

Annual Report

2012 - 2013



Manipur Science & Technology Council
Central Jail Road, Imphal-795001

CONTENTS

1.0	Background	1
1.1	Objectives of the Council	1-2
1.2	Organisation	2-3
1.3	Existing Staff	4
2.0	Short-term Activities including Science Popularisation	5
2.1	Science Meet 2012	5-10
2.2	Transit of Venus	10-12
2.3	Contact Programme for Talented Girls School Students of Manipur	12-17
2.4	Contact Programme for Talented Boys School Students of Manipur	17-21
2.5	Vigyan Prasar Edusat programme	21-22
2.6	Training Programme on Writing Research papers	22-23
2.7	Science for Sanitation Month Celebration	23-24
2.8	Eco-water literacy campaign	24
2.9	Training Workshop on Science Writing / Journalism	25
2.10	Aquarium Exhibition-cum- Flower Show	24-25
2.11	One day Brain Storming – Challenges in Water related issues	26-31
2.12	Millennium Science Lecture	31
2.13	Observation of National Mathematics Day 2012	31-34
2.14	National Science Day 2013 Observation	34
2.15	District level Nature Camp for Thoubal district of Manipur	35-37
2.14	District level Nature Camp for Bishnupur district of Manipur	37-38
3.0	Projects	
3.1	Patent Information Centre (PIC), Manipur	38-39
3.2	Intellectual Property Facilitating Centre (IPFC), Manipur	39-40
3.3	Manipur Science Aquarium	40-41
3.4	Community Pond Based Safe Drinking Water System	41
4.0	Meetings / Training attended by Officers	42-43
5.0	Visiting Scientists to MASTEC	44
6.0	Library	44
7.0	Projects in Pipeline:	44-45
8.0	Audited Statement	

MANIPUR SCIENCE & TECHNOLOGY COUNCIL

1.0 Background

The Manipur Science & Technology Council (MASTEC) formerly, State Council of Science and Technology & Environment, Manipur was set up in the year 1985 with the initiatives from the Department of Science and Technology, Government of Manipur. The Chief Minister, Manipur and the Minister in charge (S&T), Manipur are the Chairman and the Vice Chairman of the Governing Body of the Council. The Secretary (S&T), Government of Manipur is the Member Secretary of the Council. 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 subsequent to a decision of the state cabinet.

The autonomous Council is served by its own Secretariat of twenty manpower 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 autonomous Council works in co-ordination with the State Directorate of S&T in various areas of activities.

1.1 Objectives of the Council

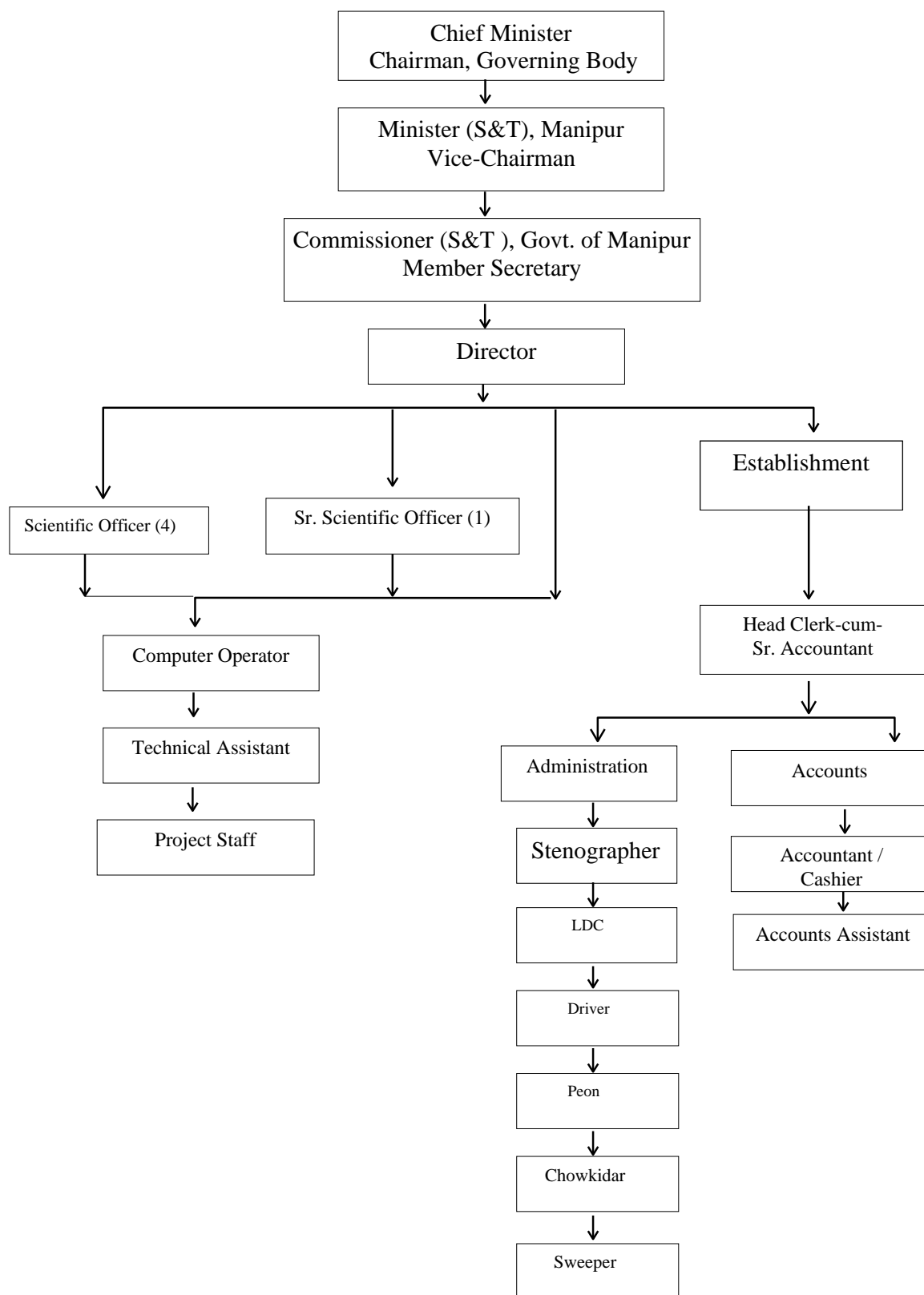
- To identify areas in which Science, Technology and Environment can be utilised for the achievement of the Socio-economic objectives of the State and in particular, tackling the problems of backwardness and underprivileged sections of Society;
- To advise on policies and measures necessary to promote 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 Science and Technology bodies having similar or related objectives;
- To identify priority areas of Science, Technology & Environmental need for long term development of the State;
- To safeguard and promote the ecology and environment in the State of Manipur;
- To utilise Remote Sensing Techniques for planning, implementation and monitoring of development 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, raise subscriptions and receive grants, loans and subsidies from Government of India, Government of Manipur and other supportive agencies in India and abroad and to invest the resources towards the achievement of the objectives of the Council.

1.2 Organisation

The Council has a Governing Body consisting 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 staff members (including five 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, S&T, Government of Manipur is the Member Secretary of the Council. The Member Secretary is the Chief Executive of the Council Secretariat. The structure of the existing organization is shown in the chart.

Organisation Chart



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	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	A. Tombi Devi	B.A.	Stenographer
12	R.K. Bhanisana Devi	B.Sc.	Accountant
13	H. Thangthianmang	B.A	L.D.C.
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	Mrs. Chingthanching	VIII Passed	Chowkidar
20	Kh. Leidou Maring	VIII Passed	Sweeper

Project Staff :

21	L.Nilkumar Singh	B.Sc. (Fishery)	Fishery Officer
22	L. Surjit Singh	M.Sc. PGDCA	J.R.F.
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 organised various centrally sponsored training workshops and other short term activities relevant to the state including science popularisation with a big success to fulfil the objectives for establishment of the Council. The Council receives overwhelming response from all sectors of the scientific community in the state while implementing S&T programmes. The following were the short term programmes implemented by the Council during the year 2012- 2013.

2.1 Science Meet 2012

Manipur Science & Technology Council in association with four leading science NGOs namely, 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 the 5-day long Science Meet 2012 during May 11-15, 2012 at Iboyaima Shumang Leela Shanglen, Imphal. The programme was catalysed and supported by National Council for Science & Technology Communication (NCSTC), Department of Science & Technology, Government of India, New Delhi and Department of Science & Technology, Government of Manipur. Science Meet forms the biggest science festival in the state and is organized as a regular feature every year. The Meet aimed at creating a common platform for students where they can interact with teachers, scientists, science lovers and exchange scientific views among themselves.

Shri M. Okendro Singh, Minister (Education) inaugurated the Science Meet 2012 with a function and Dr Kh. Ratankumar Singh, Minister (Works) presided over the inaugural function. The activities of Science Meet 2011 included Competitions, Exhibitions, Popular Science Show, Folk Form of Communication, Scientific Demonstration-cum-Lecture, Tara Mandal show etc. The competitions included Science Model, Science Quiz, Spot Painting, Declamation, Best Appreciation Award and Best Guide Teacher Award for Science Model. The Exhibitions included Science Model, Book, Information Technology, Innovative Technologies Exhibition etc. The Popular Science Show covered Animated Scientific Films, Explaining Science behind Miracles and Tara Mandal Show. 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 single student or a team of two students from the same school were allowed to participate and display an exhibit model. Altogether fifty two models were exhibited by 98 students from different schools in the State. Dolly Devi Ahongshangbam and Moirangthem Langamba of Manipur Standard English School, Kakwa



Students displaying Science Models

stood first for their model “Gasifier Stove”. Phanjoubam Dafneshan Singh and Yoihenba Huidrom of Maria Montessori Sr. Sec. School, Koirengei were placed in second position for their model “Solar-wind energy system”. Mr Maibam Tabassum Naaz Alam and Sagolsem Sylvia Devi of Halleey English School, Imphal got the third position for their model “Solar Thermal Power Plant”. The consolation prizes went to the students team from five schools namely M. Rashad Ali and Sorokhaibam Ronald of Brighter Academy, Imphal for their model “Farm Yard Wastage Recycler”, Deepashree Hanjabam and Nikita Ahongshangbam of Maria Montessori Sr. Sec. School, Koirengei for their model “Fight obesity = Save energy”, Lalngamba Sanasam and Heikham Gunachandra of JNV Umathel for their model “Eco-friendly hydro power generation scheme for rivers in hilly terrains”, Miss Babiya Moirangthem and Ningthoujam Teresarani of Maria Montessori Sr. Sec. School, Koirengei for their model “Electricity from Rice Husk-Green Technology”, Kavita Kanchan Ningthoujam and Shelina Moirangthem of Mega Manipur School, Yaralpat for their model “Generation of electricity by rotating charkha” respectively.

The best guide teacher award for the Science Model Competition was awarded to Siddhesh Irom of Maria Montessori Sr. Sec. School, Koirengei.

Science Quiz Competition

The competition was organised for students reading in Class IX-XII Science.

Thirty nine teams registered for the competition. Each team comprised of two students. Through a preliminary round - Written Contest, five teams were selected for the final round quiz. Moirangthem Bobby Singh and Md. Tamijur Rahman of Johnstone Higher Secondary School, Imphal got the first position. The second position went to Keisham Tampha Ibema and Sonia Naorem of Herbert School, Changangei. Mr. Keisham Chaoba and Ke Lairenjam of Herbert School, Changangei got the third prize.



Student's 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) respectively. Altogether 69 students from 32 schools, 71 students from 38 schools and 39 students from 20 schools participated in the painting competition of the Sub Junior, Junior and Senior Category respectively. In the Sub-Junior Group Ankita Moirangthem of Maria Montessori Sr. Secondary School, Abraham Nongthombam of Christ Jyoti School,



Students participating Spot Painting Competition of Science Meet 2012

Mantripukhri and Nongpoknganba Soram of Mega Manipur School, Yarlpat were conferred the first, second and third positions respectively. Miss Maibam Brenda Devi and Ningombam Veeshal of Mega Manipur School, Yarlpat got the consolation prizes respectively.

In the Junior Group, Yumnam Rahul Singh of Blooming Dale School, Imphal was given the first prize. The second prize went to Rajkumari Karishma Devi of Little Flower School, Imphal and the third position went to Olina Rajkumari of Mega Manipur School, Yarlpat, Imphal East District. Aditya Prashanta G.A. of Shishu Nistha Niketan, Imphal and Jackson Akoijam of New Era English School, Paona Bazar were given the consolation prizes.

In the Senior Group, Kshetrimayum Rojesh Singh of Model Higher Secondary School, Imphal was given the first prize. Laiphrakpam Roshan of Regular English High School, Imphal and Asem Indrajit Singh of The Brilliant Public School, Samurou were given the second and the third prizes respectively. Sanahal Phairenjam of Don Bosco School, Langjing and Dayapatra Hidam of the Brilliant Public School, Samurou got the consolation prizes respectively.

Declamation Contest

The competition was opened to the students reading in Class IX-XII Science.

Twenty three students from various institutions participated in the competition. 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. The topics for the contest were i) Nuclear safety ii) Water scarcity in Manipur iii) Year of Mathematics iv) Power crisis in Manipur and its impact v) Biodiversity with special reference to Manipur. Malemnganba Sanasam of JNV, Thoubal won the first position. Miss Ningthoujam Asharani Devi of Herbert School, Changangei and Parikshit Thoudam of Sainik School, Imphal got the second and the third positions respectively.



*A student taking part in the
Declamation Contest of Science Meet*

Champion of Science Education and Leader of Science Education Awards

In Science meet 2012, the Council introduced two new awards entitled “Champion of Science Education Award” and “Leader of Science Education Award”. These two awards were given to two schools on the basis of number of participants in various competitions and number of prizes/awards received by the participating schools in Science Meet. The winner is called “Champion of Science Education and the runner up is called “Leader of Science Education”. The Mega Manipur School, Yarlpat, Imphal East district was the winner of Champion of Science Education Award 2012 and the Maria Montessori Senior Secondary School, Koirengei, Imphal East got the Award of Leader of Science Education.

Best Appreciation Award

The Best Appreciation Award was introduced by MASTEC to be given to a student who proves to have gained the maximum knowledge of science from the Meet as judged by questionnaire response and personal interview. The Appreciation Award was selected from amongst 95 participants of different standards. The award was given to Parikhshit Thoudam, Class XII of Sainik School, Imphal



*Students competing for
Best Appreciation Award 2012*

Book Exhibition

Science Book Exhibition was one of the activities of the 5 day long Science Meet 2012. Students, teachers and parents paid visit to the stalls and bought books of their interests. The leading local book stores such as Sucheta Book & Publishers, Imphal, Sangam Book Store, Imphal, Job Centre, Imphal and Sharma Book Agency, Imphal took part in the exhibition. Job Centre, Babupara, Imphal and MASCA also displayed their own collections

IT Show

Four local computer institutions/firms namely i) Swift Infotech Endeavor, Imphal, ii) Mangall's Infotech, Pologround, Imphal, iii) Emoinu Computer Enterprises, Governor Road, Imphal and iv) DEC Computers, Imphal took part in the IT show and interacted with the visitors, especially, students.

Crafts Exhibition

As a special feature of Science Meet 2012, five local craftsmen/crafts firms took part and displayed their special craft products during the Meet.

Explaining Science Behind Miracles

Miracles or magic are age-old human activities, which make the people wonder or confuse and sometimes mislead the general public. The expert members of GENIM demonstrated some items of Science behind miracles and the scientific reasons were also explained to the audience. It was kept for 3 (three) days of 2 (two) hours each day and every day hundreds of students & general public witnessed the programme

Scientific Film Shows

Science films were screened for one hour duration on all 5 days of the Meet. These scientific films were the collections of MASTEC and Vigyan Prasara, New Delhi. A few scientific films screened during the Meet included Radio, X-ray, Oyster Mushroom, medicinal Plants of Manipur, Waterworks, Rain Water Harvesting etc.

Puppet Play

Considering the art of puppetry as an effective tool for communicating science to the people, members of MASCA presented two puppet shows entitled i) Laiphao and 2) Eshing Yokshi. based on importance of water to the mankind and Chemistry in our life.

Science Drama

A science Drama based on the focal theme "**Clean Energy Options and Nuclear Safety**" was performed by the local artists. The science drama tried to highlight the scientific progress of mankind and its drawbacks if not utilized properly.

Scientific Demonstration-cum-Lecture

Dr. R.K. Bhubon Singh, Associate Professor of Chemistry, Manipur University made demonstrations on Basic Chemical reactions and interacted with the students. Shri Ch. Rajendro Singh, Associate Professor of Physics, Imphal College delivered a lecture and also made demonstrations on "Our Universe & Transit of Venus". Dr. Vishal Santra of Jadavpur University, Kolkata presented on Biological Diversity with reference to locally available snakes in Manipur. Dr. L. Sanjoy Meitei of D.M. College of Science, Imphal delivered a lecture on Purification and Treatment of Water and Waste Water in Manipur



*A session of Lecture-cum-demonstration
of Science Meet 2012*

Valedictory Function

The 5-day long Science Meet concluded with a valedictory and prize distribution function. Shri O. Ibobi Singh, Chief Minister, Manipur and Shri Francis Ngajokpa, Minister (RD&PR/Econ. & Statistics), Manipur were the Chief Guest and President of the function respectively .

The Chief Minister stated that science becomes an integral part of human life and most of the human activities are controlled and fashioned by science right from the cradle to the grave. The Chief Minister stated that organising science meet every year in the state would be a measure of supporting innovation system and would help motivate students to opt science in their future career. He also stated that scientific capability is what determines our ability to overcome the challenges which lies ahead. Initiatives of MASTEC to promote science awareness are good sign for all the communities, general mass and the students in particular, he further added. Cash prizes with citations for various competitions were distributed to the prize-winning students by the dignitaries on the dais.



Chief Minister (Chief Guest) addressing on the valedictory function



Chief Minister distributing prizes to the students

2.2 Transit of Venus: June 6, 2012

Venus, the second planet from the Sun, is often called the Earth's sister planet because of its close similarity in diameter, mass, density and probably also in composition and internal structure. It is the brightest planet of the Solar System due to the thick cloud in the atmosphere reflecting 75% of the sunlight. Because of the phenomenon known as the Green House Effect with thick CO₂ (98%) in the atmosphere on Venus, its average surface temperature is about 480⁰ C due to which it is called the hottest planet of the Solar System. Venus orbits at an average distance of 108.2 million km from the Sun and completes one revolution in 225 earth days at an inclined angle of 3.4⁰ to the plane of Earth's orbit. Venus rotates backward compared to the Earth and much more slowly completing one rotation in 243 earth days. In the ancient Greek mythology, Venus is known as the Goddess of Love, Peace and Beauty. When Venus comes between the Sun and Earth, it is known as Transit of Venus. The event occurred recently on June 6, 2012.



The Planet - Venus

To make people aware about the rare natural celestial events and astronomy in general, Manipur Science & Technology Council, with the catalytic support from the NCSTC, DST, Govt. of India, organized extensive lecture series all over the state under the banner of Transit of Venus and also set up one Observatory unit (temporary) at G. P. Women College, Imphal and opened to the Public for witnessing the event on June 6, 2012. A special programme – Panel Discussion on Transit of Venus was telecast in the Local Cable, ISTV Network on June 5, 2012.

Extensive Lecture Series

On 24th May, 2012, the statewide extensive lecture series was formally launched at

the Human Resource Development Academy, Ghari, Imphal with Shri Th. Surendranath Singh, Director, MASTEC in the Chair. The Master Resource Persons namely - Shri Ch. Rajendra Singh, Associate Professor, Physics Department, Imphal College, Imphal, Shri M. Bidyachandra Singh, Associate Professor in physics, G.P. Women College, Imphal and Dr. R.K. Romen Singh, senior lecturer (physics), Thambal Marik College, Oinam were giving lectures on the Transit of Venus to the students, teachers and staff members of the schools and colleges.

Altogether 25 lecture programmes had been conducted in the state. The duration of each lecture programme was 2 hours and interaction and discussion was also held between the resource persons and students. At the end of each lecture programme, spot quiz was also



Ch. Rajendra Singh, Associate Professor, Imphal College delivering lecture on Transit of Venus at Sacred Heart School



Students attending the Lecture Programme at Standard Robert School, Canchipur

conducted for the participating students. The lecture programme received good response from the participating schools and colleges.

Observation of Venus Transit

The Council set up one Observatory unit (temporary) with installation of a Telescope on the roof floor of G.P. Women College, Imphal for observation of the Transit of Venus on June 6, 2012 across the disk of the Sun by the people of Manipur and the students in particular. Using LCD Projector and Video Camera. the telescopic image of the disk of the Sun was projected onto a big screen in a big room of the college where hundreds of students, teachers, science lovers and general public were accommodated in groups

batch by batch to see the rare event. All visitors were happy to see the Venus moving as a black dot on the disk of the Sun for about 10 minutes and during which Resource Persons were explaining and discussing the queries from the viewers. The sky was not very clear



Telescope installed to witness Transit of Venus on June 6, 2012

after 8 a.m. due to heavy clouds. However, while the transit was not seen due to heavy clouds, multicast live online video streams of NASA with footage from telescopes was projected on screen for the public.

A large number of people came to the college campus in the very morning. All the visitors were not accommodated to the room. As an alternative arrangement, the Council distributed solar filters to the people who already arrived at the college campus but could not be accommodated in the projection room. They enjoyed seeing the

Venus transit with the help of Solar viewer. Resources persons guided the viewers while using the Solar



People witnessing Venus transit on June ,using solar viewer

Viewers since improper use of the Solar viewer or looking at the Sun continuously even with the Solar viewer was harmful to the eyes.

On the day of the transit, Spot Quiz was also conducted for the viewers particularly the students. The programme was supported by NCSTC, DST, Government of India.

2.3 Contact Programme for Talented Girls School Students of Manipur

The residential type Contact Programme for Talented Girls School Students of Manipur was organized during June 26-30, 2012 at the Training Hall of the Art & Culture Building, Imphal. The programme was catalysed and supported by National Council for Science & Technology Communication (NCSTC), Department of Science and Technology (DST), Govt. of India, New Delhi. The programme was inaugurated with a function by Shri L.P. Gonmei, IAS, Principal Secretary (S&T), Govt. of Manipur. Prof Sh. Dorendrajit Singh, Head of Physics Department, Manipur University attended the function as the Honored Guest. Shri Th. Surendranath Singh, Director, Manipur Science & Technology Council presided over the function. In his inaugural address, Shri Gonmei said that the class IX standard is the most vital stage for stimulating genuine interest in science. Once they are motivated and curiosity of science is created in their minds, many students would prefer to go in any branch of sciences for study. Scientist, Teachers and Parents are equally responsible for it, he further said. He also said that understanding a science lesson in depth is



L.P. Gonmei, Chief Guest delivering inaugural address

influenced by performing experiments. This will help a child memorise the science lesson long way he further said. He appealed to the participants to interact more with the scientists in the emerging areas of science while visiting R & D laboratories. The activities of the five day programme included visiting various research & development laboratories and meet the scientists, science popular lecture cum demonstrations, face to face with distinguished scientists, science elocution, hands on project etc.

Altogether forty four girl students including guide teachers from eleven selected Schools from five districts including one hill district participated in the programme. The participating schools included Mannu English School, Imphal East, District, Mother's Pride Academy, Bishnupur District, Phungyar Hr. Sec. School, Ukhrul Hill District (ST), Paree Imom Sindam Sang, Langjing, Imphal West District, Don Bosco High School, Phayeng, Imphal West (SC), Brighter Academy, Imphal East, Victory High School, Kakching, Thoubal District (SC), Khurkhul Standard English School, Imphal West (SC), Sangai Hr. Sec. School, Mantripukhri, Imphal, Manipur Public School, Koirengai, Imphal, Mega Manipur School, Yaralpat. On the first day, Prof Dorendrajit Singh delivered a lecture on the topic "Science in every day life" and interacted with the participants. He elaborated on importance of science & technology in the 21st century. The same day, the participants were taken to the laboratory of DOEAAC Centre, Govt. of India, Akampat, Imphal. They learned about opening of e-mail account and email communication, IT security etc. and interacted with the scientists of DOEACC Centre. A team of Scientist led by Er. Y. Subhaschandra Singh, Scientist D assisted by Er. A. Buboo Singh, Scientist C and his colleagues helped the students to familiarise with handling of the computers. The students could create e-mail accounts of their own and started communicating among themselves without mistake.

The participants visited the various departments of Central Agricultural University, Imphal. Prof N Iboton Singh, Dean, Central Agricultural University (CAU) highlighted in brief about what agriculture sciences and interacted with the students. Prof. U. Chaoba Singh, Dr. L. Nabachandra Singh. Dr. M. Sumarjit Singh, Prof. M. Dhaneshwar Singh, Dr. Kh. Ibohal Singh of the University took part in the interaction with the participants. Dr. R.K.



Students visiting in the mushroom research centre with mushroom expert Dr. R.K.Tombisana devi

Tombisana Devi, Associate Professor of Plant Pathology demonstrated on mushroom propagation with minimal expenditure for a good income generation and interacted with the participants. The students worked on a project entitled "Rose Budding – A Case Study" under the guidance of Dr. R.K. Dilip Singh, Associate Professor of Central Agricultural University, Imphal.

The participants visited Manipur Science Aquarium and Edusat Centre of MASTEC and interacted with the scientific staff of the centre. Dr. Ch. Sivaji of the centre explained to

the students about Vigyan Prasar programmes as well as the ISRO's distance learning programme. Shri L. Nilkumar Singh, Fishery Officer of the Manipur Science Aquarium made a short explanation to the students on Fishery Sciences. The students interacted with him on breeding of local fish at the aquarium.

The participants visited Physics laboratories of Manipur University. The Professor and Head of Physics Department, Manipur University took the participants to the sophisticated laboratories including XRD, XRF, electronics labs. etc. of the department and also highlighted about the research activities carried out in the physics



Interaction in Physics Deptt, Manipur University

laboratory. Earlier before taking them to the laboratory, the Professor highlighted on “Contributions of Physics to the Society”. The students met some research scholars working in the laboratory for their higher studies leading to Ph.D.. The head of the department said that the country requires more number of scientists of different disciplines. He advised the students to pursue higher studies leading to research in any branch of basic sciences and serve for the nation.

The students were taken to the department of Earth Sciences of Manipur University.

Dr. M Sanoujam, Seismologist made a presentation on the topic “Earth quakes” and interacted with the participants. He further explained about the seismic zonation as well as location of north east India including Manipur in the earthquake map of the world. Then, he took them to the Seismic observatory and showed them the Seismograph.



Student participants attending an interaction with a Seismologist on Recent Earthquakes in Manipur at Seismic Observatory campus

Besides, he demonstrated how seismic waves were recorded at the observatory and also taught them how focus or

epicentre of an earthquake could be actually identified by calculation using the data obtained from the observatory. He made the participants aware about Dos and Don'ts before, during and after earthquakes.

The participants visited the Chemistry Department of Manipur University. Dr. Bhubon Singh, Associate Professor in Chemistry made a presentation in brief on the topic “Chemistry in our lives” and answered the questions raised by the students. Seeing

enthusiasm of the students visiting Chemistry lab, Prof. L. Warjit singh, Department department, M.U. advised them to take science as a career. In the evening, a lecture was delivered on the topic “Nobel Laureates in science & medicine” by Th. Surendranath Singh, Director, MASTEC and interacted with the students. In addition, he also spoke on the theme “Year of Mathematics” mentioning the life and achievements of (late) Shri Ramanujan, the great mathematician of the country.

The participants visited the Institute of Bio-resources & Sustainable Development (IBSD), DBT, Govt. of India. Dr. Indira devi, Scientist, IBSD highlighted to the students about the facilities as well as research activities carried out in the institute. She replied to a number of questions from the students on bio-resources with reference to the state of Manipur. Dividing the students into two groups, with the guidance of the faculties, the students were taken to the laboratories of the institute and showed them the R&D infrastructure as well as activities taken up at laboratories. The students met some researchers working in the laboratories of the institute.

The students were also taken to the laboratories of Manipur Institute of Technology (MIT). Er. L. Romesh Singh, Assistant. Professor, MIT delivered a lecture on Engineering Sciences and interacted with the students. Er. Romesh took the students to some laboratories such as electronics lab., computer lab., etc.



A Scientist of MIT performing a demonstration in the electronics laboratory of MIT

of the institute and also demonstrated some experiments. In the evening of the same day, Dr. Joychandra Singh of J.N. Institute of Medical Sciences gave a lecture on the topic “Medical Sciences for welfare of the people” and interacted with the participants on medical sciences.

The students had a science elocution in which each team comprising of two or three students made presentations on a science topic of their choice for a duration of six minutes each on the 5th day of the programme. The students team of Mannu English School and Mother’s Pride Academy made presentations on the same topic “Vitamins”. The students team of Phungyar Hr. Sec. School and Paree Imon Sindam Sang presented on the topics “One



Science Elocution in progress

Lady Scientists and Global Warming” respectively. The team of Don Bosco High School,

Phayeng, Brighter Academy and Victory High School Kakching made presentations on the topics “Water Pollution in Manipur, Human Digestive System and Transit of Venus” respectively. The student team of Khurkhul Standard English School, Sangai Hr. Sec. School and Manipur Public School spoke on the topic “Global Warming”. The team of students from Mega Manipur School also spoke on Global Warming. After the students made presentations, the Jury members asked some questions and students answered. The objective was to encourage them to speak on a science topic with confidence before an audience without fear.

A face to face with some scientists was arranged on 30th June 2012. The invited scientists for the face to face programme included i) Prof. L. Nabachandra Singh, Central Agricultural University, Imphal ii) Shri Ch. Rajendro Singh, Associate Professor in Physics, Imphal College, iii) Dr. R.K. B Singh, , Associate Professor, Chemistry Department, Manipur University, iv) Dr. Th. Randhir Singh, Asst. Professor in Animal sciences, v) Dr. O.



*Face to Face:
Scientists answering to the student's questions*



*A student asking question during face to face with
distinguished scientists*

Joychandra Singh, MD, JNIMS, Imphal. About 60 science questions were asked by the students and the experts answered and also shared their knowledge with the students.

The closing function of the programme was arranged on 30th June 2012 during which the participation certificates were distributed to all the students and guide teachers. All the scientists who took part in the face to face programme also attended the function. The Programme in- charge read out the summary of the activities performed in brief. Shri Th. Surendranath Singh, Director, MASTEC while delivering concluding remarks, appealed to the student participants to memorise what they had seen and learnt from visiting R&D laboratories. He advised them to fully utilise the knowledge they gained from participation in the programme for selection of science subjects of study in their future career.



Distribution of certificates to the participants

2..4 Programme for Talented Boys School Students of Manipur

The five day long Contact Programme for Talented Boys school students of Manipur was organized during July 16-20, 2012 at the Training Hall of Art & Culture Building, Imphal. The programme was catalysed and supported by NCSTC, DST, Govt. of India, New Delhi. Altogether 44 participants from 11 schools (three students and one guide teacher from each school) from different parts of the state attended the five day residential programme. The inaugural function was graced by Shri L.P. Gonmei, Principal Secretary (S&T), Govt. of Manipur as the Chief Guest. Dr. N. Rajmuhon Singh, Professor in Chemistry, Manipur University was the Guest of Honour and Th. Surendranath Singh, Director, Manipur Science & Technology Council (MASTEC) presided over the inaugural function. Addressing on the function, L.P.Gonmei stressed on the need to give proper guidance to students in whichever field of science they wish to make a career.

While speaking as Honoured Guest, Dr. Rajmuhon mentioned the need for Contact programmes to motivate students at the right time which would help them to choose right subject of study. He further expressed about the importance of interaction of the students with working scientists in the laboratory. Visiting scientific laboratories by students and interaction with scientist will enhance their knowledge and help them learn how research work is carried out in the laboratory. Th.



Prof. Rajmuhon Singh speaking as Guest of Honour

Surendranath Singh, while delivering presidential remarks mentioned about the activities on popularization of science which the Council had been implementing in the last few years.

The main objective of the Programme was to give the students an exposure to the exciting world of science and motivate them to take up science as a career. The schools participating in the programme included Mother's Pride Academy, Bishnupur District, Don Bosco High School, Phayeng, Imphal West District, Khurkhul Standard English School, Brighter Academy, Imphal East District, Sangai Hr. Secondary School, Mantri pukhri, Manipur Public School, Koirengei, Wangkhei Govt. High School, Universal Students Academy, Mega Manipur School, Koirengei, Keisamthong Govt. High School and Don Bosco, Langjing, Imphal West. The Head Masters / Principals of schools nominated their three best students and one teacher from their schools for the programme and selection of the participants was done on first come first served basis.

The activities included visits to research laboratories, academic institutions including universities, popular science talks, face to face with scientists, science elocution on science topics, hands on practical experiments.

On the first day, Dr N Rajmuhon delivered a science talk on “Nano science materials and its future scopes”. Then, the students were taken to the computer laboratory of DOEAAC, Govt. of India, Imphal Centre. They learnt some specific areas of IT such as Opening of E-mail ID, E-mail

communication, IT security etc. The faculties of the centre namely, Er. A. Baboo Singh, Scientist C and his technical colleagues namely Kh. Subhabati Devi, A Lorendro, G. Gailunglu, B. Binita, Sangeeta N, N. Tabasana Devi, Priyabati, Nirmala and M. Binarani guided the student participants in the computer laboratory of DOEAAC. and helped

them learn some aspects of IT. During the session at DOEAAC center, all the student participants could open e-mail accounts of their own and start communicating among themselves. The Scientific staff also monitored the performance and enthusiasm of the student participants while conducting the practical in the center. Apart from learning E-mail related issues by use of computers, the students also interacted with the scientific faculties of the centre on scopes of IT. On the second day, the participants were taken to the Centre for



*Students' practical in computer applications
- Creation of E-mail accounts in progress*



*One women faculty interacting with students
in the lab. of Orchid Gene Conservation*



*Participants on walk to the farm science
centre in the KVK campus, Hengbung,*

Orchid gene conservation of Eastern Himalayan Region at Hengbung, Senapati district about 70 km from Imphal City. Dr. R.K. Kishor Singh, Scientist - D of the centre highlighted in brief to the students about the activities being carried out in the Orchid research centre. The students in three groups guided by scientific faculties of the centre were taken to different labs of the centre including Tissue culture and the green house where endangered orchids of different species were kept. The students asked questions to the research scholars working in the respective labs and discussed regarding identification and collection of the orchids from the fields. The faculties of the centre took the participants to the hybrid orchid farms of the centre where thousand of hybrid orchids were preserved for further study. Earlier, they also visited the research units and farm science centers including Emu birds breeding unit of the

KVK, Hengbung. Dr. Shabir Hussain khan, Scientist, KVK also highlighted about the research activities of the KVK in Senapati district and interacted with the participants.

The participants visited Physics Department of Manipur University. Dr. S., Brajamani Singh, Associate Professor in Physics delivered a lecture on the topic “Physics and its contributions for the societal development” and then interacted with the students. He then, took them to Electrical & Electronics, XRD lab, Scanning Electron microscope etc. and made demonstrations. Then, the participants made a visit to Earth Sciences Department of the University where Dr. Manichandra presented a talk on Earthquake. Then, he took the participants to the Seismic Observatory where he showed the seismic wave recording processes and analysis of waves for

calculation of Focus and Epi centre of the earthquakes. He further explained about the plate movements and seismically active zones. Manipur stands on plate subduction zone and falls on seismically active zone –V he said. After visit to the Observatory, the participants were taken to the laboratories of Chemistry Department, Manipur University.



Chemistry experiments performed by Dr. Bhubon & his team at Manipur University

Prof. L. Warjit Singh welcome the participants. Earlier, before taking them to the different labs. of Chemistry, Dr. Bhubon Singh presented a short duration talk on “Chemistry in our lives”. He performed some experiments namely i.) Burning money, ii) Egg in the bottle, iii) Water to Wine – Red demonstration, iv) Fire writing, v) Chemical fire, vi) Magic writing, vii) Density separation. He also took the students to the laboratories and gave them opportunity to interact with the researchers working in the Chemistry labs.

In the evening, an invited talk on “Engineering Sciences” was delivered by Dr. Th. Somchand Singh, Asst. Professor of Manipur Institute of Technology, Imphal at the programme hall. He interacted with the students on the branches of engineering sciences



Participants visiting IBSD laboratory, DBT, Imphal and interacting with researchers

including IT, Biomedical engineering and their scopes for employment opportunities. The participants were taken to the Institute of Bioresources & Sustainable Development (IBSD) at

Takyelpat, Imphal - a research centre of repute under DBT, Govt. of India on 19th July 2012. Dr. Talukdar, Director welcome the participants and also briefed about the research activities at his centre. He elaborated on importance of science & technology for a comfortable living. Dr. Indira Devi delivered a lecture on the topic “Bio- resources with reference to Manipur” and interacted with the students. The students were then taken separately in two groups to the laboratories of the Institute by Dr. Kamala Devi, Post Doctoral fellow and Miss Neeta Devi, Research student and explained about their research works and also about the equipments installed there.

The participants were then, taken to the Anatomy division of Jawaharlal Nehru Institute of Medical Sciences (JNMIN), Porompat, Imphal. Dr. (Mrs) Kaini explained about



Students interacting with Dr. Shantikumar on Human Physiology at JNIMS class room



Students studying blood cells using microscope

the Medical Sciences of which Anatomy is a part. She took them to the laboratory of Anatomy and showed them the research facilities. Students studied blood cells using microscopes under her guidance. Prof. Shantikumar Singh explained in brief about Physiology of Human Body and research in medical sciences and took them to the Physiology laboratory and answered to the queries from the students. In the evening, Dr. O. Joychandra Singh made a presentation on the topic “Health & Hygeine” and shared his knowledge with the students.

On the last day, i.e. 20th July 2012, Dr. L. Nabachandra Singh, Professor, Central Agricultural University, Imphal interacted with the students on the area of Agricultural sciences. The lecture session was followed by Students Science Elocution during which three students from each school made presentations on a science topic of their interest. The following student teams made presentations on the topics mentioned against their names

Sl. No. Name of students	Topic
1. L. Shantikumar, N. Lolit Singh & N. Priyoranjan	The Earth
2. Henjapao Silthou, Kaiminlun Kipgen & Angom Robindro	Renewable Energy
3. Ph. Nelin Singh, Ph. Abhichand Singh & Kh. Michael Singh	Global Warming
4. Th. Karles, Kh. Bidyanath & Savior Angom	Earthquake
5. S. Bidyasagar, K.R.Kopham & L. Binit Singh	Cloning

6. Md. Aziuddin Khan, W. Chitaranjan Singh & W. Gilbert Singh	Internet
7. B. Roopeswor Sharma, T. Tolensana Singh & David	Renewable Energy
8. Sanju Yumnam, Kenson M & Jodhachandra Laishram	Renewable Energy
9. Kishnanda Mangsatabam, Ng. Yaiphaba & Lamjingba K	AIDS
10. S. Tokyo Meitei, Ch. Sishirdhar & T. Salaingamba	One lady scientist
11. L. Sanatomba Singh, S. Jaswant Singh & Ch. Vishal Singh	Food & Nutrition

The Jury members of the elocution asked questions to the students and also made suggestions for improvement. The science elocution was accompanied by Face to Face with distinguished scientists during which student participants and guide teachers asked questions of their interest and the scientists of the respective fields answered. The invited scientists included Prof.. N.

Ibotombi Singh, D.M. College of Science, Professor L. Nabachandra Singh, Central Agricultural University, Dr. O. Joychandra Singh, Jawaharlal Nehru Institute of Medical Sciences, Professor Sh. Dorendrajit Singh (Physics) & Dr. R.K. Bhupon Singh (Chemistry) of Manipur University. Altogether about 50 questions were asked by the participants and the scientists delivered answers and also interacted with the participants. Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC moderated the session. The programme concluded on July 20, 2012 with distribution of participation certificates to all the participants. All the invited scientists who took part in the face to face session attended the function. .



Students' science elocution in progress



Students asking questions to the scientists during Face to face with distinguished scientists

2.5 Vigyan Prasar EduSat Network

Vigyan Prasar, an autonomous organisation of Department of Science & Technology, Government of India, New Delhi in association with Development and Educational Communication Unit (DECU) of Indian Space Research Organisation (ISRO) established some Satellite Interactive Terminals (SITs) in the country. SIT is a two



Satellite Interactive terminal - Edusat

way audio-video interactive network for science & technology communication using the satellite for education (EduSat). The main objectives of setting up of SIT included i) experience sharing – amongst the SIT s in the Country, ii) training – using distance education mode, iii) access to quality – interaction with the experts/scientists at one end and teachers, students etc. on the other end in various fields.

The main target groups for the SIT programme included representatives of science clubs, teachers, school students & children (college students and higher/technical/university students), interested general public etc. Programmes such as quiz, trainings, lectures etc. were being conducted on various topics from time to time round the year and students, teachers, science activists etc. were benefited from the programme.



EduSat programme going on

Using the Vigyan Prasara Edusat facility available with the Council and with an arrangement with Indian Institute of Remote Sensing (IIRS), Department of Space, Govt. of India, the Centre conducted the 7th batch distance learning Edusat based programme on “Basics of Remote Sensing (RS), Geographical Information System (GIS) and Global Positioning System (GPS). This was a three months certificate course through Edusat. The outreach programme (distance learning programme) of IIRS, ISRO, Department of Space, Govt. of India on Remote Sensing & Geographical Information System transmitted from Dehradun station was received at the class room of the Edusat Centre of the Council and projected to the screen and made audible as well as visible to the participants. The participants including graduate level students, research scholars and teachers attended the programme during August 6 – October 17, 2012 and learnt basics of remote sensing, global positioning system (GPS), geographical information system (GIS) & its applications etc..

2.6 Training Programme on Writing Research papers

The Council jointly with North-East Institute of Science & Technology, Substation, Imphal conducted one day training program on “Writing Research Papers” at the CSIR-NEIST Substation, Imphal on September 4, 2012. Prof H Nandakumar Sharma, Vice Chancellor, Manipur University, Profs GNK Chettry, Head of Life Sciences & Prof B Manihar Sharma, Life Sciences Department, Manipur University and Dr BG Unni, Chief Scientist, CSIR-NEIST, Jorhat, Assam were the Chief Guest, Guest of Honours and President, respectively. In the technical session, Prof N Rajmuhon Singh, Chemistry department, Manipur University presented a paper on ‘Writing scientific papers’. Dr BG Unni delivered a lecture on the topic “How to write a good research paper” & Dr H B Singh on “Proper planning for writing a research paper”. The program were attended by 27 research scholars, teachers from Institutions like Manipur University, Assam University, NERIST,

Itanager, GP Women's College, Imphal, Pettigrew College, Ukhrul, etc. At the end of the session, panel discussion and interaction were also arranged.

2.7 Science for Sanitation Month

Under the initiative of National Council for Science and Technology Communication, Department of Science and Technology, Government of India, every year the month October is celebrated as **Science for Sanitation Month** all over the country with variety of activities addressing to issues on health and sanitation. Manipur Science and Technology Council celebrated Science for Sanitation Month by organizing Lecture cum demonstration programmes addressing to various issues of Health and Sanitation



Lecture Programme at Evergreen Flowers School, Thoubal Ningombam

organizing lecture cum demonstration programmes on Health, Hygiene and Sanitation in the state. The main objective of the lecture programme was to make people aware about the benefits of good sanitation practices. The lecture programme was organized during October 3 - 31, 2012 in different schools of the state with the resource persons from State Government Institutions. Dr. O. Joychandra Singh, Assistant Professor, Jawaharlal Nehru Institute of Medical Sciences, Porompat, Imphal and Dr. Y. Meghachandra Singh, District Family Welfare Officer, Directorate of Family Welfare Services, Government of Manipur were the Key resource persons of the lecture programmes. Altogether, 10 lecture programmes were organized in different schools of the state. The duration of each lecture was two hours. Interaction and discussion session of about 30 minutes duration was also held after each lecture programme for interaction with students/participants.

The lecture covered various aspects of health, hygiene, sanitation and water. The topics included Basic concept about Primary Health Care, Health, Hygiene, Sanitation, Types of wastes related to sanitation, Proper waste and excreta disposal, Low cost sanitary latrine, Excreta the main cause of childhood diarrhoeal diseases, Soil and water pollution, Lack of Sanitation and personal hygiene, Barriers to sanitation services, Contamination of food, propagation of flies, Disease propagation routes, Sanitation of eating places, Housing and health, Indoor Air pollutants, Standards of water purity, Management of bio – medical wastes, Food Hygiene, Milk Hygiene, Meat Hygiene, Noise pollution with regards to health, Proper ventilation with regards to health, Effect of poor sanitation on education, Highlights of Deaths from unsafe water, poor sanitation and hygiene, hardware and softwares of good sanitary practices, Personal hygiene promotion, Food and domestic sanitation, Global facts of poor sanitation and its impact on health, WASH links to Health, WASH and HIV/AIDS, Conservation, management and treatment of water for drinking purposes, Treatment of Waste

water, Access to Safe water supply (Global, National, State), Diseases related with unsafe water and poor sanitation, Socio economic impact from unsafe water supply and poor sanitation and Concept about the role of health education. Leaflets on some common diseases of poor hygiene and sanitation such as diarrhoea, Viral Hepatitis etc. were distributed to the participants after each lecture programme.

About 1200 students of the state had been benefited out of the lecture programme. In fact, the programme received good response from the participants. Most of the participants / people felt about the importance of the lecture programmes in maintaining good health through proper sanitation practices. Feedbacks in the form of questionnaires were obtained from the participants. Authorities of schools suggested for organizing such programme in the state in the future for the benefit of the people.



Lecture Programme on sanitation at Mothers Pride Academy, Bishnupur

2.8 Eco-Water Literacy Campaign

With the support of Department of Science and Technology, Government of Manipur, the Council celebrated Eco-Water Literacy Campaign by organizing series of lectures with demonstrations addressing to various issues on water treatment, conservation, management etc. in the state.

The key resource persons were Shri L. Somarjit Singh, Head, Department of Botany, Imphal College and Dr. L. Sanjoy Singh, Lecturer, Department of Environmental Science, D.M. College of Science, Imphal. The campaign for 2012 was launched at John Stone Higher Secondary School, Imphal. Altogether, ten lecture-cum-demonstration programmes were arranged at different schools in the state. About

2,000 students / people had been benefited out of this campaign. During each interaction session, participants put interesting questions related to water treatment, management and conservation and resource persons gave answers.



A student interacting with the experts by asking question on water

2.9 Training Workshop on Science Writing / Journalism for Bishnupur district

The four days long Training Workshop on Science Writing / Journalism for Bishnupur district, Manipur was organized at Ningthoukhong, Bishnupur district during November 5-8, 2012. The objective was to impart training to the science teachers about science writing for print & electronic media. Science teachers from different colleges, schools and interested science graduates participated in the training workshop. Shri Th. Surendranath Singh, Director of the Council inaugurated the training workshop. Shri K. Sobhachandra Singh, Principal, Mangolnganbi College, Ningthoukhong and Shri L. Rajen Meetie, Councilor, Ningthoukhong Municipal Council were the President and Honoured Guest of the function. The programme was catalysed and supported by NCSTC, Department of Science & Technology, Govt. of India.

The activities of the programme included lectures delivered by invited resource persons and interaction with the participants, Practical activity on Script development for print, electronic media, Presentation of scripts developed by participants and evaluation process by experts. Dr. C.M. Nautiyal, Scientists, Birbal Sahni Institute of Paleobotany, Lucknow, Shri Dilip Mayengbam, Programme Executive, All India Radio, Imphal & Satyajit Usham, Editor, Huieyen Lanpao Daily were the resource persons of the training and imparted training to the participants. Dr. Nautiyal presented papers on the topics i) Techniques of Science Writing and ii) Writing for TV documentaries. Dilip Mayengbam spoke on the topic “Making Science Communication more effective”. Satyajit Usham delivered a lecture on the topic “Writing for Print Media”. Altogether 35 participants comprising of science teachers in colleges, Schools, and interested science graduates of the district attended the training workshop. Participants read out the scripts developed by them during the course of the programme and it was evaluated by the experts for further improvement.



Inaugural function of the Training Workshop on Science writing/Journalism



Script presentation by participants and evaluation by experts in progress

2.10 Aquarium Exhibition-cum- Flower Show

The Council, in association with Fish World, Keisampat Keisam Leikai, Sharma Aquarium, Keisampat Jn., International Plant Growers' Association (IPGA), Uripok Sorbon Thingel, Cinderella Plant's Care, Chmgamakhong Singjamei Chinga Keithel, King City Evergreen Nursery, Pisumthong Bazar and Gaminash Nursery, Bamon Leikai Brahmapur Nahabam Imphal East organized the 1st state level Aquarium Exhibition-cum- Flower Show during October 26 - November 6, 2012 at the Aquarium complex. Altogether 84 species comprising of 28-Indigeneous; 56-exotic in 68 tanks and 124 flower plant species were displayed during the exhibition. About 500 visitors per day including students and children visited the exhibition.



Inauguration of State level Aquarium Exhibition-cum- Flower Show

2.11 One day Brain Storming – Challenges in Water related issues

A one day **Brain Storming – Challenges in Water related issues** in Manipur was organized on November 30, 2012 at the Classic Hotel, Imphal. The objectives of the programme were to discuss technology options on some aspects of water issues in Manipur such as water conservation and management (including rain water harvesting), research and monitoring facilities, technologies for purification or treatment of water, identification of short term and long term water research and technology projects that can be taken up by various agencies jointly with the Council etc. The target participants were the officials from State organizations, researchers & teachers from Colleges & Universities and representatives from Science NGOs etc. who worked on water and related areas.

Altogether 43 delegates from different organizations including Public Health Engineering Department, Manipur Pollution Control



Dr. Sanjay Bajpai, Director, DST, Govt giving speech as Guest of Honour



A Section of the delegates attending the Brain Storming – Challenges in Water related issues

Board, Directorate of Environment, Irrigation & Flood Control Department, Professors, Researchers, Teachers from Universities and colleges etc. interacted with the resource persons and shared their opinions on local specific problems on water faced by the State and also suggested appropriate programmes on water related issues to be taken in the state in the near future. The programme was catalysed and supported by Department of Science and Technology, Govt. of India under its Water Technology Initiatives (WTI).

The programme was inaugurated by Shri W.L. Hangshing, IAS, Principal Secretary (PHE) to the Govt. of Manipur. Dr. Sanjay Bajpai, Scientist F / Director, Department of Science & Technology, Govt. of India, New Delhi attended the programme as the Guest of Honour. Shri U.C. Laisram, Director, Department of Science & Technology, Govt. of Manipur presided over the function. Dr. Arunabha Majumder, Emeritus Fellow, School of Water Resources, Jadavpur University, Kolkata, Er. A.R. Shivakumar, Scientist, Karnataka State Council of Science & Technology, Bangalore, Professor Arun Kumar, Department of Earth Sciences and Professor N. Rajmuhon Singh, Chemistry Department of Manipur University attended the programme as invited resource persons. Dr. Sanjay Bajpai, while giving speech as Honoured Guest highlighted about Water Technology Initiatives (WTI) of Department of Science & Technology, Govt. of India in the last few years. He explained in brief the goal of organizing the Brain storming on water related issues at Imphal. He said that he was interested to know more from the state delegates about the problems on water in the state and find some solutions which can be taken up in the form of projects to be supported by Department of Science & Technology, Govt. of India in the near future.



W.L. Hangshing, IAS, Principal Secretary (PHE), GoM giving

Speaking as Chief Guest, Shri Hangshing stated the scarcity of water in the state. He expressed that in spite of maximum efforts, still State PHED have not been able to provide sufficient drinking water to the increasing population specially during lean period.

Shri U.C. Laisram stated the need for a separate Water Resources Department to keep an eye on the abundance of water and take the responsibility for supply and management of water resources for the whole year in the state. The region receives good amount of precipitation and hence appropriate rooftop rain water harvesting structure should be attached in every government as well as private buildings / houses as a mandate and this would help augment the shortage of water supply to some extent he further said.

Technical Sessions

The technical session-I (Pre lunch) started with Dr. Sanjay Bajpai in the Chair and Th. Surendranath Singh as the Co-chair. Shri W.L. Hangshing delivered a lecture on the topic “Manipur Water Policy” and interacted with the delegates. Professor (Dr) Arunabha

Majumder, Emeritus Fellow of School of Water Resources Institute, Jadavpur University delivered a lecture on the topic “Water Treatment Technologies” and interacted with the state delegates. He explained about the water treatment technologies such as Plain Sedimentation and Slow Sand Filtration, Horizontal Roughing Filter – Slow Sand Filter, River Bank Filtration, Conventional surface water treatment etc. He also mentioned about Micro filtration, chlorination, ultra filtration, reverse osmosis etc. He further explained about different Procedures of Arsenic removal from Drinking Water. He suggested to implement a demonstration project to provide drinking water from community pond based on HRF-SSF and popularize the same to the public.

Er. A.R. Shivakumar delivered a lecture on the topic “Rain Water Harvesting (RWH)”. He explained elaborately about the three methods of rain water harvesting such as Roof top RWH, Runoff RWH (landscapes, parks, storm water drains, roads, etc.) and Natural storage and collection through lakes and tanks. Showing average rainfall in mm for the last five years for Imphal City as 1316 mm, he demonstrated the rain water Potential for a roof top area of 40ftX60ft as 3,31,000 liters. He discussed about collection techniques of rain water from flat roof as well as inclined roof tops. However, he said that quality monitoring of water collected for storage will be required for every six months. Rain water is the purest form of water which requires very less expenditure on maintenance he said. He suggested for popularization of Rain Water Harvesting by implementing a demonstration project in a government building like the one which Karnataka State Council of Science & Technology, Bangalore did successfully in the Assembly Secretariat building at Bangalore.



Er. A.R. Shivakumar, Scientist, KSCST, Bangalore delivering lecture on RWH

Prof N. Rajmuhon Singh delivered a lecture on the topic “Ground water Quality in Manipur with Special Reference to Arsenic and other Trace Elements”. Arsenic is a threat as poison to human health he said. Showing data based on his findings from analysis of ground water samples from tube wells in the valley districts of Manipur, he draw the attention of the delegates that the underground water contains arsenic beyond the standards recommended by WHO. Treated surface water is better for consumption than ground water if arsenic is not removed from the same. He suggested for regular monitoring of the quality of ground water by establishing a well equipped water laboratory in the state.



Prof N. Rajmuhon delivering lecture on Ground water Quality in Manipur

Dr. Arunkumar delivered a lecture on Restoration of Community ponds in the rural areas. Since majority of the people in the rural areas depend on water from community ponds, he mentioned the need for creating awareness programmes on management of pond water for rural areas on regular basis covering all the districts in the state. He gave emphasis on community participation for pond water management. He suggested that a strong data base on water resources of the state would be beneficial for proper planning in the future. Dr M. Chandra Singh, Asst. Professor, Imphal College, Govt. of Manipur also delivered a lecture on Major Issues of Loktak Lake. He shared his views on some issues such as deterioration of quality of water by excessive human activities, changes in hydrological phenomenon and degradation in ecosystem etc.

During the interaction session on problem identification and designing solutions, Er. L. Swamikanta Singh, Superintending Engineer, PHED, mentioned that they had established a small water testing laboratory in all the branch offices of PHED in all the districts with a very limited facility. They send samples to other laboratories outside the state for analysis as and when required. He further sought some clarifications from Majumder on regular cleansing of the HRF-SSF if it is to be used for longer period. Shri Debenkanta Singh, Chemist, PHED shared his experiences in water quality monitoring and he said that R & D based activities on water quality has not been initiated due to lack of required facility. Dr. K Rajen Singh, Geophysicist, PHED also highlighted some problems faced in the state on quality monitoring of water specially toxic or trace element and suggested to have an accredited water testing laboratory where any research worker or an official can avail of the facility.

Professor M. Mahendra Singh, Jawaharlal Nehru Institute of Medical Sciences, Imphal emphasized on the importance of rain water harvesting. He wanted to know from Er. Shivakumar what storage capacity of tank should be kept on which floor of a building. The expert replied that the big storage tanks must be kept on the ground floor and storage tank of about 1000 or 2000 liter capacity may be kept on the first floor depending upon the strength of the building. Professor M. Dhaneswor Singh of Central Agricultural University shared his opinions on the need for introduction of appropriate rain water harvesting schemes on every house with the initiatives from State



Officials of State PHED attending the interaction session & highlighting problems



Dr. Gonchandra Sharma, PSO, Manipur Pollution Control Board highlighting problems on water & designing solution

Government. He said that since quantity as well as quality is equally important for the people, due care should also be given to monitoring of water quality by appropriate department. Dr. Gonchandra Sharma, Principal Scientific Officer, Manipur Pollution Control Board also highlighted about the limited facilities they have in their laboratory. He said that analysis of water for all parameters could not be done in his laboratory and hence they sent water samples to Central Pollution Control Board and other national laboratories for further analysis. However, they also did whatever analysis which can be done using available facilities for the samples deposited by other state Govt. organizations/agencies he said.

Dr. T. Brajakumar Singh, Research Officer, Directorate of Environment, Govt. of Manipur who worked on water and climate changes gave his strong opinion that a lot of R&D works on water and related issues can be carried out only when the region has a well equipped water testing laboratory with some trained technicians or the existing laboratory in the University or any organization be upgraded to a national standard.

The Technical Session-II (Post Lunch session) was chaired by Dr. Arunkumar, Professor in Earth Sciences, Manipur University with Th. Surendranath Singh, Director, MASTEC as Co-Chair.

Dr. O. Geeta Devi, a Post Doctorate fellow of the Earth Sciences Department, Manipur University highlighted some problems faced by herself due to lack of water laboratory in the state while carrying out her research work on water related areas (Geochemistry) leading to Ph.D. Similar problems are faced by most of the research scholars who studies on water. She expressed that setting up a water laboratory in the University would help research scholars and researchers to carry out research projects and other R&D activities in the state. Dr. L. Minaketan Singh, Scientific Officer, MASTEC sought some clarifications from Dr. N. Rajmuhon Singh about the facilities/equipment they have in the his Department and what more additional equipment he required for carrying out further investigation on water. Dr Rajmuhon reacted saying that he took help from Jadavpur University, Kolkata and sometimes BARC, Mumbai on payment of huge amount of analytical charges for carrying out analysis of water collected from Manipur. However, he said that he and his team could be able to carry out independent research provided his laboratory is upgraded by installation of some sophisticated equipments such as AAS, ICP etc.

Dr. Mangi Khuman, Faculty of Earth Sciences Department, Manipur University mentioned that there will be a relationship between the occurrence of arsenic in ground water and geology of the area. Hence, He suggested for a geological and geochemical investigations by a team of both geologist and chemists in this regard. He also said that the region receives about 1500 mm of rain water per annum which is sufficient enough for use for the people for some months if it is properly stored by adopting



Dr. Mangi Khuman of Earth Sciences Department, M.U. suggesting some solutions on water issues in Manipur

appropriate rain water harvesting techniques. The scarcity of water for human consumption is due to improper management of water he said. He also appealed to the organizers/MASTEC to take initiatives to make the Pop Up Filter demonstrated by Er. Shivakumar for house hold rain water harvesting to the public on subsidized rate. Mr. K. Shyamsunder Singh, Geohydrologist, Minor Irrigation Department, Govt. of Manipur mentioned that they had neither a water testing laboratory nor a provision for early creation of the same in his organization. He said that creating a water testing facility centre in Imphal would facilitate generating reliable data which would help to identify local problems concerning water in the region.

Most of the delegates thanked Department of Science & Technology, Govt. of India for keeping an eye towards a hilly state like Manipur where research facilities are lacking specially in the area of water, with an aim at knowing problems on water in the state by face to face interaction with state delegates at the right time and also showing keen interest for giving some solutions in the form of projects.

2.12 Millennium Science Lecture

The Millennium Science Lecture was organized at Standard Robert School, Canchipur on December 10, 2012 in honour of the Nobel Laureates in the subjects Chemistry, Physiology and Physics of the year 2012. Resource persons delivered lectures on the contributions of the Nobel Laureates in their concerned subjects. About 200 delegates including students and teachers attended the programme.

2.13 Observation of National Mathematics Day 2012

The Council observed National Mathematics Day 2012 during February 23-27, 2012 at Manipur Science Aquarium, D.M. College Campus, 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 programme was inaugurated by Shri Ng. Brajakumar Singh, Principal, D.M. College of Commerce, Imphal as the Chief Guest and Shri Th. Surendranath Singh, Director, Manipur Science & Technology Council presided the function. Th. Surendranath Singh mentioned that the programme would motivate the young minds and help them to choose mathematics as one of the important subjects of science. Looking at the scenarios of the decrease of number of students of mathematics in the post graduate level, he appealed to the mathematics teachers to find out appropriate teaching methods to make it charm to the students. He further stated that mathematics would not be a difficult subject to study if it is properly learnt.



Chief Guest of the Inaugural Function giving Inaugural address

The main activities of Observation of National Mathematics Day 2012 included Competitions, Exhibitions, Popular Mathematics Show, Mathematics Lecture-cum-Demonstration etc. The competitions included Mathematics Model (Class VIII–XII), Mathematics Quiz (Class IX–X) and (Class XI–XII), 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 (Miracle), Scientific Films 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 twenty seven models were exhibited by 42 students from different schools of the State. Khaidem Bidyanath and Leingakpa Singam of Brighter Academy, Imphal stood first and won the prize. Curie Koijam of Mega Manipur School (Science Club Lamsang) was given the second prize. Nivedita Rajkumari and Wairokpam Priya of Brighter Academy, Imphal were placed in the third place. Tayenjam Mahen Singh of Bright Career Academy occupied the 4th position and Miss Sylvia Kharibam of Praja High School, Lamsang got the fifth position prize respectively.



Student Exhibitors displaying their Mathematics Model

Mathematics Quiz Competition

The competition was organised in two categories viz., i) Category – I (Class IX–X) and ii) Category –II (Class XI–XII). Forty one teams from 35 schools registered for the competition. Each team comprised two students from the same school. Four teams per category were selected for the final round through a preliminary round - Written Contest.

In the Category – I (Class IX–X), Hasnel Shah and Syed Jamilur Rahman of J.N.V., Khumbong got the first prize. Mr. Chongtham Sishirdhar and Takhellambam Salaingamba of Keishamthong High School, Imphal were given the second prize. Lairenlakpam Denilson Singh and Rajkumar Rohit of Tiny Tots' Unique School, Imphal got the third prize. Ransonkumar Khundrakpam and Rishikanta Ningthoujam of K.M. Higher Secondary English School, Khangabok got the 4th prize. In the Category – II



Quiz Competitions at Observation of National Mathematics Day 2012

(Class XI–XII), Laishram Boycha Singh and Laishram Priyananda Singh of J.N.V., Imphal East stood first position and won the prize. Victoria Karam and Oinam Sobana of Unique Education won the second prize. Maibam Zeron and Maibam Zames of Johnstone Higher

Secondary School, Imphal won the third prize. Phurailatpam Bidyarani Devi and Anupama Kshetrimayum of T.G. Higher Secondary School, Imphal stood the 4th position.

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 27 students from 22 schools, 40 students from 35 schools and 37 students from 32 schools participated in the Mathematics competition for Class V, Class VII and Class VIII respectively. For the competition of Class – VI standard, on the basis of marks obtained, Miss Patel Lairenjam of Little Flower School, Imphal, Mayanglambam Roshibini Devi of Little Flower School, Imphal and Dolaipabam Nawasarif of The Public Academy, Bengoon were placed in the first, second and third positions respectively. Miss Maharabam Chandreshwori Devi of Right Step English School, Awang Sekmai, L. Sudhata Chanulembi of Brighter Academy, Imphal, L. Dinesh Khuman of Right Step English School, Awang Sekmai, Baseimayum Imran of The Public Academy, Bengoon, Phusam Sayeed Akber Sheikh of The Public Academy, Bengoon, Ch. Lanthoinganbi Chanu of Right Step English School, Awang Sekmai and Waikhom Bineshwor of Brighter Academy, Imphal were placed for consolation prizes respectively.



Student's Mathematics Competition in progress

In the Class VII category, Luckyson Ningthoujam and Thanilkumar Khundrakpam, both from K.M. Higher Secondary English School, Khangabok got the first position. Th. Roshan Singh, Khundrakpam Robinson Singh and Saikhom Bishwonath Singh of New Public Higher Secondary School, Khangabok got the second position. Konjengbam Ghanapriyari of Nirmalabas High School, Imphal was in the third position. Khundrakpam Sanathoi Singh of New Public Higher Secondary School, Khangabok, Susima Ningthoujam of K.M. Higher Secondary English School, Khangabok, Vidyasagar Chingshubam of Standard Roberth Higher Secondary School, Canchipur, Moirangthem Ashokumar Meitei of New Public Higher Secondary School, Khangabok, Sony Khundrakpam and Sushitra Moirangthem of K.M. Higher Secondary English School, Khangabok, Yumlembam Kingson Singh of The Bright Career Academy and N. Rajesh Singh of K.M. Higher Secondary English School, Khangabok were placed for consolation prizes.

In the Class VII category, Thajamanbi Saikhom of K.M. Higher Secondary English School, Khangabok stood first position. Melody Khoirom of Khuman Maheikol, Mayang Imphal and Kh. Lenin Singh of K.M. Higher Secondary English School, Khangabok won the second position. Hemabati Saikhom of K.M. Higher Secondary English School, Khangabok got the third position. M. Luhenba Singh, Kh. Netaji Singh and M. Arnold Singh of K.M. Higher Secondary English School, Khangabok, Karnajit Singh of New Public Higher Secondary School, Khangabok, Kh. Samananda Singh of K.M. Higher Secondary English School, Khangabok, N.C. Joyshree of Keishamthong High School, Imphal, Kh.

Subhaschandra Singh and Sagolsem Krishnadas Singh of New Public Higher Secondary School, Khangabok were selected for consolation prizes.

Science Film Shows

During the 5-day Observation of National Mathematics day 2012 Science films were also shown for one hour duration on all 5 days. These science films were the collections of MASTEC and Vigyan Prashar, New Delhi. A few scientific films screened during the Meet were Animal Kingdom, Medicinal Plants of Manipur, Orchids of Manipur, Radio, X-ray, Waterworks, Oyster Mushroom, Rain Water Harvesting etc

Mathematics Puzzle

Explaining Mathematics Puzzles was one of the most popular shows of the Observation of National mathematics Day 2012. Experts/Artists performed/demonstrated various Mathematics puzzle items which the students were not aware of and explained the reason behind every Mathematics puzzle. They also demonstrated various techniques of Mathematics which can find Mathematical solutions in very easy and fast manner. Mathematics Puzzle was performed for 3 (three) days of 2(two) hours duration each.

Mathematics Lecture-cum-Demonstration & Hands on Experiments

Mathematics lecture-cum-demonstration was one of the important activities of Observation of National Mathematics Day 2012. Altogether there were 3 lecture-cum-demonstrations of 2 hours duration each during the Observation. Shri H. Jayenta Kumar Singh, Retd. Head, Dept. of Mathematics, D.M. College of Science, Imphal delivered a lecture on the topic “Importance of Mathematics in Science”. Dr.Kh. Manglem Singh of NIT, Imphal delivered on the topic “Computer Applications in Mathematics” and Dr. Y. Rohen Singh of NIT, Imphal spoke on the topic “Great Indian Mathematicians and their Contributions” and interacted the students. Two Resource Persons demonstrated about 35 items on learning Mathematics through origami and students interacted with the Resource Persons.

The Observation of National Mathematics Day 2012 concluded on February 27, 2013. However, the closing as well as prize distribution function was held on February 28, 2013 in the Observation of National Science Day 2013. Shri L.P. Gonmei, IAS, Principal Secretary (S&T), Govt. of Manipur as the Chief Guest of the function distributed certificates and prizes to the winners of various competitions.

2.14 National Science Day 2013 Observation

National Science Day 2013 was observed on February 28, 2013 at Manipur Science Aquarium, D.M. College Campus, Imphal. The theme of National Science Day 2013 was “**Genetically Modified crops and Food Security**”. About 250 participants consisting of students and teachers from various schools and colleges in Manipur attended the programme. The programme was inaugurated by Shri L.P. Gonmei, I.A.S., Principal Secretary (S&T), Govt. of Manipur. 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 programme respectively. The Principal Secretary (S&T), Govt. of Manipur highlighted the importance of Science in our day to day life. He stated that Science is the search for the truth behind any phenomena. Director, Manipur Science & Technology Council, Imphal mentioned about why National Science Day is celebrated. He also explained the history of discovery of Raman Effect. He further mentioned about the importance of the theme of the National Science Day 2013 in the present trend of population growth and decreasing agricultural land. He also highlighted the main activities to be organised in Science Meet 2013 during May 11-15, 2013 as a continuing programme of National Science Day 2013.



A section of Audience in the Observation of National Science Day 2013

A Science book in Manipuri language entitled “Lamyamba Bheigyanakshingee Khongul Vol – I” written by Prof. Debananda S. Ningthoujam, Manipur University, Imphal was released in the Observation of National Science Day 2013. Prof. L. Nabachandra Singh, Head, Dept. of Agronomy, Central Agricultural University, Imphal delivered a lecture on the topic “**Attaining Food Security and Role of Genetically Modified Crops**”. He explained in depth about Population Growth Vs Food requirement of India. He also mentioned about the roles of Agrochemicals in food production.

2.15 Nature Camp for Thoubal District of Manipur.

Manipur Science & Technology Council, Imphal (MASTEC) in association with local support organisations organized two district level Nature Camps in Manipur catalysed and supported of National Council for Science and Technology Communication (NCSTC), Department of Science and Technology, Government of India. The first camp was organized for the children of Thoubal district. The main objectives of these camps were to educate the children about nature through various practical on science by using low cost or no cost



Dr. O. Joychandra Singh, JNIMS interacting with the campers

equipment with nature as study object. These camp oriented at guiding the children in exploring the environment by themselves for developing an intimate understanding about science and nature in particular. All the participants, resource persons and officials of the organizers camped together at the camp venues.

The Thoubal district nature camp was organized during March 12 – 15, 2013 at Khangabok Sorok Wangma Primary School, Khangabok. The 4 days residential camp was inaugurated by Smt. L. Hemabati Devi, Ward Member, Ward No. 7 of Khangabok Part – I Gram Panchayat as the Chief Guest. The function was also attended by Shri L. Manao Singh, Headmaster, Khangabok Sorok Wangma Primary, Khangabok and Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC as the Guest of honour and the President respectively. Shri L. Somorjit Singh, Associate Professor, Imphal College gave the key note address. Altogether, 25 participants comprising of 4 guide teachers and 21 students from different schools of Thoubal districts participated in the camp. Three Key Resource Persons namely, Shri L. Somarjit Singh, Associate Professor, Imphal College, Imphal, Shri Kh. Manigopal Singh, Ngaikhong Khullen and Shri I. Sushilkanta Singh, Khagempalli Panthak, Imphal imparted in-depth training to the participants about



Demonstration of Green house



Student participants measuring growth rate of plants

the nature study. Low cost experiments were also performed during the camp. Field trip was conducted for study and collection of plants and animals by the campers. Techniques about preservation of the samples and classification and identification of various plants and animals were also taught. Observation of plants and animals under compound and simple microscopes were demonstrated and the participants observed many plants and animals of their own. Science games, role play on science were important activities of the nature camp. Sky watch programme was one of the interesting activities of the camp. Discussion and interaction with the resource persons and participants were held every day in the morning and evening for exchange of ideas. Apart from the key resource persons, Dr. O. Joychandra Singh, Assistant Professor, Pharmacology Department, Jawaharlal Nehru Institute of Medical Sciences, Imphal gave a lecture on “Health, Hygiene and Sanitation”. Dr. N. Romabati Devi, Assistant Professor, Department of Zoology, Imphal College delivered a lecture on “Classification and Identification of animals”. Lectures on the topic “Classification and identification of Plants” and “Biodiversity an overview to ecology” were also delivered during the camp. The topics covered during the camp included classification and identification of animals, classification and identification of plants, nature walk, field trip and sample collection, sorting, analyzing and preserving samples, microscopic observation of small plants and animals, biodiversity – an overview to ecology, environmental awareness, low cost experiments on science, sky watch, fun with plants – studying the parts/ processes and exploring the world, science songs, living together

– study of habitat/ecosystem, the micro world, role plays, science games, scientific film shows, green house effect, physical nature of soil, water and air, kitchen gardening, seed germination. The camp concluded on March 15, 2013 with a closing function with Smt. Kh. Surnalata Devi, Adakshya, Thoubal district Zila Parishad as the chief guest and Smt. L. Hemabati Devi, Ward Member of Khangabok Part – I Gram Panchayat. Pradhan as the president of the function.

2.16 Nature Camp for Bishnupur District

The Bishnupur district nature camp was organized in association with Community Development Organisation, Ngaikhong Khullen, Bushnupur district during March 21 – 24, 2013 at Manipur Nature Cure and Yoga Hospital, Ngaikhong Khullen. The 4 days residential camp was inaugurated with an inaugural function with Shri Th. Surendranath Singh, Director, Manipur Science and Technology Council, Imphal as the Chief Guest, Dr. K. K. Singh, Deputy Chief Medical Officer, National Hydro Power Corporation as the Guest of honour and the function was presided over by Shri L. Somarjit Singh, Associate Professor, Imphal College.



Inaugural function - Nature camp

Altogether, 24 participants comprising of six guide teachers and 18 students from the standard of Class VII to X from different schools of Bishnupur districts participated in the 4 days camp. Three Key Resource Persons namely – Shri L. Somarjit Singh, Associate Professor, Imphal College, Imphal, Shri Kh. Manigopal Singh, Ngaikhong Khullen and Shri I. Sushilkanta Singh, Khagempalli Panthak, Imphal imparted in-depth training to the participants particularly the children about the nature. Many low cost experiments were set up and analyzed during the camp. Field trip was conducted for collection of plants and animals by the campers. Techniques about preservation of the samples and classification and identification of plants and



Participants preparing mini aquarium

animals were also taught. Microscopic observation of plants and animals under compound and simple microscopes were demonstrated and the participants observed many plants and animals of their own. Science games, role play on science were important activities of the nature camp. Sky watch programme was one of the interesting activities of the camp. Discussion and interaction with the resource persons and participants were held every day in the morning and evening for sharing more information. Apart from the key resource persons, Dr. O. Joychandra Singh, Assistant Professor, Pharmacology Department, Jawaharlal Nehru Institute of Medical Sciences, Imphal gave a lecture on “Health, Hygiene and Sanitation”. Dr.

N. Romabati Devi, Assistant Professor, Department of Zoology, Imphal College delivered a lecture on “Classification and Identification of animals”. Lectures on the topic “Classification and identification of Plants” and “Biodiversity an overview to ecology” were also delivered during the camp.

The topics covered during the camp included classification and identification of animals, classification and identification of plants, nature walk, field trip and sample collection, sorting, analyzing and preserving samples, microscopic observation of small plants and animals, biodiversity – an overview to ecology, environmental awareness, low cost experiments on science, sky watch, fun with plants – studying the parts/ processes and exploring the world, science songs, living together – study of habitat/ecosystem, the micro world, role plays, science games, scientific film shows, green house effect, physical nature of soil, water and air, kitchen gardening, seed germination.

The camp concluded on March 24, 2013 with a closing function. A pledge taking session was conducted during the closing function and everyone who attended the function took pledge towards conserving and nurturing the nature for future generation. The camp was closed with concluding remarks from Shri Kh. Rakesh, Scientific Officer, Programme Co-ordinator.

3.0 Projects :

3.1 Patent Information Centre (PIC), Manipur

The Patent Information Centre (PIC) was set up at Department of Science & Technology (DST), Govt. of Manipur and was transferred to Manipur Science & Technology Council (MASTEC), Imphal on 26th November, 2007 under the supervision of PFC-TIFAC, DST, New Delhi with the objectives such as

- i) Introduce patent information as a vital input in the process of promotion of R&D programmes.
- ii Provide patenting facilities to scientists and technologists in the country for Indian and foreign patents on a sustained basis.
- iii Keep a watch on developments in the area of IPR and make important issues known to policy makers, scientists, industry etc.
- iv Create awareness and understanding relating to patents and the challenges by arranging workshops, seminars, conferences etc..



PIC Manipur unit

The PIC, Manipur is well equipped for providing services on IPR related issues in the State. The Centre works on creating awareness about Intellectual Property Rights (IPR), especially patents and Geographic Indications (GI), in the state of Manipur and provide patent searches to the interested parties in the universities, industry, government departments and R&D institutions.. Further, it guides the inventors in respect of patenting their inventions. The project team of the PIC interacted with several entrepreneurs and innovators in the state

by visiting exhibitions/ melas and distributed the leaflets/pamphlets to them for their information in the areas of IPR.

Patent Application & Searches:

The following applications were submitted during the year 2012- 2013 and patent searches were also carried out.

- Patent Application on *Solar Multi Silk & Muga Reeling cum Spinning Machine*”.
- **Manipuri Potloi/Kumin** for Geographical Indication (GI) Registration
- **Tricycle Rickshaw operated paddy thresher** for patent filing

Besides, the concept paper on “**Dry Fish Fermentation Technology**” (Patent Application No. 1274/KOL/2010 A) was published in the Patent Journal on 19/10/2012. Documentation for GI Registration on i) Ngari-Fermented Fish of Manipur, ii) Nungbi Pottery & iii) Kouna products were being carried out.

3.2 Intellectual Property Facilitating Centre (IPFC), Manipur

Intellectual Property Facilitating Centre (IPFC) for MSMEs of Manipur was set up at Manipur Science & Technology Council under the support of Ministry of Micro, Small and Medium Enterprises, Govt. of India, New Delhi. The main objectives included i) Co-locating IPR facilitation centre in PIC, ii) determining IPR needs of selected clusters of MSME in the state and evolve solutions and iii) extending legal, financial and technical support to them for protecting intellectual property of the industries such as patents, trademarks, design, copyrights etc. The centre is equipped with Questel Orbit Online Database for Patent searches, Desktop with Printer, Projector, Digital Camera etc.

Activities ;

i) Trade Mark Registration

One application from M/s Kangla Food Products, Imphal was received and Trade Mark Registration for their products Namkeen, Rice Flake (sweet & plain), Mixture (Garlic, Masur, Onion etc.), Chanadal, Kabali Chana, Badam Bora etc. is in progress.



ii) Design Registration

Design Registration for Badge depicting the Salai Taret (7 Clans) of Manipur is in progress.

iii) Observation of World Intellectual Property Day:

World Intellectual Property Day 2012 was observed on 26th April 2012 under the theme "Visionary Innovators" organized by Intellectual Property Facilitating Centre (IPFC) of the Council, Imphal in association with IPR – Cell Manipur University at Manipur

University. The main objective of the workshop was to create awareness about IPRs, especially patents, among the students, researchers, faculty members etc. Prof. L. Rupachandra, Bio-chemistry Department and Chairman IPR-Cell, Prof. L. Warjeet, Chemistry Department, Prof. E. Bijoykumar, Economics Department, Manipur University, Imphal shared their views about IPRs with the Participants. Prof. HNK Sarma, Vice Chancellor, Manipur University inaugurated the function. About 80 participants comprising of research scholars and interested faculty members attended the programme..



Vice Chancellor of Manipur University sharing his views on IPR

3.3 Manipur Science Aquarium

Manipur Science and Technology Council, Imphal with the support of Department of University and Higher Education, Government of Manipur, Imphal constructed Manipur Science Aquarium at D.M. College Complex, Imphal with the main objectives of studying the behavior of different types of fishes and conserve the fish fauna as well as creating awareness about the available local fishes to the public and create a place for recreation of the public.

Local and other aquarium fishes were kept in the tanks for viewers. These local fishes are collected from different parts of the valley as well as hill areas of the state. Interested visitors also donate fishes to the aquarium. Local fishes such as Pengba, Meitei Ngamu, Ngamu Bogra, Ngashang, Nylon-nga, Lanmeithanbi, Muka-nga, Phabou-nga, Ngakha Meingangbi, Nga-tunghanbi, Ngaton,



Aquarium tanks of Manipur Science Aquarium

Silver Carp, Japan Puthi, Puklaobi, Ngapemma, Phetin, Rou, Ngaril, Ngakrijou, Ngatup, Khajing, Ukabi, Kandala, Ngaprum, Ngashep, Ngamha, Ngawa, NgarinLeina are kept in the aquarium. The fishes procured from outside the state included Gold Fish, Fan Tail, Telescopium, Fighter Fish, Pearl Angel, Marble Angel, Black Vale, Angel, Albino Gourami, Pearl Gourami, Crocodile Fish, Albino Red Cap, Tetras, Tiger Shark, Albino Shark, Sword Tail, Yellow Parrot Fish, Red Parrot Fish, Zebra Fish, Black Molli, Red Molli, Marble Molli, Guppies. The aquarium receives visitors daily except on Friday.

Fish Collection

During the year 2012-13, various indigenous fish species such as Biota dario (Sareng Khoibi), Barilus bola, Barilus dogarsinghi (Ngawa), Chanda nama (Ngamhai), Aplocheilus lineatus (Nganap), Colisa fasciata (Ngapemma), Notopterus notopterus (Kandala) were

collected from different locations such as Imphal River, Khuga River, NHPC canal. They were identified, reared and also studied their morphology, food and feeding habit etc.

Out break of Disease

The Fishery Officer of the Center observed diseases spread to the fishes in the aquarium tanks and also took up necessary treatments. The following were the findings of the diseases spread to the fishes in the tanks.

1. **Cotton-wool** - This was observed at Albino and Tiger Shark during the winter season. The symptoms were white cotton woolly tufts on the body and fins. This is a fungal infection and treated with anti-fungal.
2. **Fin** - At Albino and Tiger Shark could observed, eye became protruded from the socket and cloudy in colour. This is another fungal infection, and treated with anti-fungal. We could save only few fishes from these two diseases.
3. **Fin rot** - Gold fish, *Puntius Japonicus* (Japan puthi) and Ngapemma was infected with this disease, the symptoms were fins become splinted and rotted, the tissue between the fin rays gradually disintegrated, The fishes was treated with antibiotic Tetracycline and general aid.
4. A disease out-break was observed to the Gold and Koi fishes which after examination was identified as *Argulus* infection, which is an Ecto-parasite. The fishes were treated with brine dip, general aid and an antibiotic

3.4 Community Pond Based Safe Drinking Water System

The project was supported by Department of Science & Technology, Govt. of India, New Delhi. It started in December 2011 for a period of 2(two) years. It was a demonstration based project. It aimed at supplying safe drinking water using ultra-filtration membrane technology developed by Bhabha Atomic Research Centre (BARC), Mumbai.

During the project period, three safe drinking water systems of 2000 lpd capacity have to be installed using BARC developed ultrafiltration membrane technology each in three identified sites such as Khabam Bamdiar, Konthoujam and Thoubal Athokpam villages in the state of Manipur. One

Community Pond based Safe drinking Water system using ultra-filtration technology developed by Bhabha Atomic Research Centre (BARC), Mumbai was successfully installed at Khabam Bamdiar village, Imphal west and started providing drinking water to the villagers and the installation of one more unit at Athokpam village, Thoubal District. is in progress.



Safe drinking Water unit installed at Khabam

4.0 Meetings/Trainings attended by Officers

Name of official with designation	Meetings / Trainings	Sponsoring agency	Venue	Period
Th. Surendranath Singh Director	Training Workshop on Space Applications in Disaster Management	NIDM, New Delhi	New Delhi	April 2-4, 2012
	Regional Meeting of State Science & Technology Councils/ Departments for NE-E Region	DST, GoI	Kohima,	November 19-20,2012
	Consultative Meet on National Data Sharing and Accessibility Policy (NDSAP)	DST, GOI	Hyderabad	March 23, 2013
Dr. L. Dinachandra Singh, Sr. Scientific Officer	Project Advisory Committee meeting on Water Technology Initiative	DST, GoI	Guwahati	October 5-6, 2012
	Regional Meeting of State Science & Technology Councils / Departments for NE- Region	DST, GoI	Kohima, Nagaland	November 19-20,2012
	S&T Council Consultative Meeting	DST, GOI	DST, GOI, New Delhi	December 11, 2012
	Consultative Meet on National Data Sharing and Accessibility Policy	DST, GOI	Hyderabad	March 23, 2013
Dr. L. Minaketan Scientific Officer	Training Workshop on Space Applications in Disaster Management	NIDM, New Delhi	New Delhi	April 2-4, 2012

Name of official with designation	Meetings / Trainings	Sponsoring agency	Venue	Period
	National Workshop on Science Communication	Vigyan Prasar, DST, Noida	Allahabad. U.P.	December 13-15, 2012
Kh. Rakesh	Core Group Meeting on S&T Oriented Demonstration Project	DST, GOI	New Delhi	September 19, 2012
	Brain Storming Session for strengthening VIPNET Programme	Vigyan Prasar DST	Gandhi Nagar, Gujarat	August 30 – 31, 2012
Er. Ch. Sarat Singh	Project Advisory Committee meeting on Water Technology Initiatives	DST, GoI	IIT, Guwahati	October 5-6, 2012
	Regional Meeting of State Science & Technology Councils / Departments for NE-E Region	DST, GoI	Kohima,	November 19-20,2012
	Workshop on Development of Micro Hydel Capabilities	DST, GoI	Kohima,	November 21, 2-12
	National Workshop on Science Communication	Vigyan Prasar, DST, Noida	Allahabad. U.P.	December 13-15, 2012
Dr. R.K. Pritamjit Singh	Technical Advisory Committee for Eco-Wash Literacy & Awareness	DST, GoI	Shimla	May 30-31, 2012
	DST Expert Group Meeting on PICs	DST, GoI	Bangalore	June 7-8, 2012
	One day Workshop on IPFC	DC-MSME, GoI	New Delhi	October 5, 2012

5.0 Visiting Scientists to MASTEC

The following scientists made official visits to MASTEC in connection with the programmes shown below.

Sl. No	Name of official with designation	Organisation	Meetings / programme which they attended	Sponsoring agency
1	Dr. C.M.Nautiyal Scientist	Birbal Sahni Institute of Paleobotany, Lucknow	Training Workshop on Science Writing / Journalism for Bishnupur District held during November 5-8, 2012	NCSTC, DST, Govt. of India
2	Dr. Arunabha Majumder Emeritus Fellow	School of Water Resources, Jadavpur University, Kolkata	Brain Storming in Water Related Areas held at Imphal on November 30, 2012	DST, Govt. of India
3	Dr. Sanjay Bajpai Director/ Scientist F	Ministry of Science & Technology, DST, Govt. of India	Brain Storming in Water Related Areas held at Imphal on November 30, 2012	DST, Govt. of India
4	Er. A.R. Shivkumar Scientist	Karnataka State Council of Science & Technology, Bangalore	Brain Storming in Water Related Areas held at Imphal on November 30, 2012	DST, Govt. of India

6.0 Library

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

7.0 Projects in Pipeline

The following R&D projects have been submitted to DST, Govt. of India, New Delhi for consideration for support.

1. MASTEC-ICAR joint venture project on Pisciculture and its allied activities for socio-economic development in Manipur
2. Tricycle Rickshaw Operated Paddy Thresher.
3. Scientific Evaluation of Water Purification Systems in Schools (Phase – II)
4. Evaluation of Medicinal and Nutritional Values of Wild Edible Plants of Manipur
5. Development and characterization of the ingredients of environment friendly Insect repellents and bio-fumigants from certain plants of Manipur
6. Exploration of Indigenous Plant species for their pesticidal properties for the management of major pests of Cole Crops in Manipur

7. Generation of Pony based animal energy for utilization in agricultural development of Manipur State
8. Processing technology and product development of Ngari - a traditional fermented fish of Manipur
9. Prospecting Tripura Traditional Medicine for Anti Arthritic Therapeutic Resources
- 10 Collection and Conservation of Medicinal Plants of Manipur
- 11 MASTEC – D.M. College of Science Joint Venture Project on Water quality assessment of community ponds and their treatment in Manipur valley, Manipur

