

ANNUAL REPORT

2007-2008



MANIPUR SCIENCE & TECHNOLOGY COUNCIL
CENTRAL JAIL ROAD, IMPHAL - 795 001

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1.0 Overview:

The Manipur Science & Technology Council (MASTEC) erstwhile State Council for Science, Technology & Environment, Manipur was set up in the year 1985 in order to play catalytic role in promoting the use of Science and Technology in the development process of the State. It was constituted with a view to develop with the local specific problems which requires S & T intervention. MASTEC has been catalyzing interaction between technology developers and users. State Council is identifying the areas in which Science & Technology can be applied for development activities and achieve the goals of the State, with a particular emphasis to eliminate the prevailing backwardness, rural unemployment and poverty. The Council got registered as an autonomous organization of the Department of Science & Technology and Information Technology, Government of Manipur in January 1996 under the Manipur Societies Registration Act, 1989 subsequent to a decision of the state cabinet.

1.1 Objectives of the Council

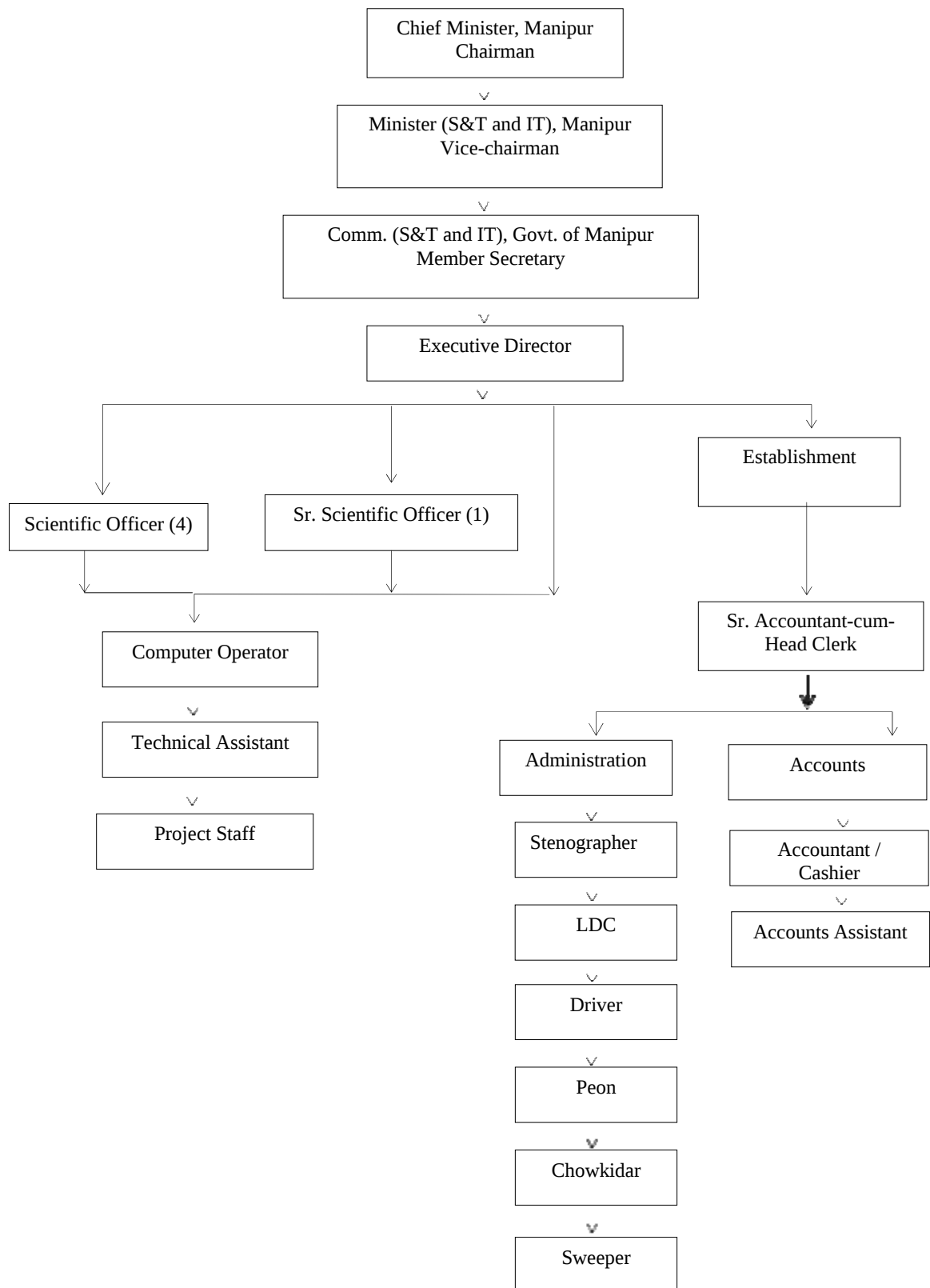
- To identify areas in which Science, Technology and Environment can be utilised for the achievement of the Socio-economic objectives of the State and in particular, tackling the problems of backwardness and underprivileged sections of Society;
- To advise on policies and measures necessary to promote 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. The Council is inducted an Executive Committee for fast execution of work. The Vice-Chairman of the Governing Body of the Council heads the Executive Committee as its Chairman. The day - to - day affairs and administration of the Council is looked after by its Member Secretary who is the Commissioner/Secretary (Sc. & Tech and IT), Govt. of Manipur assisted by Executive Director of the Council. There are 20 – manpower (core staff) in the Council supported 100% by Department of Science & Technology, Govt. of India. The autonomous Council operates with the grants received from DST, Govt. of India, DST & IT, Govt. of Manipur and funds received from various agencies through subjects and programmes.

1.3 Organisation Chart



1.4 Existing Staff

Scientific Staff:

Sl.No	Name	Qualification	Designation
1.	Th. Surendranath Singh	M.Sc., PGDCA, LLB	Executive Director
2.	Dr. L. Dinachandra Singh	M.Sc., PGDRS, Ph.D.	Sr. Scientific Officer
3.	Dr. L. Minaketan Singh	M.Sc., PGDRS, Ph.D.	Scientific Officer
4.	Kh. Rakesh	M.Sc.	Scientific Officer
5.	Ch. Sarat Singh	B.Tech.(Civil), M.Tech.	Scientific Officer
6.	Dr. R.K. Pritamjit Singh	M.Sc., Ph.D.	Scientific Officer

Technical Staff :

7.	Ch. Shivaji	M.Sc., PGDCA	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. Ronald 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.	Dr. Kadanlung K.T Panmei	B.V.Sc	Project Officer
22.	L. Surjit Singh	M.Sc.	J.R.F.
23.	Ph. Gopinchandra Singh	M.Sc.	J.R.F.
24.	Th. Shyam Singh	B.Sc. (Agriculture)	ProjectAssistant
25.	L. Lolini Devi	B.Sc.	Project Assistant
26.	Shri Manghen Vaiphei	Class VIII passed	Skilled Helper
27.	Mrs Manzangai	Class X passed	Skilled Helper

2.0 Activities

The Manipur Science and Technology Council (MASTEC) organised various centrally sponsored workshops / trainings relevant to the state including science popularisation 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 organising S&T programmes and organised with a big success.

The following were the programmes implemented by MASTEC during the year 2007- 2008.

2.1 Nature Camp for Tamenglong District:

The 4 day long Nature Camp for the children of Tamenglong district (ST district) was organized during April 2 - 5, 2007 at Sharon English High School, Longmai Bazar. The camp was organized in association with Sharon English High School, Longmai Bazar. The co – ordinating agency mobilized the participants and had arranged food and accommodation for the campers.

The camp was inaugurated by Shri L. Somarjit Singh, Lecuturer (SG), Modern College, Govt. of Manipur , Imphal as the Chief Guest on April 2, 2007 at Sharon English School. and the function was presided over by Poupulung Gonmei, Founder, Sharon English High School, Longmai Bazar. In the function, Miss Akhamlu Gonmei, Principal, Sharon English High School welcomed all the guests, resource persons, officials of MASTEC, invitees, media and the participants coming from different schools of Tamenglong district. Shri Kh. Manigopal Singh, Key Resource persons presented the key note address.

Altogether, 35 participants from 4 different schools of Tamenglong district comprising of 31 students and 4 guide teachers took part in the nature study camp. The students were selected from class VI – X standard.

Three key resource persons and two resource persons imparted nature education to the participants especially the students. During the camp period, the key resource persons, officials of MASTEC, guide teachers and students were camped in at the camp site. The key resource persons involved in the Tamenglong district camp included Shri L.Somarjit Singh, Shri I. Sushilkanta Singh, Shri Kh. Manigopal Singh, Dr. O. Shashikumar Singh, Reader, D.M. College of Science, Imphal and Shri Ch. Rajendra Singh, Selection Grade Lecturer, Imphal College..

Dr. O. Shashikumar Singh, delivered a lecture on classification and identification of animals using audio – visual aids. Shri Ch.Rajendra Singh gave a lecture on disaster

management and demonstrated earthquake kit. The topics covered during the camp included Classification and identification of animals, Classification and identification of plants, Nature walk and sample collection, Sorting analyzing and preserving samples, Biodiversity - an overview to ecology, Environmental awareness, Sky watch, Fun with plants – studying the parts/processes and exploring the whole, Looking at small animals, Field trips, Science Songs, Living together – study of habitat/ecosystem, The micro world, Role plays, Science Games, Film shows on “Our Sun”, “ Medicinal plants of Manipur”, “Village Republic”, Green House effect, The physical nature – soil, water and air, Water and soil testing using kits, Food testing using food adulteration kits, Seed Germination experiment.

The camp concluded on 5th April 2007 with a closing function. Shri L. Somarjit



Inauguration of Nature Camp



Participants departing for field study

Singh, Key resource persons, Shri Kh. Rakesh, Programme Co-ordinator and Miss Akhamlu Gonmei, Principal, Sharon English High School, Longmai Bazar were on the Dias.

On the closing function, a set of low cost equipments (simple microscope, tripod lens, doublet lens, hand lens, thermometer) and a set of study materials (Books) were distributed to the participating schools. Participation certificates were also distributed to all the participants. A best camper namely Dingampou (student), class VIII of Sharon English High School, Longmai Bazar was selected and awarded with cash prize and a set of books based on the overall performance in terms of his skill, knowledge and active participation in the camp. On the closing function, all the participants took pledge towards conserving and nurturing the nature for future generation. The camp concluded with the concluding remarks from the Principal, Sharon English School.

2.2 Science Meet-2007

Since the year 1997, Manipur Science & Technology Council (MASTEC) has been continuously organising state level science festival named - **Science Meet** as an annual feature in commemoration of the **National Science Day** and **National Technology Day**. Science Meet is the only multi-activity state level mega festival aiming to create a common platform for students, science lovers, scientists and common people to further the cause of Science Popularisation in the State. The Department of Science & Technology, Government of India, New Delhi announced the national theme of the year 2007 as “**More Crop Per Drop**”. Under this National theme of the year, a 5-day long **Science Meet 2007** during May 11-15, 2007 at Khuman Lampak Main Stadium, Imphal with the inclusion of – Tara Mandal (Planetarium) Show, Scientoon, Science Quest and Best Guide Teacher Award for the Science Model. The programme was catalysed and supported by **National Council for Science & Technology Communication (NCSTC)**, Department of Science & Technology, Government of India, New Delhi. Scientist **Dr. Asit Chakrabarti**, Dept. of Science & Technology, GoI, New Delhi was also present in the Inaugural Function held on May 11, 2007.

Activities of Science Meet 2007

The activities such as 1. Competitions for Quiz, Spot Painting, Science Model, Essay, Declamation, 2. Exhibitions (Model, Book, Poster & Photo, Information Technology), 3. Popular Science Gallery (Interactive Science Model, Science on Stamp etc.) 4. Drama/Show (Science Drama, Scientific Film, Puppet Plays, Science Explaining Miracles) 5. Science Edutainment Programme (Mathematics Lab., Scientoon, Science Quest etc.), 6. Face-to-Face with distinguished scientists, 7. Tara Mandal (Planetarium), 8. Best Appreciation Award were carried out during the Science Meet 2007.

Science Quiz Competition

The competition was for students currently reading in Class XI Sc.-Degree in Science/ Technology. 13 (thirteen) teams from secondary schools and colleges registered for the competition. Each team comprises of two students from the same secondary school/college. The preliminary round - Written Contest was held on May 14, 2007 at 11.00 a.m. and 4 teams were selected for the final round. The Final Round Quiz was held on May 14, 2007 at 2.00 p.m. and in the competition there were oral as well as

audio/visual rounds. The Quiz was on the subjects to science and technology. The first position went to Syed Samir Ahamad and Md. Mahboob Ali of Modern College, Imphal. The second position went to M. Bankim Singh and H. Robin Chandra of Imphal College, Imphal. The third and forth position went to Hemchand Wangkhem Meetei & Chongtham Santoshkumar Singh of D.M. College of Science, Imphal and Md. Jiaulhaque & Md. Anwar of The Fancier Abhiram Hr. Sec. School, Thoubal respectively.

Essay Competition

The Competition was open to individual students currently reading in Class IX-XII Science. The topics of the competition were: 1) **More Crop Per Drop** 2) **Water Harvesting in Manipur** and 3) **Conservation of Soil Fertility in Manipur**. 69 students from 32 schools/secondary schools were participated the competition held on 12th May, 2007 at 1.30 p.m. The duration of the written essay was 1 hour with a maximum length of 1500 words.

The First and second position went to Nawaz Sharif Yumkhaibam of the K.M. Blooming English School, Khangabok Bazar and Mohd. Samar Hussain of Iboton Modern School, Top Shiphai respectively and the third position went to Ningthoujam Romeo Singh of Herbert School, Changangei

Face-to-face with distinguished Scientists

A face-to-face interaction programme with distinguished scientists was organised during the 5-day Science Meet 2007. Two local scientists were invited in the face-to-face programme to interact with the students on the topics of their specialized fields. The programme was kept for 2 days of 1 hour duration daily during the 5-day meet. The speakers were giving lecture for 20 minutes and then invited questions/quarries from the audience. Hundreds of students took part in the interaction session of the programme and they could gain maximum knowledge.

The following were the resource persons and their topics were as follows:

1. Prof N. Rajmuhon Singh: Turning Points
Dept. of Chemistry, Manipur University
2. Dr. N. Raghumani Singh: Nanotechnology & its Implications
Scientist – D, BARC, Mumbai
3. Dr. Kh. Shamungou Singh : Rare Birds of Manipur
Retd. Reader, Dept. of Zoology, D.M. Sc.

4. Prof W. Vishwanath Singh : Fish Diversity and Conservation in Manipur
Director, Academic Staff College &
Professor, Life Sciences Department, Manipur University

Spot Painting Competition

The 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). The competitions were held on May 14, 2007 at 10.00 a.m. at the Khuman Lampak Main Stadium, Imphal on the themes respectively Rainfall in a Field of



Students in Spot Painting Competitions

Crops, Preservation of Rain Water for Crop Cultivation in the Field and Proper Use of Rain Water, Rivers & Lakes for More Crop Production.

In the Sub-Junior Group, Thokchom Nicktam Devi , Guineimoi Kipgen and Sayuri Sinam of Maria Montessori School, Imphal got the first , second and third prizes respectively.

In the Junior Group, the First position went to Kshetrimayum Rojesh Singh of Shantilata Memorial School, Imphal. The second and third positions went to Soram Sanathoiba of St. Joseph's School, Imphal and Pukhram Arvind Singh of Bhakti Vedanta Institute Mission School, Moirang.

In the Senior group, Kshetrimayum Johnson Singh of Shantilata Memorial School, Imphal, Lairenlakpam Ranjan Singh of Keibi High School, Keibi and Thiyam Deva Singh of The Eternal Spring English School, Sekta got the first , second and third positions respectively.

Declamation Contest

The competition was opened to students currently reading in Class XI to Degree in Science & Technology streams. Laishram Nikhil Singh of Sainik School, Imphal got the first prize. Shri Rojer Irom of Sainik School, Imphal and Sadique Siddiki of Herbert School, Imphal got the second and the third prizes respectively.

Puppet Play

The art of puppetry is effective for communicating science to our people. There are 3(three) puppet shows based on rain water harvesting, importance of water to the mankind and human evolution during the Science Meet 2007. The titles of the plays are: 1) **Nonggi Ishing Yokpa** 2) **Anishuba Thawai** and 3) **Eidi Ngak-khre**. These puppet plays were much impressive and visitors could realize how puppetry can take key role as a medium of S&T communication in the society.

Book Exhibition

As in the earlier Meets, this year too, Scientific Book Exhibition was also kept as an activity during the 5 (five) day long Science Meet 2007. A good number of students, teachers and parents paid visit at the book stalls and also bought many books of their interests. Three local book store/library, collections of MASCA were displayed in the book exhibition.

Popular Science Gallery & Science Programmes

Popular Science Gallery & Science Edutainment Programmes were organised successfully with visitors thronging the stall everyday to try their hands or to display their skills. Altogether 10(ten) interactive science models were exhibited during the Meet. The organisers also displayed Science on Stamp and many other wall posters relating to the science of Physics. In the Science Edutainment Programmes, students enjoyed simple mathematical tricks and solutions, scientoon posters and activities on science quest.

Science Model Exhibition & Competition

The competition was opened to students reading in class VIII - XII. Altogether 54 (fifty-four) models were exhibited by 23 schools/higher secondary schools of different parts of the state in the competition. The models were based on



Model Exhibitor explaining his Model

varied themes – Water Conservations – 15 models, Issues on Environment & Health - 08 models, Electronic & Electrical Gadgets - 12 models, Technological Applications - 10 models and other themes of interest - 09 models.

The following were the winners.

Position	Name of the Winners	Class	Name of the School/College	Name of Model
First	Romeo Khongbantabam Md. Samar Hussain	X X	Iboton Modern School, Top Siphai	Low Pressure Drift Irrigation
Second	A. Misban Hanif Md. Yousir Amin	IX IX	J.N.V., Yaralpat, Imphal East	Proper Management & Utilization of Water
Third	Heskey Meinam N. Tanweer Alee Shah	X X	Tiny Tots Unique School, Imphal	Rechargeable Tube Well Irrigation cum Vermicompositing
Fourth	Mutum Lamnganbi Marina Wahab	IX IX	Tiny Tots Unique School, Imphal	Integrated Farming
Fifth	Pukhrambam Olivia Devi Kunjarani Thounaojam	X X	D.A.V. Public School, Sangakpham, Imphal	Biofertilizers

A new award **Best Guide Teacher Award** for the Science Model Exhibition was also introduced for the first time in recognition of the guide teachers in developing and designing the science model for the competition. Shri **Thoungam Rajenkumar** of Iboton Modern School, Top Siphai was honoured with a citation as the **Best Guide Teacher Award** for the model **Low Pressure Drift Irrigation**

Science Drama

The artists of Generation De New Image performed two science Drams/Short Plays based on the focal theme of the "**More Crop Per Drop**". The titles of the plays were "**Laiza Ishing (Water)**" and "**Jibagi Hourakpham (Origin of Life)**".

Explaining Science Behind Miracles

Scientifically Explaining Miracle was one of the most popular scientific shows of the Meet. Miracles or magics are age-old human activities, which make people wonder

or confuse and in mislead the general public. The expert members of GENIM demonstrated many items behind miracles during Science Meet 2007 and the scientific backgrounds of the shows were also explained on the forth day of the meet. During the 5-day programme of the Science Meet 2007, Science Behind Miracles was kept for 3 (three) days of 2(two) hours duration each day and every day hundreds of students & general public had witnessed the show and many of them could learn how science is related with miracles.

Photo and Poster Exhibition

Scientific photo and poster exhibition was also kept as one of the activities during Science Meet-2007. About 50 (fifty) scientific posters and many photographs of endangered flora and fauna of the state were displayed during this Meet. Posters and the photographs were contributed from different individuals and coordinating organizations. Many & visitors were so impressed to these photographs and posters.

IT Show

The revolution of Information Technology (IT) has been the most important development in the world during the last few decades. Events in any part of the world can directly influence the events in the remotest areas. Internet has transformed the entire perspective of communication. Science Meet is an



Visitors enjoying IT Stalls during the Meet

occasion where we can introduce IT to our students in a very effective way and hence MASTEC invited local computer institutions/firms and also provided internet connectivity during the SM-2007. Six local computer institutions/firms were participated and displayed many advanced technologies and interacted with the visitors, especially, students. Hundreds of students enjoyed the display and internet facility and many people appreciated this activity.

The computer institutes/firms taking part in the IT shows included

1. Swift Infotech, Leima Shopping Plaza
2. Hari Computech, Singjamei Bazar
3. ICTC, Rims Road
4. Linux Manipur, Imphal
5. Endeavor, Pologround
6. Allied Agencies, Paona Bazar

Scientific Film Shows

One hour duration scientific film show was kept on all 5 days of Science Meet-2007. These scientific films were the collections of MASTEC and EMMRC, Manipur University.

Altogether eight scientific films were screened viz.,

1. Pluto: No more a Planet
2. Waterworks of India
3. Medicinal Plants of Manipur
4. Our Sun
5. Village Republic
6. Arvari
7. Oyster Mushroom Cultivation
8. Orchids of Manipur

Tara Mandal Show

Around 150 students/visitors per day enjoyed with Tara Mandal Show. Students and visitors learnt about various constellations, galaxies, stars etc. from Tara Mandal. Shri Lokendro Singh, Technical manpower of Manipur Science Centre, Takyelpay, Imphal explained about constellations, galaxies, stars to the visitors. This activity was a grand success as visitors – students, teachers, parents etc. appreciated the organisers for displaying such activity and also suggest to include more such activity in future.

Best Appreciation Award

The most prestigious award of Science Meet, **Best Appreciation Award** was kept on the last day of SM-2007. The award was introduced by MASTEC since the year



Students Participating BA Award Competition

1997 given to an individual student who proves to have gained the maximum knowledge of science from the Meet as judged by questionnaire response and personal interview. The Best Appreciation Award 2007 for SM-2007 was selected from 55 participants of different standards. The award was given to

Ngangbam Rajesh Singh, Class XII of HRD Academy, Imphal by Dr. S. Pravabati Devi, Retd. Lecturer, Imphal College, Imphal. The award carries a certificate of merit with a cash prize of **Rs. 2,000/-**

Closing Function

The closing function of the 5-day long Science Meet 2007 was held on May 15, 2007 at 3.00 p.m. at Khuman Lampak Main Stadium, Imphal with Shri S. Buddhachandra Singh, IAS Member Secretary, MASTEC and Commissioner (S&T), Govt. of Manipur, Shri Th. Surendranath Singh, Executive Director (MASTEC), Dr. S. Pravabati Devi, Retd.



Prize Distribution on the Closing Day

Reader of Imphal College and Secretary/President of the co-ordinating science NGOs MAPS, MASCA. STFM and GENIM on the dais. Many other invitees, dignitaries, teachers, parents of the prize winners of different competitions held during the meet were present at the closing function.

Cash prizes with citations for the various competitions were distributed to the prize-winning students by the dignitaries on the dais. Dr. R.K. Pritamjit Singh, Programme-in-Charge of Science Meet 2007 gave the complete detail activity report of

the meet. Shri Th. Surendranath Singh, Executive Director, MASTEC gave the concluding remark of the Science Meet 2007 expressing the Science Meet 2007, the state level science festival organised by MASTEC in commemoration of the **National Science Day 2007** can help the state for promotion and popularization of Science & Technology. Thus successfully ended the 5-day long Meet 2007 organised in commemoration of **National Science Day 2007 and National Technology Day 2007**.

2.3 Vigyan Prasar Edu-Sat Network Programme

Vigyan Prasar(VP), an autonomous organisation of Department of Science & Technology, Government of India, New Delhi in association with Development and Educational Communication Unit (DECU)/ISRO has established a two way audio-video interactive network for science & technology communication in the country using EduSat – the satellite for Education, Science & Technology launched by ISRO in 2004. For the first phase DECU/ISRO has setup 1 teaching end terminal at Vigyan Prasar and 20 nos. of class room end terminals (SITs) covering the entire country. MASTEC has been recognised as one of the SITs and also installation works of Disk Antenna & other equipments were done at MASTEC Complex, Takyelpat, Imphal. Transmission of programmes has already begun on a trial basis.

The mode of the interaction were as as follows.:

- Experience sharing – between various parts of the Network
- Training – using distance education mode
- Access to quality – interaction with the experts in various fields to distant and far-away places in the country
- Sharing of resource materials – by way of file transferring

The main target groups (TG) included

- Science clubs, teachers
- School students & children
- Young adults (College students and higher)
- General public like – women, industrial labours, rural audience etc.

Till now, more than 30 programmes like – quiz, lecture-cum-demonstration, training etc. for students, teachers, science activists on different issues have been covered.

2.4 Modelling Hydrological System

The 23 days long Short Term Training Course on **Modelling Hydrological System** supported by ESS Division, Department of Science and Technology (DST), Govt. of India, New Delhi was organised by Manipur Science & Technology Council (MASTEC) during May 21 – June 12, 2007 at the Senate Hall of Manipur University, Canchipur, Imphal. The programme aimed at giving

- I) Basic concepts of ground water hydrology (groundwater occurrence and its movement in various rock types, Characterisation of ground water flow regime and mass transport and techniques of assessment of ground water resources
- II) Mathematical formulation of ground water flow and contamination migration in ground water and various numerical solution techniques to solve mathematical equations
- III) Hands on training to construct, calibrate, sensitivity analysis and use of model for assessment of water resources.

Professor (Dr) C. Amuba Singh, Vice Chancellor of Manipur University, Canchipur, Imphal inaugurated the Training as the Chief Guest. Dr. S.P. Sinha Ray, Former Member, Central Ground Water Board, Govt. of India was the Guest of Honour and Shri S. Buddhachandra Singh, Commissioner (Science & Technology and IT), Govt. of Manipur presided over the inaugural function.



Inauguration



Chief Guest delivering inaugural speech



Key note address being given by
Co-Course Co-ordinator

In his inaugural address, Dr. Amuba Singh said that modelling had been a new area of study and scientists always looked at developing some models to investigate a complex system and worked to solve the problem. He said that North Eastern Region has been quite fortunate to have sufficient surface water system. However, people have been unable to harness it properly and hence getting sufficient drinking water during the lean season has been a burning issue in the state of Manipur during the last few decades he said. Looking towards renewable resources so called ground water resources would be one of the alternative means to supplement the shortage of water supply system for which a lot of study will be required and the training programme on Modelling Hydrological System would give enough knowledge in this regard he further said. He expressed his happiness to have such a good programme in Manipur in the NE region. He said that the programme would be highly beneficial not only to the participants but also to the State of Manipur. Considering the difficulties of getting appropriate experts in the region, he further appealed to the participants to try their best to learn to the fullest extent possible from the experts who have come all the way to this region from various reputed National Level organisations to train young geoscientists.

In his Key Note Address, Dr. M. Thangarajan, Retired scientist-G, National Geophysical Research Institute (NGRI), Hyderabad who was the Co-Course Coordinator of the training programme said that Groundwater modelling study had been a relatively new field to Indian hydrologists. However, in the last one decade, there had been a growing awareness among groundwater hydrologists to use groundwater model as a potential tool to assess the groundwater potential in a particular basin or sub basin or a water shed. He further said that Department of Science and Technology , Govt. of India had sponsored many such training programmes in the last three years at various parts of India to cater the needs of the young hydrologists of the Country.

Dr. Sinha Ray while speaking as Guest of Honour shared his 20 years of experience in the ground water exploration and management in the north eastern region. He said that the North eastern region being situated in one of the rain fed regions of the Country, the schemes such as rain water harvesting as well as groundwater recharging through rain water harvesting etc. should also be encouraged to supplement shortage of water supply during lean period.

In the Presidential speech, S. Buddhachandra Singh highlighted the leading role of MASTEC in initiating and organising local specific science & technology related programmes including human resource development in the state in the past few years. Though not much work in the area of ground water has been done, he mentioned the initiatives on rain water harvesting schemes taken up in the hills by the Govt. He thanked all the resource persons / scientists coming from various organisations for extending cooperation to MASTEC without whose help it could not have been possible for MASTEC to organise such a programme.

Altogether, 11 (eleven) experts from various National level R&D Institutions,. Universities, IIT, Central Ground Water Board (CGWB) etc. including two Professors from Earth Sciences Department, Manipur University participated the programme as resource persons and imparted in depth training to the participants by way of delivering lectures, discussion and demonstrations and a hands on practical on computer on use of Visual Modflow software for modelling groundwater. The experts specialised in various areas of hydrological sciences and related aspects such as occurrence, aquifer characteristics, recharge etc. included Dr. Swapna Devi, CGWB, NER, Guwahati,

Dr. A.D.Patgiri, Professor in Geological Sciences, Gauhati University, Dr. S.P. Sinha Ray, Former , Director, CGWB, NER, Guwahati, Professor A.K.Sinha, Geology Department,



A Section of participants



A Section of participants

Rajasthan University, Jaipur, Dr. V.S.Singh, Scientist, NGRI, Hyderabad, Dr. V.S.Sarma, Scientist, NGRI, Dr. Arunkumar and Dr I. Ibotombi Singh of Manipur University and the experts specialised in modelling techniques of groundwater included Dr. A.K.Rastogi, IIT, Mumbai, Dr. A.K.Keshari , IIT, Delhi and Dr. M. Thangarajan, Former Scientist –G grade, NGRI. Altogether 24 participants including participants from Mizoram and Assam state participated in the three weeks long training programme.

During the course of the training, Dr. Sinha Ray discussed on the topics i) Ground water recharging through rain water harvesting and ii) Water resources and its integrated management. Dr. Swapna Devi discussed on the topics i) Groundwater Development Prospects of North Eastern Region, ii) Hard Rock Hydrogeology – A case study of Guwahati City, and iii) Management, Protection and Conservation of Groundwater of Manipur. Dr. A.D. Patgiri delivered lectures on the topics i) Fundamental and Principles of Remote Sensing, ii)



Resource Person delivering lecture

Aerial Photography, iii) Assessing Ground water Resources for sustainable development, and iv) Applications of Remote Sensing in Hydrological studies. Dr. Ibotombi Singh discussed on the topics i) Geological Structures and Ground water Occurrence and ii) Groundwater occurrence in Shales of the Imphal Valley, Manipur. Dr. V.S.Singh discussed at length on the topic “Pump Test and Evaluation of Aquifer Characteristics”. Dr. V.S.Sarma discussed on Geophysical Techniques such as i) Electrical methods, ii) Self Potential studies and ii) High Resolution Electrical Resistivity Tomography (HERT) /

Resistivity Imaging, Dr. A.K.Sinha delivered lectures on i) Dimensions of Hydrological Science with reference to Ground water hydrology and ii) Sustainability issues & management considerations with reference to India.

Dr. M. Thangarajan, Dr. A.K.Keshari and Dr. A.K.Rastogi discussed on various aspects of mathematical formulations of modelling ground water. A.K. Keshari had shown demonstrations on mass transport modelling as a case study and, A.K.Rastogi, in addition to lectures, performed a demonstration of software on finite element applications for groundwater modelling.

The students successfully and confidently carried out a hands on practical using computer on ground water flow and mass transport modelling using Visual Modflow Software under the guidance of Dr. M. Thangarajan.

The Valedictory function of the training programme was held on June 12, 2007. Shri P.L. Thanga, I.A.S., Additional Chief Secretary to the Govt. of Manipur was the Chief Guest of the function. Dr. D.R. Ram, Director, Earth System Sciences (ESS) Division, Department of Science & Technology (DST), New Delhi and Prof. H.N.K.Sarma, Pro Vice Chancellor of Manipur University were the Guests of Honour respectively and Shri S. Buddhachandra Singh, Member Secretary, Manipur Science and Technology Council (MASTEC) presided over the valedictory function.

Shri P.L.Thanga while giving speech as Chief Guest shared his experience of attending a programme particularly on Rain Water harvesting in Tezpur in Assam when he was the Secretary to the North Eastern Council (NEC), Ministry of Home Affairs, Shillong. Quoting reports of CGWB, NER, he said that the groundwater

available in the Valley of Manipur requires to be properly explored for use for both irrigation and other domestic needs. Giving Mizoram as an example, he mentioned that Manipur which receives considerable amount of rainfall annually might also adopt rain water harvesting programmes to supplement the shortage of drinking water in the state. He expressed his happiness and gratitude to the experts from various organisations for taking lot of pain to come over to the state and deliver lectures on various aspects of ground water resources.



*Valedictory Function :
From left : D.R.Ram, Scientist F, DST, New Delhi,
P.L.Thanga, I.A.S. Chairman, MANIREDA,
S. Buddhachandra, I.A.S. Commissioner (ST & IT),
Govt. of Manipur*

In his speech, Dr D.R.Ram highlighted in brief the specific programmes being encouraged by ESS Division, DST, New Delhi. He appealed to the participants to visit the DST Website from time to time to update information and get maximum benefit from DST programmes.

In his presidential address, Buddhachandra Singh said that MASTEC had organised the training programme at the right time with the focal theme of giving adequate knowledge on groundwater basics and modelling for effective management of groundwater resources.



*P.L.Thanga, I.A.S., Addl. Chief Secretary
Govt. of Manipur distributing certificates*



*Dr. D.R. Ram, DST, Govt. of India
New Delhi distributing certificates*

The participation certificates of the participants were also distributed by the Chief Guest, Guest of Honours and the President of the function respectively. Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC proposed vote of thanks. Thus ended the 23 days long training course successfully on 12th June 2007.

2.5 Innovator's Workshop cum Exhibition of Grassroots' Technologies, Imphal

As a part of dissemination of NIF's activities in the North-east India and for scouting of new innovations and traditional knowledge (TK) from the region, GIAN-NE with help of NIF and **MASTEC**, Imphal conducted a workshop at Imphal, Manipur during 27-28 July, '07 sponsored by the Department of Scientific and Industrial Research (DSIR). The main objectives of the proposed workshop cum exhibition were to help establish linkage between the formal and informal sectors of science, to spread awareness and motivate innovators of the various opportunities and avenues available to them, to create

opportunities for local grassroots innovators and traditional knowledge holders in value addition, business development and IPR, and to come up with a comprehensive plan for future course of action.

Sri T. Phungjathang, Hon'ble Minister, Science and Technology graced the occasion as the Chief Guest and inaugurated the workshop. Sri P.L. Thanga, Chairman, MANIREDA, GOM presided over the function and Sri L. Buddhachandra Singh, Commissioner, Science and Technology, Govt. of Manipur was the Guest of Honor. Prof. Anil K Gupta, EVC, NIF delivered the key note address of the workshop. Sri Th. Surendranath, Director, MASTEC gave the welcome address.

The other dignitaries included scientists from DSIR, New Delhi; scientists from Botanical Survey of India, Shillong; Faculties from IITG; representatives of NEDFi, Guwahati and NABARD, Imphal; Faculties from Manipour University; State Government Officials from various departments; members of local NGOs, etc. Prof. K. Kanan, Vice Chancellor, Nagaland University and Prof H.N.K.Shrama, Pro-VC, Manipur University, attended the workshop in the second day.



T. Phunzathang, Minister (S&T)
Inaugurating Innovators workshop

In the first day the workshop was attended by more than 500 people, apart from the visitors to the exhibition. Women SHG members from Nambol, Thoubal, Moirang and Imphal participated in the workshop. Students from various schools also attended the workshop and visited the exhibition. The exhibition of grassroots technologies was inaugurated by the Chief Guest and took a tour of all the exhibit stalls and interacted with all innovators. Altogether 52 machineries from Assam, Nagaland and Manipur were displayed in the exhibition. The innovative machineries included a wide range of machineries – handlooms, automobiles, electronics, food-processing, wood and bamboo, solar boat, manual rob making machine, iron-net maker, etc.



Prof. Anil K Gupta, EVC, NIF
delivering the key note address

Presentations were made by resource persons from DSIR, BSI, IITG Faculties, NABARD, NEDFi, Manipur State Medicinal Plant Board, MU Faculties, etc. on various topics. The innovators and traditional knowledge holders also gave small presentations and expressed their views on various issues. There was also brief interaction session between innovators and TK holders with visiting experts and NIF staffs. The second day session was chaired by Prof. H.N. Sharma, Pro-VC, Manipur University. Prof. K. Kanan, VC, Nagaland University VC also attended the function and delivered an inspiring speech. More than 500 people attended the session.

A special session was organized on Traditional Knowledge systems. Prof. N. Rajmuhon Singh and Dr. N. Guneshwar Sharma, Member-Secretary, Manipur Medicinal Plant Board gave presentations on TK systems in the state. It was followed by an interaction session with participating traditional knowledge holders. Appreciation awards were given to five students selected from the idea competition. Among the herbal practitioners, who have shared their knowledge with us, eighteen practitioners were facilitated with shawls and certificates of appreciation for their services to the society

The workshop concluded with a small press meet and presentation of cheques for MVIF assistance to three herbal practitioners to scale-up their facilities.

Two egg incubators were handed over to ORI, Nambol and Loyalam, Thoubal for trial marketing. A wood lathe cum drilling machine was also handed over to TSF for trial marketing. The NGO would train their members who are engaged in carpentry works to use the machine.

2.6 District Level Training Workshop on Disaster Management :

Manipur Science & Technology Council (MASTEC), Imphal has organized 2 days district level training workshops at 6 different places covering all the nine districts of Manipur. The programme was sponsored by National Council for Science & Technology Communication (NCSTC), Department of Science & Technology, Govt. of India. The programme aimed at giving volunteers training on management of disasters commonly occurring in the state. The target group of participants were activists from NGOs/clubs, village authorities such as Pradhans, Members of Gram Panchayats etc. and interested individuals.

The first programme for Imphal East and Imphal West districts was organized during March 4-5, 2008 at the State Science & Technology Complex, Takyelpat, Imphal. Altogether 37 participants from both the districts attended the said training workshop. Resource persons from State Relief & Disaster Management Department and Department of Fire Service, Govt. of Manipur conducted lecture-cum-demonstration sessions on various topics



Demonstration on Rescue Operations

such as Basic Concepts of Disaster Management, Rescue Operations and First Aid to Disaster Victims, Construction Techniques of Earthquake Resistant Structures and Role of Fire Service in Disaster Management etc. On the first day of the 2-day programme there was an Inaugural Function. Shri N. Noren Singh, Director, Manipur Fire Service Department was the chief Guest and Shri Th. Surendranath Singh, Executive Director, MASTEC and Dr. B. Lalhari Sharma, Deputy Secretary, Relief & Disaster Management Department, Govt. of Manipur were the President and Guest of Honour respectively of the function. In his Inaugural Speech Director Manipur Fire Service mentioned about the importance of organizing such training workshop in order to give an idea of preparedness for the disasters to come to the general mass more particularly to the youths and village authorities who are likely to take main role at the time of occurrence of a disaster. He also highlighted the role of fire service personnel in the management of disasters. In his presidential remark, Shri Th. Surendranath Singh, Executive Director, MASTEC attracted the minds of the participants by explaining about various science popularization activities taken up by MASTEC under the sponsorship of NCSTC, DST, Govt. of India. He said that Disaster Management programme is also one of the science popularization activities. He also highlighted that the nation is observing the year 2008 as the year of understanding the Planet Earth and all the science popularization activities organized during the year will be organized under the banner of understanding the planet earth. Dr. B. Lalhari Sharma, Deputy Secretary, Relief & Disaster Management Department Govt. of Manipur highlighted about the common types of disasters occurred and likely to occur in the country as well as in the North Eastern Region. He mentioned that our state falls in the most Earthquake prone area i.e. Zone -V in the vulnerability map of India and so earthquake may strike at any day at any moment. Therefore, we must take precautionary measures, rather make preparedness plan for earthquakes. He also suggested that we must

organize long term training programme of about 10-15 days duration in order to give actual training the young volunteers about search and rescue operations and community based disaster management.

On the first day of the programme a session on lecture-cum-demonstration on Search & Rescue Operation and First Aid to Disaster Victims was conducted by two personnel from Department of Civil Defence, Govt. of Manipur viz., Shri K. Kamini Singh, Demonstrator and Shri O. Ratan Singh, Demonstrator. They

explained and demonstrated various techniques of making rope knot which are to be used at the time of occurrence of a disaster. They also demonstrated techniques for rescue of casualties/victims of disasters and giving first aid including artificial respiration.



Inaugural Function of Thoubal & Chandel Districts' programme

On the second day of the programme a team of Fire Service Personnel from Manipur Fire Service Department, Govt. of Manipur conducted a lecture-cum demonstration session on the Role of Fire Service in Disaster Management. The team explained about possible causes of occurrence of a major fire irrespective of its class and how to control/manage it. They trained the participants on the use of various Fire Extinguishers and use of sophisticated equipments available in the Fire Service Department so that they may be able to help the Fire Service Personnel at the time of occurrence of any disaster particularly in fire fighting. Shri Th. Joykumar Singh, Retd., Chief Engineer, P.W.D. Manipur also delivered a lecture on the construction techniques of earthquake resistant structures.



Lecture-cum-demonstration on Fire Fighting at Thoubal District

The second district level training workshop was for Thoubal and Chandel Districts organized during March 19-20, 2008 at the Hiyanglam Wabagai Terapishak Community Hall, Wabagai, Thoubal District. Altogether 40 participants from both the districts attended the said training workshop. On the first day of the 2-day programme there was an Inaugural Function. The Pradhan of the Hiyanglam Wabagai, Gram Panchyat was the chief

Guest and Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC and Shri Ch. Subhaschandra Singh, Senior Instructor, Manipur Civil Defence Department were the President and Guest of Honour respectively of the function. In his Inaugural Speech The Pradhan of Hiynaglam Wabagi Gram Panchayat mentioned about the need for bringing such programme to the remote places of the state so that at least awareness on the topic may be given to the minds of the general mass. He also express his willingness to organize a little longer programme of Disaster Management in the area so that the young volunteers may get the actual training of Rescue Operations and Fire fighting. In his presidential remark, Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC explained about various management aspects of pre- disaster, during the disaster and post-disaster management at community level. Shri Ch. Subhachandra Singh, Senior Instructor, Department of Civil Defence, Govt. of Manipur highlighted about various short term courses offered by the Department for the common people.

2.7 National Science Day 2008

The Country has been celebrating National Science Day on February 28 every year since 1987. The decision to designate such a day was taken by the Government of India in December 1986 and the choice of the date is linked to the discovery of the **Raman Effect**. The occasion is intended to instill and build in the confidence in ourselves and in our own abilities to think of and do entirely new things on our own. Thus, efforts are made to popularize science & technology, estimate and nurture scientific attitudes and temperament among our people, especially, the students and the common man in general as part of the National Science Day celebration. The theme of the National Science Day 2008 has been designated as “***Understanding Planet Earth***”.

In Manipur, since the year 1997, Manipur Science & Technology Council (MASTEC) has been continuously observing **National Science Day** on February 28 every year as an annual feature of the Council. This year too, the Council has observed **National Science Day-2008** on **February 28, 2008** at **Khuman Lampak Main Stadium**. The main activities of the day were **State Level Painting Competitions** for school students, **Invited Lecture** and **Science Dance Drama** on “Women’s Health and Sanitation”.

State Level Painting Competition

The State level painting competitions were organised for school students of Class III-V (Group I) and Class VI-VIII (Group II) on the theme “**Understanding Planet Earth**”. 62 students of class III-IV from 14 different schools and 75 students of class VI-VIII from 16 schools participated respectively in Group-I and Group-II competitions. The results of the competitions were as follows

Group-I : Class III-V

Position	Name of the Winner	Class	Name of the School
First	Sonia Thiyam	V	Maria Montessori School, Koirengei
Second	Khwairakpam Amarjeet	IV	Maria Montessori School, Koirengei
Third	Maria Thokchom	V	Maria Montessori School, Koirengei

Group-II : Class VI-VIII

Position	Name of the Winner	Class	Name of the School
First	Soram Sanathoiba	VII	St. Joseph’s School,
Second	Moirangthem Rebika Devi	VI	Sacred Heart School, Prompat
Third	Ph. Naocha Singh	VII	Humane Value Development Centre, Moirang

Invited Lecture

As a part of the programme of the day, Dr. Soibam Ibotombi Singh, Associate Professor, Department of Earth Sciences, Manipur University, Canchipur gave a lecture on the topic “**Understanding the Planet: Earth**”. He elaborately explained about the Earth from its formation to the phenomena and processes that are happening within the earth system. He also talked about the geology of Manipur and natural disasters like – Earthquakes, Landslides Tsunamis etc.

Science Dance Drama

A science dance drama based on “**Women’s Health and Nutrition**” was also presented by the artists of Guru Abunghal Dance & Cultural Centre, Keisamthong Longjam Leirak, Imphal. The drama is developed by Heart Care Foundation, New Delhi under the sponsorship of National Council for Science & Technology, Department of Science & Technology, Govt. of India, New Delhi as a national campaign on Women’s Health and Nutrition.

Cash prizes with citations for the competitions were distributed to the prize-winning students by Shri P.L. Thanga, Chairman, Manipur Renewable Energy

Development Agency, Shri S. Buddhachandra Singh, Commissioner, Science & Technology and Information Technology, Govt. of Manipur and Shri Th. Surendranath Singh, Executive Director, Manipur Science & Technology, Imphal.



Dignitaries on the Dais on National Science Day



A section of audience



Students participating Painting Competitions



Delivering Invited Lecture



Artists performing science based Dance Drama



Prize Distribution to the Winner

PAINTINGS OF THE PRIZE WINNERS



Group-I : First Position



Group-II : First Position



Group-I : Second Position



Group-II : Second Position



Group-I : Third Position



Group-II : Third Position

3.0 Official Visit of Officers

Sl. No.	Name & Designation	Date	Purpose and Venue
1.	Th. Surendranath Singh	May 28-29, 2007	Project Evaluation Meeting at DST, New Delhi
2.	do	July 5, 2007	Meeting on State S&T Oriented demonstration projects at New Delhi
3.	do	December 6, 2007	Expert Group Meeting on Micro Hydel Project
4.	do	January 17-19, 2008	Finalization meeting of the Planet Earth Activities at CCMB, Hyderabad.
5.	Dr. L. Dinachandra	May 23, 2007	Meeting for National Urban Information System at NSDI, R.K. Puram New Delhi.
6.	-do-	October 15- 16, 2007	5 th R&D Session of INCOH at Maharana Pratap University of Agriculture and Technology, Udaipur
7.	Kh. Rakesh	January 17–19, 2008	Finalization meeting of the Planet Earth Activities at Centre for Cellular and Molecular Biology, Hyderabad.
8.	-do-	August 4 – 7, 2007.	Sensitization meeting of Understanding Planet Earth activities for North Eastern States at Dimapur
9.	-do-	September 19, 2007	28 th Meeting of the Project Evaluation Group of the State S&T Councils related proposals on at New Delhi.
10.	Ch. Sarat Singh	May 28-29, 2007	Project Evaluation Meeting at DST, New Delhi
11.	Dr. R.K. Pritamjit Singh	July 6, 2007	Project Review Committee meeting on “Identification of Strategy for Mapping of S&T needs in a state” at New Delhi

4.0 PROJECTS (ongoing)

Research as well as application oriented pilot projects sponsored by various central agencies / departments are being implemented by the Council. The following are the projects supported by various central government agencies/organisations and being implemented by the professional manpower of the Council assisted by project staffs

Highlights of the Projects:

- 4.1** Project title : Landslide Hazard Zonation between None-Nungba along NH- 53 and Geotechnical Investigation at two Slides – Sponsored by NRDMS Division, Dept. of Science & Technology, Govt. of India

Objectives :

- (i) to study geomorphology, geology and structural parameters for slope stability.
- (ii) to study hydrological conditions.
- (iii) to study soil and rock mechanical properties.
- (iv) to prepare a detailed map from the sites specific studies, risk assessment and to develop preventive measures.

Progress :

The following works are going on

- (i) Preparation of various parameters using GIS.
- (ii) Plotting of field data for landslide areas in the map.
- (iii) Collection of ancillary data.

- 4.2** Project title :Low Cost Housing using Stabilised Mud Blocks –Sponsored by State Councils Division, Dept. of Science & Technology, Govt. of India.

Progress :

TARA Balram Earth Compressed machine was used for preparation of stabilised mud blocks. Cement (5%) has been mixed with local soil as stabiliser. 5 (five) demo units of low cost houses have been constructed using stabilised mud blocks. Local artisans and youths have been aware about the technology. The project was completed during May 2007.



Stabilised Mud Block House for KYDC Club



Stabilised Mud Block House for HYS Club



Demo Mud Block House at MASTEC
Office Complex



Stabilised Mud Block House at
Manipur Science Centre, Imphal

4.3 IIT Joint venture project titled **Community link up for Natural dyes with plants found in Manipur**

Achievements

Four training workshops cum demonstration programmes on Natural Dyes with plants found in Manipur were organized in Manipur by Dr. Padma S Vankar, Feat Laboratory, IIT, Kanpur in association with MASTEC. Shri L. Somarjit Singh, Selection Grade Lecturer, Modern College, Imphal and Shri Brajendra Singh were also involved as local resource persons. The workshops cum demonstration programme were conducted at the following Societies/SHGs who were truly involved in dyeing and weaving.

- 1) AGANGBA, Wangkhei Yonglan Leirak, Imphal (August 2, 2007)
- 2) Thambalkhong Maning Leikai Shija Weavers Co-operative Society, Thambalkhong, Imphal (August 3, 2007)
- 3) The Heirangoithong Awang Maibam Leikai United Weavers Co-operative Society Ltd. , Imphal (March 13, 2008)
- 4) The Super Specialist WCS Ltd., Imphal (March 14, 2008)

Cotton and Silk fabrics with the natural dye powders of *Acacia catechu*, *Punica granatum*, Lac, *Rubia cordifolia*, *Tectona grandis* were demonstrated using different mordants. Dyeing with fresh extract from locally available plants such as *Colocassia* (leaves), Onion (skin), Red Canna (fresh flowers), *Amaranthus* (leaves), China rose (fresh flowers) etc. were also demonstrated to the participants. Write ups for the different process of dyeing in English and Manipuri were also distributed to the participants for future reference. Altogether, 109 women were trained in the 4 workshops.



Dr. Padma S Vankar conducting the Dye workshop at The Super Specialist WCS Ltd., Imphal



Participants dyeing fabrics during the training workshop

4.4 Identification of Strategy for Mapping of S & T needs in a State

Objectives:

- Inventorization and Mapping of problems in relevant sectoral areas of the entire state requiring S&T intervention based on secondary sources.
- Documentation of problem including areas drafting of specific and well defined problem statements mapped together with S&T interventions in one priority district.

Achievements:

The project has been completed on 31st September, 2007 with the following achievements;

- Collected secondary information from different Government & Non-government Departments and Institutions.
- Surveyed all the 38 Sub-divisions of the state.
- Digitized Maps of Manipur at Sub-Divisional level.
- Entered and coded the information from secondary and field survey.
- Problems identified for 10 sectors, viz. – Agriculture, Health, Drinking Water, Animal Husbandry, Transport, Environment & Ecology, Natural Resources, Forest, Tourism and Fishery.
- Preparation of Final Report and submitted to DST, Govt. of India, New Delhi

4.5 Project Title: Pilot Project on Turkey farming

Approved Objectives :

- i) To introduce and popularise Turkey farming in the region
- ii) To transfer rearing techniques of turkey to the farmers by way of giving training, demonstration and interaction and also to study effectiveness of turkey farming for income generation

Summary of progress / achievement:

- i) A Hatchery unit has been established in the MASTEC complex with the installation of one Incubator cum hatcher for a capacity of 4000 eggs and become functional.



Hatchery unit established at MASTEC Complex, Takyelpat, Imphal

- ii) Breeding and hatching:

The turkeys procured from CARI, Barielly became matured and female turkeys started laying eggs . Earlier the male and female turkeys were kept separately from each other. As they have been quite mature, they have been kept in the ratio of 1:10 i.e. 1 male is to 10 female as advised by the experts of Turkey Research Unit, CARI, Bareilly. Collection of fertile eggs were done for incubation and hatching. The existing 40 female (adult) were doing well. Rest were male. The males were in excess. After keeping the desired number of males in appropriate ratio, with some extras, the rest male turkeys had been sold out @ Rs 150/- per kg (live) to the interested public.

The first batch 70 eggs collected from the turkey farm has been put in the hatchery and its date of hatching fall on 13th April, 2007.

The hatching rate was found very low which might be perhaps due to lack of experience of the newly engaged project staff in area of turkey production. The second batch eggs were also hatched and the third and fourth batch of eggs were incubated and hatched at its own newly established hatchery. Even though the hatching rate was low, the already hatched turkey poults were reared under strict supervision of the project officer who is a Veterinary & Animal Husbandry Graduate. The Poultry expert of State Veterinary Services also shared their knowledge in rearing these turkeys.



10 female & 1 male turkey in the breeding room

The first and second batch poults produced at its farm were growing up fast. And they are expected to start laying of eggs soon. The remaining batch poults are also doing well and will be maturing in a few months.



Some of the existing turkeys at the farm

The fifth batch eggs were being incubated, the immediate outbreak of the Bird Flu was reported in the local News papers. Then, the Government banned hatching process in all farms due to which the production processes of poultry items in the state was stopped.

iii) **Avian Influenza (Bird Flu) – a threat to Turkey farming**

The recent outbreak of Avian Influenza (bird flu) in the state of Manipur had caused severe disturbances in poultry industry. Several private poultry farms including Govt. farms were closed down. It continued for about three and half months during which neither poultry species nor feeds could be transported from one place to another place in the Imphal city. Live birds and eggs collected from farms including Govt. farms were culled and buried and transportation of poultry feeds was also not sold in the city. The hatching activities were stopped during the bird flu period. The PI had very tough time for management of the turkey farm during this period. The PI managed his best level to survive the existing turkeys from the mass culling of the poultry birds.



Presently there were 190 turkey birds (parent stock + 6 months old bird + 3 ½ months old birds) in the farm. The state was declared free from bird flu in the second week of November 2007. **Immediately we planed for an awareness programme on turkey farming for which mobilisation of participants was done through local news papers, All India Radio, DDK, Local TV channels etc.** The response from the farmers were overwhelming. The report of the training for farmers is described below.

iv) **Training cum Awareness Programme on Turkey farming**

Manipur Science & Technology Council (MASTEC) organised a training cum awareness programme on **Turkey Farming**, with the objectives of popularising Turkey farming in the region and also transfer rearing techniques to the farmers by way of delivering lectures, demonstration and interaction during December 14-15, 2007 at the Science & Technology Complex, Takyelpat, Imphal. The target participants included

poultry farmers, entrepreneurs, educated unemployed youths etc. The programme forms part of implementation of the ongoing **Pilot Project on Turkey farming** supported by Department of Science & Technology, Govt. of India. Altogether thirty one farmers from different districts in the state attended the training.

Shri S. Buddhachandra Singh, Commissioner (Science, Technology and IT), Govt. of Manipur inaugurated the training as Chief Guest and Shri Uttam C Laisram, Director (ST & IT), Govt. of Manipur presided over the inaugural function. Dr. S. Joykumar Singh, Former Director, Veterinary & Animal Husbandry Services, Govt. of Manipur was the Guest of honour of the inaugural function

In his inaugural Address, Shri S. Buddhachandra Singh said that there is heavy demand of animal proteins in the local markets showing a big gap between availability of poultry meat and production. He appealed to the poultry farmers to play a major role in the years ahead in the area of poultry production to bridge the gap between the requirement and availability of animal proteins in the form of egg and meat.



Inauguration of the training on turkey farming

In the speech by the Guest of Honour, Dr. S. Joykumar Singh said that white meat of poultry is the health conscious alternative for the consumers because of its wide acceptability by consumers irrespective of caste, creed and religion. Turkey meat has low cholesterol, low fat and high protein content which has attracted people to eat it, he further said. He further mentioned about the importance of poultry manures which could replace the chemical fertiliser needs and reduce cost of agricultural productions.

Dr. Pabitra Singh, Poultry specialist said that a matured male turkey weighs about 10 kg or more in 6 – 7 months whereas other male adult poultry species (Layer, Broiler, Banaraja, Giriraja etc.) of the same age weigh a maximum of 5-6 Kg. only. Besides, Turkey birds could adjust with any type of environment and prefer to



Demonstration on male – female identification

eat green vegetables including green grasses and it is not difficult at all to rear turkeys he said. Hence, farming of turkeys could be taken up in the rural areas where there are enough space, various types of grass grows and local vegetable items are available in plenty to provide them as feed supplements he further said.

Dr. Pabitra appreciated the activities of MASTEC. He asked the participants to gain maximum knowledge from the experts and utilise the knowledge in taking up poultry farming activities as backyard industry in the near future. Earlier Shri Th. Surendranath Singh, Executive Director, MASTEC while welcoming the guests, participants, invitees, highlighted upon the objectives of organising the training programme. He further mentioned the role of MASTEC as a window organisation of CSIR, in bringing proven technologies available with reputed R&D laboratories outside the state and transfer it to the target people of the region. Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC proposed vote of thanks.

During the course of two days programme, Dr. Ksh. Pabitra Singh (Poultry Specialist), Joint Director and Dr. K. Rashbehari Singh, Poultry Specialist (Deputy Director), Veterinary and Animal Husbandry Services, Govt. of Manipur imparted in depth training to the farmers about rearing of turkeys and its importance for income generation. The



A section of farmer participants

course contents which were covered during the training included i). Turkey industry & its prospects, ii) Breeding and management of turkeys, iii) Marketing strategies , iv) Diseases of turkeys and routine health care, v) Advantages of Turkey farming over farming of other poultry species, v) Demonstration on identification of male / female turkeys etc..

The training ended successfully on December 15, 2007 at 4.30 p.m. with a lot of commitments from the participants to take up poultry (turkey) farming in the near future in the region.

List of participants who successfully attended the training cum awareness programme are given below.

- 1 Thoudam Malemba Meetei of Thoubal District, Manipur
- 2 Th. Homendro Singh of Kongba Khetri Leikai, Imphal East Dist., Manipur

- 3 M. Lokendro Singh. Yairipok, Yambem Leikai, Thoubal District, Manipur
- 4 Ahongsangbam Marshel of Keinou, Bishnupur District, Manipur
- 5 Ksh. Momon Singh, Singjamei, Imphal West Dist.
- 6 S. Chaoba Singh, Naoremthong, Imphal West Dist.
- 7 Ph. Ningthou Singh , Sekta, Imphal East Dist.
- 8 N. Ratankumar Singh, Tere Amudon, Imphal West Dist.
- 9 L. Kumarjit Singh, Khangabok, Thoubal Dist.
- 10 R.K.Ajitkumar of Uripok Khuman Leikai, Imphal West Dist.
- 11 Kh. Ramananda Singh, Lairikyengbam Leikai, Imphal East Dist.
- 12 Md. Abdul Gani , Ushoipokpi, Thoubal Dist.
- 13 Th. Iboyaima Singh of Ngaikhong Siphai, Bishnupur Dist.
- 14 H. Kulajit Singh, Tera Tongbram Leikai, Imphal West
- 15 M. Atangba Singh , Sambei, Imphal East Dist.
- 16 Th. Jiban Singh of Uripok Yambem Leikai, Imphal
- 17 H. Bobby Singh, Mayang Imphal
- 18 Th. Shyam Singh, Pebiya Pandit Leikai, Singjamei, Imphal East Dist
- 19 W. Maipak Singh, Mayang Imphal
- 20 Ch. Bihari Singh, Kamong Longjam, Imphal West Dist.
- 21 M. Surjabal Khuman, Nambol, Bishnupur Dist.
- 22 Kh. Nabachandra Singh, Kongba Makha Nandeibam leikai, Imphal East
- 23 R.K.Jiten Meitei , Khurai Chingtham Leikai, Imphal East Dist.
- 24 S. Pilot Singh, Haobam Marak, Imphal West Dist.
- 25 Jamkhogin Haokip, Kangchup, Senapati Dist.
- 26 A. Bimol Singh, Khumbong Village, Imphal West Dist.
- 27 M. Jiten Singh, Thoubal District
- 28 Kh. Milan Singh, Haokha, Athokpam Awangleikai, Thoubal Dist.
- 29 Dr. N. Muhindro Singh, ICAR Research Complex, Lamphelpat, Imphal
- 30 H. Khagemba Meitei, Takyel Kolom Leikai, Imphal West
- 31 Th. Dhanabir Singh, Top mayai Leikai, Imphal East Dist, Manipur.

The programme was reported in many of the local News Papers published at Imphal

Training material : The literature about turkeys covering the aspects such as Origin of turkeys, guidelines of rearing turkey poults, advantage of turkey farming, how to incubate turkey eggs, diseases, routine health care including vaccination

programme, management etc. were translated from English into regional language (Manipuri Language) and distributed to the participants

v) Development of Short duration digital Film about the Turkeys

A short duration (about 20 minutes) on Farming of turkey based on the existing turkeys has been developed and distributed in the form of CDs to all the participants. An attempt was also made to make a documentary film on Turkeys for about 45 minutes for telecast in the Local TV Channels as part of popularisation of turkey farming in the region.

Specific Observation:

- i) The male turkey live birds of about two and half months old weigh 2 ½ kg to 3 kg in average where as female birds of the same age weigh 2 kg in average.
- ii) It was observed that the birds were fond of eating leafy vegetables including grass cut into small pieces. Some male birds were kept separately and they were provided locally available feeds including green vegetables to study weight gain or loss in comparison with other turkey birds who were fed with feeds from feed processing mills. They were kept for three months for observation. However, no change in weight gain was found between the two categories of birds. The male live turkeys when they become 5 months old carries an average weight of 7 kg.
- iii) The male turkeys, at the age of 7 months (adult stage) were found to have weight of 9-11 kg in average and the female were 5-6 kg in average. The rate of growth was quite satisfactory.
- iv) The turkeys attracted the people in the surrounding areas. Besides, some poultry farmers have already approached this farm to provide them eggs and poults. This Council has assured the ex-trainees that priority will be given to the trainees to get either eggs or poults.
- v) Specially during Christmas and New Years eve, many customers asked this Council to sell turkeys so that they will find an opportunity to taste it. Hence, this Farm sold out some excess live male turkeys and could earn Rs 18,200/- only @ Rs 150/- per kg.

Linkages developed :

MASTEC has developed good linkages with State Veterinary and Animal Husbandry Services, Govt. of Manipur and ICAR, Imphal Sub centre. The Head, Animal Sciences Department, CAU, Imphal shared his expertise and provided personnel encouragement in the project. Some entrepreneurs / farmers keep visiting the centre showing their interests in farming turkey. CARI extended expert advice as and when required.

4.6 Dailong Micro Hydel project – Sponsored by State Councils Division, Dept. of Science & Technology, Govt. of India

Objectives:

- (i) To design and develop the cross-flow turbines suitable for (2x50kw) capacities. The packages consist of turbine and electronic load controllers for a micro-hydel station at Dailong Village, Tamenglong, Manipur.
- (ii) To study the problems of and set guidelines for installation, operation, maintenance and energy utilisation associated with Micro Hydel Units in remote hilly terrains. Micro hydel units are environmentally clean and eco-friendly suited to decentralised power generation.



Laying of penstock

Progress: Civil Works

- i) Construction of Desilting tank and Forebay tank have been completed. Earth work in excavation for penstock trench have been completed.
- i) Joining/welding of 60 nos. of penstock pipes have been completed
- ii) Laying of 20 penstock pipes including RCC supports/saddle blocks at the joints have been completed and the work is in progress
- iii) Construction of Power House has been completed.



Power House



Fore bay tank and diversion weir

Electromechanical Equipments

Two AC Generators, two Control Panels and two Electronics Load Controllers and two turbines have been received and are yet to be installed.

4.7 Drip Irrigation System for Rabi Crops of Manipur sponsored by State S&T Councils Division, DST, GoI, New Delhi

Objectives :

- i) To substitute the flooding method/manual method of giving water to each plant by drip irrigation system
- ii) To eliminate land levelling in undulating/hilly region.
- iii) To maximise utilization of available water
- iv) To increase the cultivable area and yield of the crops.



Drip Irrigation to Cauliflower at Maklang



Drip Irrigation to Banana at Lukhambi

Progress Achieved:

- i) Drip irrigation system has been installed at the first site in a plot measuring about 0.5 acres and two different rabi crops viz., Tomato and Brinjal have been grown.
- ii) Drip Irrigation systems have also been installed in the 2nd year of the project at two project sites Lukhambi Part-II, Tamenglong District (Hill station) and Maklang village, Imphal West District in plots measuring 0.5 acres each.
- iii) Tomato, Brinjal and Cauliflower have been grown at Lukhambi Part-II and Brinjal, Tomato and Cucumber have been grown at Maklang village.
- iv) In the final year of the project Banana trees have been planted at the Lukhambi Part –II project site

4.8 CGCRI, Kolkata & MASTEC joint ventured project on Pilot Scale Demonstration of Ceramic Membrane Based Iron Removal Plants in Manipur:

Progress:

- 1) Two sites have been identified one at Shri Shri Govindaji Temple complex, Imphal and the other at Science & Technology Complex, Takyelpat, Imphal.
- 2) Drilling of two hand pumps (one each) at the two sites have been completed.
- 3) Civil works in site preparation and shed construction have been completed at the two sites.
- 4) Plastic water storage tanks have been procured and construction of one Ferro cement tank (5000 ltr. Capacity) for storage of raw water at one of the project sites is completed.
- 5) CGCRI, Kolkata is yet to install the ceramic membrane technology to the project sites.



*Drilling of tube well at
The Govindajee Temple, Imphal.*



*Shed for Iron removal plants with Water Storage Tank
at the Govindajee Temple*

4.9 Project on Community Information Centre (CIC) sponsored by Ministry of Information Technology, Govt. of India.

Objective:

1. To proliferate the use of Information Technology (IT) for Socio-Development up to the Block Level
2. To develop databases, locally relevant contents, finally leading to e-governance, e-commerce, e-learning etc.

MASTEC, NIC, Govt. of India, Imphal center and DST, Govt. of Manipur play a key role in jointly implementing the above mentioned project. NIC supports the technical know how, DST, Govt of Manipur shares in the overall administration and MASTEC

handles the financial matter including the payment of monthly honorarium to the project manpower/ staffs engaged on contract basis in the project.

So far 33 (thirty three) CICs have been set up in 33 developmental blocks in the state. Each CIC has got 6 numbers of computers connected to the Internet through a VSAT

Users:

Panchayat representatives, Student members, Women Development Organisations, Youth Club Members, NGOs, Entrepreneurs, Educational Institutions, Common men etc.

Benefits to the rural people :

- i. Internet access and e-mail connectivity
- ii. Access to data base /developmental information of national importance.
- iii. Training through distance learning techniques and connectivity to leading educational and research institutions in the country
- iv. Awareness of IT at block level

5.0 Visiting Scientists to MASTEC

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

Sl. No	Name & Address	Date of Visit	Purpose of visit
1	Dr. Asit Chakrabarty, Scientist, Department of Science & Technology, Govt. of India, New Delhi	May 11-15, 2007	Attending Science Meet 2007 held during May 11-15, 2007
2	Dr. M. Thangarajan Retired Scientist G , NGRI, Hyderabad	May 21-June 12, 2007	To attend the Training Course on Modelling Hydrological System as external Co-course coordinator
3	Dr. S.P.Sinha Ray Former Member, CGWB, Govt of India	May 20 –22, 2007	To attend the Training Course on Modelling Hydrological System as an expert
4	Dr. V.S.Singh Scientist F NGRI, CSIR, Hyderabad	May 21-23, 2007	To attend the Training Course on Modelling Hydrological System as an expert
5	Dr. Swapna Devi Scientist, CGWB, NER Guwahati	May 23-25, 2007	To attend the Training Course on Modelling Hydrological System as an expert
6	Prof. A D Patgiri Department of Geological Sciences, Gauhati University, Assam	May 23-25, 2007	To attend the Training Course on Modelling Hydrological System as an expert
7	Dr. V.S.Sharma Scientist F NGRI, CSIR, Hyderabad	May 22-24, 2007	To attend the Training Course on Modelling Hydrological System as an expert

8	Prof. A.K.Rastogi IITB, Mumbai	May 29-31,2007	To attend the Training Course on Modelling Hydrological System as an expert
9	Dr. A.K.Keshari IITD, New Delhi	June 3-4, 2007	To attend the Training Course on Modelling Hydrological System as an expert
10	Dr. D.R.Ram Scientist F / Director DST, GoI, New Delhi	June 10-12,2007	To attend the Training Course on Modelling Hydrological System as DST, GoI., Official
11	Prof. A.K.Sinha Head, Geology Department, Jaipur University, Rajasthan	June 9-12,2007	To attend the Training Course on Modelling Hydrological System as an expert
12	Shri Sanjay Bajpai Scientist DSt, Govt. of India, New Delhi	July 17, 2007	To attend the Executive Committee Meeting of MASTEC as an Official ofDST, Govt. of India, New Delhi .
13	Dr K. Kannan, VC, Nagaland University,	July 27-28, 2007	Innovator's Workshop cum Exhibition of Grassroots' Technologies, Imphal, Manipur
14	Dr Agarwal, DSIR	July 27-28, 2007	Innovator's Workshop cum Exhibition of Grassroots' Technologies, Imphal, Manipur
15	Prof. U.K. Dixit, IIT- Guwahati	July 27-28, 2007	Innovator's Workshop cum Exhibition of Grassroots' Technologies, Imphal, Manipur
16	Dr A.K. Das, IIT- Guwahati,	July 27-28, 2007	Innovator's Workshop cum Exhibition of Grassroots' Technologies, Imphal, Manipur
17	Dr. T.M. Hynniewta, Jt. Director, BSI	July 27-28, 2007	Innovator's Workshop cum Exhibition of Grassroots' Technologies, Imphal, Manipur
18	Dr. Padma Bhankar IIT, Kanpur	October 2007	Project on Natural Dye
19	Roy Choudhury, Director, M/s Jalshakti Engineering Pvt. Ltd.,	January 2008	Implementation of Dialong Micro Hydel Project

6.0 Library :

MASTEC has made a modest attempt to build up its own library. The collection is about 450 (four hundred fifty) volumes of various disciplines. In addition, a number of periodical journals, newsletters, bulletins, local papers, science publications etc. are received regularly. MASTEC aims at strengthening the library of the Council.