

# *Annual Report*

## *2013 - 2014*



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

Website: <http://mastec.nic.in> email: [mastec@nic.in](mailto:mastec@nic.in)

**Annual Report 2013 - 2014**  
**MANIPUR SCIENCE & TECHNOLOGY COUNCIL**

**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	Observation of World IP Day	5
2.2	Science Meet 2013	5-9
2.3	Training Workshop on Innovative Experiments in Chemistry	9-10
2.4	Vigyan Prasar Edusat Network	10
2.5	Training Workshop on Learning Science through Low Cost Hands on Experiments	10-12
2.6	Training Workshop on Science Writing/Journalism	12-13
2.7	Millennium Science Lecture	13
2.8	State Level Workshop on Comets and Astronomy around us	13-14
2.9	Observation of National Science Day	14-15
2.10	Celebration of National Mathematics Day	15-17
3.0	Projects	17
3.1	Manipur Science Aquarium	17
3.2	Patent Information Centre	18
3.3	Intellectual Property Facilitating Centre	18
3.4	Tricycle Paddy Thresher	19
3.5	Community Pond based Safe Drinking Water System	20
3.6	Geological and Geotechnical Investigation of two Sites located between Noney – Nungba along NH-37 and suggest Remedial Measures	21
4.0	Meetings/Trainings attended by Officers	21-22
5.0	Visiting Scientists to MASTEC	23
6.0	Library	23

## **1.0 Background**

The Manipur Science & Technology Council (MASTEC) formerly, State Council of Science, Technology and Environment, Manipur was set up in the year 1985 with the initiatives from the Department of Science and Technology, Government of Manipur. The 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 /Commissioner(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 manpowers 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;

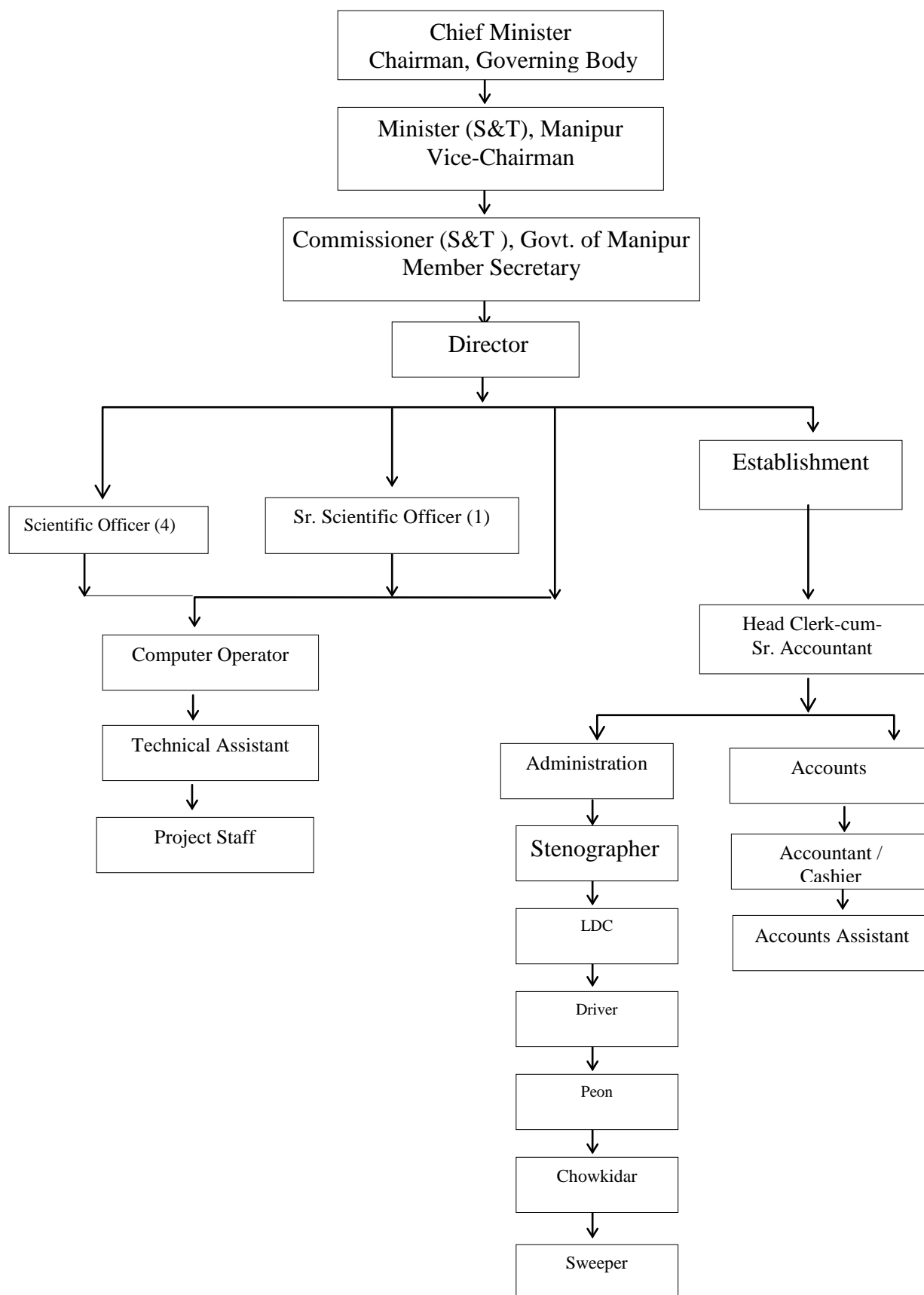
- To identify priority areas of Science, Technology & Environmental need for long term development of the State;
- To safeguard and promote the ecology and environment in the State of Manipur;
- To utilise Remote Sensing Techniques for planning, implementation and monitoring of development programmes 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 which consists of a wide distribution of membership having expertise in various fields, with the Chief Minister as the Chairman, and the Minister in charge, S&T, Manipur as the Vice Chairman. At present there are 25 employees (including project staff) in the Council. The Council has an Executive Committee to assist the activities towards achieving the objectives of the Council. The Vice-Chairman of the Governing Body of the Council heads the Executive Committee as its Chairman. The Secretary/Commissioner, S&T, Government of Manipur is the Member Secretary of the Council. The Member Secretary is the Chief Executive of the Council Secretariat.

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

### Project Staff :

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

## 2.0 Short-term Activities including Science Popularisation

The Manipur Science and Technology Council (MASTEC) organised various centrally sponsored programmes/ workshops / trainings relevant to the state including science popularisation to fulfil the objectives for establishment of the Council. The following were the programmes implemented by MASTEC during the year 2013- 2014.

### 2.1 Observation of World Intellectual Property Day

The World Intellectual Property Day 2013 was observed on 26th April 2013 under the theme “**Creativity – The Next Generation**”. It was organised in association with Department of Botany, Imphal College, Imphal. The objective of the programme was to create awareness about **Intellectual Property Rights (IPR)** among the intellectuals, entrepreneurs, individuals etc. Th. Baite, Director MSME - DI, Imphal, delivered a lecture on IPR as a resource person. About 80 participants comprising of college teachers, students and interested individuals attended the programme



*Resource person speaking on World Intellectual Property Day*

### 2.2 Science Meet 2013

As a continuing programme of Observation of National Science Day 2013 and also to observe National Technology Day 2013, the 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 a 5-day long Science Meet 2013 during May 11-15, 2013 at Lamyamba 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.

The activities of Science Meet 2013 included Science Model competition, Science Quiz, Spot Painting, Declamation Contest, Exhibitions, Best Appreciation Award (Open) and Best Guide Teacher Award for Science Model, Science Explaining Miracles, Science film show, Science Drama and Puppet Plays, Scientific Lecture-cum-Demonstration, Book & Poster exhibition, IT show etc. etc.

#### **Science Model 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 one models were exhibited by students from different schools in the State.

Serena and Pebam Rozy Chanu of Maria Montessori Senior Secondary School won the first prize on their model “DNA structure of genetically modified crops”. Shelina Moirangthem and Ayingbee Kakchintabam of Mega Manipur got the



*Students displaying Science Models*



second prize on their model “Genetically modified food and crop”. Sanasam Lalngamba and Sanasam Malemnganba of JNV Thoubal got the third position on their model “Community based integrated farming model with GM crops”. Riddhi Puyam and Oinam Nivia of Maria Montessori Senior Secondary School and I. Priya Devi & O. Samananda Meetei of Madhumati High School got the consolation prizes on their models “Genetically modified nodulated maize for higher yield and food security” and Bamboo food processing respectively.

In recognition of the contribution of teachers to guide students in developing and designing the science model, the Best Guide Teacher Award for the Science Model Competition, was awarded to Bonie Chanu Thoidingjam of Maria Montessori Sr. Sec. School, Koirengei.

### Science Quiz :

Out of 70 teams comprising of two students from a school reading in Class IX-XII, four teams were selected for the final round through a preliminary round - Written Contest. Wangjam Ashokumar Meitei and Mayengbam John Meitei of Herbert School, Changangei won the first position. Sonia Naorem and Keisham Tampha Ibema of the same School got the second prize. Shohaib Rahman and Moirangthem Nitesh Kumar of Herbert School, Changangei got the third prize. Vaskar Raj Thounaojam and Md. Siddiqui got the consolation prizes.



*Science Quiz Competition*

### Spot Painting:

The spot painting competition was organized in 3(three) groups viz., i) Sub-Junior Group (Class III—V), ii) Junior Group (Class VI-VIII) and iii) Senior Group (Class IX-X). Altogether 79 students from 40 schools, 90 students from 54 schools and 62 students from 38 schools participated in the competition of the Sub Junior, Junior and Senior Category respectively.

In the **Sub-Junior Group**, Laiphrakpam Boshni of Regular English High school, Kwakeithel and Yambem Ngongo Singh of Maria Montessori Sr. Sec. School, Imphal were given the first and second prizes respectively. Abraham Nongthombam of Christ Jyoti School, Mantripukhri got the third prize. Milli Rajkumari of Mega Manipur school, Yarlapat and Thareima S.C. Thokchom of Maria Montessori Sr. Sec. School, Imphal were given the consolation prizes.

In the **Junior Group**, Ksh. Gopinath Singh of Bhaktivedanta Institute Mission Hr. Sec. School, Imphal took the first position. Yumnam Rahul Singh of Wangkhei High School, Wangkhei and Oshila Konsam of St. George High School, Wangkhei were given the second and third prizes respectively. Malemnganbi Yumnamcha of Mount Carmel School, Churachandpur and Sony Soram of Kendriya Vidyalaya, Lamphel were given the consolation prizes.



*Spot Painting Competition*



In the **Senior Group**, Asem Indrajit Singh of The Brilliant Public School, Shamurou got the first position. Anand Naoroibam of E.K. Hr. Sec. School, Imphal and Chingakham Barun Singh of Bhaktivedanta Institute Mission Hr. Sec. School, Imphal got the second and third positions respectively.

Yumnam Ricky Singh of Wangkhei High School, Wangkhei and Laiphrakpam Roshan of Regular High School, Kwakeithel were selected for consolation prizes.

### **Declamation Contest:**

Thirty seven students from various institutions reading in Class IX-XII science participated in the competition. Neera Sinam of Nirmalabas High School, Imphal was given



*A section of Audience witnessing  
Declamation Contest*



*A student competing for the  
Declamation Contest*

the first place. Huidrom Nganthoi of Tiny Tot's Unique School, Imphal and Konjengbam Depika Hilary of Mother's Pride Academy, Bishnupur were given the second and third prizes respectively.

### **Best Appreciation Award:**

The Best Appreciation Award introduced by MASTEC was given to the student who proves to have gained the maximum knowledge of science from the Meet as judged by questionnaire response and personal interview. Eighty students competed for the award. Miss N. Asharani Devi, Class XII of Herbert School, Changangei was given the Award.

### **Book Exhibition:**

Four book stalls such as Mangal Book House, Paona Bazar, Imphal, Iwui Book Store, North AOC, Imphal, Job Centre, Babupara, Imphal and K.K. Book Store, Imphal took part in the exhibition and displayed Scientific Books/Journals/publications. A number of students, teachers and parents visited the stalls and also bought books of their interests

### **IT Show:**

Four local computer institutions/firms namely, Emoinu Computer Enterprises, Governor Road, Imphal, Mangal's Infotech Endeavor, Pologround, Imphal, Swift Infotech, Leima Shopping Plaza, Imphal and DEC Computers, Governor Road, Imphal took part in the IT exhibition and interacted with the visitors, especially, students. The visiting students enjoyed the display with internet facility.

### **Poster Exhibition:**

As a special feature of Science Meet 2013, thirty (30) posters including compilations of Vigyan Prasara, New Delhi were displayed. Five posters of State symbols viz., State Animal, State Bird, State Flower, State Fish and State Tree were also exhibited during Science Meet 2013.

### Scientific Film Show:

Some Science films were shown for one hour duration each day on all four days of the Meet. These films were the collections of MASTEC and Vigyan Prasar, New Delhi. The films screened during the Meet included i) A brief History of Time, ii) Black Hole, iii) Time Travel, iv) The Theory of Everything, v) Hubble Amazing Universe etc.

### Explaining Science behind Miracles:

Miracles or magic have been aged-old human activities making people wonder or confuse and mislead sometimes the general public. The expert members of GENIM demonstrated some interesting magic show and the scientific backgrounds of the show were explained to the audience. During the 5-day programme, Science behind Miracles was kept for 3 (three) days of 2(two) hours duration each day and every day hundreds of students & general public witnessed the show.



*Science Behind Miracle Show in progress*

### Puppet Play & Science Drama:

The art of puppetry has been an effective tool for communicating science to the people. Members of MASCA presented 3 (three) puppet shows on the topics (1) Ani Ani Nipan ( $2 \times 2 = 8$ ) (2) Genetically Modified Crops and (3) Laiphao. The objectives of the plays were to make the people realize how puppetry could be used as a medium for Science & Technology communication. Two science dramas based on Environmental Pollution and advancement of Science were played by the local artists.



*Puppet play being played during Science Meet 2013*

### Lecture-cum-Demonstration:

Five invited speakers namely Shri H. Jayantakumar Singh, Retd. Professor of mathematics, D.M.College of Science, Dr. R.K. Bhubon Singh, Associate Professor of Chemistry, Manipur University. R.K. Birjit Singh, President, the Generation De New Image, Dr. N. Brojendra Singh of Central Agricultural University, and Dr. O. Shashikumar Singh, Head, D.M. College of Science, Imphal performed lecture-cum-demonstrations and interacted with the audience..

Shri H. Jayantakumar Singh, delivered a lecture on the topic "Role of Mathematics in Science". Dr. R.K. Bhubon Singh demonstrated on "Basic Chemical Reactions". R.K. Birjit Singh spoke on Wetlands and Animals of Manipur. Dr. N. Brojendra Singh made a presentation on "Genetically Modified Crops and Food Security" and Dr. O. Shashikumar Singh delivered on the topic "Genetically Modified Organisms and Food Security".



*Demonstrations on "Some Basic Chemical Reactions"*

### Prize Distribution :

The 5-day Science Meet 2013 concluded with a Valedictory and Prize Distribution Function with. Dr. Kh. Ratankumar, Hon'ble Minister (Works & Transport), Manipur, as the Chief Guest of the function. Cash prizes with citations, memento with one Book on Life and Works of Madam Curie were distributed to the prize-winning students of various competitions by the dignitaries on the dais.



*Distribution of Prizes to student Winners  
by Minister ( Works & Transport)*

### 2.3 Training Workshop on Innovative Experiments in Chemistry

Under the Nation wide sensitization Programme for Chemistry teachers, Manipur Science and Technology Council, Imphal in association with Vigyan Prasar, Noida organised a Training Workshop on Innovative Experiments in Chemistry during July 23 – 25, 2013 at Manipur Press Club, Imphal. The main objective of the training workshop was to impart training to the teachers to perform simple experiments in chemistry for teaching science to the students in their schools for a better understanding of science among the students.

Shri Rajesh Agrawal, Commissioner, Science and Technology, Government of Manipur as the Chief Guest inaugurated the training, B.K. Tyagi, Scientist, Vigyan Prasar, Dr. Arup Misra, Professor, Assam Engineering College, Guwahati, Dr. Arindam Rana, Associate Professor, City College, Kolkata, U.C. Laishram, Director, Science and Technology, Government of Manipur attended the function as the Guests of honour. The inaugural function was presided over by Th. Surendranath Singh, Director, Manipur Science and Technology Council, Imphal

While speaking as guest of honour, Dr. Arup Misra sharing some of his experiences, emphasized about the role of teachers in disseminating Science and Technology information to the masses and the students in particular. B.K. Tyagi highlighted in brief about various activities carried out by Vigyan Prasar in the country as a part of International year of chemistry.

Rajesh Agrawal, in his inaugural Address, stated that teachers would mould the students to a proper shape. He appealed to all the teacher participants to take maximum benefit from the workshop and extend the activity in their schools to create a better understanding of science among the students. Altogether 52 participants from various schools including VIPNET science Club members participated in the training workshop.



*Inaugural function:  
Dignitaries on the dais*



*Dr. Arindam Rana, City College,  
Kolkata performing experiments*



A number of experiments based on chemistry in daily life were demonstrated and explained by Dr. Arindam Rana. Dr. Arup K Misra delivered lecture on “Green Chemistry” and interacted with the participants. Shri B.K. Tyagi gave a talk on “International Year of Chemistry – 2011” and demonstrated the Chemistry Kit developed by Vigyan Prasar. Local resource persons Dr. R.K. Bhubon Singh, Associate Professor in Chemistry, Manipur University delivered a lecture on “Chemistry teaching – an approach”. Shri Ch. Sanajaoba Singh, Nodal Safety Officer, Directorate of Health Services, Government of Manipur demonstrated some experiments on Water and Food adulteration using kits. Shri R.K. Birjit Singh, Secretary, Centre for Conservation of Nature and Cultivation of Science, Ningthoukhong demonstrated some activities on Chemistry behind Miracles. A chemistry kit developed by Vigyan Prasar was also distributed to each participant for taking up activities in schools.



*Dr. A K Misra, Assam Engineering College, Guwahati interacting with the participants*

An interaction session was arranged with the participants to obtain feedback about the workshop. Science club members expected some regular activities from Vigyan Prasar to strengthen the existing science clubs in the state. Many participants had expressed their willingness to form science club in their respective schools for the students.

## **2.4 Vigyan Prasar EduSat Network**

Satellite Interactive Terminal (SIT) is a two way audio-video interactive network for science & technology communication using EduSat – the satellite for Education. The programmes transmitted on line by Vigyan Prasar, Govt. of India, Noida, U.P. is received at the Edusat Centre of the Council at Imphal and target participants could enjoy the programme. The programmes transmitted from Vigyan Prasar included i) Training – using distance education mode, ii) Interaction in various fields of sciences with the scientists at one end and teachers, students etc. on the other end far-away places in the country, iii) Sharing of resource materials by way of file transferring.



*Vigyan Prasar Edu Sat Centre at MASTEC*

The main target groups who availed of the benefits from the SIT programme included science clubs, teachers, School students, College and University students, General public etc. The 3 month distance learning on Remote Sensing, GIS and GPS under the Indian Institute of Remote Sensing (IIRS), Dept. of Space, Dehradun was conducted for the third time during August – November, 2013. Eight participants successfully participated in the training.

## **2.5 State Level Training Workshop on Learning Science through Low Cost Hands on Experiment**

A 3-day State Level Training Workshop on Learning Science through Low Cost Hands on Experiments was organised during October 17-19, 2013 at Manipur Press Club, Imphal.

The programme was catalysed and supported by National Council for Science & Technology Communication (NCSTC), Department of Science & Technology, Govt. of India

The main objective of the Training Workshop was to impart training to Science Teachers for carrying out scientific experiments using readily available low cost materials so that they may in turn conduct the same activities at their Schools for teaching science to the students. Altogether 40 participants comprising of science teachers of different disciplines attended the workshop. The workshop was inaugurated by Shri Kh. Raghupati Singh, IAS, Additional Secretary (Science & Technology), Govt. of Manipur. Shri Th. Surendranath Singh, Director, MASTEC presided over the function. Shri Nripen Saikia, Lecturer DIET, Lakhimpur Azad, Assam was the Guest of Honour of the function.



*Additional Secretary (S&T) giving Inaugural Speech*

Shri Nripen Saikia conducted the technical sessions. Altogether nineteen experiments of Physics such as i) Determination of Area and Volume of a Cylindrical/Spherical Body, ii) Determination of Average Speed of a Moving Body (hand-barrow), iii) Investigating Centripetal and Centrifugal (Fictitious) Force, iv) Newton's Third Law of Motion, v) Verification of Archimedes' Principle (Upthrust/Buoyancy), vi) Studying Action of Spray Apparatus (Bernoulli's Principle), vii) Studying Action of Pulley (Simple Machine), viii) Identifying Centre of Gravity of non-symmetrical bodies, ix) Studying that medium is necessary for Transmission of Sound, x) Measuring the Volume of a Drop of Water, xi) Investigating the Magnetic Field and Magnetic Lines of Force, xii) Studying Magnetic Effect of Electric Current, xiii) Studying the concept of Molecular Theory of Magnet, xiv) Investigating the concept of Static Electricity (Electric Charge), xv) Verification of Laws of Reflection by Pin method, xvi) Studying Phenomenon of Refraction by Pin Method, xvii) Investigating Phenomenon of Dispersion of Light, xviii) Determining Focal Length of a Convex Lens/Concave Mirror, xix) Investigating Concept of Rainbow observed in a Soap Bubble were conducted during the Workshop.

Altogether eleven experiments of Chemistry such as i) Investigating difference between Physical and Chemical Change, ii) Studying Melting Point of Candle Wax and concept of Latent Heat, iii) Separation of mixture by Filtration process, iv) Separation of mixture of two or more immiscible liquids, v) Separation of different colours by process of Chromatography, vi) Separation of Sublime substance (Naphthalene) by Sublimation process, vii) Separation of substance (salt) by Distillation process, viii) Preparation of Carbon-dioxide Gas and studying its properties, ix) Preparation of Oxygen Gas and studying its properties, x) Preparation of Hydrogen Gas and studying its properties, xi) Investigating Displacement Reaction and arranging Metals in activity series were conducted.



*Participants in group carrying out Experiments with resource persons*

Five Experiments of Biology such as Testing presence of Starch and Protein in food items, Observing Plant Cell (onion) under microscope, Observing Stomata of a green leaf under microscope, Studying phenomenon of Osmosis using potato-cup and dry grape and Studying action of lung using a Lung Model were also conducted during the 3-day Training Workshop. An Interaction Session was arranged on the third day during which the participants raised questions and the Resource Person, Shri Nripen Saikia gave reply to the questions

## 2.6 Training Workshop on Science Writing / Journalism

The Training Workshop on Science Writing / Journalism for Sadar Hills, Manipur was organized at the Presidency college, Govt. of Manipur, Sadar hills, Manipur during November 13-16, 2013. The objective was to impart training to the science teachers about science writing for various forms of media (print & electronic). Science teachers from different colleges, schools and interested science graduates participated in the training workshop.

Dr (Mrs) T. Gangte, Principal, Presidency College, Govt. Of Manipur inaugurated the training as the Chief Guest. Shri Th. Surendranath Singh, Director, MASTEC presided over the inaugural function and Dr. Arup Kumar Misra, Professor, Assam Engineering College, Jalukbari, Guwahati attended the function as the Honoured Guest. The programme was catalysed and supported by National Council for Science & Technology Communication (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 by experts. Altogether forty one participants comprising of science teachers in colleges and schools from Sadar hills region attended the training workshop.



*Chief Guest giving inaugural address*

Dr. Misra, Assam Engineering College, Guwahati, Shri Ak Khogendro Singh, Director in charge, DDK, Imphal Station, Shri A. Gitchandra Sharma, Programme Executive, All India Radio, Imphal & Satyajit Usham, Editor, Huieyen Lanpao (English edition) were the resource persons of the training and imparted training to the participants. Dr. Arup Kumar



*Director, DDK, Imphal delivering a lecture on writing for Television*

Misra presented papers on the topics i) Making science communication more exciting and effective and ii) Role of Science Writers in popularisation of science and also interacted with the participants on the identification of topics and materials to be used for writing. Ak. Khogendro Singh, Director in charge, DDK highlighted in brief on Writing for TV. A. Gitchandra Sharma spoke on the topic “ Writing for Radio & Opportunities at AIR for Science Writers”. He also explained in brief about various science programmes of All India Radio where science teachers / writers could take part. Satyajit Usham delivered a lecture on the topic “Writing for Newspaper and role of print



media in popularization of science”. Satyajit assured to the participants that he would try to keep space in his esteemed News paper for inclusion of science articles. Altogether 41 participants comprising of science teachers in colleges, Schools, and interested science graduates including 13 lady teachers of the district attended the training workshop.

During the course of the workshop, out of 41 participants, sixteen (16) participants could develop scripts in the topics of their interest and made presentations before the panel of experts drawn from different media organisations and the experts evaluated the scripts for improvements.



*Script presentation session in progress*

## 2.7 Millennium Science Lecture

The Millennium Science Lecture was organized at Mega School Manipur at Yaralpat, Imphal East on December 10, 2012 in honour of the Nobel Laureates in the subjects Chemistry, Physiology and Physics of the year 2013.

Th. Surendranath Singh, Director, MASTEC highlighted in brief about the overview of Nobel Prizes. Dr. N. Rajmuhon Singh of Chemistry Department, Manipur University deliberated about Nobel prize in Chemistry. He mentioned about development of multi scale models for complex chemical systems. Prof. N. Nimai Singh of Physics Department, Manipur University spoke on the Nobel prize in Physics. He spoke on the theoretical discovery of a mechanism that contributes to the understanding of the origin of mass of subatomic particles.. Dr. O. Joychandra Singh of Jawaharlal Nehru Institute of Medical Sciences delivered on Nobel Prize in Physiology/Medicine. He deliberated how the cell organises its transport system. About 200 delegates including students and teachers attended the programme.

## 2.8 State Level Workshop on Comets and Astronomy around us

A comet - C/2012 S1 (ISON) was discovered by two scientists Mr. Vitali Nevski of Belarus and Artyom Novichonok of Russia in the year 2012. Scientists all over the globe believed that the same Comet ISON would be visible in the sky as bright as the Moon during November-December 2013. Vigyan Prasar and National Council for Science & Technology Communication (NCSTC), Dept. of Science & Technology, Govt. of India in association with a group of astrophysicists, amateur astronomers, science activists started a mass campaign across the country to create an awareness of the Comet to the students and the general public in the country.

Under the sponsorship of NCSTC, Dept. of Science & Technology, Govt. of India, Manipur Science & Technology Council jointly with Paschimbanga Vigyan Mancha (PBVM), Kolkata organized a two day State Level Workshop on Comets and Astronomy around us during February 12-13, 2014 at Imphal. The activities of the programme included Lectures, group discussion, presentation, night sky watch, role play, scientific film show etc..



*Role play activity in progress*

Shri Ch. Bijoy Singh, Associate Professor of Physics, D.M. College of Science delivered a lecture on Our Solar System. Dr. Arunabha from City College, Kolkata delivered lectures on History of

Astronomy in India. He also explained about the ISON Comet – its origin, paths till date and also shown photographs taken recently before it vanished on November 28, 2013.

Five groups, each group comprising of 8 members, namely Aryabhata, Destroyer, Shajik Thaba (local names of morning & evening stars), Raman and Dhruba presented reports on FAQ 1 (basic concepts on astronomy) and FAQ 2 (based on astrology, superstitions & coincidences, and worked with a set of common misconceptions, statements & beliefs etc.).

The Scientific film – Chandra, The Journey of a Star was screened in the evening. The film was based on the biography of Prof. Subrahmanyan Chandrasekhar, an Indian astrophysicist.

As part of Role Play Activity, Dr. Arunabha and Prof. Bijoy demonstrated as well as explained some activities like - Day and Night, Phases of Moon, Why moon shows only one face, Motion of Earth around the Sun, Earth's Tilt and Seasons etc. The participants joined the role play activities and enjoyed. In the evening, using a telescope, Dr. Arunabha explained how to trace the stars, planets and several constellations and identified pole star, different constellations. The participants also witnessed the planet Jupiter along with its 4 moons.

Dr. Pritamjit, Scientific Officer of MASTEC gave a demonstration of the software Stellarium and also demonstrated to the participants on the making of a comet models with the help of ping pong size balls, glue, crape paper of different colours, A4 white paper, needles, small & medium size threads, piece of thick cloth, sand etc. He also explained the structure of a comet and its tails.

## 2.9 Observation of National Science Day 2014

The Observation of National Science Day 2014 was organised on February 28, 2014 at Diligent Public School, Moirang. The theme for National Science Day 2014 was **“Fostering Scientific Temper”**. About 200 participants consisting of students and teachers from various schools in Manipur attended the programme. A lecture on the topic **“Life and Works of C.V. Raman”** was delivered by Shri R.K. Birjit Singh, President,



*Dignitaries on the Dias at Observation of National Science Day 2014*



*A Section of Participants at Observation of National Science Day 2014*

Generation De New Image (GENIM), Ningthoukhong. He explained in depth about life history of Prof. C.V. Raman right from his childhood (school days) to his discovery of Raman Effect. He asked the young students to work hard and become a Nobel Laureate in the future and bring fame for the Nation.

During the function for observation of National Science Day 2014, the Director, Manipur Science & Technology Council (MASTEC), Imphal released a book entitled

“Life and Works of Prominent Scientists” written by Prof. N. Rajmuhon Singh, Chemistry Department, Manipur University, Imphal and handed over the book to the Principal, Diligent Public School, Moirang

## 2.10 Celebration of National Mathematics Day 2013

A 5-day programme on Celebration of National Mathematics Day 2013 was organised during March 26-30, 2014 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 Rajesh Agrawal, IAS, Commissioner (Science & Technology), 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 as the Chief Guest, Guest of Honour and President respectively.

The main activities of Celebration of National Mathematics Day 2013 included Competitions, Exhibitions, Popular Mathematics Show, Mathematics Lecture-cum-Demonstration etc.

The competitions included Mathematics Model (Class VIII–XII), Mathematics Quiz (Class IX–X), Mathematics Competition for Class VI, Class VII and Class VIII. The Exhibitions included Mathematics Model, Poster Exhibition, Hands on Experiment (Origami) etc. The Popular Mathematics Show covered Mathematics Puzzle/Miracle, Scientific Films etc.

The Mathematics Model competition was organised for students reading in Class VIII – XII. Altogether thirty seven models were exhibited by 62 students from different schools in the State. Curie Koijam of Mega Manipur School, Yaralpat stood first position on her model “Visualization of Geometrical Shapes”. Khadangbam Chinglembi Chanu of Praja High School, Lamshang got the second position on her model “Visualisation of  $(a+b)^3$ ” and Yumnam Lanchenbi Chanu of Praja High School, Lamshang got the third position on her model “Visualisation of Cartesian Co-ordinates”.



*Commissioner (S&T) giving Inaugural Speech*



*Student Exhibitors displaying their Mathematics Model*

### Mathematics Quiz Competition :

The competition was organised for Class IX-X Category. Thirty five teams from 27 schools registered for the preliminary written competition out of which three teams were selected for the final round. Khundrakpam Robinson Singh and Moirangthem Ashokumar Meitei of the New Public Hr. Sec School, Khangabok won the competition. Waikhom Prabin Singh and Khangjrakpam Johnson Singh of Emmanuel English Academy, Yaingangpokpi got the second position. Salam Birantan Meitei and Ningthoujam Nareshkumar of J.N.V. Khumbong got the third prize.



### Mathematics Competition

Mathematics Competition for students of three different categories viz., i) Class VI ii) Class VII and iii) Class VIII was organised on March 28, 2014. Altogether 122 students from 95 schools, 140 students from 123 schools and 87 students from 62 schools participated in the competition for Class VI, Class VII and Class VIII respectively. For the category of class VIII, Arjun Thokchomcha of The K.M. Blooming Hr. Sec. School, Khangabok got the first position. Nilakanta Khundongbam and Phijam Devadutta Mangang of The K.M. Blooming Hr. Sec. School, Khangabok got the second and third positions respectively. Moirangthem Ashokumar Meitei and Khundrakpam Robinson Singh of The New Public Hr. Sec. School, Khangabok were in the fourth and fifth positions respectively.



*Students Mathematics Competition in progress*

For the category of class VII., Tourangbam Mrakshita Devi and Hemjit Singh Sanasam of The K.M. Blooming Hr. Sec. School, Khangabok were the first and second position holders respectively. Maheshwor Leishangthem, Rakesh Ningthoujam and Moirangthem Jibit Singh of The K.M. Blooming Hr. Sec. School, Khangabok got the third, fourth and fifth positions respectively.

For the category of class VI, Jodha Thongjaomayum of Tiny Tots' Unique School, Imphal got the first position. Kh. Chaothoi Khuman and Suchitra Elangbam of K.M. Blooming Hr. Sec. School, Khangabok got the second and third positions respectively. Rajyashori Limbu of Tiny Tots' Unique School, Imphal was kept in the fourth position and Sagolsem Khogen Meitei of The New Public Hr. Sec. School, Khangabok was in the fifth place.

### Science Film

During the 5-day Celebration of National Mathematics Day 2013, the science films such as Animal Kingdom, Medicinal Plants of Manipur, Orchids of Manipur, Radio, X-ray, National Geography, Rain Water Harvesting etc. were screened.

### Mathematics Puzzle

Invited resource persons performed various Mathematics puzzle items and explained the reason behind every puzzle item. They also demonstrated various techniques which could find mathematical solutions in easy and faster way. About 40 items of Mathematics Puzzle were demonstrated during the four days programme.

### Lecture-cum-Demonstration and Origami

Altogether 3 lecture-cum-demonstrations of two hours duration each were arranged. Shri H. Jayenta Kumar Singh, Retd. Professor of mathematics, D.M. College of Science delivered on the topic "Applications of Mathematics in Science" and interacted with the students. Dr. N. Premjit Singh of Mathematics Department, Manipur University, Imphal demonstrated on How to drag students towards Mathematics. Dr. Y. Rohen Singh of Dept. of Mathematics, NIT, Imphal delivered and interacted with the students on the topic "Great Indian Mathematicians and Their Contributions". The Demonstration on low cost hands on



*Students with Resource Person conducting Hands on Experiments*

experiments in Mathematics was also carried out. Two invited resource persons. The experts demonstrated about 30 items on learning Mathematics through origami and the students interacted with them. The Prizes for various competitions were distributed to the prize-winning students on the last day of the programme.

### **3.0 Projects**

#### **3.1 Manipur Science Aquarium**

The **Manipur Science Aquarium** was first of its kind so far opened in the state of Manipur. The Centre has various indigenous fish species collected from different locations in the state. Attempts have been made to study the biology, food and feeding habit etc. of these indigenous fishes.

The project staff of the centre visited various rivers, streams and lakes such as Litan River, Iril River, Khuga River, Loktak etc. in the state for collection of indigenous local fishes. Some individuals also donated different local fishes such as Pacu, Koi, Ngapemma, Kanddala, Nylon Ngamu, Ngamhai, Ngarang, Ngaril, Ngaton etc. to the Centre.

#### **Disease Outbreak**

The Fishery officer and its team examined carefully the outbreak of diseases from time to time and found the following diseases spread out among some fishes kept in the aquarium tanks in 2013-2014..

- i) **Cotton-wool** - This was observed at Ukabi, Ngamu, Pabounga, Ngaril etc. during the winter season. The symptoms were white cotton woolly tufts on the body and fins. This being a fungal infection was treated with anti-fungal.
- ii) **Fin rot** – Oscar, Gold fishes, Ngapemma etc. were infected with fin rot due to which the fins become splinted and rotted, the tissue between the fin rays gradually disintegrated, The fishes was treated with antibiotic Tetracycline and general aid.
- iii) **Arugulas Infection** (Ecto-parasite) was seen in Gold fishes and the fishes were treated with brine dip, general aid and an antibiotic (Terramycin 250 mg).

#### **Breeding:**

As research and development activity of the centre, breeding of Gold Fish (Fan Tail) was carried out successfully during February 2014..

#### **Visitors:**

Apart from the normal visitors, a big team of visitors from different institutions/organizations namely SSA, Imphal West, Assam Rifles Public School, 30 AR Mantripukhri, K. Bethel Priomary School, Signadda Dam, Keishamthong Model H/S, Sangaitel H/S, Moirang Multipurpose Higher Secondary School, Neverth Kids Care Centre, Palel, Hancham Pheng Primary School, Ukhrul, Royal Academy of Science, Wnagkhei, M. Ganga Academy, Sugnu visited the centre.

On 1<sup>st</sup> June 2013, one Ngaril Leina (*Angulla bengalensis bengalensis*) (3 ft 11 inches) expired due to an unknown reason. As requested, the body had been handed over to the Department of Zoology, D M College of Science Imphal for preservation and further study.

### 3.2 Patent Information Centre, Manipur

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

- To create awareness about IPRs, especially patents, in the state of Manipur and neighboring region of this centre and enable patent searches for the universities, industry, government departments and R&D institutions in the State and around.
- To analyze the patent information on a regular basis and suggest new programmes for R&D based on such information
- To analyze the patent information on a regular basis and suggest new programmes for R&D based on such information
- Guide the inventors in respect of patenting their inventions

#### Progress :

Patent Application Submitted:

- A new method of separation and isolation of indirubin from KUM (*Strobilanthes flaccidifolious nees.*) leaves has been filed for patent on 11.6.2013 and its allotted Patent Application No. is 0695/KOL/2013
- Tricycle Threshing Machine has been filed for patent on September 30, 2013 and its allotted Patent Application No. 1128/KOL/2013
- The registration of Manipuri Potloi/Kumin under Geographical Indication (GI) is in process.

Patent search was done regularly for the interested people who visited the center.

Documentation for GI Registration on Ngari – A Fermented Fish of Manipur and on Nungbi Pottery is in progress.



### 3.3 Intellectual Property Facilitating Centre (IPFC) for MSMEs, Manipur

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

#### Progress : Trade Mark

The INDIAN HAPPY BEVERAGES has been filed under Trademark and its application No.2685914 in Class 32 dated February 24, 2014 has been obtained.



CC Tea

CC TEA has been filed under Trademark and its application No. 2705420 on March 25, 2014 has been obtained.



### 3.4 Tricycle attached paddy thresher

The farmers in the state thresh paddy mostly by traditional manual method using locally made wooden tools with the involvement of about 20 adults for threshing paddy grown in one acre of land in 5 hours in a sunny day. They cannot afford hiring of the high cost of tractor operated threshers.

The project was taken up with the following objectives

- i) To develop and fabricate a tricycle attached low cost paddy thresher which can be operated without electricity or any fuel
- ii) To introduce and demonstrate the thresher to the farmers in and outside the state.

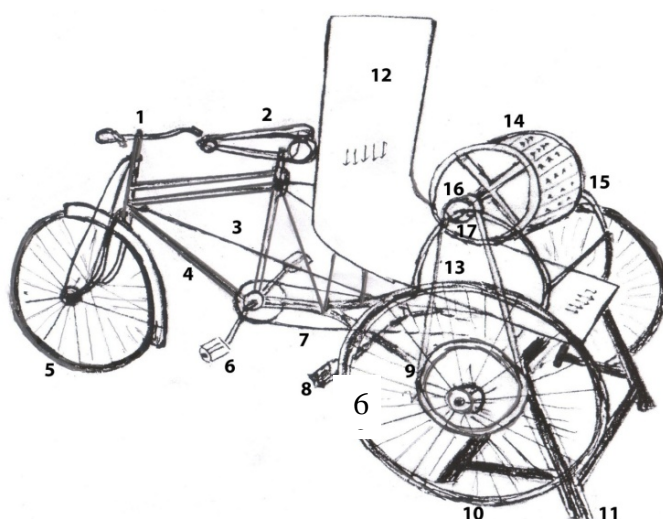
### Progress & Achievements

Under this project 12 (twelve) Nos. of Tricycle Paddy Threshers were to be fabricated. So far 1 (one) Tricycle Thresher has been fabricated and the rest are under the process of fabrication. Field trial of the tricycle Thresher has been done at different sites in Imphal West district of Manipur during November-December, 2013.

The Field trial has been done for threshing mustard oil seed at some different sites in Imphal West district in March, 2014. It has been found that the Tricycle Thresher can thresh moist paddy also and its performance in threshing mustard oil seed was encouraging.

### Technical Specification

The machine runs on 0.25 HP power (Human Power) with average output of the machine as 300 kg/h. The body is made of high quality steel and the machine has low Maintenance



- 1 - HANDLE
- 2 - SADDLE
- 3-SAFETY BRAKE STRING
- 4 - BODY FRAME
- 5 - FRONT WHEEL
- 6 - PEDAL
- 7 - CHAIN
- 8 - BRAKE SHOE
- 9 - PULLEY
- 10 - REAR WHEEL
- 11 - STAND
- 12 - PADDY COLLECTING PLATE
- 13 - PULLEY BELT
- 14 - SPIKES
- 15 - THRESHING DRUM
- 16 - DRUM PULLEY
- 17 - DRUM AXLE

*Drawing of paddy thresher*

### 3.5 Community Pond based Safe Drinking Water System (BARC UF Technology )

#### About BARC UF Technology :

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

#### Objective :

The project “Community Pond based Safe Drinking Water System (BARC UF Technology )” was taken up with the objectives of conserving community ponds, supply safe drinking water from community ponds using BARC Ultra filtration technology and also popularize the technology for transfer in future.

#### Progress:

Three safe drinking water systems of 2000 lpd capacity each had to be installed using BARC developed ultrafiltration membrane technology during the project period of 2(two) years. Khabam Bamdiar, Konthoujam and Thoubal Athokpam were the identified villages for installation of the drinking water system units.

Out of the 3 (three) sites, installation of 2 (two) safe drinking water systems one at Khabam Bamdiar village, Imphal West and another system at Athokpam village, Thoubal District have been completed and made operational. Supply of machineries and installation of the system was done by BARC licensee M/s SONDKA, Mumbai. Dr. Prasada Raju, Advisor, Dept. of Science & Technology, Govt. of India visited the 2 (two) sites during May 18-19, 2013.

#### Observations:

In the early stage of operation of the system, water from pond was pumped into the over head tank and it was released through the Ultrafiltration unit. After few hours of operation filtration rate decreases because the pond water contained invisible sticky colloidal



**Women and men collecting water from the drinking water system**

particles which form a thin layer on the outer surface of the UF cartridge. Hence, the filters required cleaning every alternate days. This was one peculiar in the state of Manipur as our valley is composed of clayey soils. In order to solve the problem, desilting tank of 5000 litres capacity was constructed and pond water was pumped in the desilting tank first and kept two days for settling the suspended colloidal particles. After two days the water from the tank has been transferred into the over head tank and released though the UF unit. This drastically

minimised colloid content and flow rate could also be maintained as 90-100 litres per hour. The cleaning of the filters was then performed once within 10-12 days. The cleaning became faster taking hardly 20 minutes. Both the systems have been functioning smoothly.

### **3.6 Geological and Geotechnical Investigation of two Sites located between Noney – Nungba along NH-37 and suggest Remedial Measures.**

The Northeast region of the country, by virtue of its continued evolution, seismicity, fragile geological formations and structures, is highly prone to mass movement causing landslides.

In the event of continued rainfall over a period of a few days, the plains(valleys) are affected by floods and hills by landslides causing disturbances to the normal life of the people in Manipur. Further, the Geological formations along the road section between Noney-Nungba along NH-37, belonging to Barail and Surma Groups comprising of sandstones, shale, siltstone, ferruginous sandstones etc. are susceptible to weathering and erosion leading to slopes failure and mass wasting on moderate to large scale. The stratified nature of rocks, affected by tectonic deformation, plays important roles in causing landslides. The geotechnical aspects of the soil and rock types require to be investigated to determine their shear strengths and other lithological, structural, geomorphological as well as hydrogeological properties. Two sites namely Rengpang and Awangkhul along NH-37 have been selected for carrying out the proposed study. The project is sponsored by Department. of Science & Technology, Govt. of India for a period of two years.

#### **Objectives:**

- i. To study geomorphology, geology and structural parameters for slope stability
- ii. To generate detailed map on 1:2000 scale
- iii. To study soil and rock mechanical properties and their influences on slope stability
- iv. To develop remedial/preventive measures

#### **Progress :**

The implementation of the project has just started. The preliminary survey as well as literature consultation is in progress.

### **4.0 Meetings/Trainings attended by Officers**

<b>Name of official with designation</b>	<b>Meetings/Trainings</b>	<b>Sponsoring agency</b>	<b>Venue</b>	<b>Period</b>
Th. Surendranath Singh Director	Core Group Meeting of State S&T Oriented Demonstration Projects	DST, GoI	Bhopal	April 15, 2013
	National Meeting on Restructuring of S&T Councils	DST, GoI	Kohima, Nagaland	July 29-30, 2013

	Meeting of Scientific Advisory Committee (SAC) to PM with State S & T Councils and S&T communication & Popularisation: Strengthening of collaboration with State S& T Councils	DST, Govt. of India	Indian Institute of Science, Bangalore	July 5-6 2013
Dr. L. Minaketan Singh, Scientific Officer	Refresher course on update on IPR	DST, Govt. of India	Guwahati	May 15-17, 2013
	Interaction meeting of State S&T Councils with INSA Officials	INSA, DST, New Delhi	INSA, New Delhi	June 28, 2013
	Meeting of Scientific Advisory Committee (SAC) to PM with State S & T Councils and S&T communication & Popularisation: Strengthening of collaboration with State S& T Councils	DST, Govt. of India	Indian Institute of Science, Bangalore	July 5-6 2013
Er. Ch. Sarat Singh	Core Group Meeting of State S&T Demonstration Projects	DST, GoI	Bhopal	April 15, 2013
	National Meeting on Restructuring of S&T Councils	DST, GoI	Kohima, Nagaland	July 29-30, 2013
Dr. R.K. Pritamjit Singh	One day Workshop for the Officials of IPFC	DC-MSME, GoI	NIESBUD, Noida	March 7, 2014
	National Workshop on ISON – Comet of the Century	NCSTC, DST, GoI	Guwahati Planetarium	August 22-24, 2013
	National Workshop on ISON – Comet of the Century	NCSTC, DST, GoI	Guwahati Planetarium	August 22-24, 2013

## 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	Date of visit
1	Dr. Prasada Raju, Advisor,	DST, Govt. of India	Site visit to Safe Water drinking units at Khabam village and Thoubal Athokpam village.	May 18-19, 2013
2	Dr. Arindam Rana Professor of Chemistry	City College, Kolkata	Innovative Experiments in Chemistry	July 23-25, 2013
3	Prof. Arupkumar Misra	Assam Engineering College, Guwahati	i) Innovative Experiments in Chemistry ii) Training workshop on Science Writing / Journalism	July 23-25, 2013  Nov. 13-16, 2013
4	B.K.Tyagi, Scientist	Vigyan Prasar	Innovative Experiments in Chemistry	July 23-25, 2013
5	Dr. Arunabha Misra	Vidyasagar College, Kolkata	State Level Workshop on Comets and Astronomy around us	February 12-13, 2014

## 6.0 Library

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