

Annual Report

2008-09



MANIPUR SCIENCE AND TECHNOLOGY COUNCIL
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MANIPUR SCIENCE & TECHNOLOGY COUNCIL (MASTEC)

Annual Report for 2008 – 2009

1.0 Background

The Manipur Science & Technology Council (MASTEC) formerly, State Council of Science and 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 (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 20 manpower supported by the Department of Science & Technology, GOI. 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 also works in co-ordination with the Department of S&T and IT, Govt. of Manipur in various areas of activities.

1.1 Objectives of the Council

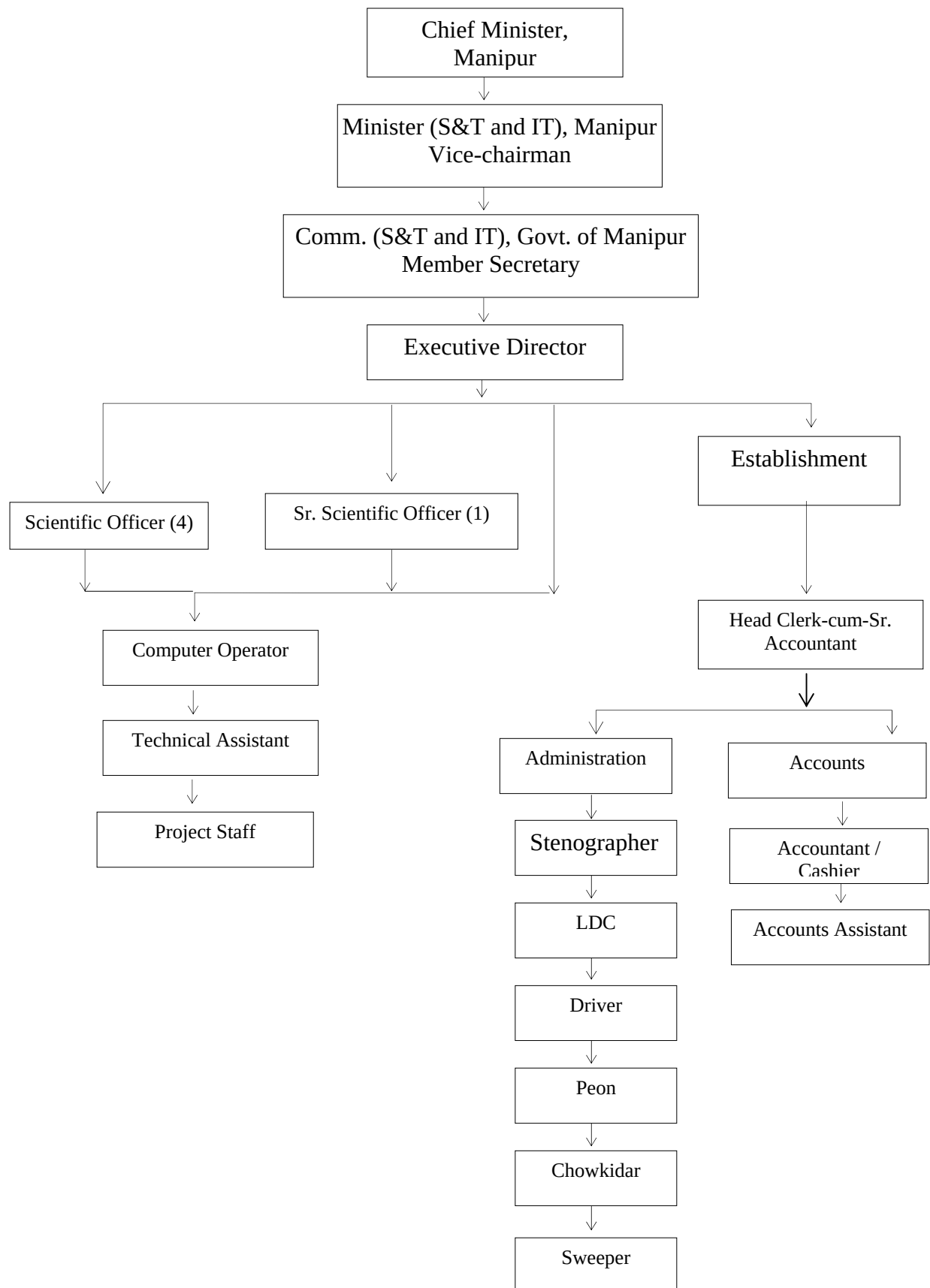
- To identify areas in which Science, Technology and Environment can be utilised for the achievement of the Socio-economic objectives of the State and in particular, tackling the problems of backwardness and underprivileged sections of Society;
- To advise on policies and measures necessary to promote 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 local specific 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 27 members (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, 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	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.	Er. 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.	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. 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.	L. Surjit Singh	M.Sc.	J.R.F.
22.	Ph. Gupinchandra	M.Sc.	Project Assistant.
23.	Guru Aribam Diana	M.Sc. (Food Tech.)	Project Assistant
24.	Sukham Sheitajeet Singh	B.Sc.	Skilled worker
25.	V. Chinzagin	Class-VIII passed	Unskilled worker

2.0 Short-term Activities including Science Popularisation

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 2008- 2009.

2.1 District Level Training Workshop on Disaster Management

The third district level training workshop on Disaster Management for 2-days duration was organized for Bishnupur and Churachandpur districts during April 4-5, 2008 at All India Youth Federation Office, Kumbi Terakha, Bishnupur District. The programme was organized in association with All Manipur Nupi Marup, Kumbi Local Council. Altogether 50 participants from both Bishnupur and Churachandpur districts participated in the training workshop. In the Inaugural function of the training workshop held on the 4th April,

2008. Shri W. Yaima Singh, Chairperson, Kumbi Nagar Panchayat, Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC and Smt. Kh(O) Leima Devi, President, All Manipur Nupi Marup, Kumbi Local Council were the Chief Guest, President and Guest of Honour respectively. Chairperson, Kumbi, Nagar Panchyat in his Inaugural Speech expressed the importance of organizing such training workshops at rural areas to train the young volunteers about different aspects of disaster management. He also expressed his willingness to organize a programme of longer duration so that the volunteers not only get the basic ideas of disaster management but also to get in-depth training so that they may be



Inaugural Function of Bishnupur District's Programme



Resource Person Demonstrating Search & Rescue Operation

able to take part physically in rescue operations at the time of occurrence of any disaster.

On the first day of the programme, Shri Ch. Sarat Singh, Scientific Officer (Engg), Programme in charge, Manipur Science & Technology Council, Imphal presented a keynote address and explained Dos & Don'ts and preparedness plans of common disaster for the common people in the Country. A session on lecture-cum-demonstration on Search & Rescue

Operation and First Aid to Disaster Victims was also conducted by Shri. Kamini and Shri S. Nandababu Singh, Demonstrator, Directorate of Civil Defence, Manipur. They explained and demonstrated various techniques of making rope knot which are to be used for rescue of disaster victims at the time of occurrence of a disaster. They also demonstrated low cost and easy methods of making stretchers. They also demonstrated various techniques for rescuing and lifting/transfer casualties/victims from the disaster site safe site. Further they also explained and demonstrated about giving first aid including artificial respiration and bandaging of various injury types. They also explained and demonstrated about identification of poisonous and non-poisonous snakes and further trained the participants how to give first aid to a snake bite victims.



A Participant Performing Fire Fighting Demonstration



Resource Person Demonstrating Artificial Respiration

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 demonstrated how to extinguish a fire at the beginning. Shri Ng. Amumacha Singh, Retd. Joint Director, Department of Education (Schools) conducted a session on the cause and preparedness plans of common disasters. Participation Certificates were distributed to the participants on the last day of the programme. The fourth district level training workshop on Disaster Management was organized for Ukhrul District during April 14-15, 2008 at Thawai Govt. High School, Thawai Village, Ukhrul District. About 45 participants have attended the programme.

The programme was inaugurated by Shri Ng. Khaching, Headman, Thawai village. The Inaugural Function was presided over by Reg. C.L. Lazaruf, Pastor, Thawai Baptist Church

and the Honoured Guest of the function was Shri Ng. Amumacha Singh, Retd., Joint Director, Department of Education (Schools), Manipur. The Chief Guest addressed to the participants that such a programme is very important in the present scenario of natural and artificial disaster occurring in the country and in the state as well. He also appreciated Manipur Science & Technology Council, Imphal for bringing the programme at the right moment and NCSTC, DST, Govt. of India for sponsoring the programme particularly at the

district level. The president of the function also expressed his willingness to organize similar programme for a little longer duration in the future so that the volunteers may learn more on the topic and may involved physically in the management of disasters. In the Inaugural function Shri Chj. Sarat Singh, Scientific Officer, MASTEC gave a keynote address and explained about need for preparedness for disasters and listed out the common disaster of the country and of the state.

A session on lecture-cum-demonstration on Search & Rescue Operation and First Aid to Disaster Victims was also conducted by two personnel from Department of Civil Defense, Govt. of Manipur viz., Shri K. Kamini Singh, Demonstrator and Shri O. Ratan Meitei, Demonstrator. They explained and demonstrated various techniques of making rope knot which are



A Section of Participants of the Senapati District's Programme

to be used for rescue of disaster victims at the time of occurrence of a disaster. They also demonstrated low cost and easy methods of making stretchers. They also demonstrated various techniques for rescuing and lifting/transfer casualties/victims from the disaster site safer sites. Further they also explained and demonstrated about giving first aid including artificial respiration and bandaging of various injury types. They also explained and demonstrated about identification of poisonous and non-poisonous snakes and further trained the participants how to give first aid to a snake bite victims.



Demonstration of Using Fire Extinguisher



Demonstration of Ready Made Stretcher Making



Resource Person Explaining about Formation of Rescue Team

A team of Fire Service Personnel from Manipur Fire Service Department, Govt. of Manipur also 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 Ng. Amumacha Singh, Retd. Joint Director, Department of Education (Schools) conducted a session on the cause and preparedness plans of common disasters.

The fifth programme was organized for Senapati District, Manipur during April 18-19, 2008 at H.M. Higher Secondary School, Kethelmanbi, Senapati District, Manipur. Altogether 50 participants have attended the programme. In the Inaugural Function of the programme held on the 18th April, 2008, the A.D.C., Kangpokpi and Zonal Education Officer, Senapati District were the Chief Guest and President of the function. Shri S. Mangi Singh, Deputy Director (Academy), Board of Secondary

Education, Manipur was the Honoured Guest of the Inaugural Function. The chief Guest mentioned about the major disasters occurred in the world in the past. He appealed to all the participants that it is the right time for all of us to have a well prepared disaster management plan in order to reduce the hazards or rather minimizing the risks. The president of the function expressed the importance of organizing such a valuable training workshop.

A session on lecture-cum-demonstration on Search & Rescue Operation and First Aid to Disaster Victims was conducted by Shri Budhachndra Singh, Demonstrator and Shri S. Nandababu Singh, Demonstrator, Directorate of Civil Defense, Manipur. They explained and demonstrated various techniques of making rope knot which are to be used for rescue of disaster victims at the time of occurrence of a disaster. They also demonstrated low cost and easy methods of making stretchers. They also demonstrated various techniques for rescuing and lifting/transfer casualties/victims from the disaster site safe site. Further they also explained and demonstrated about giving first aid including artificial respiration and bandaging of various injury types. They also explained and demonstrated about identification of



A Participant of Senapati District Giving Feedback Report

poisonous and non-poisonous snakes and further trained the participants how to give first aid to a snake bite victims.

A team of Fire Service Personnel from Manipur Fire Service Department, Govt. of Manipur also 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 demonstrated how to extinguish a fire at the beginning. Shri Ng. Amumacha Singh, Retd. Joint Director, Department of Education (schools) conducted a session on the cause and preparedness plans of common disasters. Participation Certificates were distributed to the participants on the last day of the programme.



Demonstration of Rescue Operation at Tamenglong District

The sixth and last programme was organized for Tamenglong District during April 29-30, 2008 at Sharon English School, Noney, Tamenglong District, Manipur. Altogether 50 people participated in the 2-day programmed. The programme was Inaugurated by the Headman of Noney village, Tamenglong district and was presided over by Dr. L. Dinachandra Singh, Senior Scientific Officer, MASTEC. Shri Athau, Officer-in-Charge, Manipur Police, Noey area was the Honoured Guest of the Inaugural Function.

In his Inaugural Speech Headman, Noney village 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. In his presidential remark, Dr L. Dinachandra Singh, Senior Scientific Officer, MASTEC explained about various science popularization activities taken up by MASTEC under the sponsorship of NCSTC, DST, Govt.



Demonstration of Fire Fighting at Tamenglong District

of India. He said that Disaster Management programme is also one of the science popularization activities. Shri Athau, Officer-in-Charge, Manipur Police, Noey area also highlighted the role of Police Personnel in the management of natural and artificial disasters.

On the first day of the programme Shri Ch. Sarat Singh, Scientific Officer (Engg), Manipur Science & Technology Council, Imphal gave a keynote address and explained Dos & Don'ts and preparedness plans of common disaster of the Country. A session on lecture-cum-

demonstration on Search & Rescue Operation and First Aid to Disaster Victims was also conducted by Shri K. Kamini and Shri O. Ratan Singh, Demonstrator, Directorate of Civil Defence, Manipur . They explained and demonstrated various techniques of making rope knot which are to be used for rescue of disaster victims at the time of occurrence of a disaster. They also demonstrated low cost and easy methods of making stretchers. They also demonstrated various techniques for rescuing and lifting/transfer casualties/victims from the disaster site safe site. Further they also explained and demonstrated about giving first aid including artificial respiration and bandaging of various injury types. They also explained and demonstrated about identification of poisonous and non-poisonous snakes and further trained the participants how to give first aid to a snake bite victims.

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 demonstrated how to extinguish a fire at the beginning. Shri Ng. Amumacha Singh, Retd. Joint Director, Department of Education (schools) conducted a session on the cause and preparedness plans of common disasters.



A Participant of Tamenglong District Giving Feedback

From the analysis of the feedback reports from the participants of all the districts it is observed that the duration of the district level programme is little short and at least 4/5 days programme is required. Moreover, demonstration on search and rescue operations are very interesting but since the time duration is short the participants are unable to learn the techniques except very few. However the women participants are more in the district level programme and it shows that women are interested to learn more on Disaster Management in order to mitigate the hazards.

2.2 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 established a two way audio-video interactive network for science & technology communication in the country using EduSat – the satellite for Education. For the first phase DECU/ISRO had setup 1 teaching end terminal at Vigyan Prasar and 20 nos. of class room end terminals (Satellite Interactive Terminals - SITs) covering

the entire country. Manipur Science & Technology Council (MASTEC) has been recognised as one of the SITs and the centre is located at MASTEC Complex, Takyelpat, Imphal.

The mode of the interactions included

- 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.

More than 35 programmes like – quiz, lecture-cum-demonstration, training etc. for students, teachers, science activists on different issues were covered till now.

2.3 Science Meet-2008

The Country has been celebrating National Science Day on February 28 since the year 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 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, inculcate scientific temper 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.

India conducted five successful underground nuclear tests on May 11 and 13, 1998 at Pokhran. May 11 is being celebrated as **National Technology Day** since 1999 in commemoration of these successful nuclear tests. The basic idea of the National Technology Day is to focus national attention especially on technology and technologists and also to stimulate and promote a technological temper among the people. Major milestones in the fields of nuclear science, defence research and aviation technology all achieved on May 11, 1998 made it easy to designate this day as the **National Technology Day**. The objective is to focus attention of the nation - students, teachers, engineers, researchers, entrepreneurs, and thinkers - on issues of technology development of the Nation.

The joint initiative of UNESCO and the International Union of Geological Sciences (IUGS) with many other international organisations have been announced to observe “*The International Year of Planet Earth*” during the year 2007-2009. The main objective is to have a better understanding by the people about our planet for a safer, healthier and wealthier place for our children and grandchildren. They also announced 10 broad, societally relevant and multidisciplinary themes: health, climate, groundwater, ocean, soils, deep Earth, megacities, hazards, resources, and life. The Department of

Science & Technology, Government of India, New Delhi announced the national theme of the National Science Day 2008 as “*Understanding Planet Earth*”.

Since the year 1997, Manipur Science & Technology Council (MASTEC) in association with the leading science NGOs of the state have been continuously organising state level science festival - **Science Meet** as an annual feature of the council being the continuing programme of **National Science Day** and in commemoration of **National Technology Day**. Science Meet is the only multi-activity state level mega science festival aiming to create a common platform for students, science lovers, scientists and common people to further the cause of science popularisation in Manipur.

This year too, MASTEC in association with the Department of Science & Technology and Information Technology, National Informatics Centre(NIC), Bharat Sanchar Nigam Ltd.(BSNL), Manipur Remote Sensing Application Centre(MARSAC), Manipur Renewable Development Agency(MANIREDA), Dept. of Computer Science, Manipur University, Institution of Electronics & Telecommunication Engineers (IETE) Imphal Centre, Science Teachers' Forum Manipur (STFM), Manipur Association for the Promotion of Science (MAPS), Manipur Science Communicators' Association (MASCA) and Generation De New Image (GENIM) organised the 5-day long **Science Meet 2008** during May 11-15, 2008 at Iboyaima Shumang Leela Shanglen, Palace Compound, Imphal. The Department of Higher & Technical Education, Govt. of Manipur also took part in the meet. The theme of the meet was ***Understanding Planet Earth and Trends in IT - Development of Sustainable Rural Economy***. The programme was catalysed and supported by National Council for Science & Technology Communication (NCSTC), Department of Science & Technology, Government of India, New Delhi and Department of Science & Technology and Information Technology, Govt. of Manipur, Imphal.



Phungzathang Tonsing, Minister (S & T & IT), Manipur and Dr. T. Meinya, Member of Parliament visiting the Science Meet 2008

Activities of Science Meet 2008 :

This year Science Meet was organized with the inclusion new activities - Painting Competition on Computer for Students, Remote Sensing Applications, Renewable Energies, Video Conference and Manipur Information Technology Expo.(MITEX) Seminar. The activities of the Science Meet 2008 included Competitions such as Science Model (Class X-XII), Science Quiz (Class XI Sc. – Bachelor Degree in Sc.), Spot Painting (Class III-V, Class VI-VIII & Class IX-XII), Declamation (Class XI Sc. – Bachelor Degree in Sc.), Best Appreciation Award (Open), Guide Teacher Award for Science Model Competition, Exhibitions, Book and Career Counseling, Poster and Photo fair, Popular Science Gallery & Science on Stamp, IT Fair : Free Internet surfing for students, Popular Science Lecture-cum-Demonstration, Popular Science Show, Scientific Films, Science Explaining Miracles, Folk Form of Communication, Science Drama, Puppet Play, Mathematics Lab/Origami, Video Conference etc.

Science Model Competition :

Generation De New Image (GENIM), Ningthoukhong in co-ordination with MASTEC took the responsibility of organising Science Model Competition. The competition was organised for students reading in Class X – XII based on the themes viz, 1) Groundwater – towards sustainable use, 2) Hazards – minimising risk, maximising awareness, 3) Earth & Health – building a safer environment, 4) Resources – towards sustainable use, 5) Deep Earth – from crust to core and 6) Earth & Life – origins of diversity

Altogether 54 (fifty-four) models were exhibited by 23 schools/higher secondary schools from different parts of the state. Shri Nauseen Arjamand of Mannu English School, Imphal stood first, Mutum Lamnganbi of Tiny Tots' Unique School, Imphal and Ninthoukhongjam Poklen of Halleey English School, Imphal stood second and third positions respectively.



Science Model Competition

Shri Thongam Ashakiran Devi of Mannu English School, Imphal, H. Suranjoy Singh of Manipur Public School, Imphal and N. Saratkumar Singh of M.M. Higher Secondary School, Imphal were given first, second and third guide teachers prizes respectively.

Science Quiz Competition

Science Quiz Competition was organised by Manipur Association for the Promotion of Science (MAPS) in coordination with MASTEC. The competition was for students currently reading in Class XI Sc.-Degree in Science/Technology. Thirteen teams from secondary schools and colleges registered for the competition. Each team comprised of two students from the same secondary school/college. The preliminary round - Written Contest was held on May 14, 2008 at 11.00 a.m. and 4 teams were selected for the final round. The Final Round Quiz was held on May 14, 2008 at 2.00 p.m. and in the competition there were oral as well as audio/visual rounds. In both the preliminary and final rounds, the questions were based on Groundwater – towards sustainable use, Hazards



Science Quiz Competition

– minimising risk, maximising awareness, Earth & Health – building a safer environment, Climate – the 'stone tape', Resources – towards sustainable use, Deep Earth – from crust to core, Soils – the living skin of the Earth, Earth & Life – origins of diversity was on the subjects to science and technology. The team consisting of Syed Samir Ahamad and Md. Mahboob Ali of Modern College, Porompat, Imphal won the first position. Yumnam Ramananda Singh and H. Bankim Singh of D.M. College of Science, Imphal and Nameirakpam Amarjit Meetei & Kh. Rajkumar Singh of Brighter Academy, New Checkon, Imphal took the second and third prizes respectively.

Spot Painting Competition

Manipur Science Communicators' Association (MASCA), a leading science NGO of the state organized the spot painting competition of the Science Meet 2008 in 3(three) groups viz., i) Sub-Junior (Class III—V), ii) Junior (Class VI-VIII) and iii) Senior (Class IX-XII). The competition was held based on the themes such as Hazards – minimising risk, maximising awareness, Earth & Health – building a safer environment, Resources – towards sustainable use, Earth & Life – origins of diversity.

Altogether 279 students of class III-XII from different schools and secondary schools of the state were participated in the competition. The following were the prize winners.

Sub-Junior Group

Position	Name of the Winners	Class	Name of the School
First	Khwairakpam Amarjeet	V	Maria Montessori School, Imphal
Second	Khwairakpam Martina	III	Maria Montessori School, Imphal
Third	Anchal Yanglen	IV	Mega Manipur School, Yaralpat

Junior Group

Position	Name of the Winners	Class	Name of the School
First	Nydia Takhellambam	VIII	Maria Montessori School, Imphal
Second	Soram Sanathoiba	VII	St. Joseph's School, Imphal
Third	Maria Thokchom	VI	Maria Montessori School, Imphal

Senior Group

Position	Name of the Winners	Class	Name of the School
First	Nongthombam Newtarjit Singh	IX	Sacred Heart School, Porompat
Second	Rahul Yumlembam	IX	Brighter Academy, Imphal
Third	Kshetrimayum Baby Devi	IX	Model Higher Secondary School

Declamation Contest

The competition was opened to students currently reading in Class XI-Degree in Science & Technology streams. The competition was organised by Manipur Science Communicators Association on the topics such as Groundwater – towards sustainable use, Hazards – minimising risk, maximising awareness, Earth & Health – building a safer environment, Resources – towards sustainable use, Deep Earth – from crust to core, Soils – the living skin of the Earth, Earth & Life – origins of diversity. Out of 14 contestants, Singamayum Khurshida of Herbert School, Imphal won



Declamation Contest

the first prize of the contest on the topic “Deep Earth – from Crust to Core”. Mr. Hemchandra Nameirakpam of Maria Montessori Senior Sec. School, Imphal and Sadique Siddiki of Herbert School, Imphal won the second and third positions respectively on the topics Groundwater – Towards Sustainable Use and Soils – the living skin of the Earth respectively.

Best Appreciation Award

The most prestigious award of Science Meet, Best Appreciation Award was introduced by MASTEC since the year 1997 and given to an individual student who proved to have gained the maximum knowledge of science from the Meet as judged by questionnaire response and personal interview. The competition was open to all the students. Dr. S. Pravabati Devi, Retd. Lecturer, Imphal College, Imphal sponsored this programme. Sixty eight participants contested for the same. The award was given to Ngangbam Rajesh Singh, Class XII of HRD Academy, Imphal .



Best Appreciation Award

Book Exhibition & Career Counseling

Scientific Book Exhibition was kept as an activity during the 5 day long Meet. The activity was organised by MASCA in association with MASTEC. A number of students, teachers and parents paid visit at the book stalls and also bought many books of their interests. The agencies such as Sangam Book Store, Imphal , Sharma Book Agency , Imphal, Job Centre Babupara, Imphal and MASCA, Imphal displayed books of various disciplines.



Book Exhibition Stalls

Photo and Poster Exhibition

Scientific photo and poster exhibition was one of the activities. The activity was taken care by GENIM in association with MASTEC. About 50 scientific posters and many photographs of endangered flora and fauna of the state and the Mother Earth were displayed during this Meet. Posters and the photographs were contributed by individuals and coordinating organizations. Many students & visitors were found impressed to these photographs and posters.



Photo and Poster Exhibitions

Popular Science Gallery & Science on Stamp

Popular Science Gallery & Science on Stamp 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 different scientific fields.

IT Fair

The revolution of Information Technology (IT) has been the most important development in the world during the last few decades.. Internet has transformed the entire perspective of communication system. MASTEC made provisions for internet connectivity during the SM-2008. Local computer institutions/firms namely, NIC, MSU, Imphal, DOEAC Centre, Akampat, Swift Infotech, Leima Shopping Plaza, Infotech, M.G. Avenue, Computer Gallery, Keisampat, Endeavor, Pologround and Allied Agencies, Paona Bazar, Imphal participated and displayed advanced technologies and interacted with the visitors, especially, students. Thousands of students enjoyed the display and internet facility.



Video Conferencing & IT Stalls

Popular Science Lecture-cum-Demonstration

Science Teachers Forum Manipur (STFM), a co-organiser of Science Meet 2008 took the responsibility of Popular Science Lecture-cum-Demonstration programme. The members of STFM, Shri K. Tollendra Singh and Dr. R.K. Robindro Singh gave lecture cum demonstration on earthquake and physical science. The students and visitors were so impressed to the demonstrations with the working models.

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 mislead the general public. The expert members of GENIM demonstrated many items behind miracles during Science Meet 2008 and the scientific backgrounds of the shows were also explained on the 4th day of the meet. Science Behind Miracles was kept for 3 (three) days of



Explaining Science Behind Miracle

2(two) hours duration each day and hundreds of students & general public had witnessed the show daily and many of them could learn how science was related with miracles.

Scientific Film Shows

One hour duration scientific film show was kept on all 5 days of Science Meet-2008. These scientific films were the collections of MASTEC, EMMRC, Manipur University and Manipur Remote Sensing Application Centre (MARSAC). Altogether ten scientific films namely India in Space, Launching of GSLV, Pluto: No more a Planet, Waterworks of India, Medicinal Plants of Manipur, Our Sun, Village Republic, Arvari, Parakhi and Orchids of Manipur were screened during the meet.

Science Drama and Puppet Play

The artists of Generation De New Image presented one science Drama based on the focal theme "Understanding Planet Earth". Under the project ASHA, the artists of the DKT India Pvt. Ltd., Manipur had also staged a special play "Lanphamda Lan (War on Battle Field)" based on HIV/AIDS. The art of puppetry had been very much effective for communicating science to our people. Members of MASCA presented 2(two) puppet shows based on biodiversity conservation and planet earth during



Performing Puppet Play

the Science Meet 2008. These puppet plays conveyed messages to the public how puppetry could take key role as a medium of S&T communication in the society.

Mathematics Lab/Origami

Science Teachers' Forum Manipur (STFM), a leading science organisation in the state displayed many scientific tools based on Mathematics. The members of STFM explained the theories behind those tools and also narrated about the discoverers/scientists.

Video Conference

The National Informatics Centre, Manipur State Unit, Imphal under the supervision of State Informatics Officer displayed the facilities available with them and demonstrated the know how of Video Conferencing Techniques. During the meet they demonstrated the video conference by contacting Deputy Commissioners of Thoubal, Churachandpur and Senapati districts respectively and NIC Agartala (Tripura) for interaction with the visitors of Science Meet 2008.

Concluding Function :

The Science Meet 2008 concluded on May 15, 2008 with a function at 3.00 p.m. with Shri S. Buddhachandra Singh, IAS Member Secretary, MASTEC and Commissioner (ST & IT), Govt. of Manipur as the Chief Guest of the function. , Shri Th. Surendranath Singh, Executive Director (MASTEC), Dr. S. Pravabati Devi, Retd. Reader of Imphal College and Secretary/President of the co-ordinating science NGOs MAPS, MASCA. STFM and GENIM were also on the dais on the closing function.



Member Secretary distributing Prize

2.4 Science for Sanitation Month: Celebrations

Sanitation is a significant factor for good health and hygiene. Large part of urban, sub urban and rural areas have unacceptable sanitation facilities. This is because of many overlapping factors, the most important being lack of awareness of the benefits of good sanitation practices. As of 2002, about 2.6 billion people lacked access to improved sanitation which constituted about 42% of the total world population and over half of those without improved sanitation nearly 1.5 billion people lived in China and India. The Year 2008 has also been announced as **The International Year of Sanitation** by the United Nations to create awareness about good sanitation practices and to initiate actions addressing towards improvement of the basic sanitation facilities. Therefore, awareness about the practice of good sanitation is very important.

Under the initiative of National Council for Science and Technology, Communication, Department of Science and Technology, Government of India, the month **October 2007** was celebrated as **Science for Sanitation month** all over the country with many awareness programmes addressing to the issues of Health and Sanitation. In Manipur also, Manipur Science and Technology Council, Imphal had organized lecture programmes on Health and Sanitation in the state in co-ordination with Directorate of Health Services, Government of Manipur under the catalysation and support of National Council for Science and Technology Communication (NCSTC), Department of Science and Technology (DST), Government of India.



Audience at the Lecture Programme
at Nirmalabas School, Imphal

The lecture programme was organized during April 3 – May 27, 2008 in different schools of the state with the resource persons from Directorate of Health Services, Govt. of

Manipur. The resource persons involved in the lecture programme were Dr. Waribam Khoibi Devi, Senior Medical Officer, School Health Services, Dr. L. Tomcha Khuman, Deputy Director, Dr. Y. Meghachandra Singh, Senior Medical Officer and Dr. O. Joychandra Singh, Deputy Director, all from the Directorate of Health Services, Government of Manipur. Altogether, 50 lecture programmes were organized in different schools of the state. Publicity about the lecture programme was made in the electronic and print media for information of all the schools. There were two lecture sessions. The duration of each lecture was two hours - one and half hours for the lecture and another 30 minutes for interaction with the students/participants. The lecture covered various aspects on health and Sanitation such as



Lecture programme at Jawahar Navodaya Vidyalaya, Khumbong, Imphal West District

Basic concept about Primary Health Care, Types of wastes related to sanitation, Access to Safe water supply (Global, National, State), International Year of Sanitation, Excreta the main cause of childhood diarrhoea diseases, soil and water pollution, Lack of Sanitation and personal hygiene, Contamination of food, propagation of flies, WASH links to Health, Poor Sanitation, unsafe water and hygienic environments, Effect of poor sanitation on education, Highlights of Deaths from unsafe water, poor sanitation and hygiene, Diseases related with unsafe water and poor sanitation, Barriers to sanitation services, Hardware and softwares of good sanitary practices, Personal hygiene promotion, Food and domestic sanitation, Global facts of poor sanitation and its impact on health and Socio economic impact of unsafe water supply and poor sanitation.



Dr. L. Tomcha interacting with the students on health & sanitation at Halley English School,

About 15,000 students/people of the state had been benefited out of this lecture programme. During the interaction programme, students including the teachers put many interesting questions related to health issues and satisfactory answers for the questions were explained to them by the resource persons. Authorities of many schools felt that the programme is very good and the most benefited are those students who had attended the programme, they said. The schools authorities also suggested to organize such programme in future to benefit the students in different issues of science.

On the positive response of the schools/participants of the programme, the producer of local TV Serial in Manipuri named “Khangjinminashi”, in English it means “Let us Know”

gave the full coverage of the programme and was telecast in the Local TV channel during June 2008 with a view to popularize science to the masses. The lecture were organized at the schools namely 1) Nirmalabas High School, Imphal, 2) Sofia High School, Singjamei, 3) Modern English High School, Keisampat, 4) Shantilata Memorial School, Imphal, 5) Don Bosco High School, Imphal, 6) Blooming Flower School, Khurai, 7) Standard Robarth Hr. Sec. School, Canchipur, 8) Macha Leima School, Imphal, 9) St. Peter High School, Kwakeithel, 10) Royal Academy, Stadium Road, 11) Halley English School, Soibam Leikai, 12) Ananda Singh Hr. Sec. School, Wangkhei Khunou, 13) St. John Bosco High School, Kakwa, 14) Bal Vidya Mandir, Palace Compound, 15) Bal Bidya Mandir, 16) Mahei Sindam Shang, Mayang Imphal 17) Little Master School, Shamurou, 18) Children Model Academy, Thanga, 19) The Ideal School, Thanga, 20) MBC Hr. Sec. School, Imphal, 21) Jawahar Navadaya Vidyalaya, Khumbong, 22) Camp's English Academy, Khabam Leikai, 23) Heingang High School, Heingang, 24) Eden High School, Wangkhei, 25) S.I. Academy, Porompat, 26) Kendriya Vidyalaya, Lamphel, 27) H.M. Higher Secondary School, Keithelmanbi, 28) Little Bird School, Moirang, 29) Konjeng Govt. Jr. High School, Moirang, 30) Bethel English School, Nambol, 31) Brighter English School, Oinam, 32) Scholar English Academy, Keikhu, 33) Young Pioneer School, Imphal, 34) Cambridge School, Khergao, 35) Paradise Academy, Canchipur, 36) Maria Montessori School, Koirengei, 37) Oriental English School, Keibi, 38) Sacred Heart School, Porompat, 39) Catholic School, Canchipur, 40) Mannu English School, Checkon, 41) St. Anthony School, Chingmeirong, 42) St. George School, Wangkhei, 43) Eastern Shine School, Moreh, 44) St. John's English High School, Nambol, 45) Vale Academy, Ghari, 46) Scholar English School, Irengband, 47) Standard English School, Khongjom and 48) St. Joseph School, Sangaiprou

2.5 National Science Day 2009

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 Department of Science & Technology, Government of India, New Delhi has announced the theme of the National Science Day 2009 as ***“Expanding Horizons of Science”***.



Audience of the Science Day observation

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 in association with Manipur Science Communicators Association (MASCA) and Imphal College, Imphal has observed **National Science Day 2009** on **February 28, 2009** at **Imphal College, Imphal**.

The main activity of the day was **Invited Lecture**. The speakers of the day included Shri Ch Rajendro Singh of Dept. of Physics, Imphal College, Imphal He delivered lecture on the topic **Why National Science Day and** Prof N Rajmuhon Singh of Dept. of Chemistry, Manipur University delivered on **Expanding Horizons of Science**. About 500 students from different schools, colleges and teachers attended the programme and interacted with the resource persons.

2.6 State Level Training Workshop on Cultivation & Conservation of Medicinal Plants

Manipur Science & Technology Council (MASTEC), Imphal organized a 3-day State Level Training Workshops on Cultivation and Conservation of Medicinal Plants of Manipur during March 21-23, 2009 at the Conference Hall of State Youth Centre, Khuman Lampak, Imphal. The programme was sponsored by Department of Science & Technology, Govt. of India, New Delhi. The programme aimed at giving awareness on the importance of Medicinal Plants of Manipur and scientific methods of cultivation and conservation of these plants to the general public. The target group of participants were representatives from NGOs, Clubs, Self Help Groups and interested individuals. Altogether 61 participants from all over the state participated in the said training workshop. Resource persons from various Institutions, Departments and Organisations of Manipur conducted lecture-cum-demonstration sessions on various topics related to the subject. A field visit was also organized and visited some places where medicinal plants are grown/cultivated using scientific methods.



**Executive Director, MASTEC
Inaugurating the Training Workshop**



Participants of the Training Workshop

On the first day of the 3-day programme there was an Inaugural Function. Shri Th. Surendranath Singh, Executive Director,

Manipur Science & Technology Council, Imphal was the chief Guest, Dr. Th. Brojendro Singh, Senior Lecturer, Oriental College, Imphal and Shri Ng. Amumacha Singh, Retd. Joint Director, Department of Education (S), Govt. of Manipur were the President and Guest of Honour respectively of the function. In his Inaugural Speech Executive Director, Manipur Science & Technology Council, Imphal mentioned about the importance of organizing such training workshop in order to make the general mass about the importance of using medicinal plants for various types of ailments. He also highlighted about the importance of having ownership of the indigenous medicinal plants of Manipur and appealed that without an owner any object will not remain for long time. He announced that Manipur Science & Technology Council has become a nodal agency/patent centre for the state and anybody can register to this Patent Centre for any new plants having medicinal value. In his presidential remark, Dr. Th. Brojendro Singh, Sr. Lecturer, Oriental College, Imphal, mentioned about the traditional methods of using herbs and plants in the treatment of many ailments by our Traditional Medical Practitioners (Maiba/Maibis). He also highlighted that use of ayurvedic medicines prepared from plants is better than those of allopathic medicines in respect of its side effects. He further suggested for consumption of vegetable items instead of meat items. Shri Ng. Amumacha Singh, Retd. Joint Director, Department of Education (S), Manipur mentioned about the rich Flora and Fauna of Manipur. He mentioned once again that Manipur falls in the Indo-Burma Bio-diversity Hot Spot and we need to preserve the natural plants of the region most of which are of medicinal values. He explained about in-situ conservation and ex-situ conservation of the medicinal plants of Manipur. He appealed to the participants that it is the right time for all of us to save our greeneries and natural habitats in order to save from Global Warming.

On the first day's technical session of the programme there were two lectures and one lecture-cum-demonstration. The first lecture was delivered on the topic "Application of Plants as Medicine with Special Reference to Past, Present and Future Status in Manipur by Dr. T.B. Singh, Sr. Lecturer, Oriental College, Imphal. He explained about the traditional methods of application of Medicinal Plants by our Traditional Medical Practitioners and need for conservation of the endangered species of Medicinal Plants found only in Manipur.



**Lecture-cum-demonstration by
Resource Person**

The second lecture was delivered by Shri K. Devadutta Sharma, Farm Manager, Horticultural Department, Govt. of Manipur on the topic “ Intervention of Centrally Sponsored Schemes and Central Sector Scheme for Commercialization of Medicinal Plants in Manipur”. He explained in depth about different schemes that can be adopted by the NGOs for cultivation of Medicinal Plants. He also mentioned about various scientific methods of cultivation of medicinal plants including selection of plants at suitable soil/sites and modern methods of irrigating the plants. He further explained about how to get materials for setting up of green houses and seedlings from the State Govt. on subsidized rate.



Resource Person delivering Lecture



Medicinal Plant Species demonstrated during the programme

A lecture-cum-demonstration session was conducted on the first day of the programme by Shri K. Mangi Singh, Medicinal Plants Activists on the topic “ Identification and conservation techniques of Medicinal Plants in Manipur. He highlighted information on some very important/valuable medicinal plants and the ailment in which these plants are used including mode of preparation of the medicine out of the plants and respective doses. He demonstrated some rare/indigenous species of Medicinal Plants of Manipur.

On the second day of the programme a lecture was delivered by Dr. H. Birkumar Singh, Scientist-in-charge, North East Institute of Science & Technology (formerly Regional Research Laboratory), Imphal Sub-centre, Lamphelpat, Imphal on the topic “Cultivation Tip and Conservation Measures of Medicinal Plants in Manipur”. He explained in depth the cultivation methods of some important Medicinal Plants in Manipur. He also highlighted about the techniques for formulation of projects for cultivation and conservation of Medicinal Plants that can be taken up/implemented by the NGOs/ Self Helped Groups.



Resource Person delivering Lecture

A field visit was also organized as a part of the training workshop on the second day of the programme. Two sites have been visited one at Medicinal Plant Garden at Laipham, Khunou, set up by one NGO headed by Shri K. Mangi Singh, Medicinal Plants Activist and the other at Herbal Garden, Horticultural Farm, Department of Horticulture, Govt. of Manipur. The participants have witnessed the cultivation/plantation techniques of various medicinal plants including preparation of Nursery.



Resource Person delivering lecture



Resource Person delivering lecture

On the last day of the programme three lectures were delivered. The first lecture was delivered by Smt. Th. Sobita Devi, Botany Dept., D.M. College of Science, Imphal on the topic *Dr. L. Tomcha Khuman during the lecture at Halley English School, Soibam Leikai* “Identification, Utilization and Plantation of Some Important Medicinal Plants in Manipur. She highlighted a list of few important medicinal plants used in the treatment of very common diseases such as Diabetes, High Blood Pressure etc and .explained the merits and demerits of using these plants in respect of its dose. A lecture on “Therapeutic Compounds of Plant Bio-resources in Manipur, A Paradigm to Paradoxical Economy in Manipur” was delivered by Ms. M. Neshwari Devi, H.R.D.R.I., Imphal. She highlighted the chemical/therapeutic compounds that are present in some important medicinal plants in Manipur. The last lecture of the programme was delivered by Shri L. Somorjit Singh on the topic “Conservation Strategies of Medicinal Plants in Manipur”



Participants visiting Herbal Garden at Naharup, Imphal East



Participants visiting Medicinal Plants Garden at Mantripukhri, Imphal

Feedback reports which were already distributed to the participants, were collected from the participants on the last day of the Training programme and analysed the same. From the analysis of the feedback report it has been observed that the participants would be more benefited if they get interacted with more number of experts in the field and also they were of the opinion that such type of training workshop must be organized at district level so that maximum number of people could participate from far off places of Manipur since few participants could attend in the state level programme. They are also of the opinion that a longer programme may be organized for about 5 days with field visits to see the natural habitats of plants bio-resources in the hilly areas of the state. Participation certificates were distributed to the participants in the valedictory function held on the last day of the three days programme.



Distribution of certificates

2.7 Orientation Programme for Science Teachers/Communicators of Manipur.

The 2 days Orientation Programme for science teachers/communicators of Manipur was organized jointly by Vigyan Prasar, Department of Science and Technology, Government of India and Manipur Science and Technology Council, Imphal during March 25 – 26, 2009 at State Youth Centre, Khuman Lampak, Imphal. It was inaugurated with Shri B.K. Tyagi, Scientist, Vigyan Prasar as the Chief Guest and Shri Th. Surendranath Singh, Executive Director, Manipur Science and Technology Council (MASTEC) presided over the function. Shri L.



Shri B.K. Tyagi, scientist, Vigyan Prasar giving inaugural address

Somarjit Singh, Selection Grade Lecturer, Imphal College, Imphal and Shri Kapil K Tripathi were the Guests of Honour.

In the inaugural address, Shri B.K. Tyagi while stating the objectives of the two days programme highlighted about the needs of forming Science Clubs in Manipur as the Science Club movement is very poor in the state. He added that Science Club will open avenues for updating science knowledge and generation of scientific information to the students by way of networking with different Science Institutions, Clubs etc. of the country. Stating that the programme is just the beginning, he sought a long term partnership with the Science teachers/communicators particularly the participants in the movement of Science popularization.

Shri Th. Surendranath Singh, Executive Director (MASTEC) while giving the Presidential remarks highlighted some of the activities taken up by MASTEC. The participants were also informed about the ongoing Vigyan Prasar Edusat Programmes taken up by MASTEC at the Satellite Interactive Terminal, Imphal. He requested all the teachers to send students to join the Edusat Programme for interaction with officials of Vigyan Prasar and prominent Scientists of the Country. Taking into consideration the importance of International Year of Astronomy – 2009, he explained about the origin of internationally accepted Calendar.

Shri L. Somarjit Singh, Selection Grade Lecturer, Imphal College requested all the participants to take active part in the programme and take maximum benefit from the resource persons so as to enable them to expand the knowledge to the student of their schools.

In respect of the number of participants, Manipur Orientation Programme for science teachers/communicators is the 2nd biggest programme of its kind in the country, Shri Kapil K Tripathi said during his speech. He requested all the participants to take maximum benefit from the programme.



Participants of the 2 days programme

The inaugural function was attended by invitees from various Institutions, organizations and personnel from electronic and print media. The inaugural function was concluded with vote of thanks from MASTEC. The participants for the 2 days programme were drawn through wide publicity in the media. Out of the total 87 participants registered for participation, 74 participants took part in the 2 days programme and the participants comprised of 70 School science teachers and 4 science Communicators. Except 2 hill districts, all districts were represented in the two days programme.

In the 1st technical Session, Shri B.K. Tyagi, Scientist, Vigyan Prasar gave a talk about Vigyan Prasar. He also spoke about VIPNET programmes of Vigyan Prasar. Dr. Kh. Shamungou Singh, Retd. Reader, Zoology Department, D.M. College of Science delivered a lecture on the topic “Faunal Biodiversity of Manipur”. The Astronomy Kit developed by Vigyan Prasar was demonstrated by Kapil K Tripathi. Planet Earth Programme taken up by Vigyan Prasar was highlighted by Shri B.K. Tyagi.

On the first session of the 2nd day Shri Kapil K. Tripathi demonstrated various innovative physics experiments. The experiments such as How much is 1Newton, Newton 3rd



K Tripathi demonstrating physics experiment



A participant interacting with the expert

Law, Weightlessness, Lift a weight by moving, another weight in circle, Show conservation of angular momentum, Surface tension, Burning Candles in limited air, Why water not falling, Underwater optics, Reflection, Refraction, total internal reflection, Make Concave and Convex lenses, What is conductor, Application of electronics, Difference between electronics and electrical, Make a series and parallel connections, Electromagnetic effect, Make a simple motor, Show Eddy current, Centre of Mass, Idea of Charge, Make a simple Electronic Circuit (Automatic Light), Make a door bell circuit, Wave motions, Visual books on light and optics and Visual books on basic electricity were demonstrated during the course.



Demonstration of Kits

As a part of the programme, Weather testing and Biodiversity kits developed by Vigyan Prasar were also demonstrated to the participants. Shri B.K. Tyagi gave a talk on the **International Year of Astronomy – 2009**. In the last technical session Shri L. Somarjit Singh, Selection Grade Lecturer, Imphal College, Imphal delivered a lecture on the topic “Floral

Biodiversity of Manipur”. During the 2 days programme, a Scientific Film “Passage to Moon” was also shown to the participants.

On successful completion of the programme, each participant was given a set of posters and CD (Innovative Physics) and Astronomy, Biodiversity and Weather testing kits for further demonstration to the students of their schools. CD on Scientific Film “Passage to Moon” was also distributed to all the participants for shows in the respective schools. The 2 days orientation programme for science teachers/ communicators of Manipur was closed with concluding remarks from Executive Director, MASTEC.

Dr. S. Pravabati Devi, producer of a science serial named **Khangjinminashi** (Let us know science) of the local Television Network (ISTV), a popular channel of the state, recorded all the Innovative Physics Experiments demonstrated by Kapil K Tripathi and telecast in the ISTV as an episode of the serial. In order to monitor the efficacy of the programme, on the last day feedback sheet in the form of questionnaire were distributed to all the participants. As per the feedback sheet we obtained from the participants, the following comments/suggestions were recommended.

1. Organization of such orientation programme at district level
2. Duration of the programme is short
3. More number of demonstrations covering other subject areas may be included in the Orientation course.
4. Organization of such programme at least once a year is very essential.
5. Number of Resource persons may be increased.
6. To organize similar programmes for students of Class X – XII

3.0 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:

3.1 Manipur Science Aquarium

The concept of aquarium keeping started as old as traditional keeping of fishes as food item prevailed. This was most likely originated when fish were cultured in some type of enclosures after monsoon floods receded. The earliest known aquarists were the Sumerians, who kept fishes in artificial ponds at least 4,500 years ago. The Chinese and Japanese started breeding of ornamental fishes. The ancient Romans were the first known marine aquarists.

The first display aquarium was opened to the public in 1853 at Regent's Park in London. It was followed by aquariums in Berlin, Naples, and Paris. Nowadays hobbyists could keep fish as well as corals and invertebrates successfully.

Today, scientists have classified more than 20,000 species of fish around the world. Scientific advances throughout the 20th century have made aquarium keeping easier and more convenient than ever. The world's best aquarium is in San Francisco. The aquaria are placed in 10 levels one above the other. The best one in India is the Taraporevala Aquarium in Mumbai.

The Manipur State also has a vast potential of fisheries resources comprising ponds, tanks, natural lakes, marshy areas, swampy areas, rivers, reservoirs, submerged cropped land, low lying paddy fields etc. the largest source of fish is the Loktak Lake. Majority of the indigenous ornamental fish trade in India is from the North Eastern states and the rest is from Southern states, which are the hot spots of fish biodiversity in India. A good number of ornamental fishes are available in the state, specially, in the hilly terrain areas.

Keeping the above facts, Manipur Science & Technology Council has started construction of Manipur Aquarium Science at D.M. College of Commerce, Imphal with the support of Department of University and Higher Education, Government of Manipur with the following objectives;

- To study the behaviour of different types of local and marine fishes
- To conserve the fish fauna of the state
- To make aware of the available local fishes to the public
- To create a place for recreation of the public

Achievements:

- RCC construction of aquarium tanks have been completed
- Fixing of wall & floor tiles, water supply system, drainage system are going on

3.2 Patent Information Centre

Intellectual Property Rights (IPR) play a key role in gaining an advantageous position in the competitive technological game for economic growth. India enjoys a large asset of R&D personnel and infrastructural facilities. Scientists and policy makers need more information, orientation and facilities for protecting the products of intellectual prowess of Indian scientists. As a step in this direction, a single window Patent Facilitating Cell now called Centre (PFC), was created by the Department of Science & Technology (DST) at the Technology Information, Forecasting and Assessment Council (TIFAC), an autonomous body under DST in June 1995. With the technical and financial support of TIFAC, every state has also established one **Patent Information Centre (PIC)**. Very recently, PIC Manipur has been

transferred from the Department of Science & Technology and Information Technology, Govt. of Manipur to Manipur Science & Technology Council, Imphal with 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.
- Guide the inventors in respect of patenting their inventions.

Achievements:

- Appointment of Research Fellow and procurement of equipments are in process
- Retention of Patent for Pedal Operated Rice Mill is in process

3.3 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 and study hydrological conditions.
- (ii) to study soil and rock mechanical properties.
- (iii) to prepare a detailed map from the sites specific studies, risk assessment and to develop preventive measures.

Achievements:

i) Geological Mapping:

Geological formation of the study area (Fig 1) has been mapped. It belonged to the Barail and the Surma groups of rocks consisting of shale, siltstones, sandstones, conglomerate and recent alluvium. These rock formations are tectonically deformed and highly weathered.

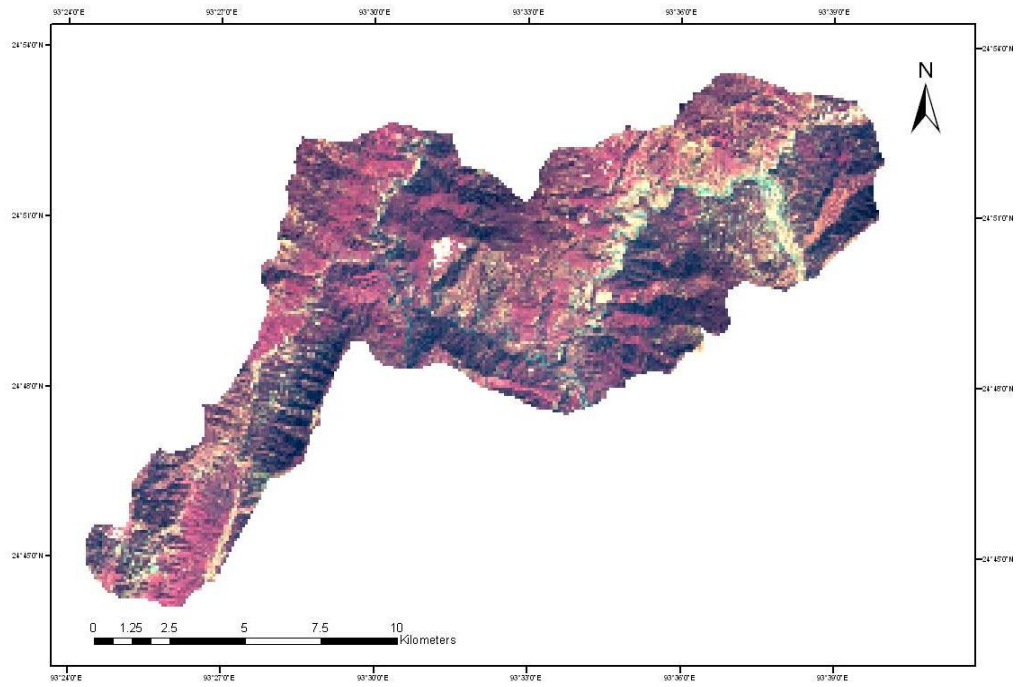


Fig 1. Imagery of the Study Area

The litho tectonic map of the study area developed on the basis of visual interpretations of LISS III imagery, available geological map on regional scale and field survey is shown in Fig . 2.

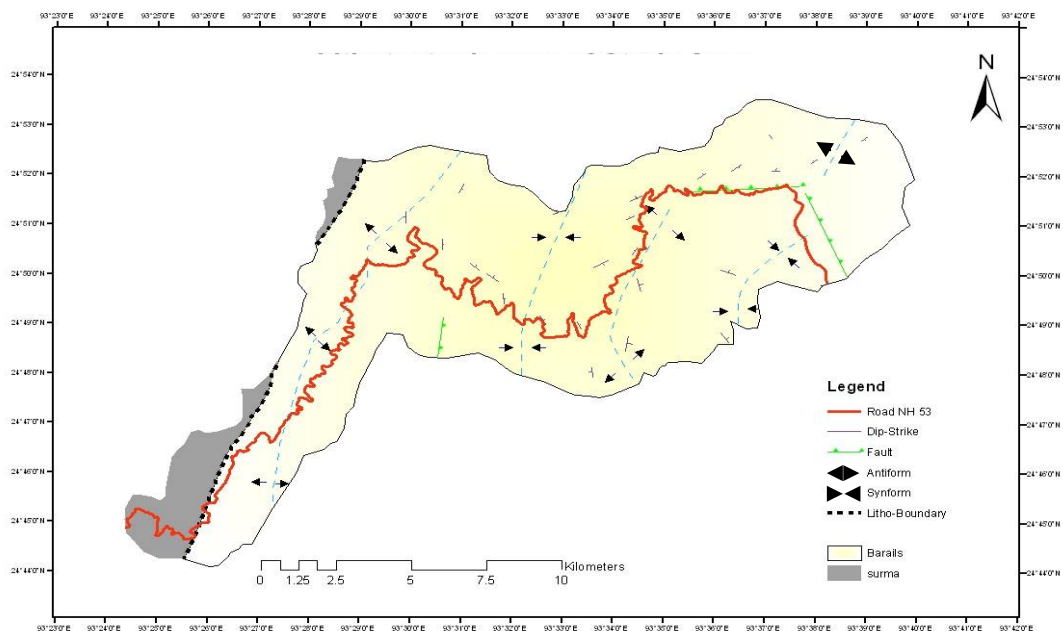


Fig 2. Litho-tectonic map of the study area

A simplified stratigraphic succession of the study area has been studied as shown at table 1 below.

Table 1 Stratigraphic Succession of the Study Area

Litho-units and age	Description of rocks
Alluviums (Quaternary to Holocene)	Dark grey to black clay, silt and sandy fluvio-lacustrine deposits peripheral parts of the fan.
----- Pleistocene (?) Older	----- Gradational Contact ----- Clay, sand, gravel, pebble, and boulder deposits of the foothills and older terraces in the upper part catchments and foothill.
~~~~~ The Surmas (Upper Oligocene to Miocene)	~~~~~ <b>Stratigraphic Break</b> ~~~~~ Shale, sandy-shale, siltstone, ferruginous sandstone, massive sandstone. Alternations of sandstone and shale with minor conglomerate. Transitional character from flysch to molasses sediments.
~~~~~ The Barails (Upper Eocene to Oligocene)	~~~~~ <b>Stratigraphic Break</b> ~~~~~ Massive to thick bedded sandstone. Alteration of shale and sandstone with carbonaceous matter. Intercalation of bedded sandstone with shales. Flysch of turbidite character.
----- The Disangs (Eocene to Up.Cretaceous)	----- Gradational Contact -----Dark grey to black, splintery shales and intercalations of shales, siltstones and sandstones showing occasionally rhythmites characters.
~~~~~ Basement	~~~~~ <b>Stratigraphic Break</b> ~~~~~ Complex Unknown

The area between Noney and Awangkhum was found covered with highly deformed and crushed material and recent alluvium. The Aleng River near Noney is following an anticlinal axis of eroded hinge of fold. However, towards Awangkhum thickness and frequency of sandstone beds and degree of deformation increase indicated by the presence of minor folds, faults and variation in the altitude of beds.

After Awangkhum, rock formations are represented by the rhythmic intercalations of thinly laminated shales, sandy shale, thickly bedded siltstones and sandstones. Thickness of sandstone beds increases towards the top. Rocks are highly folded as overturned fold. Some parts of the area are covered with thick alluvium and luxuriant bamboo growth, despite this, the area is vulnerable to landslides.

The Irang River is running along a faulted anticlinal axis. The rock formations between Awangkhum and Taobam are represented by the intercalations of thinly bedded sandstones, siltstones and light earthy coloured shales, which is highly deformed due to secondary generation of folding. The rock units of the area between Taobam (The Irang River) and Khongsang are highly deformed as manifested in folds, faults and are fracture and jointed. The intercalations of shales, siltstones and sandstones gradually become thicker towards Khongsang village. Near Khongsang, the rocks are moderately to intensely weathered with thick cover of recent alluvium. Due to folding and faulting, at places, rock formations have almost become vertical. A number of minor folds and different sets of joints are present between Khongsang and Rengpang.

Rock formation between Rengpang and Nungba are represented by thickly bedded to massive sandstones with sandy-shales and silty-shales intercalations. However, near Nungba

the thickness and frequency of sandstone beds again decrease. At a distance of about two kilometer north of Nungba, there is unconformable contact between the Barail and the Surma groups, represented by a thin band of metamorphosed conglomerate. Presence of thin bands of coal, light grey to brownish coloured sandstone and reddish coloured shales indicate that during the deposition of Surma the basin become very shallow.

**ii) Physiographic study** The entire study area is a hilly terrain extending parallel to sub-parallel, trending NNE-SSW and N-S directions with height varying from 200m to 1520m above mean sea level. The area under investigation can be broadly divided into the units such as Highly folded and faulted hills ranges, Narrow Valley, Ridges: The physiography map of the study area is shown in the fig 3.

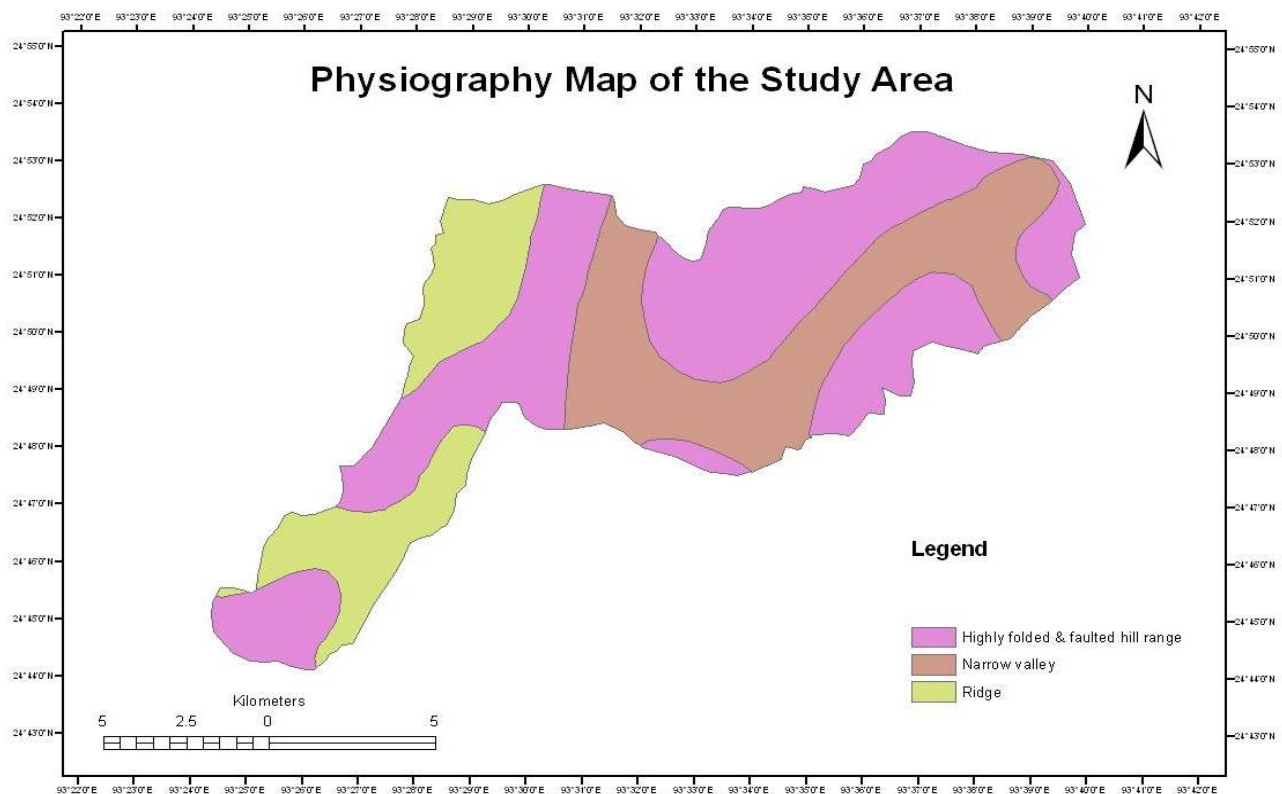


Fig 3

**iii) Drainage System:**

The drainage network of the study area falls into the Barak river basin. Barak river, the largest river of Manipur drains the western half of the state having about 250 sq. km. of its river valley area. The most important tributaries of Barak river are Jiri, Tipai, Juko, Makru, Irang, Leimatak, Maklang etc. The Ijai or Iyai, Leimatak and Toubam or Irang river are main tributaries falling into the study area. The drainage map of the study area was prepared from the 1:50,000 scale topo sheet of survey of India (SOI) ( Fig. 4 ) In the study area sudden

widening followed by compressed valley can be seen along the course of the Ijai river near Langkhong Kabui village, may be due to the sudden appearance of hard and compact lithology or some structural complexities in the area showing anomalous drainage pattern.

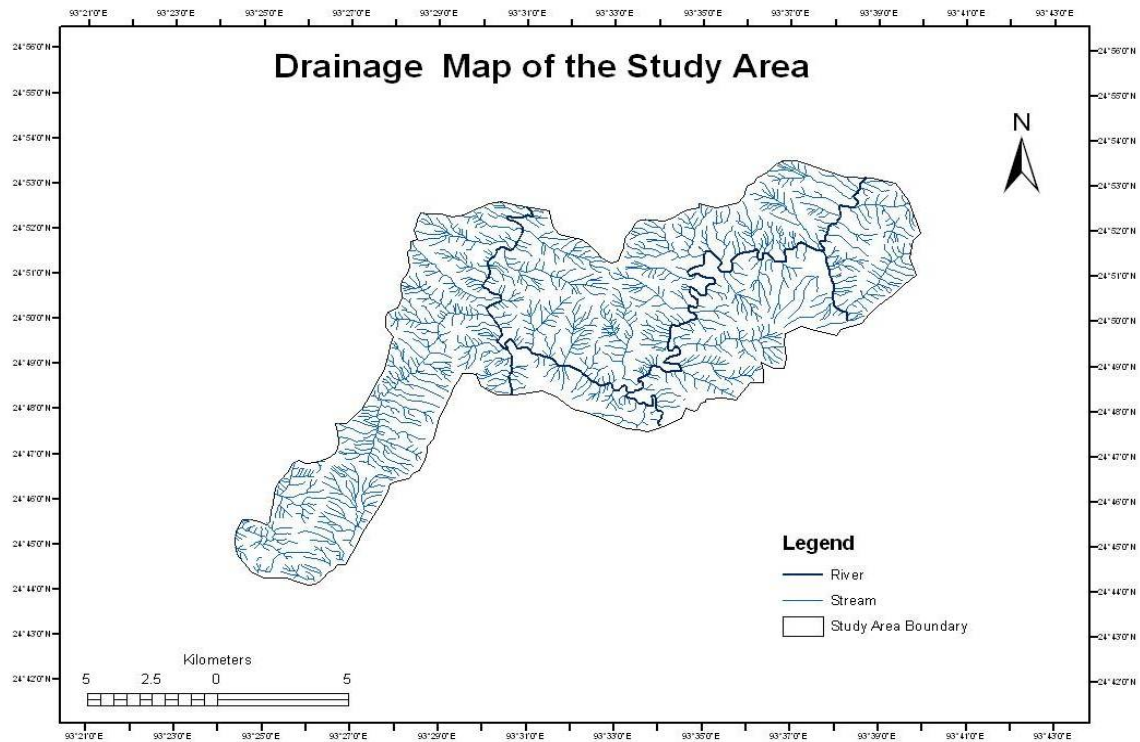


Fig 4

#### IV) Landslides

A Landslide is the downward and outward movement of slope forming materials, composed of rock, soil, artificial fills (dumping) or a combination of all these along the surface of separation by falling, flowing under a fast or slow rate, but under the action of gravitational force and where the triggering factor may be natural or anthropogenic. Landslide is a major geological hazard, which poses serious threat to human population and various other infrastructures like highways, rail routs and civil structures like dams, buildings and structures. Expansion of urban and recreational developments on hill areas result in ever increasing number of residential and commercial properties that are often threatened by landslides. Landslides also occur very often during other major natural disaster such as earthquakes, floods and volcanoes. Since the land routs are often disturbed by landslides, they cause major hurdles in mobilizing relief and reconstruction efforts.

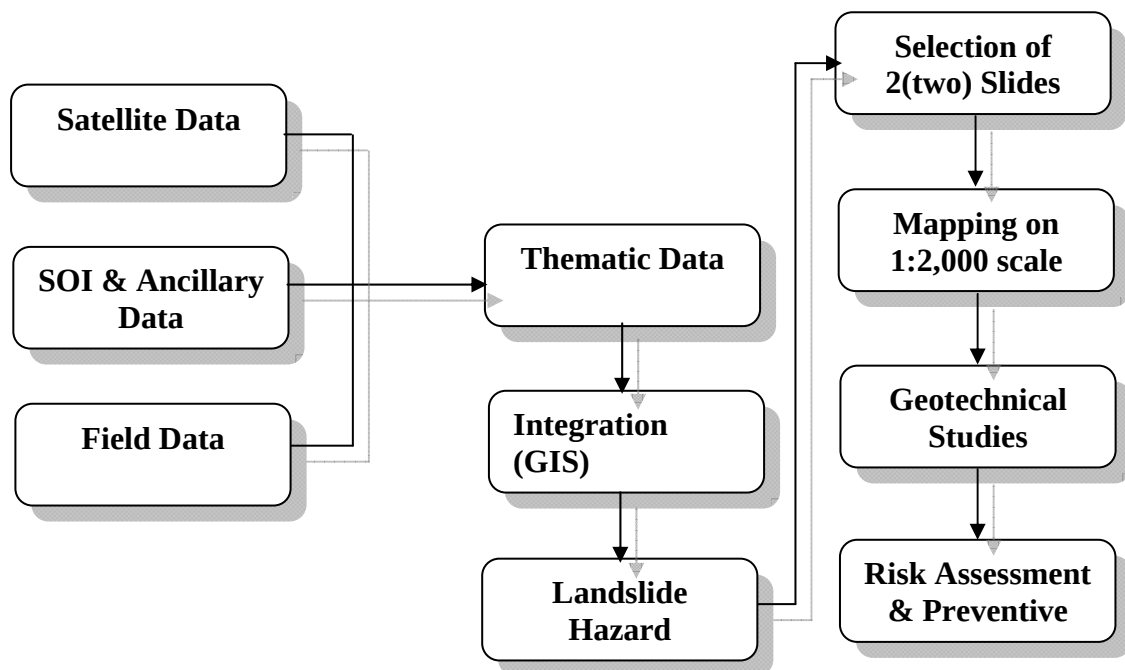
#### Causes of Landslides

The causes of landslides are usually related to instabilities in slopes. Causes may be considered to be factors that made the slope vulnerable to failure, that predispose the slope to becoming unstable. The trigger is the single event that finally initiated the landslide. Thus,

causes combine to make a slope vulnerable to failure, and the trigger finally initiates the movement. Landslides can have many causes. Usually, it is relatively easy to determine the trigger after the landslide has occurred. Although it is generally very difficult to determine the exact nature of landslide triggers ahead of a movement event. Landslide causes can be broadly divided into two categories, i.e. natural and anthropogenic.

### Preparation of Landslide Hazard Zonation Map

A landslide hazard zonation is a division of the land surface into areas, and the relative ranking of these areas according to degrees of actual or potential hazard from landslides on slopes (Varnes, 1984). This is a method to evaluate the risk where there is the potential for landslides. It is an important tool for designers, field engineers and geologists, to classify the land surface into zones of varying degree of hazards based on the estimated significance of causative factors which influence the stability (Anbalagan, 1992). The landslide hazard zonation map, in short called LHZ map, is a rapid technique of hazard assessment of the land surface (Gupta and Anbalagan, 1995). Depending upon the specific use, landslide hazard zonation maps (LHZ) can be prepared on the scales such as i) 1:50,000 - 1:25,000 for regional planning , ii) 1:15,000 -1,10,000 for district level planning and iii) 1:5,000-1:2,000 for site specific micro zonation. The flow chart for preparation of landslide hazard zonation is below.



Flow chart for preparation of landslide hazard zonation

The literature survey followed by the field checks has revealed that the geo-environmental factors such as Slope Aspect, Slope Morphometry, Land use/Land cover, Dip Slope Relation, Rock mass Strength , Drainage, Geology, Ridge/Crest Line, Road ,Lineament , Relative Relief were found playing a significant role in causing slope instability problems in the study area.



## V) Slope

The slope morphometry map has to be prepared for study of slope of the area. It is prepared by dividing the larger topographical map into smaller units/facets within which the contour lines have the same standard spacing, Five categories of slope morphometry such as Escarpment / cliff slope, Steep slope, Moderately steep slope, Gentle slope and Very gentle slope are used depending on their slope angle in a particular facet. Various slope categories, based on the frequency of occurrence of particular angles of Slopes are shown in the map below. Since the slope angle is considered to be an important geo-environmental parameter inducing slope instability, LHEF value 2 (maximum) has been assigned for it.

Table : Relative Slope

No. of contours per cm of length in the facet	Slope Angle	Category	LHEF Rating (Out of 2)	Area (Sq. Km.)	Percentage
< 7	< 15 ⁰	Very gentle slope	0.5	7.72	4.54
8 – 12	16 ⁰ - 25 ⁰	Gentle slope	0.8	81.96	48.25
13 -18	26 ⁰ -35 ⁰	Moderately steep slope	1.2	73.80	43.44
19 -25	36 ⁰ -45 ⁰	Steep slope	1.7	6.42	3.77
> 25	> 45 ⁰	Escarpment / cliff slope	2.0	--	--

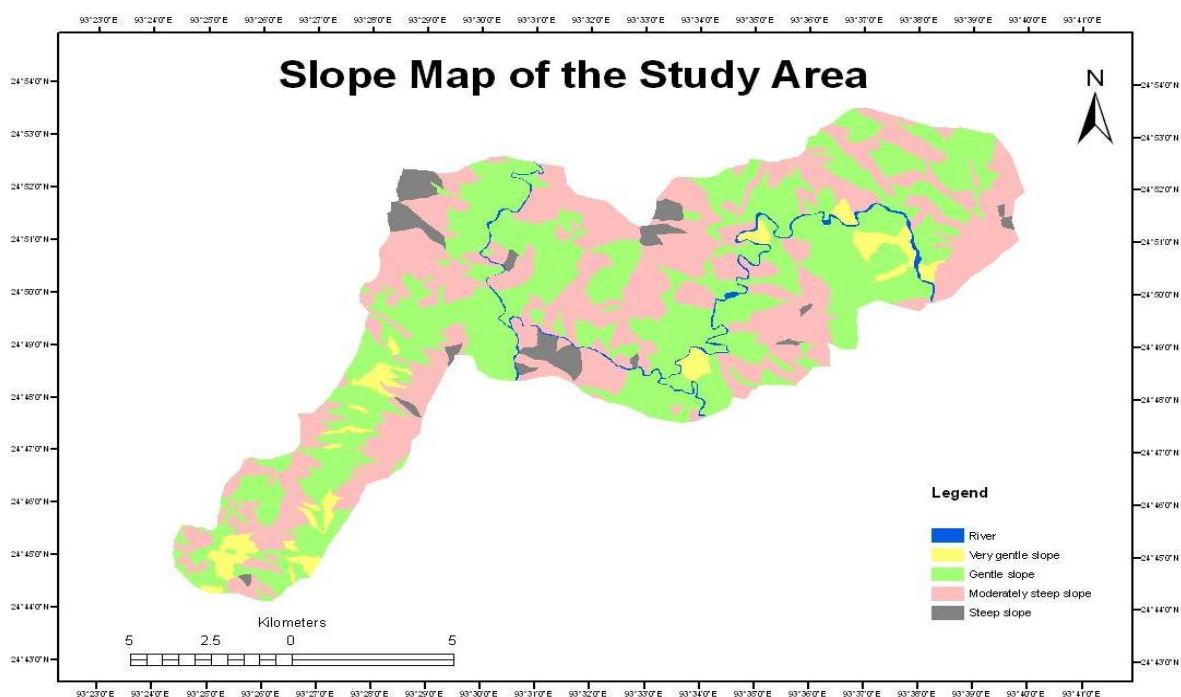


Fig 5. Slope Map

By studying the above table, it shows that the majority of the area falls under the very gently slope category followed by gently slope, moderately steep slope, very gently slope and steep slope covering an area of 7.72 sq.km, 81.96 sq.km, 73.80 sq.km, and 6.42 sq.km respectively. Gently slope category covers almost half of the total area i.e., 48.25%, whereas very steep slope covered the least i.e., only 3.77% of the whole area.

## VI) Facet Map

Facet is a polygonal area of mountainous terrain which has more or less similar characters of slope, showing consistent slope direction and inclination. The slope facets are generally delimited by ridges breaks in slope, streams, spurs, gullies and rivers etc. The facet maps ( Fig 6 ) forms the basis for the preparation of thematic maps in general and LHZ mapping in particular and individual facet is the smallest mappable unit. In all 1045 facets including sub facets have been delineated from the study area on the basis of visual interpretation of topographic maps.

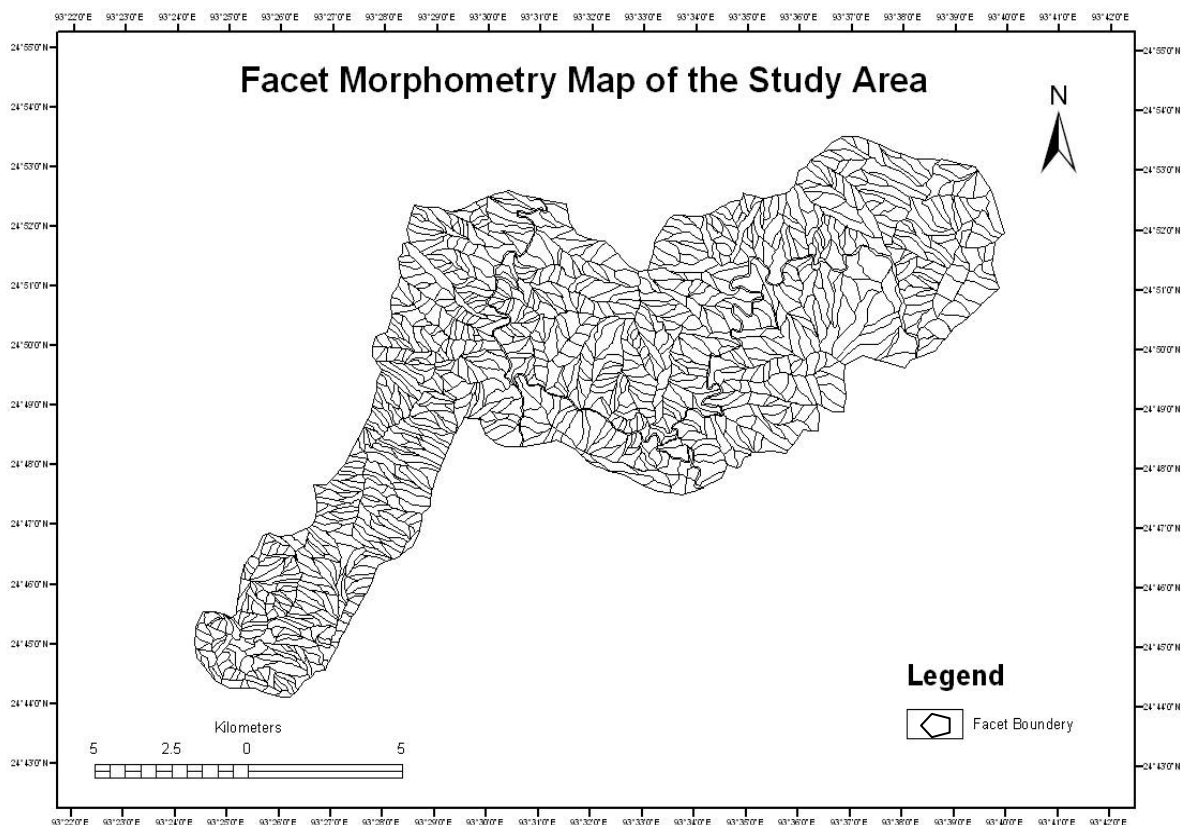


Fig 6

## VII) Lithological study

The rocks in the study area are occupied by the Barail and Surma Groups of rocks. The Barail Group are characterized by alteration of sandstones and shale showing intercalations sometimes thickly bedded sandstone beds showing typical turbidite character at places whereas

Surma Group are characterized by shale, sandy-shale, siltstone, ferruginous sandstone, massive sandstone etc. They are sometimes characterized by alternations of sandstone and shale with minor conglomerate showing transitional character from flysch to molasses sediments. Rock types such as sandstone, shale, siltstone etc. are highly fractured and weathered in nature. So, they are relatively very weak and very common to easy for slides. These groups of rocks are almost covered with tertiary sediments. The slope forming materials predominantly consisting of debris made up of silty and sand mixed with some clay along with small amount of rock debris. The individual litho units of the area are difficult to map in the 1:50,000 scale because of their thin and fragile intercalation nature of rock types. So they are treated as two groups of rocks mentioned above. These lithotype is falls into the Type II of LHEF rating scheme (BIS, 1998) assigning with their relative rating values multiplied with the corresponding correction factor of weathering. Table on Lithological Rating Scheme (after Anbalagan, 1992 & BIS, 1998) is shown below.

Lithology	Type	Rating
Rock Type	Type I	
	Quartzite and limestone	0.2
	Granite and gabbro	0.3
	Gneiss	0.4
	Type II	
	Well cemented sedimentary rocks dominantly sandstone with minor beds of claystone	1.0
Rock Type	Poorly cemented sedimentary rocks dominantly sandstone with minor clay-beds	1.3
	Type III	
	Slate and phyllite	1.2
	Schist	1.3
	Shale inter-bedded with clayey and non clayey rocks	1.8
	Highly weathered shale, phyllite and schist	2.0
Soil Type	Older well-cemented fluvial fill material	0.8
	Clayey soil with naturally form surfaces	1.0
	Sandy soil with naturally form surface (alluvial)	1.4
	Debris comprising mostly rock pieces mixed with clayey/sandy soil (colluvial)	
	---- Older well compacted	1.2
	---- Younger loose material	2.0
Correction factor for weathering i) Highly weathered – rock discolored, joint open with weathered product, rock fabric alter to a large extent --- correction factor $C_1$ ii) Moderately weathered – rock discolored with fresh rock patches weathering more around joint planes but rock intact in nature ---Correction factor $C_2$ iii) Slightly weathered – rock slightly along joint planes, which may be moderately tight to open intact rock --- correction factor $C_3$ . The correction for weathering to be multiplied with the fresh rock rating. For rock type – I, $C_1 = 4, C_2 = 3, C_3 = 2,$ For rock type – II, $C_1 = 1.5, C_2 = 1.25, C_3 = 1$		

## VIII) Structure

Structures of the area include bedding planes, several set of joints, faults and folds etc. The structural discontinuity in relation to the direction and inclination of slope has greater influence on the stability of slope. The structural data have been superimposed on the lithological map and observed structural details are plotted on Georient 9.0 software and preferred orientation and possible failure mode (planar or wedge failure) is obtained for the facets occupied by bedrock. According to Anbalagan (1992) the following three types of relationships among these variables are categorised.

- a) The extent of parallelism between the directions of the discontinuity or the line of intersection of two discontinuities and the slope.
- b) Steepness of the dip of the discontinuity or plunge of the line of intersection of two discontinuities.
- c) The difference in the dip of discontinuity or plunge of the line of intersection of two discontinuities to the inclination of slope.

If the planes of discontinuity or the line of intersection of two discontinuities tends to be parallel with the direction of inclination of slope face, the risk factor of slope failure increases. If the inclination of slope is more than the dip of discontinuity or plunge amount of line of intersection two discontinuity planes, the failure potential remains high. The following Landslide Hazard Evaluation Factor (LHED) rating scheme of structural conditions have been assigned for calculation of Total Estimated Hazard.

Table: Structural Rating Scheme (after Anbalagan, 1992 & BIS, 1998)

Relationship of structural discontinuity with slope		Category	Ratings
Relationship of parallelism between the slope and discontinuity	I	>30°	0.20
	II	21°-30°	0.25
	III	11°-20°	0.30
	IV	6°-10°	0.40
	V	<5°	0.50
Relationship of dip of discontinuity and inclination of slope.	I	>10°	0.3
	II	10°-0°	0.5
	III	0°	0.8
	IV	-10°- 0°	1.0
	V	>-10°	0.2
Dip of discontinuity	I	<15°	0.20
	II	16°-25°	0.25
	III	26°-35°	0.30
	IV	36°- 45°	0.40
	V	>45°	0.50
Depth of soil cover		<5 m	0.65
		6-10 m	0.85
		11-15 m	1.30
		16-20 m	2.0
		>20 m	1.20

## IX) Relative Relief:

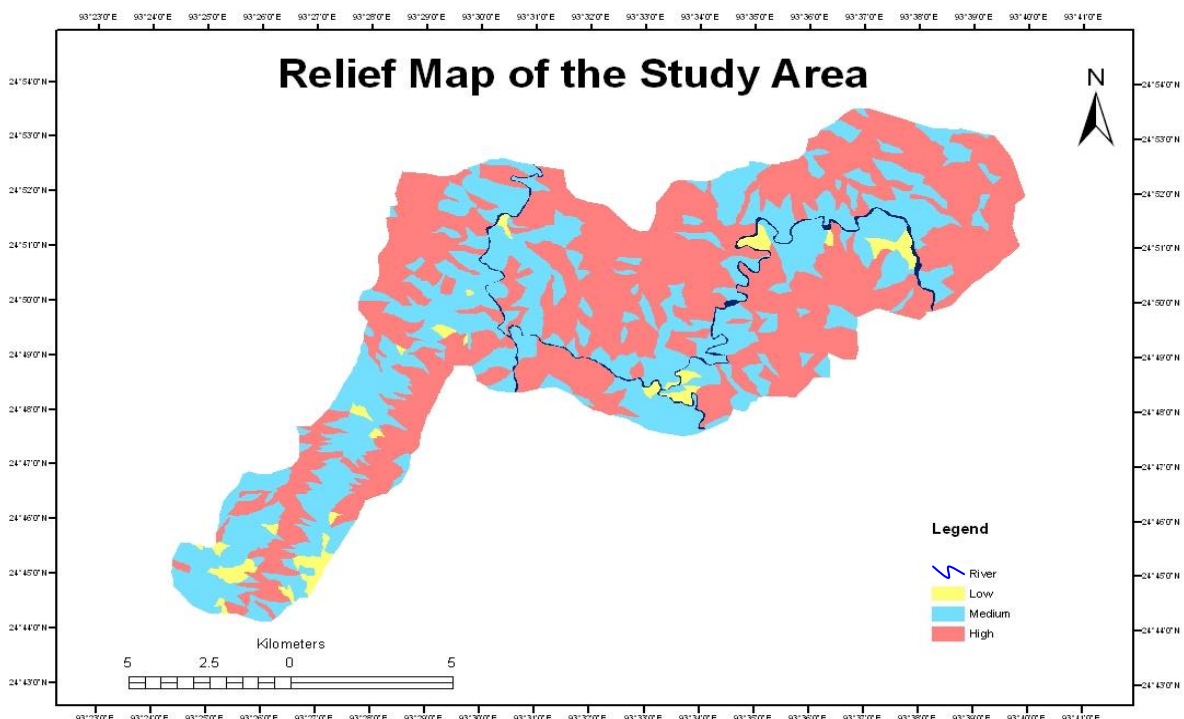
Relative Relief map represents the difference between the maximum and minimum heights within an individual facet. It shows the major breaks in the slopes of the area. Relief map (Fig 7 ) of the study area and along parts of NH-53 has been prepared from the slope facet map by subtracting the lowest contour value from the highest contour value in a facet. The entire areas have been subdivided into three categories of Relative Relief viz:

- i) Low (<100m)
- ii) Medium (101- 300m) and
- iii) High (>300m).

The map shows that major part of the area lies under high relative relief followed by medium and low relative relief. The relative relief is considered as a geomorphic factor inducing landslide, where high relative indicates high slope height and more weight of slope forming materials in a facet. LHEF value 1 has been assigned to this geo-environmental parameter. LHEF rating for this factor are given in the Table.

**Table: Relative Relief (after Anbalagan, 1992 & BIS, 1998)**

Relative Relief	Category	LHEF Rating (Out of 1)	Area (Sq. Km.)	Percentage
< 100 m	Low relief	0.3	<b>4.89</b>	<b>2.88</b>
101 – 300 m	Moderate relief	0.6	<b>67.99</b>	<b>40.02</b>
> 300 m	High relief	1.0	<b>97.02</b>	<b>57.10</b>



**Fig 7. Relief Map of the study area**



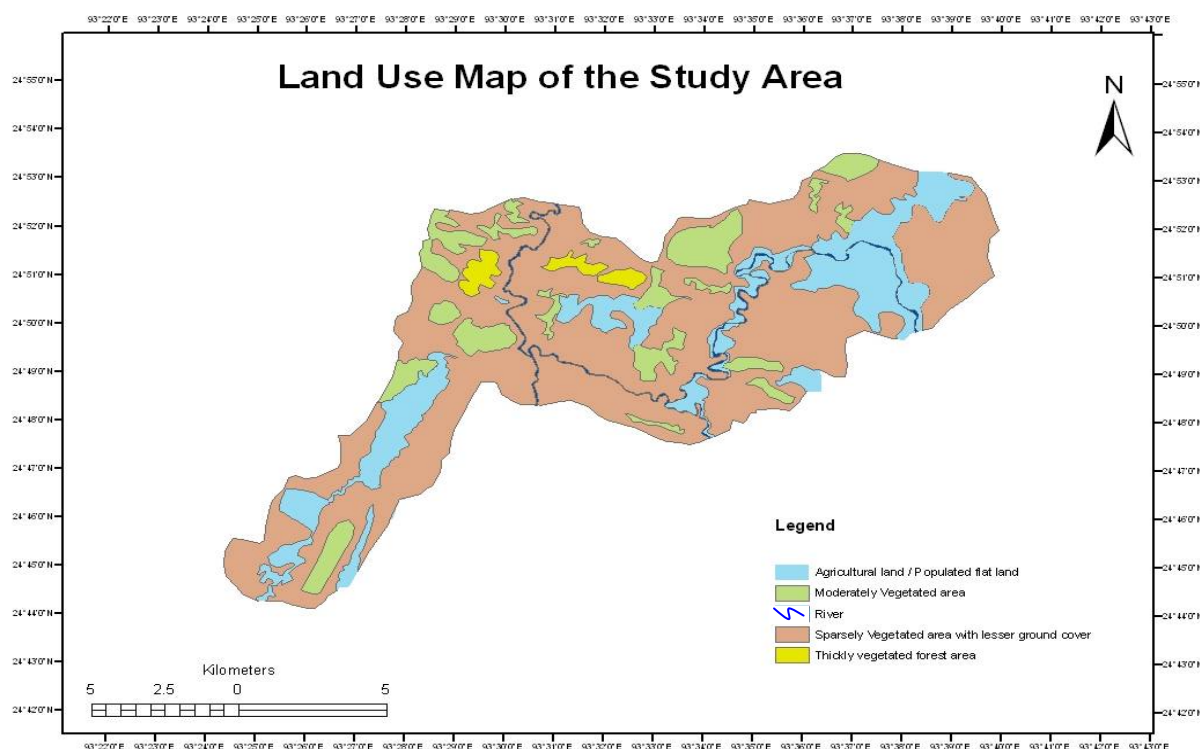
## X) Land-Use/Land Cover:

The nature of landuse/landcover is an indirect indication of the stability of hill slope. Vegetation cover generally check the action of climatic agents and protect the slopes from erosion and weathering. Land-use/Land-cover map of the project area has been prepared on the basis of visual interpretation of **LISS III** with field check. On the basis of land-use/land-cover pattern, the area has been divided into five categories such as Agriculture land/ populated flat land, Thickly Forest Cover, Moderately Forest Cover, Sparsely Forest Cover and Jhum/ Terrace cultivation/ Barren. Based on their intensity of vegetation cover, their relative ratings were awarded as shown in the table below.

**Table: Land use/ Land cover Rating Scheme (after Anbalagan, 1992 & BIS, 1998)**

Category	LHEF Rating (Out of 2)	Area (Sq. Km.)	Percentage
Agriculture land/ populated flat land	0.6	<b>31.37</b>	<b>18.46</b>
Thickly Forest Cover	0.85	<b>3.30</b>	<b>1.95</b>
Moderately Forest Cover	1.20	<b>20.83</b>	<b>12.26</b>
Sparsely Forest Cover	1.50	<b>114.40</b>	<b>67.33</b>
Jhum/ Terrace cultivation/ Barren	1.80	--	--

Land-use/land-cover map and table shows that the major part of the area falls under the sparsely forest cover having 67.33% of the total study area showing faster erosion and greater instability followed by agricultural land. Agriculture in general is practiced in low to very low



**Fig 8: Land Use /Land Cover Map**

slopes though moderately steep slopes are also used at some places. Since agriculture in the upside of the road represents the repeated artificial water charging for cultivation purpose may cause the instability of slope. Moderately forest cover and thickly forest cover were contributed in small percentage about 12.26 and 1.95 respectively.

#### **XI) Hydrological Condition**

Hydrogeological conditions of a region is influenced by a number of factors like climate, lithology, structural discontinuities, neotectonic activities, landuse and landcover, drainage pattern/network etc. Groundwater conditions of the study area (hilly terrain) is generally chanalised along structural discontinuity of rocks. It does not have uniform flow pattern. The observational evaluation of the groundwater on hill slopes is not possible over large scale. Thus, five categories of hydrological condition in LHEF rating scheme (Anbalagan, 1992 & BIS, 1998) such as Flowing, Dripping, Wet, Damp and Dry are used assigning with their respective rating. Southwestern portion of the study area is generally wet whereas northern portion is damp.

#### **XII) Landslide Hazard Evaluation Factor (LHEF) Rating Scheme:**

LHEF rating scheme is a numerical weightages, governed by the major causative factors like lithology, structure, slope morphometry, relative relief, and land use/land cover of the slope instability. Each identified facet wise details of all these contributory factors were prepared for assigning Landslide Hazard Evaluation Factor (LHEF) rating for each factor. The maximum rating of an individual contributory factors are shown in table below.

**Table: Maximum Rating of an individual contributory factors**

<b>Contributory Factors</b>	<b>Rating (Maximum)</b>
Lithology	2.0
Structure	2.0
Slope Morphometry	2.0
Relative Relief	1.0
Land use & Land Cover	2.0
Hydrological condition	1.0
<b>Total</b>	<b>10</b>

### **Calculation of Total Estimated Hazard (TEHD) :**

TEHD simply indicates the probabilities of instability of each facet. The Total Estimated Hazard (TEHD) of an individual facet has been calculated by adding the ratings of the individual causative factors obtained from the landslide hazard evaluation factor rating scheme. Depending on the value obtained from the total estimation hazard, each facet has falls into their respective hazard classification.

### **XIII) Landslide Hazard Zonation :**

Based on the distribution of TEHD values of each facet the landslide hazard zonation map has been prepared and facilitates spatial classification of the study area into four zones viz. Low Hazard (LH), Moderate Hazard (MH), High Hazard (HH) and Very High Hazard (VHH).

**Table: LHZ based on TEHD (after Anbalagan, 1992 & BIS, 1998)**

Zone	TEHD Value	Description of Zones	Area (Sq. Km.)	Percentage
I	< 3.5	<b>Very Low Hazard (VLH) Zone</b>	<b>Nil</b>	<b>Nil</b>
II	3.6 – 5.0	<b>Low Hazard (LH) Zone</b>	<b>2.90</b>	<b>1.71</b>
III	5.1 – 6.0	<b>Moderate Hazard (MH) Zone</b>	<b>6.96</b>	<b>4.09</b>
IV	6.1 – 7.5	<b>High Hazard (HH) Zone</b>	<b>55.90</b>	<b>32.91</b>
V	> 7.5	<b>Very High Hazard (VHH) Zone</b>	<b>104.14</b>	<b>61.29</b>

From the above table the study area is devoid of Very Low Hazard Zone (VLH). Major part of the area falls into the category of Very High Hazard Zone which is about 61.29% of the total area covering 104.14 sq.km. followed by High Hazard Zone covering 55.90 sq.km with 32.91% of the total area. 6.96 sq. km. and 2.90 sq.km covering only Moderate Hazard and Low Hazard with 4.09% and 1.71% of the total area respectively. Majority of the study area are distributed with Very High Hazard and High Hazard zone unevenly. Microzonation or detailed mapping can be carried out for further investigation. Detailed mapping of the two slides on 1:2,000 scale will be carried in the second part of the project and the two sites have been identified. Landslide hazard zonation map in Fig. 9 and Landslide incidence map of the study area are shown in the fig 10 respectively.

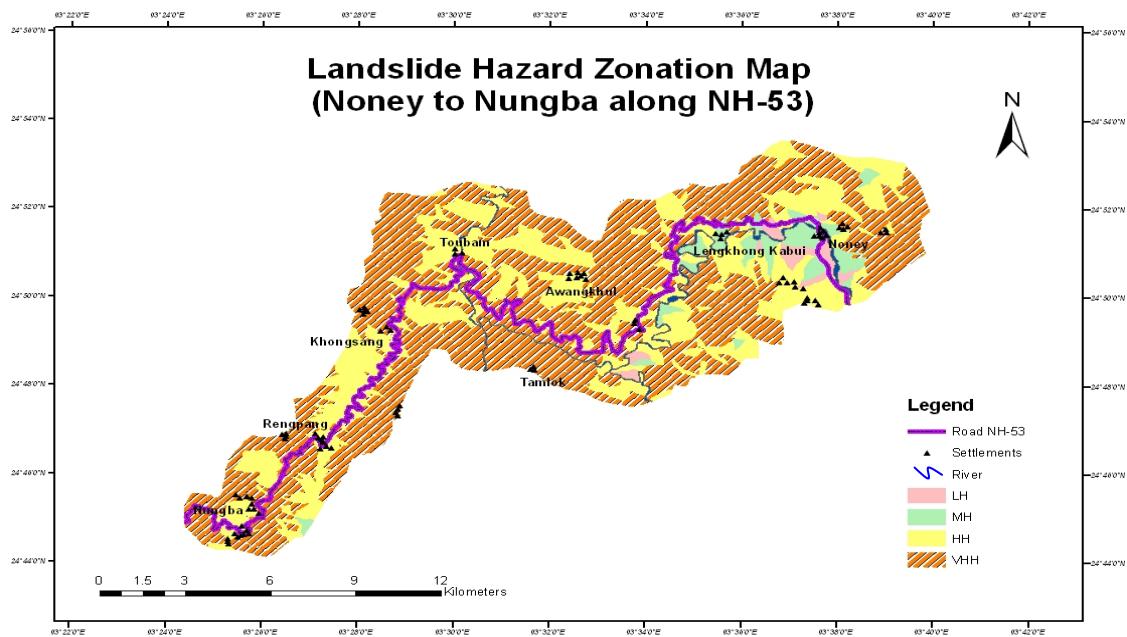


Fig. 9: Land slide zonation Map

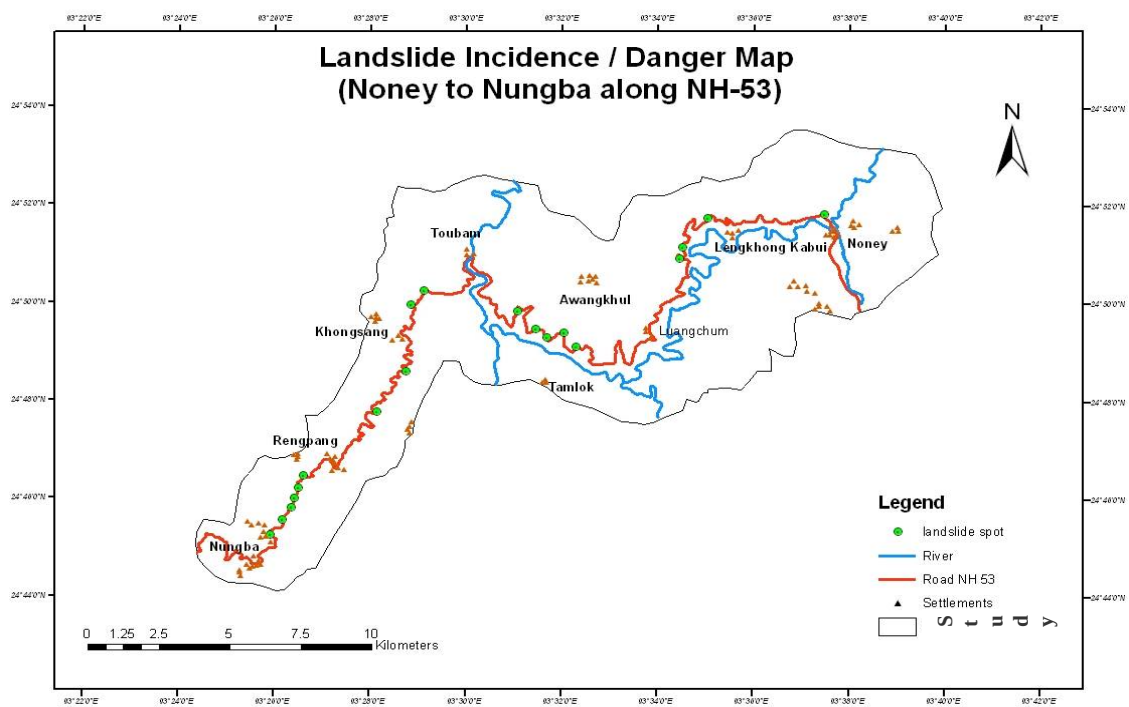


Fig 10: Landslide Incidence Map

## Photographs of Landslide Activated Area

	
Landslide at Nungba	Landslide at Rongdai
	
Construction of retaining wall to avoid Landslide at Awangkhum Pt. II near Army Outpost	Collapse of the same Retaining wall observed
	
Landslide near Rongkhong Bridge	Old Slide at Awangkhum





### 3.4 Dailong Micro Hydel project – Sponsored by State Councils Division, Department 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 decentralized power generation.

#### Progress/Achievements:

- i) Construction of Desilting tank/Intake well and Forebay tank have been completed.
- ii) Laying of penstock pipes including saddle/anchor blocks have been completed except from Y – piece to power house and delivery pipe from fore-bay tank to the penstock pipe.
- iii) Construction of Power House has been completed.
- iv) Work order for short supply items, installation of EM parts and commissioning of the project has been placed to M/s Jalshakti Engineering Pvt. Ltd., Kolkata and a team from M/s Jalshakti Engineering Pvt. Ltd., Kolkata checked the EM parts at site

### Some Photographs of the ongoing Micro Hydel Project



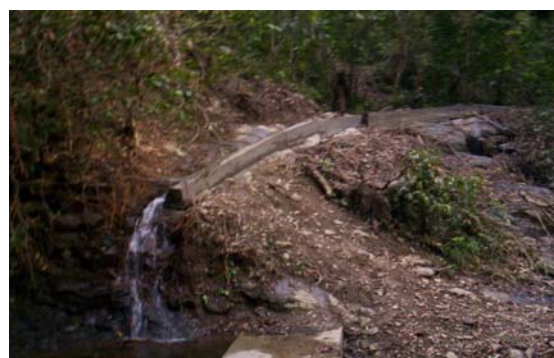
**A Team from M/s Jalshakti Engineering Pvt. Ltd., Kolkata checking the EM parts**



**Newly constructed Fore-bay Tank**



**Laid Penstock Pipes with saddle/anchor blocks**



**Desilting/Intake arrangement**

### 3.5 Demonstration and Scientific Evaluation of Stand Alone Water Purification Systems in Schools

Under the project, water samples from the campus of 20 (twenty) identified schools have been collected and the analysis of the water samples have been carried out at M/s R.V. Briggs and Co. Pvt. Ltd., Kolkata which is one of the Laboratories recognized by DST, Govt. of India. The water sample analysis report in the prescribed format is as given hereunder.

Sl. No.	Name of the School with complete Address	Contaminants reported in raw water supplied to school (above desirable limits stated in BIS standard)	Remarks (Relevant information on present drinking water system)
1.	Kendriya Vidyalaya, Lamphelpat, Imphal West District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : <1 Iron : Below Detection Limit	Tap water stored in Masonry tank having 4-5 taps.

2.	Kendriya Vidyalaya, Langjing, Imphal West District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : 2.25 NTU Iron : 0.28 mg/l	Tap water stored in overhead tank and distributed at 3-4 points.
3.	Kendriya Vidyalaya, Leimakhong, Imphal West District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : <1 Iron : Below Detection Limit	Tap water stored in overhead tank and distributed at 3-4 points.
4.	Kendriya Vidyalaya, Loktak Project, Bishnupur District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : <1 Iron : Below Detection Limit	Tap water stored in Masonry tank having 3-4 points.
5.	Jawahar Navodaya Vidyalaya, Khumbong, Imphal West District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : 1.0 NTU Iron : Below Detection Limit	River water stored in overhead tank and distributed at 4-5 points.
6.	Jawahar Navodaya Vidyalaya, Yarlpat Imphal East District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : present E. Coli/100 ml : Absent Turbidity : 4.31 NTU Iron : 0.17 mg/l	Tap water stored in Masonry tank having 3-4 points.
7.	Jawahar Navodaya Vidyalaya, Bishnupur, Bishnupur District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : 186 NTU Iron : 12.42 mg/l	Ground water supplied through submersible pump and stored in Masonry tank with 3-4 points
8.	Jawahar Navodaya Vidyalaya, Umathel, Thoubal District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : 1.86 NTU Iron : 0.14 mg/l	River water stored in Masonry tank
9.	Jawahar Navodaya Vidyalaya, Lambui, Ukhrul District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : <1 NTU Iron : 0.13 mg/l	Ground water/Hand pump

10.	Jawahar Navodaya Vidyalaya, Churachandpur, Churachandpur District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : 1.37 NTU Iron : 0.63 mg/l	Ground water/Hand Pump
11.	Jawahar Navodaya Vidyalaya, Mao Maram, Senapati District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : present E. Coli/100 ml : Absent Turbidity : 8.92 NTU Iron : 0.45 mg/l	River/spring water stored in Masonry tank
12.	Jawahar Navodaya Vidyalaya, Tamenglong, Tamenglong District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : present E. Coli/100 ml : Absent Turbidity : <1 NTU Iron : Below Detection Limit	River/spring water stored in Masonry tank
13.	Vungzagen Govt. High School, Churachandpur, Churachandpur District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : 1.37 NTU Iron : Below Detection Limit	River/spring water stored in Masonry tank
14.	Jiribam Higher Secondary School, Jiribam Sub-division, Imphal East District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : <1 NTU Iron : Below Detection Limit	Dug well directly taken out using pulley system
15.	Tamphasana Girls' Higher Secondary School, Imphal West District	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Present Turbidity : 3.14 NTU Iron : Below Detection Limit w	Tap water stored in Masonry tank having 3-4 points.
16.	Moirang Multipurpose Higher Secondary School, Moirang, Bishnupur District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : 23.0 NTU Iron : 0.70	Surface/Pond water
17.	Kakching Higher Secondary School, Kakching, Thoubal Dist.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : 19.8 NTU Iron : 0.52	Surface/Pond water

18.	Maha Union High School, Chandel, Chandel District.	Coliform organization/ 100 ml : <1 Faecal Coliform/100 ml : Absent E. Coli/100 ml : Absent Turbidity : <1 NTU Iron : Below Detection Limit	Tap water stored in Masonry tank having 3-4 points.
19.	Lanva Model High School, Churachandpur, Churachandpur District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : 3.53 NTU Iron : 0.35 mg/l	Dug well directly taken out using pulley system
20.	Tadubi Higher Secondary School, Tadubi, Senapati District.	Coliform organization/ 100 ml : >200 Faecal Coliform/100 ml : Present E. Coli/100 ml : Absent Turbidity : 2.65 NTU Iron : 0.14 mg/l	River/spring water stored in Masonry tank

### **3.6 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

### **3.7 Dry Fish Fermentation Technology in Manipur** sponsored by DST, Govt. of India.

Objectives:

- To conduct survey and study for the availability/ abundance of the raw materials i.e. the dry fish and market analysis of the fermented fish (Ngari).
- To carry out dry fish fermentation (Ngari) in a scientific and hygienic manner.
- To cause an overall improvement of the traditional dry fish fermentation as the traditional practice is unhygienic, time consuming and labour intensive work.
- To introduce a ramming machine for dry fish fermentation to the general public of Manipur through S&T input.
- To conduct demonstration programme of the improved/new technology for the general public so as to enable them to set up their own fermentation units for production of Ngari at commercial scale.
- Comparative study of the food value of Ngari produced out of the new technology with that of the traditional technology.

Achievements:

Traditional dry fish fermentation process in Manipur is appeared to be unhygienic and unscientific. However, this traditional technology has already been deeply rooted in the Manipur Valley. Local Entrepreneurs engaged in this traditional process invest on procuring raw materials and labour charges. The job is of a good economic return about 50% of investment amount. This popular traditional technology seems to be very unfair if anybody happens to see the processing technology, no one will encourage it. The process is therefore taken up inside the screen to avoid any visitor. Keeping in view, the necessity of improving the present technology, Manipur Science and Technology Council, Imphal has taken up a Project under the sponsorship of Department of Science and Technology, Govt. of India.

The project was started in November 2008 with the appointment of project staff. Under the project, MASTEC has conducted a survey in the Imphal main market for study of the availability/abundance of raw materials i.e the dry fish (*Puntius sophore*) and for study of the market of fermented dry fish (Ngari).

A ramming machine has been developed for fermentation of Dry fish. Using the machine dry fish fermentation is going on in PET Bottle and kept for observation.

#### 4.0 Official Visit of Officers

Sl. No.	Name of official	Date	Purpose and Venue
1.	Th. Surendranath Singh	June 2, 2008	Meeting on Natural Hazard Scénario in NE India at NEIST, Jorhat, Assam
2.	do	November 19-21, 2008	Workshop on Demonstration-cum-Technology Transfer for the North Eastern States organised by Meghalaya State S&T Council, Shillong
3.	do	December 17-18, 2008	11 th All India Patent Information Centre (PIC) Interactive Meeting Water World Resort, Mehsana, Gujarat
4.	L. Dinachandra Singh	June 2, 2008	Meeting on Natural Hazard Scénario in NE India at NEIST, Jorhat, Assam
5.		February 27-28, 2009	Implementation & Monitoring Committee Meeting on Landslide Hazard Zonation between None-Nungba along NH- 53 and Geotechnical Investigation at two Slides at IIT, Mumbai
6.	Dr. L. Minaketan Singh	Nov 03, 2008 – January 23, 2009	Participation in Foundation Training Programme for Scientists and Technologists sponsored by DST, Govt. of India and conducted by Indian Institute of Public Administration (IIPA), New Delhi – 110002.
7.	Kh. Rakesh	June 12 - 14, 2008	Regional Orientation Workshop on Micro Organisms: Let us observe and learn Dept. of Botany, Cotton College, Guwahati
8.	-do-	September 23 – 26, 2008	Regional level training Programme on Understanding Planet Earth at Indian Institute of Entrepreneurship, Guwahati
9.	Ch. Sarat Singh	November 19-21, 2008	Workshop on Demonstration-cum-Technology Transfer for the North Eastern States organised by Meghalaya State S&T Council, Shillong
10		March 4-5, 2009	Visiting M/s R.V. Briggs & Co. Pvt. Ltd., Kolkata for submission of Water samples collected from 20 identified Schools of Manipur for analysis.
11	Dr. R.K. Pritamjit Singh	December 17-18, 2008	11 th All India Patent Information Centre (PIC) Interactive Meeting Water World Resort, Mehsana, Gujarat

## 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	B.K.Tyagi, Scientist, Vigyan Prasar, New Delhi	March 24-26, 2009	Attending two days Orientation Programme for Science Communicators / science teachers as Govt. of India Official
2	Kapil K Tripathi Scientist, Vigyan Prasar, New Delhi	March 24-26, 2009	Attending two days Orientation Programme for Science Communicators / science teachers as Govt. of India Official

## 6.0 Library :

MASTEC has made a modest attempt to build up its own library. The collection is about 600 (six hundred ) 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.