

Annual Report

2015 - 2016



Manipur Science & Technology Council

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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.

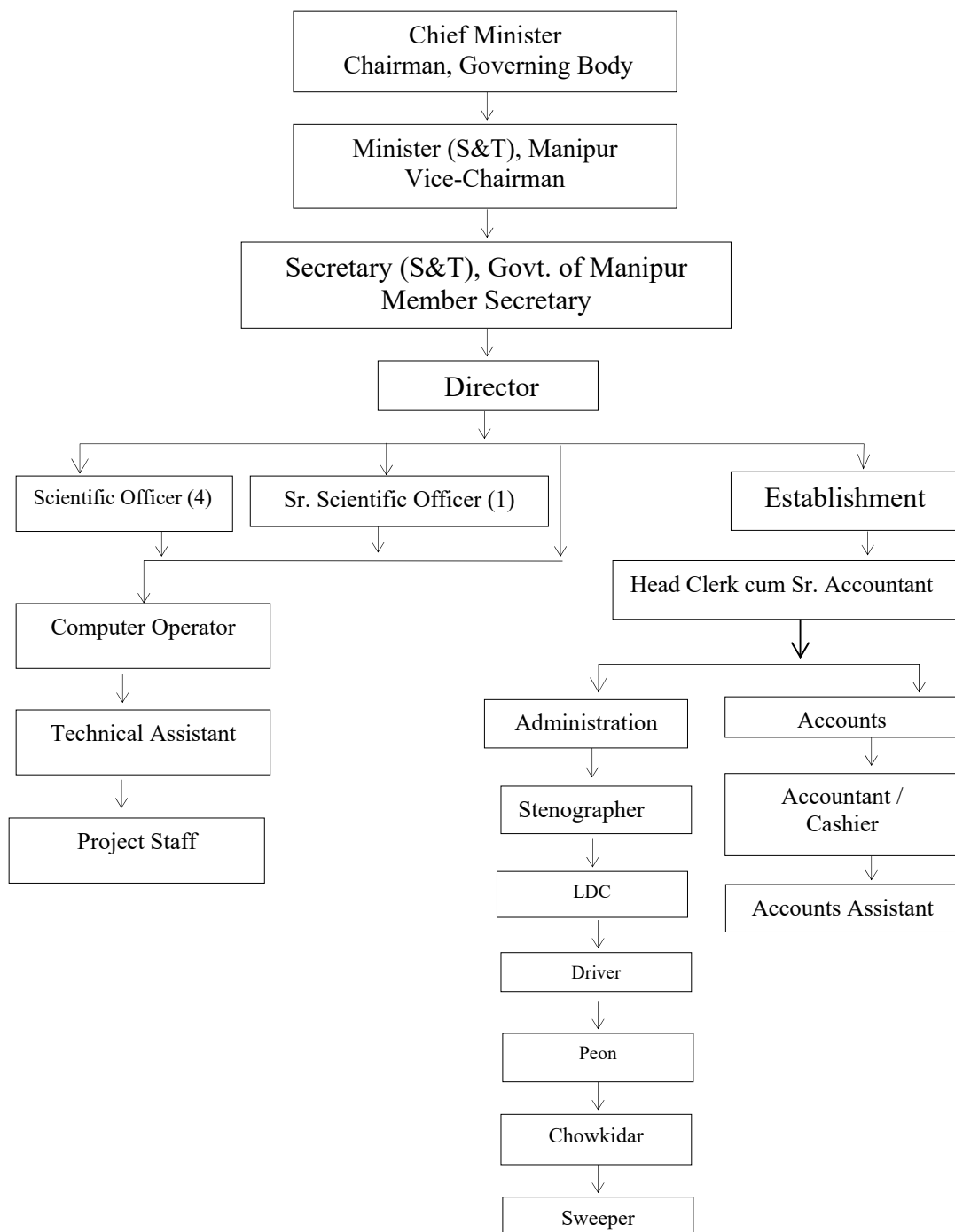
The autonomous Council is served by its own Secretariat of twenty man powers supported by the Department of Science and Technology(DST), Government of India. The Council Secretariat operates with the grants received from DST, Government of India, DST, Government of Manipur and the funds received from 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 utilise Remote Sensing Techniques for planning and implementation of programmes with S&T inputs and to promote and support the activities of the Remote Sensing Centre;
- 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.

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.	Scientific Officer
5.	Er. Ch. Sarat Singh	B.Tech, M.Tech.	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.	Chuyaitom Moirangthem	M.Sc.	J.R.F.
24.	L. Prasad Singh	M.Sc.	Research Assistant
25.	S. Sanjay Singh	XII -Sc.	Attendant cum watchman
26.	H. Sanjay Singh	X	Attendant cum watchman
27.	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 Observation of World Intellectual Property Day

The World Intellectual Property Day 2015 was observed on 26th April 2015 under the theme “Get Up, Stand Up. For Music” at Shri Shri Balmukunda Dev Music College, Imphal. The main objective of the workshop was to create awareness about IPRs among the intellectuals, entrepreneurs, individuals etc. Th. Surendranath Singh, Director MASTEC, Imphal, delivered a lecture on IP related issues and interacted with the audience. About 100 participants including students, faculty of the college and renowned singers and lyricist attended the programme.



Dignitaries at the Dias

2.2 Science Meet supported by DST, Govt. of India

As a continuing programme of Observation of National Science Day and National Technology Day, a 5-day long Science Meet was organised during May 11-15, 2015 at National Institute of Electronics and Information Technology (NIELIT), Akampat, Imphal East. The programme was held in association with National Institute of Electronics and Information Technology (NIELIT), Science Teachers' Forum Manipur (STFM), Manipur Association for the Promotion of Science (MAPS), Manipur Science Communicators' Association (MASCA) and Generation De New Image (GENIM). The programme was catalysed and supported by National Council for Science & Technology Communication (NCSTC), Department of Science & Technology, Government of India, New Delhi.



Hon'ble Chief Minister, Manipur giving Inaugural Speech

The programme was inaugurated by the Hon'ble Chief Minister, Manipur. Smt. Nidhi Mani Tripathi, IAS, Secretary (S&T), Govt. of Manipur presided over the inaugural function.

Activities of Science Meet

The activities of Science Meet included Competitions, Exhibitions, Popular Science Show, Folk Form of Communication etc. The competitions included Science Model (Class VIII–XII Science), Science Short Play Competition (Open upto Science Degree), 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 and Book. The Popular Science Show covered Science Films, Science Explaining Miracles. The Folk Form of Communication included Science Drama and Puppet Plays.

Science Model Competition & Exhibition

The competition was organised for students reading in Class VIII – XII. A student or a team of two students from the same school were allowed to participate and display an Exhibit Model. Altogether 65 (sixty-five) models were exhibited by 120 students from various schools of the State. Mr. Ajoy Nameirakpam of Catholic School, Canchipur got the first position on his model Automatic Spining Machine. M. Jeaneva Devi and Th. Tampha Devi of Ananda Purna Schhol, Thoubal got the second position on their model “Innovative Fodder Cutter”.

Md. Asad and Thongam Avinash of Ananda Purna Schhol, Thoubal was placed in the third position on their model “Onthokpa Loo”. Primakov Chungkham of UNACCO School, Imphal East got the consolation prize on her model Waste Management. Munisana Thongbam and Laishram Rima of Brighter Academy, Khumbong got consolation prize on their model Electronic Science Quiz Board

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 given to Shri K. Bishal Singh, Assistant Teacher of Catholic School, Canchipur. Imphal.



Exhibitors displaying Science Models in Science Meet 2015

Science Quiz Competition

The competition was organised for students reading in Class IX-XII Science. Altogether 44 (forty-four) teams from 35 schools registered for the competition. Each team comprised of two students from the same school. Three teams were selected for the final round through a preliminary round - Written Contest. In the final competition, the first position went to Brajamohon Yumnam and James Angomcha of Sacred Heart Hr. Sec. School, Imphal. Chungneithang Kom and Naorem Lolit Singh of Herbert School, Airport Road, Imphal got the second position. The third position went to Syed Jamilur Rahman and Hasnel Shah of JNV, Khumbong, Imphal West and L. Raman & L Newton of Mother’s Pride Academy, Bishnupur.



Science Quiz competition

Spot Painting Competition

The spot painting competition was organized in 3(three) groups viz., i) Sub-Junior Group (Class III—V), ii) Junior Group (Class VI-VIII) and iii) Senior Group (Class IX-X). Altogether 46 students from 35 schools, 51 students from 40 schools and 43 students from 34 schools participated in the competition of the Sub Junior,



Students' Spot Painting Competition of Science Meet 2015

Junior and Senior Category respectively. In the Sub Junior Group, Veronica Sougrakpam of UNACCO School, Imphal East got the first position. Khongbantabam Chusin Singh of Kendriya Vidyalaya, Langjing and Oinam Romenson Singh of Mother's Pride Academy, Bishnupur got the second and the third positions respectively. Laishram Mamtaj Devi of Mother's Pride Academy, Bishnupur and Thingam Dushanna Chanu of UNACCO School, Imphal East got the consolation prizes respectively.

In the Junior group, Malemnganba Waikhom of Shishu Nistha Niketan, Imphal got the first position. M. Preety Devi of Mega Manipur School, Yarlpat got the second position. W. Tangjakhombi of Mega Manipur School, Yarlpat got the third position. Reshmi Laishram of Mega Manipur School, Yarlpat and Laitonjam Bankimchandra Singh of Loyola School, Bishnupur got the consolation positions.

In the Senior Group, Ashem Indrajit Singh of the Little Master English Hr. Sec. School, Shamurou and M. Waripson of Kakching Hr. Sec. School, Kakching got the first and second positions respectively. Soibam Rohit Meitei of UNACCO School, Imphal East got the third position. Kshetrimayum Gopinath of Kanan Devi Memorial School, Pangei and Yoihenbi Keisham of Mega Manipur School, Yarlpat were placed for consolation prizes.

Declamation Contest

The competition was opened to students reading in Class IX-XII Science. Thirty-two students from various institutions participated in the competition. Only 15 contestants were selected for the contest through a 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 five topics and then interacted with the judges of the competition. The topics for the contest were (i) Science for Nation Building (ii) Swine Flu and (iii) The Planet Earth. Mr. Primakov Chungkham of UNACCO School, Imphal East got the first position. Gurumayam Vashista Sharma of Herbert School, Imphal got the second position. Konjengbam Dipika Hillary of Herbert School, Imphal and Vishal Nair of Shishu Nistha Niketan, Imphal jointly got the third position of the declamation contest.



Declamation Contest of Science Meet 2015 in progress

Science Short Play Competition

The competition was open to all the students upto Science Degree standard. A team of at least 5 (five) and at the most 10 (ten) students from the same school/Institute was allowed to compete for the competition. The teams were supposed to play a Short Play on any theme of Science in a duration of 15 minutes. Altogether, 7 (seven) teams took part in the competition. The students team from Brighter Academy, Khumbong and Herbert School, Imphal got the first and second positions of the competition respectively. The students team from SCM Boarding School, Singjamei, Imphal got the third position.



A Team performing Science Short Play

Best Appreciation Award

The Best Appreciation Award was given to an individual student who proves to have gained the maximum knowledge of science from the Meet as judged by questionnaire response and personal interview. The Best Appreciation Award for SM-2015 was selected from 140 participants of different standards. The award was given to Vishal Nair, Class X of Shishu Nistha Niketan,



Final round of Best Appreciation Award of Science Meet 2015

Book Exhibition

Book Exhibition was also one of the activities of the Science Meet 2015. A large number of students, teachers and parents visited the book stalls. Three Book Stalls viz., i) M/s Job Centre, Babupara, Imphal ii) Sharma Book Agency, Imphal and iii) Sangam Book Store, Paona Bazar, Imphal participated in the Book Exhibition.

Scientific Film Shows

Science films collected by MASTEC, NIELIT and Vigyan Prashar, New Delhi were shown during the meet. A few scientific films screened during the Meet included *Uchek Langmeidong* (A Manipuri Animation Film), A Brief History of Time, Black Hole, Time Travel, Earthquake, The Theory of Everything etc.

Explaining Science Behind Miracles

Scientifically Explaining Miracle was one of the shows of the Meet. The expert members of GENIM demonstrated many items behind miracles and the scientific backgrounds of the shows were also explained to the audience. During Meet 2015, Science Behind Miracles was kept for 3 (three) days of 2(two) hours duration each day and every day hundreds of students & general public had witnessed the show and many of them could learn how science is related with miracles.

Puppet Play and Science Drama

The art of puppetry has been very much effective tool for communicating science to the people. Members of MASCA presented 2 (two) puppet shows based on the focal theme of National Science Day 2015 during the Science Meet 2015. These puppet plays were much impressive and visitors could realize how puppetry can be used as a good medium for Science & Technology communication.

One Science Dramas “*Aruba Ichel*” meaning Holy Stream based on the theme Science for Nation Building was played in Manipuri language by the local artists during Science Meet 2015. The Science Drama highlighted the importance of Science in removing superstitions from minds of the people in the society.

Prize distribution

The Science Meet was concluded with a Function on May 15, 2015 during which prizes were distributed to the prize winners of the competitions. Prof. C. Amuba Singh, Former Vice Chancellor, Manipur University Shri T.P. Singh, Director, NIELIT, Imphal and Shri Th. Surendranath Singh, Director, Manipur Science & Technology Council, Imphal were the Chief Guest, Guest of Honour and



Distribution of prizes to winners of Science Meet 2015

President respectively of the Closing Function. The Prizes distributed included Cash prizes with citations, memento and one book entitled “Srinivasa Ramanujan – A Life in the Jungle of Mathematics” written by Prof. N. Rajmuhon Singh, Manipur University,

2.3 Observance of National Mathematics Day supported by DST, Govt. of India

As a continuing programme of Celebration of National Mathematics Day, a 4-day programme was organised during June 26-29, 2015 at Manipur Science Aquarium, Imphal with various activities including competitions for the students such as Mathematics Quiz, Mathematics Competition, Mathematics Model Exhibition-cum-competition, Mathematics Magic, Learning Mathematics through Origami, Science Film Show, Science Drama, Poster Exhibition and Lecture-cum-demonstration etc.

The programme was inaugurated by Prof. C. Amuba Singh, Former Vice Chancellor, Manipur University, Imphal as the Chief Guest. Shri Ng. Brajakumar Singh, Principal, D.M. College of Commerce, Imphal and Shri Th. Surendranath Singh, Director, Manipur Science & Technology Council, Imphal were the Guest of Honour and President of the inaugural function respectively. In his Inaugural speech, Prof. C. Amuba Singh, mentioned the importance of Mathematics in science learning.



Chief Guest Lighting Inaugural Candle

The main activities of Celebration of National Mathematics Day included Competitions, Exhibitions, Popular Mathematics Show, Mathematics Lecture-cum-Demonstration etc.

Mathematics Model Competition-cum-Exhibition

The competition was organised for students reading in Class VIII – XII. Altogether thirty-five models were exhibited by 57 students from different schools in the State.

Curie Koijam of Mega Manipur School, Yaralpat was placed in the first position on her model “Geo Board”. Marynah Khulem of Brighter Academy, Khumbong got the second position on her model “To prove $(a+b)^3$ ”. M. Surjalata Devi and Maibam Premila Devi of Paradise English School, Thoubal Okram got the third position on her model “Innovative Clinometer”. Rajyashori Limbu and S. Jiddy Devi of Tiny Tot’s Unique School, Imphal got the fourth position on their model “To find area of Circle”. S. Lanchenbi and H. Daina of Halleey English School, Imphal got the 5th position on their model “Application of similarity theorem to determine the height of a building”.



Student Exhibitors displaying their Mathematics Models

Mathematics Quiz Competition

The competition was organised for Class IX-X Category. Forty-five teams from 32 schools registered for the competition. Each team comprised two students from the same school. Three teams were selected for the final round through a preliminary round - Written Contest. In the final round competition, Kh. Robinson Singh and M.

Ashokumar Meitei of New Public Hr. Sec. School, Khangabok got the first position. The second position went to Senjam Victoria and Nongthombam Sanathoi of Sangai Hr. Sec. School, Mantripukhri. Rohen Phanjoubam and Chingkheileima Chanu of Paradise English School, Thoubal Okram received the third position.

Mathematics Competition

Mathematics Competition for students of three different classes viz., i) Class VI ii) Class VII and iii) Class VIII was also organised on March 28, 2014 as one of the activities of Celebration of National Mathematics day 2014. Altogether 122 students from 95 schools, 140 students from 123 schools and 87 students from 62 schools participated in the Mathematics competition for Class VI, Class VII and Class VIII respectively.



Students' Mathematics Quiz Competition

For class VI category, Wahengbam Riya Devi of Padma Ratna English School, Kakching got the first position of the competition. Sagolsem Inunganba of Yumnam Khunou Jr. High School received the second position and Paikhoma Wahengbam of Padma Ratna English School, Kakching got the third winner. Janardhan Soram of C.G.C.C. Wangoi and Enarick Chanabam of C.T. Hr. Sec. School, Mayang Imphal were placed for consolation prizes respectively.

For Class – VII category, W. Ningthem Meitei of Tiny Tot's Unique School, Imphal and Yumkhaibam Vicky Luwang of Emmanuel English Academy, Yaingangpokpi got the first and second prizes respectively. Usham Adhitya Luwang of Tiny Tot's Unique School, Imphal received the third position. Ricky Thoudam of UNACCO School, Imphal and Nelson Laishram of C.T. Hr. Sec. School, Mayang Imphal received the consolation prizes.



Mathematics Competition in progress

For Class – VIII category, Patel Lairenjam of Little Flower School, Imphal and Anjali Konjengbam of Nirmalabas High School, Imphal got the first and second positions respectively. Rajyashori Limbu of Tiny Tot's Unique School, Imphal got the third position. Mumtarani Lairenjam of Little Flower School, Imphal and Heigruram Dhaneshwori Devi of the Paradise English School, Thoubal Okram received the consolation prizes.

Science Film Shows

Science films namely Animal Kingdom, Medicinal Plants of Manipur, Orchids of Manipur, Radio, X-ray, National Geography, Transit of Venus, Rain Water Harvesting etc. were shown for one-hour duration daily.

Mathematics Puzzle

Explaining Mathematics Puzzle was one of the activities of the National Mathematics Day celebration. Experts/Artists performed/demonstrated various Mathematics puzzle items which the students were not aware of before and explained the reason behind every Mathematics puzzle. They also demonstrated various techniques of Mathematics which can find solutions easily and in faster way. About 40 items of Mathematics Puzzle were demonstrated with explanation.

Mathematics Lecture-cum-Demonstration

Mathematics lecture-cum-demonstration was one of the important activities of Celebration of National Mathematics Day 2012. Altogether there were 2 lecture-cum-demonstrations of 2 hours' duration each during the Celebration. The students reading in Class VIII to Class XII participated and interact with the Resource Persons during the Lecture-cum-demonstration.

Hands on Experiments (Origami)

Demonstration of low cost hands on experiments on Mathematics was one of the activities of Celebration of National Mathematics Day 2014. Two Resource Persons demonstrated about 35 items on learning Mathematics through origami and hundreds of students interacted with the Resource Persons.

Poster Exhibition

Posters of various Mathematical formulae and logic including origin of 0 (zero), Π (pi), History of Great Mathematicians were displayed apart from Scientific Posters during the 4-day Celebration of National Mathematics Day 2014. Posters supplied by Vigyan Prasara, New Delhi were also exhibited in the Celebration.

Prize distribution

The 4-day programme on Celebration of National Mathematics Day 2014 concluded on June 29, 2015 with a function with Shri Th. Surendranath Singh, Director, Manipur Science & Technology Council, Imphal, Prof. N. Rajmuhon Singh, President, Manipur Association for the Promotion of Science, Imphal and Shri L. Somarjit Singh, Secretary, Manipur Science Communicators' Association, Imphal on the Dias Prizes for various competitions were distributed to the prize-winning students by the Dignitaries.



Prize distribution to the winners of competitions

2.4 North East Students' Summer Training on Basic Sciences

Three students of SDJM Higher Secondary School, Imphal namely H. Pushparani Devi, Oinam Sharmila Devi and Likmabam Rocky Meitei were nominated to participate in the 9th North East Students' Summer Training on Basic Sciences (NESST-BASE 2015) organized during May 18-30, 2015 at Bose Institute, Darjeeling Campus. Ms N. Tilotama Devi was nominated to the programme as a guide teacher.

2.5 3rd State level Aquarium cum flower Exhibition

The 3rd State Level Aquarium Exhibition-cum- Flower Show was organized during July 02 – 09, 2015. The entrepreneurs namely Fish World, Keisampat Keisam Leikai, Aqua Delight, Chingmeirong Khongnangani Karak, Phurailatpam Surjakanta Sharma, Uripok Yambem Leikai, Happy Fins, Singjamei Waikhom Leikai, Cinderella Plant's



Inauguration of Aquarium Exhibition

Care, Chingamakhong Singjamei Chinga Keithel, King City Evergreen Nursery, Pisumthong Bazar, Lei-Yum, Nagamapal Paonam Leikai and Gaminash Nursery, Bamon Leikai Brahmapur Nahabam Imphal East, Nilguni, Uripok, Eriema Dry Flowers & Toys, Pisum Oinam Leikai, Wayside Nursery, Tendongyan and L. Ibopishak Singh, Sega Road took part in the exhibition. Altogether 81 species (34-Indigeneous; 47-exotic) in 75 tanks and 136 flower/plant species were displayed. A large number of visitors including students, children and fish & flower lovers visited the exhibition.

2.6 Nomination of Science Teachers

With an understanding and also as requested by the National Co-ordinator, National Teachers Science Congress, five science teachers from five Schools in Manipur were nominated by the Council to participate in the Regional Workshop for Science Teachers for North Eastern states held during August 19-20, 2015 at Regional Institute of Education (RIE), Shillong.

2.7 North East Zonal Level Science Drama Competition

The Council nominated a team of 9 (nine) students and 2 (two) Science Teachers from Manipur to participate in the NE Zonal Level Science Drama Competition 2015-16 organised by Regional Science Centre, Guwahati on October 15, 2015 at Regional Science Centre, Guwahati. The team played a Science Drama entitled “Live and Let Live” in the Science Drama competition. The theme of the Science Drama was Conservation of Natural Bio-diversity. The Science Drama was given The Best Jury Award.

2.8 Nomination of Science Teachers from Manipur to HBCSE, TIFR, Mumbai

The Council nominated a team of 3 (three) teachers of chemistry to participate in the Chemistry Olympiad Exposure camp and three Physics teachers for Physics Olympiad camp at Homi Bhabha Center for Science Education (HBCSE), TIFR Mumbai held during November and December 2015.

2.9 Training on Remote Sensing, GPS, GIS

The Outreach programme of ISRO on Remote Sensing, GPS, GIS applications was held during August - November 2015. The lectures transmitted from the studio of IIRS, Dehradun was received at the Edusat Center of the Council. Thirteen students attended the training programme in the Classroom of the Edu Sat Center.

2.10 Millennium Science Lecture

The Millennium Science Lecture was organized at Meci Explorer Academy at Ghari, Imphal West on December 10, 2015 in honour of the Nobel Laureates in the subjects Chemistry, Physiology and Physics of the year 2015.

Th. Surendranath Singh, Director, MASTEC highlighted in brief about the overview of Nobel Prize distribution in science and physiology. Dr. N. Rajmuhon Singh of Chemistry Department, Manipur University deliberated about Nobel prize in Chemistry. Prof. N. Nimai Singh of Physics Department, Manipur University spoke on the Nobel prize in Physics. Dr. O. Joychandra Singh of Jawaharlal Nehru Institute of Medical Sciences delivered on Nobel Prize in Physiology/Medicine. About 300 delegates including students and teachers of the Academy attended the programme.

2.11 Observation of One day National Mathematics Day 2015

The National Mathematics Day 2015 was observed on December 22, 2015 at Sangai Higher Secondary School, Mantripukhri, Imphal. The programme was catalysed and supported by Department of Science & Technology, Government of India, New Delhi. The main feature of the programme was delivering lectures by invited



Dignitaries on the Dias in the Observation of National Mathematics Day



A section of participants in the Observation of National Mathematics Day

Resource Persons and interaction with the students. Shri Th. Surendranath Singh, Director, Manipur Science & Technology Council, Imphal, Shri H. Jayantakumar Singh, Retired Professor of Mathematics, D.M. College of Science, Imphal and Shri Ng. Amumacha Singh, Principal, Sangai Higher Secondary School, Imphal were the Chief Guest, Guest of Honour and President of the function respectively. A lecture on the topic “Applications of Mathematics in Science Learning” was delivered by Shri H. Jayantakumar Singh and it was followed by interaction with the participants. About 200 participants consisting of students, teachers from various schools in Manipur attended the programme.

2.12 Learning Science through Low Cost Hands on Experiment for science teachers in hill districts (1st batch) supported by Vigyan Prasar, DST, Govt. of India

Manipur Science and Technology Council (MASTEC), Imphal and Vigyan Prasar, Department of Science and Technology, Govt. of India organized 2 (two) residential

workshops on “Learning Science through Low Cost Hands on Experiment” at Imphal. The two workshops were organized with the financial support from Vigyan Prasar, Noida. The two workshops were organized specially for the science teachers teaching in the five hill tribal districts of Manipur. The main objective of organizing these workshops is to impart training to the science teachers teaching in schools located in tribal inhabited five hill districts of Manipur in carrying out various scientific experiments using readily available low cost instruments so that they may in turn



Director, MASTEC giving the inaugural address

conduct the same activities at their schools for the students. The 1st (first) residential Workshop was organized during January 27 – 30, 2016 at Youth Hostel, Imphal and it was inaugurated with Shri Th. Surendranath Singh, Director, Manipur Science and

Technology Council, Imphal as the Chief Guest, Shri Nripen Saikia, Senior Lecturer, DIET Lakhimpur, Assam as the Guest of honour and Shri L. Somarjit Singh, Associate Professor, Imphal College, Imphal presided over the inaugural function.

Altogether, 31 Science teachers, 15 from Government schools and 16 from private schools participated in the first training Workshop.

One Key resource person namely Shri Nripen Saikia, Senior Lecturer, DIET, Nalbari, Assam and 4 other local resource persons namely Shri L. Somarjit Singh, Associate Professor, Botany Department, Imphal College, Imphal, Shri K. Tolendro Singh, National Awardee and Senior Teacher, Lamshang High School, Lamsang, Shri N. Shyamkishwor Singh, Senior teacher, St. George High School, Imphal and Dr. Ch. Indira Devi, Lecturer, Johnstone Higher Secondary School,



Shri Nripen Saikia, Key resource persons from Assam demonstrating experiments



Fabricating low cost teaching equipments during the workshop

Imphal imparted in-depth training to the participants. Ninety-seven (97) experiments were demonstrated to the participants. The participants were also allowed to fabricate instruments of low costs using the materials provided by the organizer. The low cost experiments such as Determining the area and volume of a cylindrical body, Determining the area and volume of a spherical body, Determining average speed of moving bodies (Ant, worm etc.), Studying change of work done with variation of mechanical

energy, Studying conservation of linear momentum (Newton's Cradle), Experimental verification of Archimedes' Principle (Buoyancy), Measuring temperature of water at various states (Ice, water, steam etc.), Studying concept of centrifugal & centripetal (Centre-seeking) force, Studying action of a spray-apparatus (an example of Bernoulli's principle), Studying action of a pulley and concept of simple machine (lever), Verifying laws of reflection using a Ray Streak Apparatus (slit and light source), Studying dispersion of light (Rainbow) using soap-bubble (also mirror and water), Observing image and determining focal-length of a convex lens. Observing image and determining focal-length of a concave mirror, Studying phenomenon of static electricity (observing effect of charge), Studying magnetic field and imaginary magnetic field-lines, Studying working principle of an electric motor (spinning coil), Studying traveling of sound (Longitudinal and transverse wave), Studying reflection



Presentation of project by participants

of sound using PVC pipe and clock, Verifying that medium is necessary for transmission of sound, Dispersion of light using water and plane mirrors, Water fountain, Inflating a balloon in a normal pressure, Test your strength, Water boil without fire, Electric Motor, Surface Tension – 2 items, Tyndall effect, Pressure exert in all directions, Laws of falling bodies, Inertia of motion, Laws of conservation of energy, Newton’s third law of motion, Center of Gravity, Studying physical and chemical change of various substances, Determining the melting point of candle-wax etc. Determining the boiling point of water, Separating components of heterogeneous mixture, Separating immiscible liquids by using a separation funnel, Separating components of a mixture by sublimation process, Separating colours by process of paper-chromatography, Separating elements of a salt solution by distillation process, Oxygen gas preparation and testing its properties, Hydrogen gas preparation and testing its properties Carbon dioxide gas preparation and testing its properties, Ammonia gas preparation and testing its properties, Measuring acidity and alkalinity (in pH) of various substance using indicators, Volumetric analysis of concentration of acid and base, Studying displacement reaction and arranging metals in the activity series, Natural acid – base indicators – 3 exp. (Principles depending on change of colours), Milk can dance (Precipitation and separation of proteins), Magnetic Fluids, Convection in water, CO₂ in our mouth, Reaction of acids with milk, Coagulation, Colloidal Solution (Milk), All around cleaners (Detergency), Milk colloidal (Colloidal solution), Heating of sugar (Carbon compounds combustion), Sugar where has it gone (Intermolecular reaction), Melting Camphor (Sublimation), Sugar that attracts matchstick (Solubility), Reaction between CO₂ and Ca(OH)₂, Identifying protein, starch and fats/oil in food items, Studying diffusion and osmosis (net flow across semi-permeable membrane) using a potato osmometer, Preparing a slide of onion-film and observing cells under microscope, Preparing a slide of leaf-epidermis and observing stomata under microscope (and in hot water), Studying water-loss (transpiration) through stomata in green leaf, Identifying monocot and dicot seeds of flowering plants, Studying action of lung during respiration in human body, Identifying reproductive parts of a flower (Hibiscus etc.), Collecting insects and examining their body organs (wing, antenna, leg etc.), Studying that oxygen gas is released during photosynthesis, Ascent of Sap in plant, Determination of the age of a tree, Germination of seed, Preservation of biological specimen (dry and wet), Fermentation process, Study of Salivary amylase, Osmosis, Diffusion, Starch test, Protein test, Plant anatomy (Dicot), Onion cell, Application of curve in our daily life, Naper’s Bone, Visualizing of cone and cylinder, Showing gravitation with the help of mathematical developed object, Easy way of finding the centre of a ring, To make parabola, circle, semicircle and parabolic curve by straight lines, P-wave and S-wave, Function of Stethoscope, Function of Kaleidoscope, Different shapes of illusion, Making of simple Seismogram.

Shri Ch. Rajendra Singh, Associate Professor, Physics Department, Imphal College, Imphal delivered a lecture on Natural disaster earthquake. The earthquake Kit by Vigyan Prasara was demonstrated to the participants. An Interaction and discussion session was held on the last day. Feedback sheet in the form of questionnaire were distributed and obtained suggestions and comments from the participants. The training workshop concluded on January 30, 2016 with a closing function during which



Distribution of kits, chemicals, materials and certificates to the participants

Earthquake Kit, Chemistry kit, books published by Vigyan Prasar, Noida, chemicals and low cost instruments/equipments were distributed to the participants.

2.13 Teachers' Science Congress, Manipur supported by DST, Govt. of India

The three day long State Level Teachers' Science Congress was organised during February 2-4, 2016 at Manipur Science Center, Takyelpat, Imphal West. Prof. C. Amuba Singh, Former Vice Chancellor, Manipur University, Imphal inaugurated the science congress as the Chief Guest of the function. Shri N. Praveen Singh, Director of Education (S), Govt. of Manipur and Shri U.C. Laisram, Director (S&T), Govt. of Manipur were the Guest of Honour and the President of the function respectively. Shri Th. Surendranath Singh, Director,



A section of the participants attending the Teachers Science Congress 2016



Prof. I.S.Khaidem, Former Vice Chancellor, Manipur University and Dr. Ng. Nimai of Manipur University conducting the technical session.

MASTEC welcomed the dignitaries, invitees, delegates. While giving inaugural address, Prof. C. Amuba Singh expressed his desire to keep such science congress a regular feature annual or biennial in the state.

Altogether fifty six science teachers from seven districts participated in the congress. The activities of the congress included lecture cum demonstration on learning by doing, invited talk, paper presentation by science teachers under the theme Innovative Teaching Methodology.

A lecture cum demonstration on learning by doing (hands on experiments)

was delivered by Shri Nripen Saikia, Senior faculty, DIET, Nalbari, Assam. He performed some experiments on physics by using low cost teaching aids and interacted with the science teacher delegates.

Prof. I.S. Khaidem, Former Vice Chancellor, Manipur University conducted the technical session-I as the Session Chair with Dr. Ng. Nimai Singh, Professor of Physics, Manipur University, Imphal as the rapporteur. Dr. Ph. Brajayanti Devi, Head, Science & Mathematics Division, North East Regional Institute of Education, NCERT, Govt of India, Shillong delivered two invited talks one after another on the topics namely, i) Innovative practices for teaching science with a special focus on development of scientific skills and ii)



Dr. Ph. Brajayanti Devi from NERIE, NCERT, Shillong delivering invited lectures

Innovative techniques for assessment of students performances towards scientific temper and scientific values. She then, answered the questions raised from Session chair and other delegates.

H. Jayantkumar Singh, Former Head, Department of Mathematics, DMC of Science, Imphal presented a paper “Motivation, the prime mover for teaching-learning process”. Prof. I. Tomba Singh, Mathematics Department, Manipur University presented his paper entitled “On Simple Techniques for Construction of Odd Magic Squares using Basic Latin Squares”. The paper on Learning Science through effective teaching was delivered by Ch. Rajendro Singh, Head, Physics Department, Imphal College. L. Somarjit Singh, Associate Professor, Botany Department, Imphal College presented his paper on The Art of learning Science. Ng. Amumacha Singh, Retired Joint Director, Education (S), Govt. of Manipur (Principal, Sangai Higher Secondary School, Imphal) presented his paper on Activity Method - A Presentation.

The second day i.e. February 3, 2016 had two pre lunch parallel sessions. Prof. N. Rajmuhon Singh and Prof. R.K.Bhubon Singh of Chemistry Department, Manipur University were the Session chair and rapporteur of one session for the sub theme “Challenges of teaching science subjects at schools” whereas Prof. B. Manihar Sharma of Life Sciences, Manipur University and Dr. H. Manoranjan Sharma of Thoubal College were the Session chair and rapporteur of the other session for the sub theme “Multimedia for science education & Monitoring students’ performance at Schools, Vocational courses”.

Under the sub theme “Challenges of teaching science subjects at schools”, P. Ibopishak Singh, Science Teachers Forum (STFM) presented his paper on the title “Innovative Teaching Technique in Science and Mathematics with low cost teaching aids in secondary level”. Rosekumar Ningthoujam, Graduate Teacher (SCIENCE) of Top Dusara High School, Top Mayai leikai, Imphal East presented his paper “Innovative Low cost teaching aids”. Mrs Taorem Bhavini Devi of Recent Hr. Sec. School presented her paper entitled “Learning by Doing”. Prof. R.K.Bhubon Singh as a rapporteur read out the summary report of the presentations made by the teacher delegates.

Under the sub theme Multimedia for science education & Monitoring students’ performance at Schools, Vocational courses, Miss Thounaojam Thorny Chanu, *COMET* School, Imphal presented her paper entitled “A comparative study on Lecture and Practical teaching method”. Ksh. Chitrabhanu Devi presented her paper “Media in Science Education: A case study of recent “Manipur Earthquake”. Mrs. Soyam Nungshithoibi Devi, Science Graduate Teacher of Ibotonsana Girls’ Hr. Sec. School presented a paper on Innovative Assessment of students’ performance. Mrs. Meeni Sinam of Keishamthong High School presented a paper entitled “Think green, live Green and eat green “.

The post lunch technical session on February 3, 2016 was chaired by Prof. Sh. Dorendrajit Singh of Physics Department, Manipur University and Dr. O. Ibopishak Singh was the rapporteur of the session. W. Gunananda Singh, Chaoyaima Hr. Sec. School, Thoubal presented his paper entitled “Challenges in teaching mathematics”. M.Pahari Singh of Keishamthong High School, Imphal presented his paper entitled “Challenges and recommendation for better mathematics teaching”. N S Singh and Ch. I Devi made presentations on the topics “motion and energy involving mathematics” and “Low Cost Experiment” respectively. K. T Singh, Praja High school spoke on “Difference between poster and oral presentation”. Dr. O. Arunkumari Devi presented on “Rubric as an assessment tool for student’s performance”. O. Ibochou Singh presented a paper “Challenges in teaching physics, chemistry biology, geology, mathematics”

Best Paper Selection

The competition for the Best paper selection was held on **February 4, 2016** i.e. the last day of the science congress.

Altogether 14 school teachers including five lady teachers competed for the best paper selection by presenting their



Jury members attending the teachers' Best paper presentation



A competitor presenting his paper during the Best paper selection session

papers. Shri Ng. Amumacha Singh, Former Joint Director, Education (S), H. Jayentkumar Singh, Former Head of Mathematics Department, DMC of Science, G.Tomba Sharma, Former Principal, DMC of Science, Imphal, Dr. N. Rajmuhon Singh, Professor of Chemistry, Manipur University, Imphal, Ch. Rajendro Singh, Head of



Third best paper prize distribution



Distribution of second best paper prize



Distribution of first best paper prize

Physics Department, Imphal College, and Dr. Ph. Brajayanti Devi, Head of Science & Mathematics were the Jury members of the competition.

Dr. Ch. Indira Devi of Johnstone Higher Secondary School, Imphal was conferred the first position on her paper "Learning chemistry by doing". The second position went to N. Shyamkishore Singh, St. George High School, Imphal East on his paper "Observation versus seeing on motion and energy involving mathematics". The third position went to Kojam Tolendro Singh of Praja High School, Lamsang, Imphal West on his paper "Low Cost Improvised Teaching Aids". The competition for best paper selection was followed by open discussion of the delegates / school teachers with the panel of experts.

After the panel discussion was over, the certificate of merit with cash prize was distributed to the winners of the best paper selection. Shri G.Tomba Sharma, Member of the Advisory Committee of the Congress distributed the third best paper presentation prize to K. Tolendro Singh of Praja High School, Imphal West. Shri H. Jayentkumar Singh, Former Head of Mathematics Department, D.M.C. of Science, Imphal distributed the second best paper presentation prize to Mr. N. Shyamkishwor Singh of St. George High School, Wankhei, Imphal West. Shri Ng. Amumacha Singh, the moderator of the discussion session distributed the certificate of merit and cash prize to Dr. Indira Devi of Johnstone Higher Secondary School, Imphal who got the first position. Dr. L. Dinachandra Singh, Senior Scientific Officer of the Council while giving the concluding remarks appealed to the school teachers to start writing research papers on science teaching and science education related aspects as preparation for participation in the forthcoming National Teachers Science Congress.

2.14 Learning Science through Low Cost Hands on Experiment (2nd batch)

The 2nd (second) batch Residential training Workshop on low cost hands on experiments was organized during February 10 – 13, 2016 at Youth Hostel, Imphal. The workshop was inaugurated by Shri H. Gyan Prakash, Special Secretary (S&T), Govt. of Manipur. Shri L. Somarjit Singh, Associate Prof., Imphal College, Imphal attended the inaugural function as guest of honour. Shri Th. Surendranath Singh, Director, Manipur Science and Technology Council, Imphal presided over the function.

Altogether twenty-nine (29) Science teachers (eight teachers from Government schools and twenty one teachers from private schools) participated in the second training Workshop. Shri Nripen Saikia, Senior



Special Secretary (S&T) giving the inaugural address



Nripen Saikia, Key resource person conducting practical session



Hands on experiment in progress local resource person

Lecturer, DIET, Lakhimpur, Assam and 4 other local resource persons namely Shri L. Somarjit Singh, Associate Professor, Botany Department, Imphal College, Imphal, Shri K. Tolendro Singh, National Awardee and Senior Teacher, Lamshang High School, Lamshang, Shri N. Shyamkishwor Singh, Senior teacher, St. George High School, Imphal and Dr. Ch. Indira Devi, Lecturer, Johnstone Higher Secondary School, Imphal imparted in-depth training to the participants. One hundred experiments were demonstrated/performed during the course of the training. The experiments performed during the course included Determining the area and volume of a cylindrical body, Determining the area and volume of a spherical body, Determining average speed of moving bodies (Ant, worm etc.), Studying change of work done with variation of mechanical energy, Studying conservation of linear momentum (Newton's Cradle), Experimental verification of Archimedes' Principle (Buoyancy), Measuring temperature of water at various states (Ice, water, steam etc.), Studying concept of centrifugal & centripetal (Centre-seeking) force, Studying action of a spray-apparatus (an example of Bernoulli's principle), Studying action of a pulley and concept of simple machine (lever), Verifying laws of reflection using a Ray Streak Apparatus (slit and light source), Studying dispersion of light (Rainbow) using soap-bubble (also mirror and water), Observing image and determining focal-length of a convex lens, Observing image and determining focal-length of a concave mirror, Studying phenomenon of static electricity (observing effect of charge), Studying magnetic field and imaginary magnetic field-lines, Studying working principle of an electric motor (spinning coil), Studying traveling of sound (Longitudinal and transverse wave), Studying reflection of sound using PVC pipe and clock, Verifying

that medium is necessary for transmission of sound, Dispersion of light using water and plane mirrors, Water fountain, Inflating a balloon in a normal pressure, Test your strength, Water boil without fire, Electric Motor, Surface Tension – 2 items, Tyndall effect, Pressure exert in all directions, Laws of falling bodies, Inertia of motion, Laws of conservation of energy, Newton’s third law of motion, Center of Gravity, Studying physical and chemical change of various substances, Determining the melting point of candle-wax etc, Determining the boiling point of water, Separating components of heterogeneous mixture, Separating immiscible liquids by using a separation funnel, Separating components of a mixture by sublimation process, Separating colours by process of paper-chromatography, Separating elements of a salt solution by distillation process, Oxygen gas preparation and testing its properties, Hydrogen gas preparation and testing its properties, Carbon dioxide gas preparation and testing its properties, Ammonia gas preparation and testing its properties, Measuring acidity and alkalinity (in pH) of various substance using indicators, Volumetric analysis of concentration of acid and base, Studying displacement reaction and arranging metals in the activity series, Natural acid – base indicators – 3 exp. (Principles depending on change of colours), Milk can dance (Precipitation and separation of proteins), Magnetic Fluids, Convection in water, CO₂ in our mouth, Reaction of acids with milk, Coagulation, Colloidal Solution (Milk), All around cleaners (Detergency), Milk colloidal (Colloidal solution), Heating of sugar (Carbon compounds combustion), Sugar where has it gone (Intermolecular reaction), Melting Camphor (Sublimation), Sugar that attracts matchstick (Solubility), Reaction between CO₂ and Ca(OH)₂, Identifying protein, starch and fats/oil in food items, Studying diffusion and osmosis (net flow across semi-permeable membrane) using a potato osmometer, Preparing a slide of onion-film and observing cells under microscope, Preparing a slide of leaf-epidermis and observing stomata under microscope (and in hot water), Studying water-loss (transpiration) through stomata in green leaf, Identifying monocot and dicot seeds of flowering plants, Studying action of lung during respiration in human body, Identifying reproductive parts of a flower (Hibiscus etc.), Collecting insects and examining their body organs (wing, antenna, leg etc.), Studying that oxygen gas is released during photosynthesis, Ascent of Sap in plant, Determination of the age of a tree, Germination of seed, Preservation of biological specimen (dry and wet), Fermentation process, Study of Salivary amylase, Osmosis, Diffusion, Starch test, Protein test, Plant anatomy (Dicot), Onion cell, Application of curve in our daily life, Naper’s Bone, Visualizing of cone and cylinder, Showing gravitation with the help of mathematical object, Easy way of finding the centre of a ring, To make parabola, circle, semicircle and parabolic curve by straight lines, P-wave and S-wave, Function of Stethoscope, Function of Kaleidoscope, Different shapes of illusion, Making of simple Seismogram, Experiment on – sum of three angles of a triangle is equal to 180° , Proof of Pythagoras theorem and Functions of Telescope and Binocular etc.



Group wise presentation of project by participants

A lecture on Natural disaster and earthquake was delivered by Ch. Rajendra Singh, Associate Professor of Imphal College and interacted with the participants. He further demonstrated the earthquake Kits to the participants. The workshop concluded on

February 13, 2016 with a function during which earthquake kit, Chemistry kit, books, chemicals and low cost equipments were distributed to the participants.

2.15 Observation of National Science Day 2016

The Observation of National Science Day 2016 was held on the theme “Make in India: S & T driven Innovations” on February 28, 2016 at D. M. College of Commerce, Imphal. About 250 participants consisting of students, teachers from schools/colleges and general public attended the programme.

Prof. S. Dorendrajit Singh of Physics Department, Manipur University, Imphal delivered a lecture on the focal theme of National Science Day 2016. The State Science Communicator Award 2016 was distributed on the day of Observation of National Science Day 2016. The State Science Communicator Award 2016 was given to 2 (two) persons viz., i) Prof. N. Rajmuhon Singh, Dept. of Chemistry, Manipur University, Canchipur and ii) Dr. H. Birkumar Singh, Principal Scientist and Scientist-in-Charge, CSIR-North East Institute of Science & Technology, Branch Laboratory, Lamphelpat, Imphal. The award carrying Rs 10,000/- cash, citation, memento and shawl each were handed over to the two Awardees by the Chief Guest of the function.



Director, MASTEC handing over State Science Communicator Award 2016 to Dr. H. Birkumar Singh of NEIST, CSIR

2.16 4th State Level Aquarium cum Flower Exhibition

The 4th State Level Aquarium cum Flower Exhibition was inaugurated at a function at Manipur Science Aquarium complex, Imphal on March 31, 2016. Er. Rajen Singh, State Informatics Officer (SIO), National Informatics Center, Govt. of India, Imphal and Dr. Ibocha Singh, Principal, D.M.College of Commerce were the Chief Guest and President of the function respectively. Shri. Surendranath Singh, Director, MASTEC presided over the inaugural function. During the exhibition, 30 local and 48 exotic fish species were displayed. On an average, viewers of about 300 persons per day witnessed the exhibition. The Aquarium cum Flower Exhibition concluded on 13th April 2016.

3. Projects :

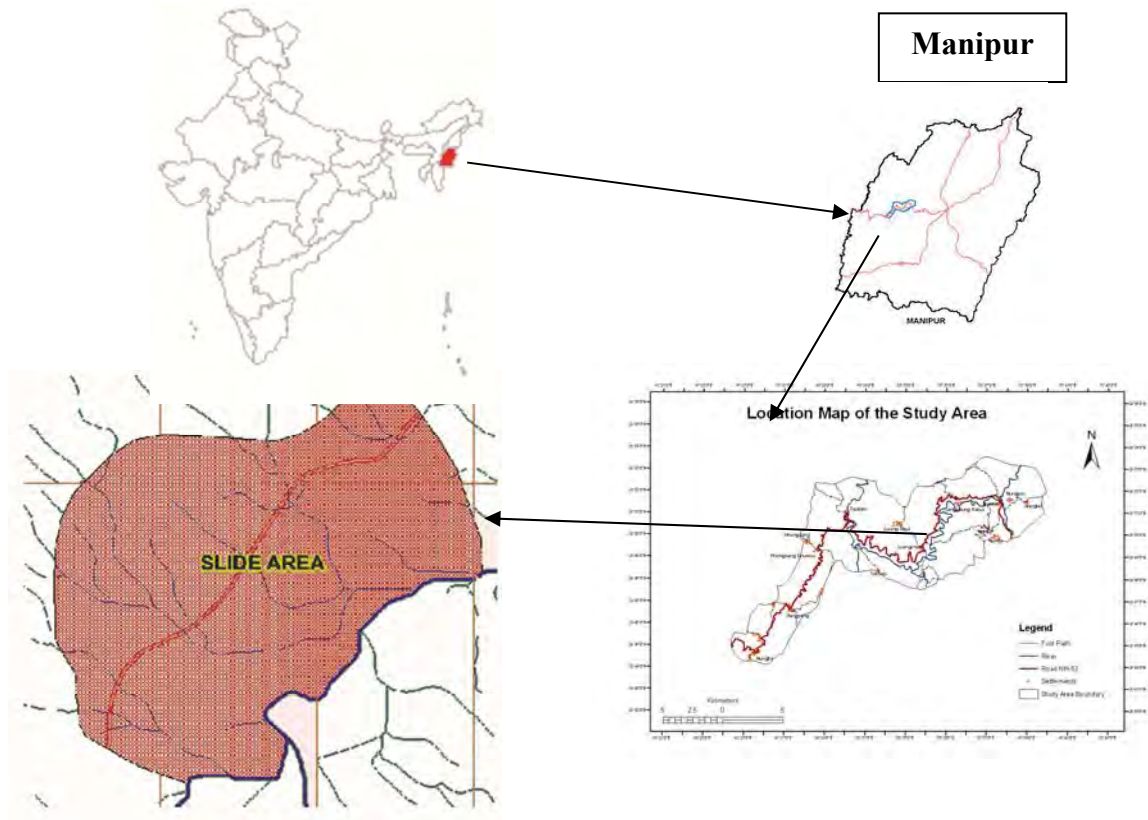
The Council implemented the following projects during the year 2015- 2016.

3.1 Geological and Geotechnical Investigation of two sites located between Noney-Nungba along NH-37 and suggest remedial measures

The project was sponsored by DST, Govt of India for a period of 2(two) years. The objectives of the project included

- To study geomorphology, geology and structural parameters for slope stability and generate detailed maps on 1:500 scale
- To study soil and rock mechanical properties and their influences on slope stability and to recommend remedial/preventive measures

Location Map

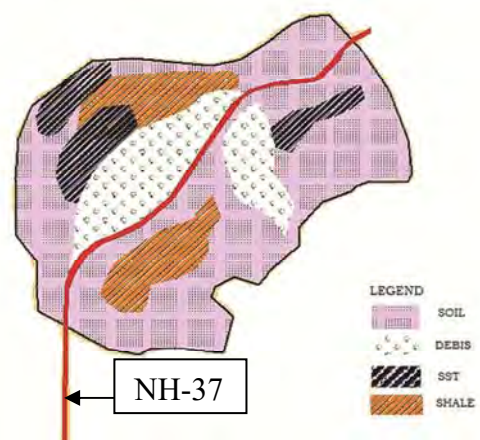


Study Area :

The identified study site is located between 24°50'00"N – 24°50'10"N to 93°28'44"E- 93°28'56"E about 40 km from Noney along NH- 37 with an area of about 0.007 Sq. km. Circular type of slide has been observed and this type of failure often occurs on hill slopes characterized by overburden soil and debris and it slides down by a vertical height of about 100 m.

Lithology mapping:

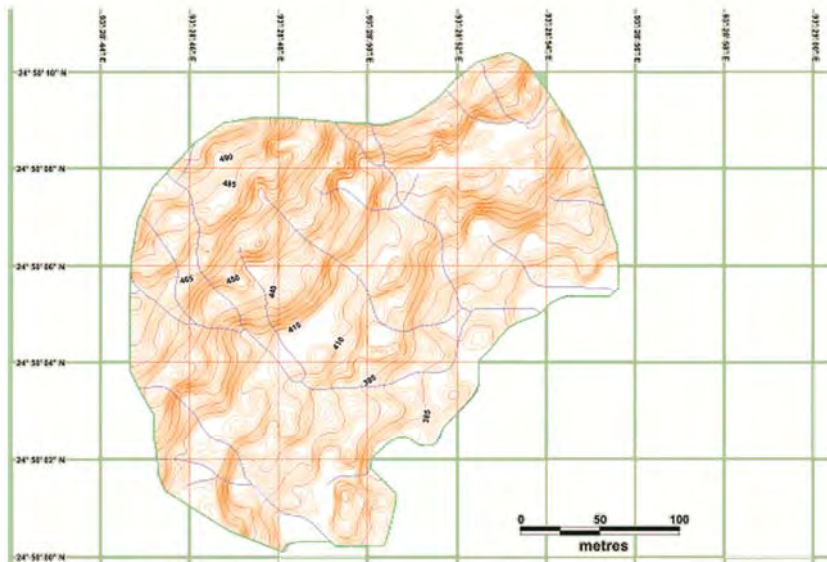
The rocks in the area are occupied by the Barail Group of Sedimentary rocks such as shale, sandstone respectively with debris and soil as envelope and in some areas they were well exposed to weathering agent. The slope forming materials predominantly consist of debris made up of silty and sand mixed with some clay along with very small amount of rock debris. The constituent litho units are susceptible to weathering and erosion leading to slopes failure and mass wasting on moderate to large scale. The stratified nature of rocks, affected by deformation, plays important role in causing landslides.



Lithology of the study area

Contour mapping:

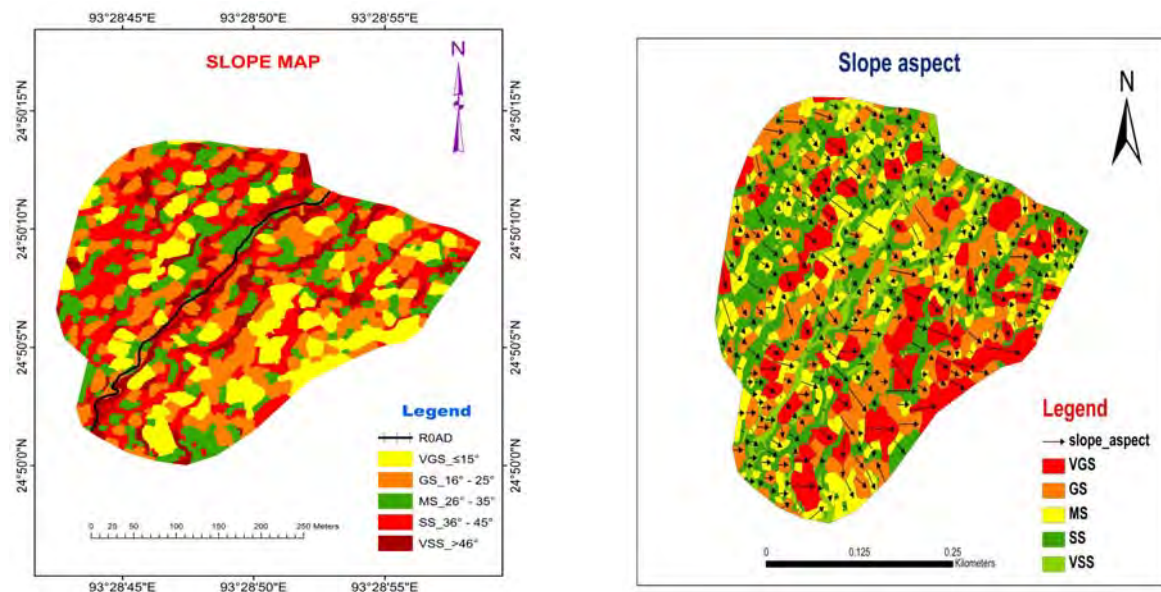
The contour map has been prepared on the scale of 1:500 with 50 cm interval, which provides details about the study area regarding the altitude and slope. The hill slopes were gently dipping along the *South-East* direction. The highest point of the hillock is 490 metres lying on the north-west while the lowest point is marked as 385 metres.



Contour map of the study area

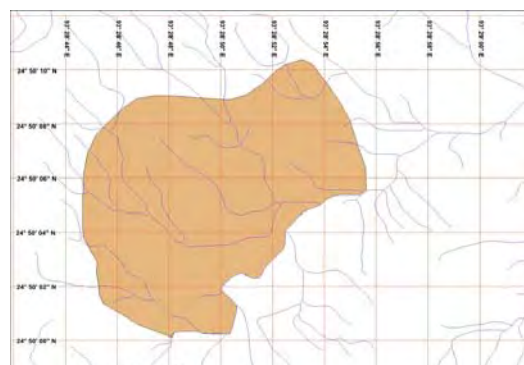
Slope Classification:

The slope of the study area has been classified into five types such as i) Escarpment/cliff slope, ii) Steep slope, iii) Moderate slope, iv) Gentle slope and v) Very gentle slope.



Drainage:

Drainage density is the index of porosity and permeability of the soil. Detailed drainage map has been prepared by using recent topographic sheets. Along with the slope, drainage was flowing along the *South-East* direction. The mode of connection made by the minor stream to the main stream and pattern shows a distinct Dendritic pattern.



Drainage map

Subsurface Geology:

Geophysical resistivity surveys using *Resistivity Tomography Survey* method had been carried out to evaluate the subsurface geology, the thickness of topsoil, weathered zone, fractured zone and depth to bed rock.

3.2 Tricycle Rickshaw Operated Paddy Thresher

The project was supported by DST, Govt. of India and taken up with the objectives such as i) to develop and fabricate a tricycle attached paddy thresher for socio-economic development and ii) to introduce and demonstrate the thresher to the farmers in and outside the state.

The project was implemented in 2 (two) phases namely Phase I- Fabrication of the paddy thresher and Phase II - Field trial run and demonstration.

About the Thresher

The Thresher is operated manually just like driving a Tricycle Rickshaw. It does not require electricity or any other fuel operation. It can also be used to thresh moist crop and keeps the whole straw unspoiled after threshing instead of cutting/chopping by the heavy duty diesel operated Paddy Threshers.

Under this project, altogether 12 (twelve) Nos. Tricycle Paddy Threshers have



Paddy Thresher



Paddy threshing in the field

been fabricated and field trials have been carried out at different sites/locations in the three paddy harvesting seasons i.e. during November-December in the year 2013, 2014 and 2015. The experimental data generated during the trial period is as given below:

S.No.	No. of labour	Threshing Time (hr)	Quantity of Paddy threshed (kg)
1.	3	1	300
2.	5	1	550

New Observations

From the field trials carried out for threshing mustard oil seed it has been observed that the Tricycle Thresher can thresh the mustard oil seed effectively with encouraging output. Thus the Tricycle Paddy Thresher can be used not only to thresh paddy but also to thresh other similar crops.

Patent

1 (one) No. Patent filed (Patent application No. 1128/KOL/2013 dated September 30, 2013 entitled TRICYCLE THRESHING MACHINE). Published in the Indian Patent Office Journal (Patent office, Kolkata).

3.3 MASTEC – ICAR joint venture project on pisciculture and its allied activities for socio-economic development in Manipur supported by DST, Govt. of India

The project was implemented in two phases. In the first phase, about 65400 fingerlings of mixed carps comprising of species *Cyprinus carpio* (Common carp), *Ctenopharyngodon idella* (Grass carp), *Cirrhinus mrigala* (Mrigal), *Labeo rohita* (Rohu), *Catla catla* (Catla) were stocked in the water spread area of 7.19 hectares at the farms of 11 beneficiaries. The composition of the fishes were 5% surface feeder mainly *Catla catla*, 20% column feeder (*Labeo rohita*) 50% bottom feeder (comprising of *Cyprinus carpio* and *Cirrhinus mrigala*) and 25% Grass carp. Fishes were fed with rice bran, oil cake and pellet in the composition of 40%, 40% and 20%. Regular monitoring of the quality of water spread, diseases etc. revealed that the growth of the fishes in all the farms was more or less the same and this might be perhaps due to adoption of the same water management, feed management as well as manuring techniques in all the locations. Survival rate of about 75% was observed in the farms. A total of 14302 kg of fish had been produced in the first phase.



Hormone injection *Cyprinus carpio*

In the 2nd phase, ponds renovation such as strengthening of the embankment, deepening of the shallow ponds, fixing of siphoning pipes, and eradication of weeds, insects and weed fishes was taken up in the demonstration farms. Insects were eradicated by soap oil emulsion method (1:3) and weed fishes by frequent netting. Liming of the ponds at the rate of 300 kg per hectare and manuring using raw cow dung at the rate of 2000 kg per hectare was done.



Distribution of fish fingerlings

Feeds were distributed to the beneficiaries as critical inputs. About 60396 fingerlings of mixed carps comprising of *Catla catla*,

Labeo rohita, *Cirrhinus mrigala*, *Ctenopharyngodon idella*, *Cyprinus carpio* were distributed to the beneficiaries for stocking in their farms. On completion of 8 months, the stocks were harvested in the month of March 2016. Survival of about 61% was recorded in the total water spread area of 7.19 hectares. A total of 13550 kg of fish was produced.

Demonstration on breeding of highly priced local fish species *Bangana dero* and *Osteobrama belangeri* was extended to one farmer Shri Ranjit Singh at Arapti in the month of October 2015. Fish farming technique was also extended to one farmer and a new pond of about 0.5 ha has been dug in his land at Wairi.

A highly priced and ornamental hill stream fish *Barilius sp.* was found in Manipur. During the month of April 2015, fries of *Barilius sp.* were collected from Litan river and transferred to the pond of Litan demonstration farm for mixed culture with different carp species. Normal feed such as rice bran, oil cake and pellet was given and the fish attained growth. It was learnt that culture of *Barilius sp.* can be taken up in ponds. Breeding of this fish will be tried when the fish attains maturity.



Fish harvest at farm

Local and exotic ornamental fishes were reared in Manipur Science Aquarium. Critical inputs such as feed and medicines were distributed to the 4 beneficiaries. Some local ornamental fishes from various places of the state were also collected and reared at aquariums. The fishes were from various water bodies such as lakes, ponds, rivers, canals etc. About 25 local sp. and 29 exotic fish species were available in the centre.

Natural Breeding of Jewel chichlid (*Hemichromis bimaculatus*) was tried with the available facilities at Manipur Science Aquarium. During the month of June 2015, natural breeding of Jewel chichlid was operated. Survival rate of the fry was 80%.

3.4 Patent Information Centre supported by DST, Govt. of India

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) Wireless mobile to mobile power transfer, iii) Roof top Rain Water Harvesting Tank, iv) Electric Spinning machine, v) Technology for automatic operation of water pumping engine and vi) Eco multi stove for necessary patent filing process.

Patent Applications Submitted

The Patent application for Wireless Mobile to Mobile power transfer has been submitted with reference No. PAA 2146 of 9/06/2015

Publication:

The **Tricycle Threshing MACHINE** (Patent Application No. **1128/KOL/2013**) was published in the Patent Journal of India on **03/04/2015**

Examination request filled

A new method of separation and isolation of indirubin from KUM (*Strobilanthes flaccidifoliosus* nees.) leaves has been filled with Application Number 0695/KOL/2013 on 05/10/2015 for examination and Tricycle Threshing Machine (Application Number 1128/KOL/2013) has also been requested for examination

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

The Intellectual Property Facilitating Centre (IPFC) was set up at Patent Information Centre, Manipur under the support of Ministry of Micro, Small and Medium Enterprises (MSMEs), Govt. of India with the objectives of determining IPR needs of selected clusters of MSME in the state and extend legal, financial and technical support to them for protecting intellectual property of the industries such as patents, trademarks, design, copyrights etc.

Kanglei Esing has been filed for its trademark with Application No. 3097086 in Class 32 dated November 9, 2015

The documentation on the items such as Kouna Products, Potloi, Nungbi Pottery has been in progress for GI registration

3.6 Manipur Science Aquarium supported by DST, Govt. of Manipur

The Manipur Science Aquarium has various indigenous fish species collected from different locations in the state. Attempts have been made to study the biology, food and feeding habit etc. of these indigenous fishes.

The project staff of the centre visited the rivers, streams and lakes in the state such as Litan River, Iril River, Khuga River, Loktak etc. in the state for collection of indigenous local fishes. Some individuals also donated different local fishes such as Crocodile Fish, Ngawa (*Barilius* Sp.), Pengba etc. to the Centre.

Disease Outbreak

The Fishery officer and its team examined carefully the outbreak of diseases from time to time and found the diseases such as Dropsy, Argulus infection (actoparasite), White Spot, Fungal infection etc, spread out among some fishes kept in the aquarium

tanks. Appropriate treatment was also done to protect the fish from diseases.

Fish Collection

The officials of the centre visited rivers and places of the state such as - Imphal River, Litan River, Iril River, Ithai River, Thanga, Moirang etc. and collected local indigenous fishes such as Ngawa (*Barilus bola*), Ngamhai (*Chanda nama*), Lanmeithanbi (*Aplocheilus lineatus*), Ngapemma (*Colisa fasciata*), Kandala (*Notopterus notopterus*), Ngaten (*Ompok bimaculatus*), Ngamu (*Channa punctatus*), Nylon Ngamu (*Glossogobius giuris*) Ngamu sengum (*Gara lamta*), Ngasheksha (*Osteobrama cotio*) etc.

Anniversary

The Fifth anniversary of Manipur Science Aquarium was observed on 31st March 2016 with an exhibition of aquariums and flowers during which 30 local and 48 exotic fish species were displayed. Apart from the normal visitors, schools and organisations visited the centre in groups.

3.7 Generation of Pony Based Animal Energy for utilisation in Agricultural Development of Manipur State” supported by DST, Govt. of India

The project is a joint venture project of the Council, Imphal and Dept. of Animal Sciences, Central Agricultural University (CAU), Imphal. Major activities with R&D part were being carried out at Central Agricultural University.

4.0 Meetings/Trainings attended by Officers

Name of official with designation	Meetings / Trainings	Sponsoring agency	Venue	Period
Th. Surendranath Singh, Director	All India State S&T Councils Meeting	DST, GoI	Jaipur	August 27-28, 2015
	Conference on Disaster Risk Reduction	NEC, Govt. of India	Shillong	November 23-25, 2015
	State S&T Councils Meeting	DST, GoI	INSA, Delhi	December 14-15, 2015
	Collection of Solar LED kits	DST, Govt. of India	Kohima	March 23-24, 2016
Dr. L. Dinachandra Sr. Scientific Officer	All India State S&T Councils Meeting	DST, GoI	Jaipur	August 27-28, 2015
Dr. L. Minaketan Scientific Officer	Consultative meeting on National data sharing policy	DST, Govt. of India	ASCI, Hyderabad	June 12, 2015
	PAC (Project Advisory Committee) Meeting	DST, Govt. of India	INSA, Delhi	August 26 - 27, 2015
	Olympiad Exposure Camp	HBCSE, TIFR, Govt. of India	Mumbai	Nov 30- Dec 03, 2015

Kh. Rakesh Scientific Officer	Demonstration of Hybrid Solar Lamp and collection of 10 lamps	DST, Govt. of India	Kohima	March 23-24, 2016
Er. Ch. Sarat Singh Scientific Officer	Core Group Meeting: SSTP	DST, Govt. of India	Bhubaneswor	May 14, 2015
	PAC (Project Advisory Committee) Meeting	DST, Govt. of India	INSA, Delhi	August 26 - 27, 2015
Dr. R.K.Pritamjit Scientific Officer	Project Advisory Committee Meeting	DST, Govt. of India	Bangalore.	August 11-12, 2015

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	Nripen Saikia Sr. Lecturer, DIET,	DIET, Nalbari, Assam	Resource person -Hands on Experiment	January 27-30, 2016
2	Dr. Ph. Brajayanti Associate Professor	NERIE, NCERT, Shillong	Resource person – Teachers' Science Congress	Feb 2-4, 2016
3	Dr. S. Mule Scientist -H	Bhabha Atomic Research Center, Mumbai	Meeting with State S&T Council officials and site visit for feasibility studies for installation of BARC technologies	Feb 29 – March 1, 2016
4	Er. V.K.Upadhyay Scientist - D	Bhabha Atomic Research Center, Mumbai	Meeting with State S&T Council officials and site visit for feasibility studies for installation of BARC technologies	Feb 29 – March 1, 2016

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 science 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.