. Y. Rohen Singh, Associate professor, Dept. of Mathematics, National Institute of Technology (NIT), Imphal delivered a lecture on Mathematics and Innovations. Dr. M. Premjit Singh, Associate Professor, Dept. of Mathematics, Manipur University, Imphal spoke on the topic “ Mathematics as a Career” and interacted with the audience.

Hands on Experiments

Demonstration of low cost hands on experiments on Mathematics was one of the activities of Celebration of National Mathematics Day 2016. Two Resource Persons, Shri K. Tolendro Singh, National Awardee and Shri N. Shyamkishore Singh, Science Teachers Forum, Manipur demonstrated about 80 items on Hands on Activities/origami and hundreds of students interacted with the Resource Persons during the 4-day programme.

Prize Distribution ceremony

The Celebration of National Mathematics Day 2016 concluded on April 20, 2017. Shri H. Gyan Prakash, IAS, Secretary (Science & Technology), Govt. of Manipur was the Chief Guest, Dr. Th. Biren Singh, Principal, Oriental College, Imphal was the President and Shri Th. Surendranath Singh, Director, Manipur Science & Technology Council, Imphal was the Guest of Honour of the Closing & Prize Distribution Function. Prizes comprising of Cash, Citation and book on Ramanujan’s Life were distributed to the prize winning students of various competitions held during the 4-Day programme of Celebration of National Mathematics Day.



Prize distribution ceremony

2.4 Science Meet 2017 catalysed & supported by NCSTC, DST, GoI

As a continuing programme of National Science Day held on Feb 28, 2017, Manipur Science & Technology Council in association with National Institute of Electronics & Information Technology (NIELIT), Imphal, Science Teachers’ Forum Manipur (STFM), Manipur Association for the Promotion of Science (MAPS), Manipur Science Communicators’ Association (MASCA) and Generation De New Image (GENIM) organised a 5-day long State Level Science Festival under the banner of **Science Meet**

2017 during May 11-15, 2017 at National Institute of Electronics & Information Technology, Imphal. The programme was organised as a continuing programme of Celebration of National Science Day 2017 and Observation of National Technology Day 2017. The theme for National Science Day 2017 was **“Science & Technology for specially abled persons”**

Shri Gyan Prakash, Secretary (S&T), Govt. of Manipur as the Chief Guest inaugurated the Science Meet 2017. During the inaugural function, the State Science Communicator Award for the year 2017 was given out to Dr. Ch. Indira Devi, Lecturer in Chemistry, Johnstone Higher Secondary School, Imphal, in recognition of her contributions in science popularisation and communications in the state.



Secretary(S&T), Govt. of Manipur giving Inaugural Address of Science Meet 2017

Activities of Science Meet 2017

The main activities of Science Meet 2017 were Competitions, Exhibitions, Popular Science Show, Folk Form of Communication, Scientific Lecture-cum-Demonstration etc.

The competitions included Science Short Play (Class VI-XII), Science Model (Class VIII–XII Science), Science Quiz (Class IX–XII Science), Spot Painting (Class III-V, Class VI-VIII & Class IX-XII Science), Declamation Contest (Class IX–XII Science), Best Appreciation Award (Open) and Best Guide Teacher Award for Science Model, etc. The Exhibitions included Science Model, Book, Information Technology, Poster Exhibition etc. .The Popular Science Show covered Science Films, Science Explaining Miracles. The Folk Form of Communication included Science Drama and Puppet Plays.

Science Short Play Competition

The competition was organised for the teams of students not more than 8 students per team from the same institution for the students reading in Class VI-XII Science. The Science Short Plays were played on some given Science themes such as Health and Hygiene, Environment Conservation, Life & Works of a Scientist etc. and the time duration for a Play was limited to 30 minutes. The first position holder team was selected for participation in the North East Zonal Level Science Drama Competition to be held sometime in October-November, 2017 at Regional Science Centre, Guwahati, Assam. Altogether 14 (fourteen) teams from 10 (ten) Schools participated in the competition. The result of the Science Short Play Competition of Science Meet 2017 was as given below :



Science short play competition

Position	Name of the Team	Name of the School	Title of Play
First	L. Sushma & party	Brighter Academy, Khumbong	Eina Ngamlakkhini (I will win)
Second	L. Ariyan & party	Praja High School, Lamsang	Sadalbagi Eshei (The hunter's song)
Third	Nelson Oinam & party	S.C.M. English School, Imphal	Makhoibusu Hinghansi (Let them live)

Science Model Competition & Exhibition

The competition was organised for students reading in Class VIII – XII. A single student or a team of two students from the same school were allowed to participate and



Students displaying Science Models during Science Meet 2017 & interacting with visitors

display an Exhibit Model. Altogether eighty models were exhibited by 140 students from different schools of the State. The result of the Science Model Competition was as given below :

Position	Name	Class	School	Model Title
1 st	Chabungbam Jeet Meetei Sanamacha Khumanthem	X	K.M. Blooming Hr. Sec. School, Khangabok	To demonstrate the characteristics of a sound
2 nd	Irengbam Shelena Chanu Lourembam Joshilia	VIII	Pitambara English School, Imphal	USB Fan
3 rd	Premi Thoudam Khaidem Omita Devi	VIII	M.S. Global Academy, Thoubal Haokha	Innovative Fish Catching Device
Consolations				
1.	Th. Morningson Maring Subhajit Okram	X	Ananda Purna School, Thoubal	Agarbati Stick Maker
2.	Kh. Nganthoi Chanu A. Babyrani Devi	VIII	Pitambara English School, Imphal	Home made Projector
3.	Kangjam Harry Singh Christina Oinam	X	Shantilata Memorial School, Imphal	Projector using bulb & torch
4.	Kshetrimayum Satyajoy Singh Yengkhom Rohit Singh	X	Grace Cottage Academy, Kakching	Fingerless Writer
5.	R.K. Devisana Waikhom Sunamita Chanu	VIII	Sacred Heart Hr. Sec. School, Porompat, Imphal	Aqua- vegetation System

The Best Guide Teacher Award for the Science Model Competition in recognition of the guide teachers in developing and designing the science model for the competition was awarded to Laishram Roski Singh Science Graduate Teacher, Pitambara English School, Kwaikethel, Imphal for guiding the model entitled “USB Fan and Home made Projector”

Science Quiz Competition

The competition was organised for students reading in Class IX-XII Science. Eight four teams comprising of two students from the same school from 68 schools were



Finalist team of Science Quiz Competition A section of Audience witnessing students quiz

enrolled for the competition. Three teams were selected for the final round through a preliminary written test. The following were the winners of the final round Science Quiz competition.

Position	Name of the Winners	Class	Name of the School
First	Laishram Imoba Meitei Yumnam Devajit Singh	XI XI	MECI Explorer Academy
Second	Kangabam Robin Singh Thangjam Angousana	XI XI	MECI Explorer Academy
Third	Lourembam Jackson Keisham Jackson	X X	S.C.M. English School, Imphal

Spot Painting Competition

The painting competition was organized on the 2nd day of the 5-day programme. The competition was organised in 3 (three) categories/groups viz., i) Sub-Junior Group (Class III—V), ii) Junior Group (Class VI-VIII) and iii) Senior Group (Class IX-X). Altogether 120 students from 90 schools, 150 students from 120 schools and 82 students from 75 schools participated in the competition of the Sub Junior, Junior and Senior Category respectively. The following were the winners of the competition.



Students participating Spot Painting Competition of Science Meet 2017

Sub-Junior Group (Class III – V)

Position	Name of the Winners	Class	Name of the School
First	Khusi Aheibam	IV	Kendriya Vidyalaya, Lamphel
Second	Nganthoi Mayengbam	V	Maria Montessori Sr. Sec. School, Koirengei
Third	Seliya Takhellambam	V	Nirmalabas High School, Imphal
Consolations			
1	Daulas Lambamayum	V	St. George High School, Wangkhei
2	Ningthoujam Niraj Singh	V	Heritage Convent, Naoremthong

Junior Group (Class VI – VIII)

Position	Name of the Winners	Class	Name of the School
First	Suraj Yumlembam	VII	Maria Montessori Sr. Sec. School, Koirengei
Second	Venish Keisham	VIII	Pitambara English School, Imphal
Third	Noorika Pebam	VIII	ShishuNisthaNiketan, Imphal
Consolations			
1	Ningthoujam Monish Singh	VIII	Heritage Convent, Naoremthong
2	Jessika Arambam	VIII	ShishuNisthaNiketan, Imphal

Senior Group (Class IX – XII)

Position	Name of the Winners	Class	Name of the School
First	Malemnganba Waikhom	X	ShishuNisthaNiketan, Imphal
Second	Telen Khaidem	IX	D.A.V. Public School, Sangakpham
Third	Ksh. Gopinath Singh	XII	Kanan Devi Memorial School, Pangei
Consolations			
1	Yesmin Chishti	XII	UNACCO School, Imphal
2	Aheibam Puja Devi	X	Kendriya Vidyalaya, Lamphel

Declamation Contest

The competition was organised for students reading in Class IX-XII Science. Fifty eight students from various institutions participated in the competition. Only 15 contestants were selected for the contest through a preliminary written test. The students gave an oral presentation for 7 minutes either in English or Manipuri with Slide/Power Point Presentation on any of the given three topics and then the judges asked questions related to the topic. The topics for the contest were (i) Science & Technology for specially abled persons (ii) Expanding the Horizons of Science (iii) Wealth from Waste. The winners of the competition were as given below:



A student giving presentation for the Declamation Contest

Position	Name	Class	School
1 st	Priyanka Thingujam	XII	UNACCO School, Imphal
2 nd	Letminlum Haokip	XII	Shishu Nistha Niketan, Kwakeithel, Imphal
3 rd	Vishal Nair	XII	Kendriya Vidyalaya, Loktak

Best Appreciation Award

Best Appreciation Award which is the most prestigious award of Science Meet 2017 was organised on the last day of Science Meet 2017. The award was given to an individual student who proves to have gained the maximum knowledge of science and

technology from Science Meet 2017 as judged by questionnaire response and personal interview. The Best Appreciation Award for SM-2017 was selected from 120 participants of various classes from different schools. The award was given to Khondram Ranjan Singh, Class X of Bishnupur Public School, Bishnupur



A student giving presentation for Best Appreciation Award

Book Exhibition

Scientific Book Exhibition was also one of the activities of the Science Meet. A good number of students, teachers and parents visited the book stalls and also bought many books of their interests. The local book stores namely, Sangam Book House, Paona Bazar, Imphal, Job Centre, Babupara, Imphal and Sharma Book Agency, Paona Bazar, Imphal displayed Scientific Books/Journals/publications in the book exhibition.

IT Show

IT show was also one of the Exhibition activities of the Science Meet. Four Computer institutions/firms including NIELIT participated in the IT show. Visitors, especially, students interacted with the Firms and also purchased various computer Related items on discounted prices. Hundreds of students enjoyed the display and internet facility and many people appreciated this activity. Four computer firms viz., i) NIELIT, Imphal ii) DEC Computers, Imphal iii) Mangal's Infotech Endeavor, Imphal and iv) Swift Infotech, Imphal participated in the IT shows of Science Meet 2017.

Scientific Film Shows

Science films were also shown for one hour duration on all 5 days of Science Meet. These scientific films were the collections of MASTEC and Vigyan Prashar, New Delhi. A few scientific films screened during the Meet were Orchids of Manipur, Medicinal Plants of Manipur, Time Travel, Hubble Amazing Universe, Rain Water Harvesting, A brief History of Time, Black Hole, Mushroom Cultivation, The Theory of Everything, etc.

Explaining Science Behind Miracles

Scientifically Explaining Miracle was one of the most popular scientific shows of the Science Meet. Miracles or magic are age-old human activities, which make people wonder or confuse and in mislead the general public. The expert members of GENIM demonstrated many items behind miracles during Science Meet and the scientific backgrounds of the shows were explained to the audience. During the 5-day programme, about 45 (forty five) items on Science Behind Miracles were performed by the experts in three days and hundreds of students & general public witnessed the show and many of them could learn how science is related with miracles.

Puppet Play

Puppetry has been a very effective folk form of communicating science to the people particularly to the students. During the 5-day Science Meet 2017 altogether 4 (four) puppet plays were shown by popular Theatre/Film Artiste of the State. The titles of the puppet plays were : 1) Science & Technology for specially abled persons 2) Clean Environment 3) Renewable Energy and 4) Recycling of Waste

Materials. Visitors could realize how puppetry can be used as a good medium for Science & Technology communication.

Science Drama

One Science Drama entitled “Dakku Machagi School (School of small Robber)” was played by a team of Drama and Film Artists of Manipur on the 2nd day of the 5-day Science Meet 2017.

Prize Distribution Function

The 5-day programme concluded on May 15, 2017 with a function with Shri H. Gyan Prakash, IAS, Special Secretary (S&T), Govt. of Manipur, Shri T. Prameshwor Singh, Director, NIELIT, Imphal and Shri Th. Surendranath Singh, Director, MASTEC, Imphal, as the Chief Guest, President and Guest of Honour respectively of the Closing cum prize distribution function. Cash prizes with citations and memento were distributed to the prize-winning students of various competitions.



Distribution of Prizes to Winners of various competitions

2.5 State Science Communicator Award 2017

The state Science Communicator Award for 2017 was given to Dr. Ch. Indira Devi, Lecturer, Johnstone Higher Secondary School, Imphal on 11th May, 2017, in recognition of her contributions in the field of science communication and popularization in the state.



Secretary (S&T), Govt. of Manipur giving State Science Communicator Award 2017

2.6 Contact Programme for Talented School Students (Girls) of Manipur

The six days long Contact Programme for Talented School Students of Manipur (Girls) catalysed and supported by NCSTC, Department of Science & Technology Govt. of India was organized during May 18-23, 2017 at the Training hall of Art & Culture Building, Palace Compound, Imphal. Professor H.Nandakumar Sarma, Former Vice Chancellor, Manipur University, Imphal was the Chief Guest of the inaugural function. Altogether 51 girl students including 13 guide teachers from different schools covering six districts in the state attended the residential programme.

In his inaugural address, Professor Sarma mentioned about some prominent specially abled persons like Stephen Hawkins whose scientific contributions are remembered forever in the scientific community. He further said that visiting laboratories of scientific institutions including universities followed by



Prof. Sarma giving Inaugural address

interaction with the scientists working in the labs. will not only motivate students but also attract them towards sciences as future career. He expressed his desire to increase the frequencies of organising such programmes for talented students so that more number of school students would be benefitted.

Shri Th. Surendranath Singh, Director, MASTEC while giving welcome and programme introduction highlighted about the role of MASTEC in the area of popularization of science & technology in the state. He emphasised on the need for science motivation programmes for talented students. He further said that MASTEC will make its maximum efforts to organize such programme every year in the interest of the students of the state. .



Director, MASTEC giving welcome address

On the first day i.e. 18th May 2017, after the Inaugural function was over,



Students being received by NIELIT faculty at their entry gate

Prof. N. Debananda Singh of Biotechnology Department, Manipur University, Imphal delivered an inspiring talk on “Career Prospects of basic sciences especially in Biotechnology and interacted with the students”. He mentioned about the advancements in research on biotechnology and related issues in research institutions.

As post lunch programme, the participants visited the computer center of National Institute of Electronics and Information Technology and learnt some aspects of Information technology such as



Practical class on creation of E-mail ID at NIELIT computer lab. in progress



Students interacting with IBSD scientists working in the labs.

communication through e-mail, cyber crimes do's and don'ts, internet browsing etc.. All the students created E-mail IDs of their own and communicated among themselves to cross check if their e-mail IDs so created were in proper position. Earlier, Shri Baboo Singh, Scientist D, delivered a lecture on the topic “Cyber crimes” and interacted with the students. The technical staff of the institute comprising of Mrs. B. Binola Devi (Guest faculty support staff), Sangita N, Guest faculty support staff, N. Dinamani, Guest faculty, Mrs N. Tabasana, Technical Officer, Lanthoi Maisnam, JTA,

Mrs. Gangmei Gailunglu Kabuini, STA and Swavana Y assisted Mr. Buboo Singh in conducting computer practical with the students.

On 19th May 2017, as pre- lunch programme, the participants visited the Institute of Bioresources & Sustainable Development (IBSD), DBT, Govt. of India, Takyelpat, Imphal West. Dr. Bisheswori Devi, Scientist, IBSD delivered a short lecture in brief on Bioresources with reference to Manipur and also highlighted about the research activities carried out in different divisions of the institute. Then, dividing the participants into three groups, they were taken to the laboratories such as Microbial bioresources, Plant bioresources (medicinal & aromatic), Natural product chemistry, Bioinformatics, Animal bioresources (insect & aquatic). The students also interacted with the scientists working in the labs.

The students visited Manipur Institute of Technology (MIT) where Dr. Th. Somchand Singh, Head of Civil Engineering department, MIT delivered a lecture on the



Chemistry teacher delivering lecture on chemistry in our lives



A section of students attending lecture on chemistry at Manipur University

topic “ Engineering sciences and role of engineers in the society”. Dr. Lakhipyari of Civil Engineering department and Er. Selina Devi of Computer Sciences Department took part in the interaction with the students. In addition, they took the students to the labs.



A student interacting with faculties of MIT by asking questions on engineering

such as Electronics & communication, computer language lab, computer science, Physics, Chemistry, Civil engineering workshop of MIT. In the evening, Shri Ganga Ningombam, Secretary, Yoga Research and Training Centre (YRTC), Imphal delivered a lecture on Yoga for health. Miss. Kh. Thoithoi Devi, a member of YRTC demonstrated some Yoga Ashanas specially for ladies. Later, the same evening, the students and guide

teachers joined the practice of Yoga under the guidance of the Yoga teacher. On 20th May 2017, the students visited the Chemistry department of Manipur University. Prof. R.K.Bhubon Singh, of the chemistry department delivered a lecture on the topic “ Chemistry in our life” and interacted with the students. He conducted some chemistry experiments in the form of science behind



Expert explaining about earthquakes

miracles and explained how it were done. Later, he interacted with the students by giving answers to the questions put by the students.

After visiting the chemistry lab, the participants visited the seismic observatory of the Earth Sciences Department, Manipur University. Earlier, Dr. Manichandra S. Seismologist explained about earthquakes using power point presentation and how the waves were measured in the observatory unit. He showed the world's plate tectonic boundaries and explained about plate movements which lead to the causes of earthquakes.

Dr. Sh. Dorendro Singh, Professor of Physics Department, Manipur University delivered a lecture on “ Physics in the society”. He mentioned why physics occupied an important position among the basic sciences in the development of a nation. He said that physics is the backbone for development of a nation and interacted with the students. Then, Dr. Manoranjan Singh of the Department took the students, in two groups, to the laboratories including Electron microscope lab., XRD lab. of the department and explained about the uses of the devices available in the department for research purpose. In the evening, yoga was practiced by the students under the guidance of the Yoga teacher.

In the morning of 21st May, 2017, Dr. R.K. Dilip Singh, Associate Professor, Horticultural Department, CAU conducted a hands on practical along with the student participants on i) Rose budding & ii) Mango grafting. After the hands on project work, Dr. O. Joychandra Singh of Jawaharlal Nehru Institute of Medical Sciences delivered a lecture on Medical Sciences in the 21st century and interacted with the students. In addition, Dr Joychandra Singh highlighted to the students the ways how to go for medical courses after XII standard.

An interaction meeting with the parents on the theme “ let us understand together” was held on 21st May 2017 during which the mentors Prof. N. Rajmuhon Singh and Professor Sh. Dorendrajit Singh of Physics Department, Manipur University explained to the parents about the ongoing programme and expected knowledge benefits for the students from attending the programme. They further explained elaborately on various study opportunities in basis sciences in the country which their wards can pursue after XII standard. As part of career counseling, they created awareness to the parents about a number of fellowship schemes such as KVPY, INSPIRE, ISHAN UDAI etc. with which children can pursue higher studies in basis sciences in reputed institutions/ Universities including IISc., IISER, NISER, TIFR etc. The mentors replied to a number questions raised by the parents/guardian of the children who took part in the meeting.

On 22nd May, 2017, the students visited the Tissue Culture lab., Soil Sciences lab., Plant pathology, Mushroom cultivation unit, agri-engineering division, horticultural farm of Central Agricultural University (CAU), Imphal and interacted with the scientists working there. Earlier, before visiting laboratories of the University, Dr. Daya Ram, Asst Professor delivered a lecture in brief on Agricultural sciences and answered to the questions raised by the students. Dr. Daya Ram took the students



Scientists interacting with students'



Demonstration of rose budding in the horticultural farm at Agricultural University

team to different labs of the Agricultural university.

As post lunch programme, the participants visited the laboratory of Pharmacology Division of Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Imphal. Earlier, Dr. Joychandra Singh highlighted about the activities carried out at his department. He further explained about a project on the development of medicine using medicinal plant available in the state for control of diabetes. It was an experiment of a Post graduate student based on which the thesis was to be written. It was interesting that the mouse was made diabetic and then, the treatment was done using the medicine from plant leaves to control the sugar level of the mouse. The doctors working in the department answered to questions asked by the students.

On 23rd May, 2017, there arranged a science elocution during which students representing a school made presentations on a science topic which was already given to them well in advance. Some students made presentation using power point system and some students used charts for making presentation. Considering the names of topics selected by the students, three experts from the disciplines such as Medical Science, chemical sciences and physical sciences were invited to attend the session and evaluated the performances. The following students made presentations on the topics given against their names.

Name of Students	Name of School	Topics of elocution
Shimreiphy Raingam Leishipem Zimik Varechon Shimray	Asui Memorial School, Wunghon,Ukhrul Road, Yaingangpokpi	Human Digestive System
Lamkhanthem Haokip Lhinghoithem Sitlhou K.T.Blessy Hovala	JNV – Kangpokpi, Manipur	Diabetes
L. Baby Chanu Moirangthem Celina Jellu Gangmei	St. George High School Wangkhei, Imphal	Electricity in Society
Thokchom Daina Devi Rojina Aribam Langlen Ningthoujam	New Public Hr.Sec.School, Khangabok	A Modern Scientist
Suchitra Soibam Lavnya Nongthonbam Oinam Tikeshwori	JNV-Bishnupur	Global warming
R.K. Nomika Devi Bandana Kh. & Saileshya M	Don Bosco Langjing Imphal West	Earthquake
Shrishti Mukhiya Luxmi Sapam Kh. Roshni Devi	Wangkhei High School Wangkhei	Vitamins & Impact of Vitamin deficiency in Human being
Jenifer Moirangthem Celina Kumam Christina Hemam	ST. Xavier's School Moirang	Human Respiratory System
Th. Jayaluxmi Devi Ch. Sarita & Ch. Roshini	Praja High School, Lamsang	Global warming
Esther Lhouvum Veimoikim Kipgen Ramreichon Hungyo	Apex Christian High School, Motbung	One lady scientist (Janaki Ammal)
S.Ghanapriya Devi M.K.Anisha Rose L.Jelina Devi	Paree Imom Sindam Sang, Langjing	Global warming

Matsushita Oinam Naorem Marshida Devi Laishram Yashmine Devi	JNV- Khumbong	Global warming
Nikita Laishram Ningthoujam Meenakshi Rajkumari Gaiyatri Devi	Kendriya Vidyalaya No.1 Lamphelpat	India's Space Science Programme



Science elocution session during which students make presentation before the jury members. Juries will ask questions and students answer



Scientists of different subjects at the Dais for face to face interaction with students

A girl asking question to the experts

Three criteria such as Presentation, Materials/data used and Question/Answer were adopted for identifying marking pattern of the science elocution. A face to face with distinguished scientists was arranged during which students were given opportunity to ask questions and experts answered. Altogether five number of scientists of different disciplines namely i) Chemistry, ii) Physics, iii) Mathematics iv) Botany, and v) Zoology were invited as the experts for the session for interaction with the students. The 6 day residential programme concluded on 23rd May 2017 with a function with Shri Th. Surendranath Singh, Director, MASTEC in the Chair. All the invited scientists who attended the face to



Director, MASTEC distributing certificates to the students and guide

face session also took part in the function. The participation certificates were distributed to the student participants and guide teachers by the dignitaries at the Dais during the closing function. Thus ended the six day long programme successfully with a concluding remarks from the Director, MASTEC.

2.7 Contact Programme for Talented School Students (boys) of Manipur

The six days long second Contact Programme for Talented School Students (boys) of Manipur catalysed and supported by NCSTC, Department of Science & Technology Govt. of India was organized during **June 2-7, 2017** at the Training hall of Art & Culture Building, Palace Compound, Imphal. Shri M.H. Khan, Principal Secretary (S&T), Govt. of Manipur inaugurated the programme as the Chief Guest. Dr. N. Rajmuhon Singh, Dean of Mathematical and Physical Sciences, Manipur University attended the inaugural function as the Guest of Honour and Shri Th. Surendranath Singh, Director, MASTEC presided over the function. Altogether 49 boys including 12 guide teachers from 12 schools attended the programme.



Inaugural Function of the Contact programme for talented school students

While giving inaugural address, M.H.Khan mentioned that advancement of science & technology is the key to the development of a nation. He stated that the students will get direct exposure by way of visiting various laboratories where scientists are working and they could learn science subjects by interaction with scientists during the 6 days programme.

Earlier, Prof. Rajmuhon while giving speech of the Guest of Honour mentioned that the country has created a lot of opportunities for study in basic sciences by way of introducing a number of scholarship / fellowship schemes (KVPY, INSPIRE, Ishan Uday etc.) with which a student can pursue higher studies in basic sciences without depending to their parents for money. He further mentioned about the contributions made by some distinguished scientists who grew up from the soil of Manipur, who were working in different research laboratories of repute in the country.



Dr. Rajmuhon delivering a lecture on Inspiring the Youth through text books

In his presidential remarks, Th. Surendranath Singh mentioned about some of the programmes on popularization and communication of science being implemented by the Council as annual feature. He highlighted that visits to the laboratories of scientific and academic institutions, popular science talk, science elocution, hands on practical, some chemistry experiments, face to face with distinguished scientists etc. would be the major activities of the six day programme.

On the first day of the programme, Prof. N. Rajmuhon Singh delivered a lecture on the topic “ Inspiring Youths through text books” and interacted with the students. In



Participants being welcomed by the faculty of NIELIT at the entry gate of



Practical on Email ID creation and use of Internet in progress

the afternoon, the participants visited the laboratory of National Institute of Electronics and Information Technology (formerly, DOEACC center) and learnt some aspects of Information technology such as communication through e-mail, internet browsing etc.. All the students created E-mail IDs of their own and communicated among themselves to cross check if their e-mail IDs so created were correct. Earlier, Shri Baboo Singh, Scientist, NIELIT delivered a lecture on the topic “Cyber crimes” and interacted with the students. The technical staff of the institute comprising of Mrs. B. Binola Devi (Guest faculty support staff), Sangita N, Guest faculty support staff, N. Dinamani, Guest faculty, Mrs N. Tabasana, Technical Officer, Lanthoi Maisnam, JTA, Mrs. Gangmei Gailunglu Kabuini, STA and Swavana Y assisted Mr. Buboo Singh in conducting computer practical with the students

On the second day, the participants visited the R&D laboratory of NEIST, CSIR, Govt. of India Lamphelpat, Imphal. The participants under the guidance of the faculty of the institute, performed an experiment on Extraction of Oil from Aromatic plants at the laboratory of NEIST. Earlier, Dr. H. Birkumar Singh, Principal Scientist, NEIST explained about the research activities carried out at NEIST. In addition, he delivered elaborately on his finding on the local state flower – Kombirei. As part of counseling, he mentioned about the job opportunities in CSIR or any scientific laboratories/ institution in



A section of the student participants in the lecture hall at NEIST, CSIR, Imphal



Experiment on extraction of oil from aromatic plants in progress at NEIST-

the country that the students can avail of if he or she opt any branch of basic sciences for further study upto Ph.D. or Post Doctorate degree.

The students visited the Manipur Institute of Technology, Imphal where faculty members led by Dr. Th. Somchand Singh made presentations on prospects of Engineering sciences in the society and interacted with the participants. The students visited the

Computer lab, electronics lab, computer language lab, electrical and civil engineering lab of the institute. Earlier, the faculties of the institute explained about all India Examinations through which students can join engineering colleges, NITs or IITs. While asking by one student about the subjects to be taken at XII standard for entry to engineering studies, Dr. Somchand told the students to take physics, chemistry and mathematics with strong background in mathematics.



Interaction session of the students with Engineering faculties at MIT, Imphal

On the third day (i.e June 4, Sunday), an invited talk was arranged. Dr. O. Joychandra Singh of Jawaharlal Nehru Institute of Medical Sciences, Imphal delivered a lecture on the topic “ Health & Hygiene” and interacted with the students. As part of counseling, he explained to the students about NEET and AIIMS entrance examination through which students can join medical colleges in India. After the medical session was over, a session on mathematics started. Shri H. Jayantakumar Singh, Former Head, Mathematics Department, DMC of Science, Imphal delivered a lecture on the topic “ Some applications of mathematics in daily life” and answered the questions put by the students. ”. He further interacted with the students how to study mathematics. He advised the students to think of seriously i) What to do ? ii) How to do ? iii) Why to do ? for solving problems of mathematics, He said that mathematics is the father of science and without it, science could not be studied at higher level. He explained in brief to the students about the difference between mathematics and natural sciences.

After the lunch break, a meeting was arranged for the parents of the students under the theme” let us understand together” during which the organizers highlighted to the parents about the benefits the students will get from attending the programme.

In addition, an invited resource person from Manipur University delivered in brief about the study opportunities with fellowships in various institutions in India. He mentioned that parents need not worry for their wards’ study expenditure as there are a



A mother of a student participant asking the expert about KVPY & INSPIRE



Parents meeting with the experts & organizers in progress

number of scholarship / fellowship schemes of Govt. of India. He appealed to the parents to support their wards if they are interested to pursue higher studies in basic sciences and become a scientist in his or her subject. A number of questions were raised by the parent members and answers were given by the expert members. Altogether 27 parents attended the interaction meeting.

In the evening of the same day, Dr. R.K. Dilip Singh, Associate Professor, Horticultural Department, CAU conducted a hands on practical along with the student

participants on i) Rose budding & ii) Mango grafting. The practical session continued from 7 p.m. to 9.30 p.m. as evening programme of the day.

On the 4th day, the students were taken to the Chemistry department of Manipur University. Dr. R.K.Bhubon Singh, Professor in chemistry delivered a lecture on the topic “Chemistry in our life” and interacted with the students. He conducted some chemistry experiments in the form of science behind miracles and explained how it were done. Later, he interacted with the students by giving answers to the questions put by the students. In the Seismic observatory of the Earth Sciences Department of Manipur University, Shri Someswor Roy of Seismic observatory explained to the participants how the earthquakes occurred and how seismic waves have been recorded at the seismological observatory. He further mentioned and interacted with the students about the movements of plate tectonics along plate margins and its relationships with the occurrence of earthquake. He mentioned some of the Dos & Don'ts to be followed before an earthquake, during and after an earthquake for awareness of the students. He showed the seismic waves which was recorded recently at the observatory. As post lunch session, the students were taken to the Physics department. Prof. N. Nimai Singh, Head of Department welcome them and then he delivered a lecture on Physics & its contributions in the society and interacted on physics with the students. He suggested the students to opt basic sciences after 10 + 2 standard. He highlighted about the career opportunities for further study at some of the national institutions of repute such as IISER, NISER through KVPY, INSPIRE scheme of DST, Govt. of India. He further advised the students to avail of the students' fellowship programmes of Govt. of



A Professor in chemistry delivering a lecture on Chemistry in our lives



A Professor in Physics delivering a lecture on physics in the society



Photo session of the resource person & participants on the bank of Loktak lake



A lecture session on Loktak lake- a Ramsar site of international importance

India with which students could proceed further study without financial constraints. Then, he took them to the practical labs and performed some experiments and also explained to

them about the facilities including Electron microscope available there with which students could carry out research in their area of interest in physics.

On the fifth day, the students had a visit to Manipur Science Center at Takyelpat, Imphal west and enjoyed with the science facilities available in the center. After that, they were taken to the Loktak lake- a Ramsar site of International importance. Dr. Kh. Samungou Singh, a zoologist cum environmentalist delivered on the topic “ Loktak & its importance for survival of the people living in its surroundings. He further shared his knowledge on the role of the Loktak lake in balancing the ecosystem of the region. He also explained about the endangered local fishes living in the lake and appealed to the students to do research on zoology or bBiology related issues and help protect the lake from biological degradations.



Jury members attending the Students' science elocution contest of the Contact



Students making presentation on science topics during science elocution contest

A science elocution was arranged on the last day i.e. 6th day of the programme. During the programme, a team of two or three students representing a school made presentation on a science topic for a duration of six minutes. Jury members evaluated their performances and also provided inputs for improvements. The following school students made presentations on the topics given against their names.

Sl. No.	Name of Students	Name of School	Topic
01	Michael Khundrakpam Mayengbam Bishwonath Laishram Ranjan Khuman	The Eastern Star Hr. Sec. School, Khangabok	Respiratory System
02	Wareppam Chandra Singh Mahesh Moirangthem Roneld Singh Moirangthem	Success School Imphal East	Renewable Energy
03	Thokchom Sagar Singh Vivekananda Wahengbam Sushil Sanasam	Bishnupur Public School	An Indian Scientist - bdul Kalam
04	K.Jackson Th. Mohenlal & H Prithiviraj	S. Choaba Memorial English School	Water Pollution
05	L. Salailamba Meitei K. Samananda Meitei Ch.Kangleingamba Khuman	Halleey English School Soibam Leikai	Digestive System
06	Moirangthem Devajit Singh Abujam Rabikumar Singh Thongam Anish Singh	Langjing High School	Water pollution

07	Oinam Gouradash Singh Oinam Rupachandra Singh Lourembam Priyanda Singh	Public School, Oinam	Water pollution
08	Ch. Ibosana Singh L. Bidyasagar Singh Narendrajit Wahengbam	Free Progress Academy, Konhoujam	Nuclear Energy
9	Manglemngamba Naorem Mohd.Imtiyas Tampakmayum Ronan Warepam	ST.George High School Wangkhei	Global warming
10	Aribam Bikashchandra Tongbram Naradaya Meitei David Angom	Wangkhei High School Imphal	Cloning
11	H.Harrydutta Sharma Lanjenthoba Leishangthem Pibarel Potshangbam	Keikshamthong H/S	Renewable Energy
12	Mairembam Renit Singh Moirangthem James Singh Ningthoujam Dildar Singh	St.Xavier'S School, Moirang	Respiratory System



Subject experts at the Dias for the face to face interaction with students



A student asking question during the face to face interaction session

Soon after the science elocution, a face to face session was arranged. All the student and guide teacher participants were invited to ask questions of their interest (any subject) to the resource persons and resource persons were prepared to answer. Resource persons included i) Dr. L. Hemchandra Singh (Zoology), D.M.College of Science, Imphal, ii) Dr. M. Premjit Singh (Mathematics), Manipur University, iii) Dr. O. Ibopishak Singh (Chemistry), Modern College, Imphal, iv) Dr. R.J. Shiek (Physsics),D.M.College of Science and v) Dr. H. Birkumar Singh (Botany), North East Institute of Science & Technology, CSIR, Imphal. Shri Th.

Surendranath Singh, Director, MASTEC moderated the session. A number of questions covering Physics, Chemistry, Botany, Zoology, Mathematics and Medical science were asked by the students and the experts answered and also interacted with the participants.



Certificate distribution on the closing function of the contact programme

After the face to face programme, a feed back session was arranged. The participants submitted the feed back sheets duly filled in and it was analysed and then the programme organizers interacted with the participants.

The closing function of the six day long Contact programme for Talented Students was arranged with Director, MASTEC in the chair. All the subject experts who were present during the face to face also attended the function as the guests of honr. The participation certificates were also distributed during the function. The Principal Co-ordinator of the programme read out the summary report of the activities performed during the course of the programme. The programme concluded on June 7, 2017 at 5 p.m. with a concluding remarks from Director, MASTEC.

2.8 North East Students' Summer Training on Basic Sciences

Three students namely T. Chinglemba of COMET School, Imphal, L. Sunny Meetei of H.R.D. Academy, Imphal and Ak Pokba Honorius of Millenium Institute of Sciences, Imphal were nominated to participate in the 11th North East Students' Summer Training on Basic Sciences (NESST-BASE) organized during May 22 – June 03, 2017 at Bose Institute, Darjeeling Campus. Shri Th. Bijen Singh, Lecturer in Chemistry, COMETSchool, Imphal escorted the students to Darjeeling as a guide teacher.

2.9 Sci- Connect Stage –II (Workshop on Hands on Activity & Science Quiz)

The Workshop on Hands on Activity & Science Quiz under Stage – II Sci-Connect programme was organised during August 21-23, 2017 at the MP Hall of Jawahar Nabodaya Vidyalaya (JNV), Imphal West. Shri Th. Surendranath Singh, Director, MASTEC, Imphal, Dr. Sachin C Narwadiya, Scientist Vigyan Prasara and Shri Mintu Chakraborty, Principal, JNV, Imphal West attended the inaugural function. Shri Th. Surendranath Singh, Director, MASTEC while welcoming the participants, resource persons, dignitaries at the Dais, media and invitees, highlighted in brief about the activities of the Council. Dr. Sachin C Narwadiya, Scientist, Vigyan Prasara highlighted about the stages (stage I, II & III) of the Sci- Connect programme. He mentioned that the objective of the programme was to nurture the young talents of the North East.

Shri Mintu Chakraborty, Principal, JNV, Imphal West while giving his speech thanked Vgyan Prasara and MASTEC for organizing such an important but innovative students programme. He appealed to both the organizers to organize more and more number of science popularization programmes in the state so that more number of students will be benefitted. Five scientists from Vigyan Prasara namely, Sandipan Dhar, Sachin Narwadiya, Narender Singh and Navneet Gupta imparted in depth training to



Inaugural Function of Workshop on Hands on Activity & Science Quiz



Mock Science Quiz in progress

the participants by way of giving lecture cum demonstrations. Altogether, 28 participants (15 students selected from stage – I and 13 teachers from the schools where the students were reading) attended the three day programme.

On the first day (Technical Session-I), Shri Narender Gupta conducted Hands on activity in chemistry and interacted with the participants. After the hands on activity by Narender Singh, a film show – Wise Spice was screened. Dr. Sachin explained to the participants about the Quiz - dos and don'ts. He further conducted Mock Quiz with the Anchor cum Quiz Master Miss Jeshmin Khongbaltabam. The students were grouped as Team A, Team B, Team C, Team D and Team E. The team A consists of L. Yashmin Devi, JNV, Khumbong, S. Ronaldo Singh, JNV Khumbong and Jumjumba Konthoujam of Free Progress Academy. The team B consists of Suchitra Soibam, Varsali kiyam and M. Paikhomba of JNV, Bishnupur. N. Meenakshi of K.V. Lamphel, Dhananjoy Laishram and Motilal Yanglem of JNV Khumbong formed the team C. The team D comprised of Amarjit Laishram, JNV Thoubal, Hatneineng Khongsai of JNV Kangpokpi and Morungman K of St. George High School. The team E consisted of Laishram Babina, Naorem Marshida and Joyrani Wahengbam of JNV, Imphal West.



Navneet Gupta of Vigyan Prasar delivering lecture on resources of Vigyan Prasar & Web portal



Sandipan Dhar made demonstration on Earthquake using Kit & role game

Shri Navneet Gupta, Project Officer –Edu Sat - VP delivered a lecture on the topic “Resources of Vigyan Prasar and web portal of Vigyan Prasar. Shri Sandipan Dhar made demonstration on Earthquake Kit with role game. As final activity of the first day, a film show – question of science was screened.

In the Technical Session of the second day, final quiz preparation was arranged. Miss Jeshmin Kh. conducted the quiz as the quiz master. Shri Navneet Gupta of Vigyan Prasar and L. Surjit Singh of MASTEC were the time keepers. Five number of quiz rounds were held. On the basis of total marks obtained, the Team B was declared the winner of the quiz. Team C and Team D were in the second and third places respectively. The shooting of the Quiz Show was done by the camera team led by Shri Ajai Chawla from New Delhi.



Science Quiz final in progress

Shri Th. Surendranath Singh, Director, MASTEC, with an objective of motivating the students, delivered an invited lecture on the topic “Nobel Prize distribution”. As post lunch session, Shri Sandipan Dhar delivered a lecture on Biodiversity and demonstrated with role plays with the involvement of students. A film titled “Math Factor” was screened as last item of the second day programme.

In the Technical Session III on the third day, Shri Sandipan Dhar conducted a lecture cum demonstration on Astronomy and role plays and interacted with students. After the lecture, a film show was arranged.

The valedictory function was organised with the presence of Shri Th. Surendranath Singh, Director, MASTEC, Dr. Sachin Narwadiya, Scientist, Vigyan Prasar and Shri Mintu Chakraborty, Principal, JNV, Imphal West. All the participating students and teachers were given participation certificates during the function. In addition, the prizes for the three winners of the science quiz were distributed during the valedictory function.

Th. Surendranath Singh while addressing his speech mentioned that all the students of the stage II programme were equally good and talented. He further said that he



Sachin Narwadiya distributing



Address by Director, MASTEC at the valedictory function

was quite impressed by the performance of the students in the Quiz session. Dr. Sachin announced that the stage III programme would be held at Guwahati shortly. He further informed that the first winner i.e. Team B of the quiz will be invited to the stage III at Guwahati.

Shri Mintu Chakraborty thanked all the participants, Scientists /officials of Vigyan Prasar, Officers and officials of MASTEC, Camera team members, Media personnel and all those who were involved directly or indirectly in the organization of the three day workshop on Hands on Activity and Science Quiz. Thus, ended the programme on August 23, 2017 successfully.

2.10 Vigyan Prasar Edusat Network

The 3 month distance learning ISRO outreach programme on Remote Sensing, GIS and GNSS under the Indian Institute of Remote Sensing (IIRS), Dept. of Space, Dharwad were conducted during August 21 to December 1, 2017. Altogether 55 students from different colleges were attended the programme.

2.11 Sci- Connect Stage III

The final round of Science Connect (Stage – III) of Vigyan Prasar, DST, Noida, U.P. was held at Guwahati during November 15-16, 2017 for the students of north eastern states. The team from Manipur (three students and two escort teachers) led by Dr. L. Minaketan Singh, MASTEC (State Programme Co-ordinator) took part in the Science Connect Programme at Guwahati.

2.12 Technology based Entrepreneurship Development Programme

Food processing industries play an important role in the conversion and effective utilisation of agri-horticultural produces. So, processing of agri-horticultural commodities into various products can generate lot of employment opportunities in the urban as well as to rural population. Utilisation of available vast resources for processing through value addition can help the common man and to boost the economy at the rural level. Among the

food processing, fruits and vegetables processing dominate the sector. The state has vast resources of minor fruits and vegetables for vegetables for processing. A large number of educated unemployed youths of different districts of the state are willing to take up fruits and vegetables industries. Hence, the Technology based Entrepreneurship programmes (TEDP) on food processing was taken up.

Two six weeks technology based entrepreneurship programmes (TEDP) were organised in two districts of Manipur i.e. Thoubal and Bishnupur. TEDP for Thoubal district was organised during September 29 – November 11, 2017 at Integrated Rural Development Service Organisation, Wangjing. Twenty two entrepreneurs including five male and seventeen female from the district attended the 6 weeks TEDP programme on food processing. Again the TEDP for Bishnupur district was organised during February 15 – March 29, 2018 at Loktak Modern Fish Market, Moirang. Eight male and twenty two female entrepreneurs from the district attended the programme on food processing. The two programmes were supported by Entrepreneurship Development Institute of India (EDII), Ahmedabad under DST-NIMAT project.

Altogether 17 resource persons from various disciplines gave both theory and practical classes during the two 6 weeks TEDP programmes. The trainees were imparted practical training for preparation of 30 food products and these products were displayed during the valedictory function held on the last day. Best trainee awards were given to two entrepreneurs in recognition of their skill and interest during the TEDP. Nongmaithem Babina Devi of Thoubal Ningombam Mamang Leikai was the winner of Thoubal district and Smt. Kumam Jibanlata Devi of Moirangthem Leikai, Moirang was the winner for Bishnupur district.



Processed Food items made by trainees during the workshop valedictory

.2.13 India International Science Festival (IISF)

The 3rd India International Science Festival (IISF) was organised by Ministry of Science & Technology, GoI & Ministry of Earth Sciences, GoI jointly with VIBHA during October 13-16, 2017 at Anna University, Guindy, Chennai, Tamilnadu State.



MASTEC Officers interacting with the visitors



Visitors to MASTEC's Stall

Two officers of the Council (MASTEC) namely Dr. L. Minaketan Singh, Scientific Officer and Dr. R.K.Pritamjit Singh, Scientific Officer participated in the India

International Science & Technology Mega Expo occupying Stall No. 16 of Expo hall No.1 . The activities of the Council was displayed in its stall in the form of information bulletin, flex etc. The publications of the Council including its annual reports, books and Patent guidelines etc were also displayed in the stall. During the four days festival, the officers interacted with a number of visitors comprising of students, researchers, teachers, scientists including Govt. of India officials who paid visit to the stall.

2.14 Millennium Science Lecture

The Millennium Science Lecture was organized at Jawahar Navodaya Vidyalaya, Imphal West on December 10, 2017 in honour of the Nobel Laureates in the subjects Chemistry, Physiology and Physics of the year 2017. Dr. T. Meinya Singh, Hon'ble M.P. Lok Sabha. inaugurated the function as the Chief Guest.

Prof. S. Dorendrajit Singh of Physics Department, Manipur University, Shri Ch. Rajendro Singh, Head of Physics Department, Imphal College and Dr. O.. Joychandra Singh of Jawaharlal Nehru Institute of Medical Sciences delivered lectures on the Nobel Prize in Chemistry, Physics and Physiology/Medicine respectively. . About 300 delegates including students and teachers of the School attended the programme.

2.15 Observation of One day National Mathematics Day 2017 (December 22)

The National Mathematics day was observed on December 22, 2017 at St. Thomas High School, Kontha Ahallup, Imphal East. District. Shri H. Jayentakumar Singh, Former Head, Mathematics Department, DMC of Science, Imphal delivered lecture on the Role of Mathematics in Society and interacted with the students. Three hundred students including faculty of the school attended the programme

2.16 Observation of one day National Science Day 2018

The National Science Day 2018 was observed on February 28, 2018 at the Training Hall of Manipur Science & Technology Council, Science & Technology Complex, Takyelpat, Imphal. The programme was catalysed and supported by National Council for Science & Technology Communication (NCSTC), Department of Science & Technology, Government of India, New Delhi. The theme for National Science Day 2018 was

“Science & Technology for a sustainable future”. About 500 participants consisting of students and

teachers from various schools and colleges in Manipur attended the programme.

A lecture on the focal theme **“Science & Technology for a sustainable future”** was delivered by Prof. Sh. Dorendrajit Singh, Dept. of Physics, Manipur University, Canchipur, Imphal and interacted with the students.



Resource Person delivering lecture in the Celebration of National Science Day 2018

2.17 Training workshop on Hands on Science

Vigyan Prasara, Govt. of India. Noida, U.P. and Manipur Science and Technology Council, Imphal organised the four days Training workshop on Hands on Science during March 21 – 24, 2018 at Youth Hostel, Khuman Lampak, Imphal. Shri Y. Joykumar Singh, Hon'ble Deputy Chief Minister (S&T), Manipur as the Chief Guest inaugurated the workshop and Ms. Nidhi Kesarwani, Secretary (S&T), Govt. of Manipur presided over the inaugural function. The main objective of organising the training workshop was to impart

training to science teachers teaching in schools located in tribal inhabited hill districts of Manipur in carrying out various scientific experiments using readily available low cost or no cost equipments so that they may in turn conduct the same activities at their schools to benefit the students.

In his inaugural address, the Chief Guest mentioned that thinking, imagination and observation are the basic steps through which one can understand the basic principles of science. He further said that Mathematics being the backbone of science, it will be difficult to learn science without the strong base of mathematics. The minister appealed to the teachers to motivate the students and make them think what science is all about. Students in the valley are good in science and mathematics but most of the students in the hills are poor in these subjects. Such training will help teachers to focus on imparting knowledge of science in the easiest way to the students, he added.

Professor B. N. Das, Physicist, while giving his key note address mentioned the importance of concept of science in human lives. He said that as most of the process in our life is associated with scientific ideas, imparting scientific knowledge and sharing scientific ideas with the younger generation are important. Scientific ideas will come first and after that technology will automatically come for its application he added..

Ms. Nidhi Kesarwani, Secretary 9S&T) while giving presidential remarks emphasized on



Dr. B. N. Das demonstrating experiments



Hands on activities by participants in progress

the role of teachers to impart knowledge of science to the students in the schools. She said that motivation is the basic step towards teaching and teachers should also understand the curiosity of their students. Altogether, 55 teachers from hill districts attended the training.

During the four days course, Dr. B.N. Das key resource person from Kolkata along with 5 local resource persons namely L. Somarjit Singh, N. Shyamkiswor Singh, K. Tolendro Singh, Ch. Rajendra Singh and Dr. Ch. Indira Devi demonstrated a no. of experiments. About 80 experiments had been demonstrated to the science teachers and the teachers also performed experiments by themselves. Altogether, 42 science teachers from the hill districts of Manipur nominated by the Directorate of Education (S) participated in the training workshop. On successful completion, kits for demonstration of experiments, Vigyan Prasar kit on Emergence of Modern Physics and CDs on Magical year and Innovative Physics Experiments were distributed to the participants.

3. Projects :

3.1 Installation & Evaluation of Water Filtration units at Public Ponds in SC/ST areas in Imphal West District of Manipur sponsored by DST, Govt. of India

Introduction

Most of the people in the remote villages are not aware of the harmful effects of drinking untreated water. Due to unavailability of drinking water supply, the rural people

particularly Schedule Caste and Schedule Tribe are still using Public Ponds as source of drinking water. There are sufficient number of rainfed Public Ponds in these rural areas and the people are neither aware of the harmful effects of using unfiltered pond water nor they don't have much knowledge of the new development in water filtration technologies. Therefore, the project has been taken up to demonstrate one of the well known water filtration technologies (**BARC UF Technology**) to the rural SC/ST villages in Manipur.

BARC UF Technology :

. Bhabha Atomic Research Centre (BARC), Mumbai has developed the ultra filtration membrane technology for water purification and that can take care of biological and other contaminants like suspended solids, organics, residual chlorine, odour etc. Ultra filtration is a membrane filtration process in which hydrostatic pressure forces a liquid against a semi permeable membrane. It can physically remove bacteria, suspended solids and high molecular weight organics without use of electricity, at water pressure, mainly by sieving mechanism.

The Ultra Filtration technology developed by Bhabha Atomic Research Centre (BARC), Mumbai is made of polysulfone type ultra filtration membrane in cylindrical configuration. It has the following features :

- a) Very effective as it removes most of the bacteria.
- b) As the device filters out bacteria, no dead bacteria in the product water.
- c) Remove complete turbidity and produces crystal clear water.
- d) Does not need electricity or addition of any chemical.
- e) Provision to remove organics or colouring material if they are present in the raw water.
- f) Highly strong (both chemically and mechanically) membranes giving high life.
- g) Almost maintenance free except occasional cleaning of suspended solids which deposit on the membrane surface.

Objectives :

The project was taken up with the objectives of harvesting rain water in Public Ponds, and to install BARC Ultra Filtration Units for supply of drinking water and make the people aware of drinking filtered pond water.

The project activities included creation of awareness programme among the beneficiary villagers, Installation of BARC UF technology filtration system at 5 (five) sites, Training on operation and maintenance of the filtration system and evaluation as well as monitoring

Project Sites :

Under this project, altogether 5 (five) Water Filtration Units have been installed of which 3 (three) are at Schedule Tribe villages and 2 (two) are at Schedule Caste villages in the Imphal West District of Manipur. The details of the project sites are as given below :

1 Yurembam West Kabui Village (ST):

The village is a Schedule Tribe village located in the western side of Imphal City in Imphal District of Manipur along NH-37 and about 15 kms from Imphal head quarter. The village has 80 households with total population of about 500. The main occupation of the villagers is agriculture farming/poultry. The people in the village use water from a community pond of size about 250 ft x 100 ft x 8 ft both for drinking and other purposes. The turbidity of the pond water is high, more than 30 NTU.

2 Konthoujam East Kabui Village (ST) :

The village is a Schedule Tribe village located in Imphal West District of Manipur about 18 kms from Imphal city towards the south of NH-37. The village is having 110 households with about 850 population. The size of the community pond where the

system was implemented was about 200 ft. x 150 x 10 ft. This pond is rain fed during rainy season and does not dry throughout the year. The villagers use water from the pond for their daily uses and for drinking purpose also. Filtrated water produced from the system is sufficient for drinking of the local villagers.

3 Yurembam South Kabui Village (ST) :

The village is a scheduled tribe village located in the Imphal west district of Manipur about 16 kms from Imphal head quarter along NH-37. The total population of the village is 450 and having 72 households. The villagers use pond water for drinking and domestic purposes. The size of the community pond was about 400 ft x 250 ft x 10 ft. and it does not dry throughout the year. The water of the pond has high turbidity about 24 NTU. The filtration unit of 2000 lpd capacity installed using BARC-UF technology supply sufficient drinking water to the villagers.

4 Tairenpokpi Village (SC) :

The village is a Schedule Caste village having 120 households and population of about 700 people. The village is located in Imphal West District about 20 kms. from Imphal city. The main occupation of the villagers is farming and preparation of local liquor. There is no provision of tap water in the village and people use community ponds as source of water both for drinking and for other purposes also. The community pond where Water Filtration Unit have been installed is about 200 ft x 100 ft x 8 ft. which is rain fed through small streams coming from the foothills and does not dry throughout the year.. Turbidity of the pond water is quite high and there grows small weeds inside the pond.

5 Pheiyeng Khunjao Village (SC):

The village is a Schedule Caste village located in Imphal West District of Manipur, about 22 kms. from Imphal along Imphal-Kangchup Road. The village is having 122 households with about 900 population. The size of the community pond where the system was implemented is about 300ft. x 250ft x 10ft. This pond is rain fed during rainy season and does not dry throughout the year. At present there is no provision for tap water in the village and the villagers use water from the pond for their domestic uses as well as for drinking.

Achievements:

Installation of the Filtration Systems :

The filtration Unit consisted of RCC structure for support of the overhead tank, an RCC desilting tank and a platform for 2 sets of filters and for the drinking water tank. The filter is supplied and installed by M/s Sonadka, Pune, Maharastra which is one of BARC's Licensee for the BARC-UF filtration system. The whole filtration unit is fenced with angle iron posts and wire netting. Civil construction works such as construction of Desilting Tank, Structure for supporting overhead Raw water Tank and platform for installation of Filtration System, Platform for Filtered Water Tank, fencing of the units etc. and installation of the filtration system for the first 3 sites were completed in the year 2016-17. Civil construction works for the remaining 2 SC sites were completed in the 2nd year i.e. during 2017-18 and installation of the filtration systems at these 2 sites were also carried out simultaneously. The water of community



ponds in the remote SC/ST villages have been changed into drinking water using BARC-UF water filtration technology. They have been given training on operation and maintenance of the BARC-UF Water Filtration System.

Evaluation and Analysis of Water Samples :

After operational and full functional of the 5 Water Filtration Units, water sample analysis for the Raw pond water and filtered water of the units have been carried out. The analysis reports of the water sample of the 5 sites are as given below:

Site No. 1 : Yurembam West Kabui Village

<u>Sl. No.</u>	<u>Parameter</u>	<u>Pond Water</u>	<u>Filtrated Water</u>
1.	Colour	Slightly muddy	Crystal clear
2.	Taste	Tasteless	Tasteless
3.	Turbidity	30 NTU	2 NTU
4.	pH	8	7.5
5.	EC	162	140
6.	Total Hardness	140	80
7.	TDS	128	108
8.	Calcium	18.6	15
10.	Chloride	68	38
11.	Total alkalinity	166	101
12.	Free CO ₂	18	4
13.	Sodium	38	32
14.	Potassium	12.2	11
15.	Iron	0.02	0.01
16.	Total Coliform	Present	Absent

Site No. 2: Konthoujam East Kabui Village (2nd Site)

<u>Sl. No.</u>	<u>Parameter</u>	<u>Pond Water</u>	<u>Filtrated Water</u>
1.	Colour	Slightly muddy	Crystal clear
2.	Taste	Tasteless	Tasteless
3.	Turbidity	29 NTU	2 NTU
4.	pH	7.2	6.4
5.	EC	152	128
6.	Total Hardness	142	82
7.	TDS	141	121
8.	Calcium	23	17
9.	Magnesium	20.3	17.1
10.	Chloride	70	40
11.	Total alkalinity	176	114
12.	Free CO ₂	22	8
13.	Sodium	54	33
14.	Potassium	13.4	11.6
15.	Iron	0.03	0.02
16.	Total Coliform	Present	Absent

Site No. 3 : Yurembam South Kabui Village (3rd Site)

<u>Sl. No.</u>	<u>Parameter</u>	<u>Pond Water</u>	<u>Filtrated Water</u>
1.	Colour	Slightly muddy	Crystal clear
2.	Taste	Tasteless	Tasteless
3.	Turbidity	24 NTU	2 NTU
4.	pH	7.4	6.8
5.	EC	172	121
6.	Total Hardness	152	84
7.	TDS	141	122
8.	Calcium	25	19
9.	Magnesium	20.1	17.2
10.	Chloride	71	39
11.	Total alkalinity	175	113
12.	Free CO ₂	22	8
13.	Sodium	51	33
14.	Potassium	13.7	10.8
15.	Iron	0.03	0.02
16.	Total Coliform	Present	Absent

Site No. 4 : Tairenpokpi Village, Thoubal district (4th Site)

<u>Sl. No.</u>	<u>Parameter</u>	<u>Pond Water</u>	<u>Filtrated Water</u>
1.	Colour	Slightly muddy	Crystal clear
2.	Taste	Tasteless	Tasteless
3.	Turbidity	28 NTU	2 NTU
4.	pH	8	7.2
5.	EC	172	135
6.	Total Hardness	152	72
7.	TDS	135	112
8.	Calcium	25	23
9.	Magnesium	19.2	16
10.	Chloride	64	33
11.	Total alkalinity	171	105
12.	Free CO ₂	20	6
13.	Sodium	41	33
14.	Potassium	12.6	11.1
15.	Iron	0.03	0.01
16.	Total Coliform	Present	Absent

Site No. 5 : Pheiyeng Khunjao Village (5th Site)

<u>Sl. No.</u>	<u>Parameter</u>	<u>Pond Water</u>	<u>Filtrated Water</u>
1.	Colour	Slightly muddy	Crystal clear
2.	Taste	Tasteless	Tasteless
3.	Turbidity	29 NTU	2 NTU
4.	pH	7.3	6.7
5.	EC	169	119
6.	Total Hardness	162	86
7.	TDS	148	120
8.	Calcium	24	19
9.	Magnesium	21.3	17.5
10.	Chloride	69	37

11.	Total alkalinity	178	111
12.	Free CO ₂	23	8
13.	Sodium	53	36
14.	Potassium	13.2	11.2
15.	Iron	0.03	0.02
16.	Total Coliform	Present	Absent

Observations:

In the early stage of operation of the system, water from pond was pumped into the over head tank and it was released through the Ultrafiltration unit. After few hours of operation filtration rate decreases because the pond water contains invisible sticky colloidal particles which form a thin layer on the outer surface of the UF cartridge. Hence, the filters required cleaning every alternate days. This was one peculiar feature in the state of Manipur as the valley is composed of clayey soils. The water from the pond was first stored in the desilting tank for 2 days and made the colloidal particles settled beneath the desilting tank. After two days water from the tank is pumped into the over head tank and released through the UF unit and found that the problem of colloid was very minimal and flow rate was maintaining at 90-100 litres per hour. The cleaning of the filters needs once in 15 days. The cleaning process is very simple. The candles are washed with water or with a soft sponge/cotton cloth and it takes hardly 20 minutes. All the 5 filtration units are now functioning smoothly.

Salient Feature of the Filtration System :

Dimension of Cartridge	: 45 mm diameter, 250 mm length
Total no. of Cartridge	: 23
Material of Construction	: Polysulfone membrane
Flow rate of the System	: About 90-100 litre per hour
Size of Stainless Steel Container	: 300 mm x 350 mm
Design of the System	: about 2000 lpd

Proposed Post project Activities :

- i. Transfer of the technology in other parts of the state through concerned line Departments.
- ii. Domestication of the Filtration system with lower capacity for households in the rural areas & monitoring of the existing Filtration Units

3.2 DAE Technologies Display and Dissemination Facility (DTDDF) Centre sponsored by BARC, Mumbai

With the objective of development of rural population through innovation and technology, Manipur Science & Technology Council (MASTEC), Imphal has set up Dept. of Atomic Energy (DAE) Technology Demonstration & Dissemination Facility (DTDDF) Centre at MASTEC Complex, Takyelpat, Imphal under the support of Bhabha Atomic Research Centre (BARC) Mumbai. Some technologies available with DAE, Bhabha Atomic Research Centre, Mumbai will be demonstrated and made aware to people at the DTDDF Centre at MASTEC complex Takyelpat to solve various rural problems. The details of the technologies installed in the DTDDF Centre, Imphal are as given below:

S.No.	Name of the DAE Technology
1.	Tissue Culture Lab.
2.	Foldable Solar Dryer (FSD) (25 Kg capacity)
3.	Vibro Thermal Disinfector (VTD) (5 Kg/hr capacity)
4.	On-line Domestic Water Purifier based on ultra filtration polysulfone membrane (DWP) (60 ltrs/hr capacity)

5.	Fluoride Detection Kit for Ground Water (FDK)
6.	Soil Organic Carbon Detection Kit (SOCDK)

The DTDDF Centre, Imphal was inaugurated on March 15, 2018 by the Hon'ble Deputy Chief Minister/Minister (Science & Technology), Manipur in the presence of the Secretary (Science & Technology), Govt. of Manipur and 5 Scientists including Head Technology Transfer and Communication Division, Bhabha Atomic Research Centre



Deputy C.M. inaugurating the DTDDF centre at MASTEC complex, Takyelpat, Imphal



BARC scientists explaining about the technologies to the Dy. C.M., Manipur

3.3 Patent Information Centre (PIC)

The Patent Information Centre (PIC) of the Council worked to fulfill the following objectives

- To create awareness about IPRs, especially patents, in the state and also facilitate universities, industries, government departments and R&D institutions for patent filling and searches
- To create Intellectual Property Cells in the Universities (IPCU's) specially in Govt. Universities/Institute of Higher Educations
- To analyze the patent information on a regular basis and suggest new programmes for R&D based on such information.
- To carry out the patent searches using software to guide the inventors in respect of patenting their inventions.
- ICT enabled networking of PICs and Intellectual Property Cell in University (IPCU) and development of e-platform for query and solutions among PICs/IPCUs/stakeholders.
- Training and capacity building in post patent filling activities i.e. technology valuation & audit, technology licensing and technology transfer & commercialization.
- To create awareness on sharing of IPRs in terms of knowledge and economic wealth through awareness programs among school children, rural innovators, block level officers etc. of state government
- Proper documentation with greater cohesion with State Biodiversity Boards (SBBs) through strengthening of Peoples' Biodiversity Registers (PBRs)

Patent Searches:

Patent search was done regularly for the interested people who visited the center. The officials of PIC did patent searches on i) Improvised Meitei PUNG & ii) Smart Car Dustbin

Patent Filing:

A percussion instrument (Meitei Pung) was filed with Patent Application No.: 201731028511

Trade Mark Searches & registration:

The searches for the items such as LYS, Ching – Choom, IMA CHENGHI, MAHAO, Mapu Ahum Hair Oil, Sangbrei Hair Oil and Sorojini Hair oil have been made during 2017-2018 and the above mentioned items have been applied for Trade mark registration out of which three items got Trade Mark registration number. They have also been published in the Trade Mark Journal.



IMA
CHENGHI
MAHAO



Trade Mark Registered:

- Ching – Choom : Trade Mark No. 3547726 on 12/05/2017
- Mapu Ahum Hair Oil : Trade Mark No. 3567569 on 09/06/2017
- Kanglei Eshing : Trade Mark No. 3097086 on 09/11/2017

Design Registration:



Biomass grinder
300090 of 06/12/2017



Multiple Fuel household cook stove
301374 of 17/01/2018



Hydrolic briquette moulder
301872 of 31/01/2018

Geographical Indication Registration under process:

The rain proof coat namely HEI of Phaibung village Senapati District is under process for registration under Geographical Indication



Opening of IPR Cell

It has been agreed in principle to establish two more IPR Cells – one at National Institute of Electronics & Information Technology (NIELIT), Imphal and another one at Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Imphal. However, it has been planned to start the functions of the two IPR cells in reality during 2018-2019.

3.4 Intellectual Property Facilitating Centre (IPFC) for MSMEs, Manipur

IPR protection - key role in getting competitive advantage through technological gains, particularly MSME has least inclined to adopt IPR as a business strategy. The main objectives are a) Co-locating IPR facilitation centre in PIC b) determine IPR needs of selected clusters of MSME in the state and evolve solutions and c) extend legal, financial and technical support to them for protecting intellectual property of the industries such as patents, trademarks, design, copyrights etc. It is essential to make informed decision using IPR as a tool for value addition of the technological gains. MSME needs more information, orientation and facilities for protecting their IPR.

Intellectual Property Facilitating Centre (IPFC) for MSMEs of Manipur was set up at Patent Information Centre, Manipur under the support of Ministry of Micro, Small and Medium Enterprises, Govt. of India, New Delhi with the objectives of

- Co-locating IPR facilitation centre in PIC
- Determine IPR needs of selected clusters of MSME in the state and evolve solutions
- Extend legal, financial and technical support to them for protecting intellectual property of the industries such as patents, trademarks, design, copyrights etc.

Patent searches

- Weavers power spinning machine
- Smart Car Dustbin

Design Registration:

Biomass grinder – Registration No. 300090 of 06/12/2017

Multiple Fuel household cook stove – Registration No. 301374 of 17/01/2018

Hydrolic briquate moulder – Registration No. 301872 of 31/01/2018

3.5 Manipur Science Aquarium

Manipur Science Aquarium in the premises of D.M. College Campus, Imphal is maintained by MASTEC with the support of Department of Science & Technology, Govt. of Manipur. The centre is open on all working days for the general public.

Aquarium cum flower Exhibition

The 5th State Level Aquarium Exhibition-cum- Flower Show was organized during March 19 – 27, 2018 at the Centre in association with Fish World, Keisampat Keisam Leikai, Happy Fins, Singjamei Waikhom Leikai, Aqua Delight, Khongnang Ani Karak, Imphal Aquarium, Ningthemcha Karong, Lei-Yum, Nagamapal Paonam Leirak, G N Bio-Plants, Bamon Leikai, Nilguni, Uripuk, Panthoibi Biotech, Canchipur, Kh. Ibopishak, Sega Road Khwairakpam Leikai, Angamba Nursery, Heirangoithong, Eriema Dry Flowers & Toys, Pisum Oinam Leikai, Imphal, Manipur.

Significant displays were made by the entrepreneurs. Happy Fins and Imphal Aquarium jointly demonstrated construction aquarium tanks and displayed one table design aquarium. Altogether 75 fish species (25 local and 50 exotic) in 65 tanks and 145 flower/plant species, 30 bonsai and 15 were exhibited/displayed. A number of students, children and fish & flower lovers visited the exhibition centre.



Dy. C.M. & other visitors seeing the aquarium exhibition



Visitors seeing the flowers during the exhibition

4.0 Meetings/Trainings attended by Officers

Name of official with designation	Meetings / Trainings	Sponsoring agency	Venue	Period
Th. Surendranath Singh, Director	Theme meeting on the outreach of DAE Technologies for societal applications	DST, GoI	BARC Mumbai	April 5-7, 2017
	State S & T Conclave	DST, GoI	Ahemadabad	April 27-28, 2017
	Review Committee Meeting	DST, GoI	NewDelhi	August 28, 2017
	Expert Group Meeting on PIC	DST, GoI	Bhubaneswor	October 5-6, 2017
	North East Regional Brainstorming workshop on Bioresources	DST, GoI	Shillong	Dec 4-5, 2017
Dr. L. Dinachandra Sr. Scientific Officer	Project Evaluation Group Meeting	DST, GoI	Chennai	January 29-30, 2018
	State S & T Conclave	DST, GoI	Ahemadabad	April 27-28, 2017
Dr. L. Minaketan Scientific Officer	Attending India International Science Expo	DST, GoI.	Chennai	October 13-16, 2017
	Attending Sci-Connect Stage –III programme	Vigyan Prasar, DST, Govt. of India	Guwahati	November 14-16, 2017
Er. Ch. Sarat Singh	PEG on State S&T Programme	DST, New Delhi	Chennai	September 7, 2017
Dr. R.K.Pritamjit Singh	One day Workshop for the IPFCs	DC, MSME, New Delhi	Bangalore.	June 16, 2017
	1st Meeting of the Expert Group on Patent Facilitating Programme	DST, New Delhi	Bhubaneswar, Odisha	October 5 – 6, 2017
	Attending India International Science Festival	DST, New Delhi	Anna University Campus, Chennai	October 13-16, 2017

Dr. Ch. Shivaji	National Orientation Programme for EduSAT Network	Vigyan Prasar, DST, Govt. of India	Chennai	March 6-8, 2018
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5.0 Visiting Scientists to MASTEC

The following scientists made official visits to MASTEC in connection with the programmes shown against their names

Sl. No	Name of official with designation	Organisation	Meetings / programme	Date of visit
1	Dr. Sachin Narwadiya Scientist	Vigyan Prasar	Sci-Connect Stage II programme	August 21-23 2017
2	Sandipan Dhar,	Vigyan Prasar	Sci-connect Stage II programme	August 21-23, 2017
3	Narender Singh	Vigyan Prasar	Sci-connect stage II programme	August 21-23, 2017
4	Navneet Gupta Scientist	Vigyan Prasar	Sci-connect stage II programme	August 21-23, 2017
5	S.K. Gupta Head. TT & CD	BARC, Mumbai	Inauguration of DTDDF at MASTEC Complex	March 15, 2018
6	Dr T.R. Ganapathi Scientist & Section Head	BARC, Mumbai	Inauguration of DTDDF at MASTEC Complex	March 15, 2018
7	Dr. Bhaskar Sanyal SO/F	BARC, Mumbai	Inauguration of DTDDF at MASTEC Complex	March 15, 2018
8	Dr. Soumitra Kar SO / F	BARC, Mumbai	Inauguration of DTDDF at MASTEC Complex	March 15, 2018
10	Dr. S.N. Dutta SA/E	BARC, Mumbai	Inauguration of DTDDF at MASTEC Complex	March 15, 2018
11	Shri B.K.Tyagi Scientist	Vigyan Prasar, Noida, U.P.	Workshop on Hands on science as DST Official	March 2018
12	Prof. B.N. Das	Vigyan Prasar	Attending training workshop on Hands on science as resource person	March 21-24 2018

6.0 Library

The Council has made a modest attempt to build up its own library. There is a collection of about six hundred volumes of various disciplines. In addition, a number of periodical journals, bulletins, local papers, science publications etc. are received regularly. MASTEC aims at strengthening the library of the Council.