Annual Report
1999-2000

Manipur Science and Technology Council (MASTEC)

(An Autonomous Body of S&T, Government of Manipur)

Central Jail Road, Imphal – 795001

CONTENTS :

1.1 BACKGROUND :

The Manipur Science & Technology Council (MASTEC) formerly, State Council of Science, Technology and Environment, Manipur was set up in the year 1985 with the initiatives from the Department of Science and Technology , Government of Manipur. . The Chief Minister, Manipur and the Minister in charge (S&T), Manipur are the Chairman and the Vice Chairman of the Governing Body of the Council. The Secretary ,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 19 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 works in co-ordination with the State Directorate of S&T in various areas of activities.

1.2 OBJECTIVES :

- To identify areas in which Science, Technology and Environment can be utilised for the achievement of the Socio-economic objectives of the State and in particular, tackling the problems of backwardness and underprivileged sections of Society;

- To advise on policies and measures necessary to promote Science, Technology and Environment and their utilisation for achievement of socio-economic objectives;

- To initiate, support, promote and co-ordinate Research Design and Development projects and programmes, including demonstration projects which are likely to be relevant to the problems, surveys and optimum utilisation of natural resources of the State;

- To promote and undertake activities for the popularisation of Science and Technology and the spread of a Scientific Temper and attitude among the people of the State;

- To supplement and complement the ongoing technical efforts of the State Government;

- To interact with other State, National and International Science and Technology bodies having similar or related objectives;

- To identify priority areas of Science, Technology & Environmental need for long term development of the State;

- To safeguard and promote the ecology and environment in the State of Manipur;

- To utilise Remote Sensing Techniques for planning, implementation and monitoring of development programmes with S&T inputs and to promote and support the activities of the Remote Sensing Centre;

- To promote, support and undertake the application of renewable sources of energy for the benefit of the people;

- To accept donations, raise subscriptions and receive grants, loans and subsidies from Government of India, Government of Manipur and other supportive agencies in India and abroad and to invest the resources towards the achievement of the objectives of the Council.

1.3 **ORGANISATION :**

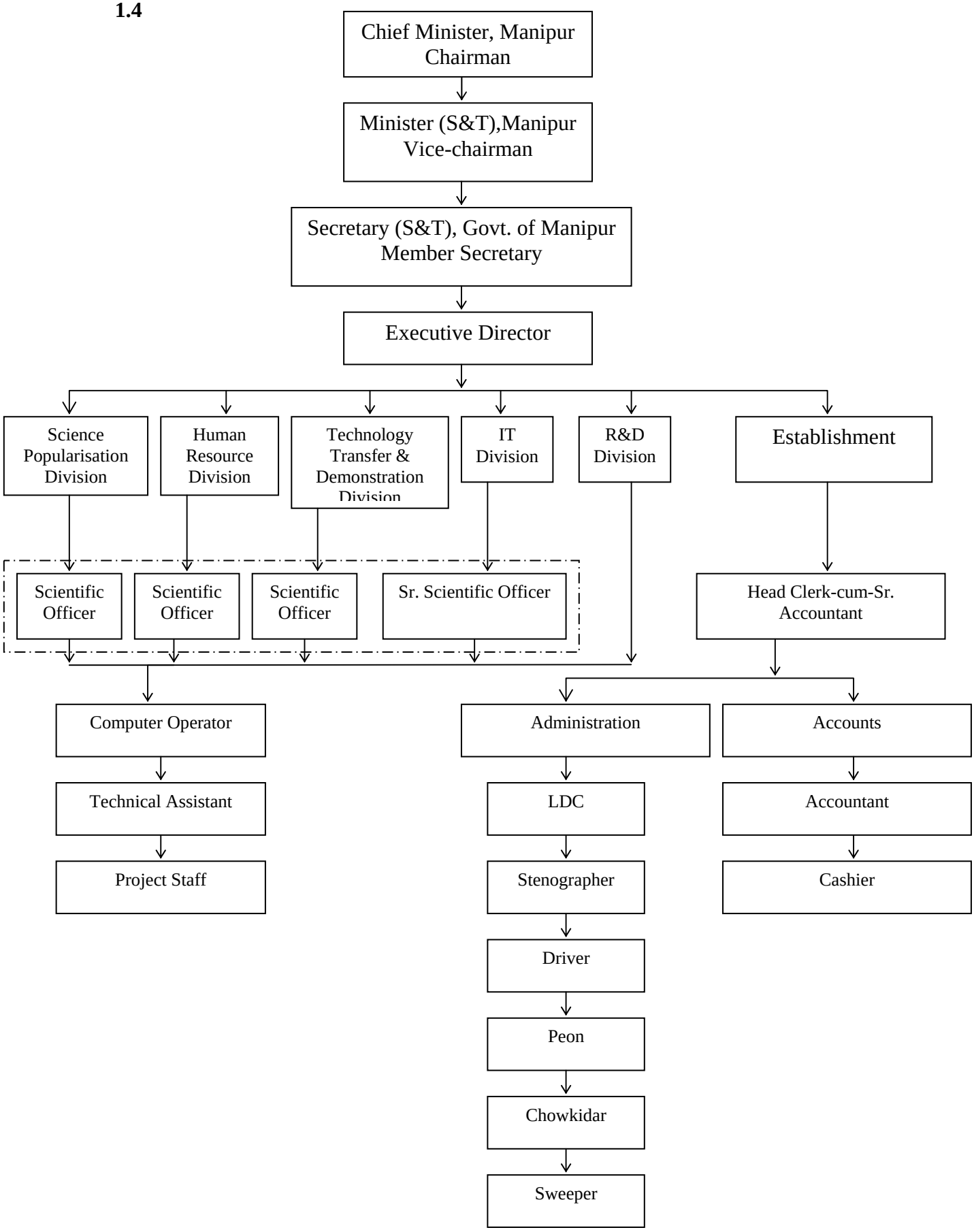
The Council has a Governing Body which consists of a wide distribution of membership having expertise in various fields, with the Chief Minister as the Chairman, and the Minister in charge, S&T, Manipur as the Vice Chairman. At present there are 22 members in the Council. The Council has an Executive 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.

Manipur Science and Technology Council (MASTEC) has at present five divisions viz.

- R&D Division
- IT Division
- Science Popularisation Division (SPD)
- Human. Resource Division (HRD)
- Technology Demonstration and Transfer Division (TDTD)

Organisational Chart of MASTEC:

1.4



EXISTING STAFF :

Sl. No.	Name	Qualification	Designation
1.	Dr. R.K. Shyamananda Singh	M.Sc., M.Phil, Ph. D.	Executive Director
2.	Th. Surendranath Singh	M. Sc., PGDCA, LLB	Sr. Scientific Officer
3.	Dr. L. Dinachandra Singh	M.Sc., PGDRS, Ph. D.	Scientific Officer
4.	Dr. L. Minaketan Singh	M.Sc., Ph.D.	Scientific Officer
5.	Kh. Rakesh	M.Sc.	Scientific Officer

Technical Staff :

6.	Ch. Shivaji	M.Sc., PGDCA	Computer Operator
7.	Mrs H. Binodini Devi	B.Sc.	Technical Assistant
8.	Y. Shyamsunder Singh	B.Sc., LLB	Technical Assistant

Ministerial Staff :

9.	Y. Rajen Singh	B.A.	Head Clerk cum Sr. Accountant
10.	K. Nara Singh	B.A.	Accountant
11.	Mrs R.K. Bhanisana Devi	B.Sc.	L.D.C.
12.	H. Thangthianmang	B.A	L.D.C.
13.	A. Tombi Devi	B.A.	Stenographer
14	L. Boyai Singh	VIII Passed	Driver
15.	L. Open Singh	X Passed	Peon
16.	S. Deven Singh	X Passed	Peon
17.	Jamkhanmuan	VIII Passed	Peon (Dak Runner)
18.	Mrs. Chingthanching	VIII Passed	Chowkidar
19.	Kh. Leidou Maring	VIII Passed	Sweeper

Project Staff :

20	M. Pradipchandra Singh	M.Sc.	J.R.F.
21.	Th. Shyam Singh	B.Sc.(Agri)	Supervisor
22.	Imo Thiyam	B.E.(Mech.)	Project Asst.
23.	R.K. Okendro Singh	X Passed	Field Worker
24.	Md. Abdul Jalil	VIII passed	Field Worker
25.	Md. Wahid Khan	VIII Passed	Field Worker

1.5 ACTIVITIES (workshop/seminars/trainings)

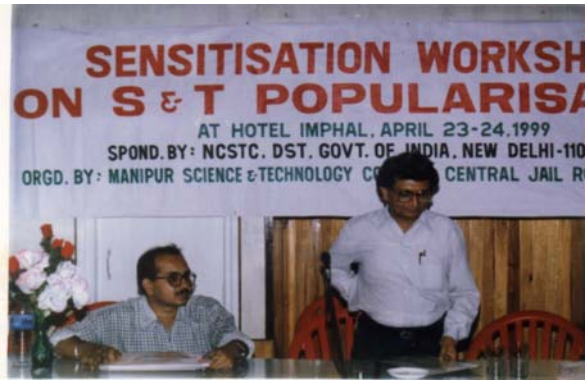
The Manipur Science and Technology Council (MASTEC) organised various centrally sponsored workshops / trainings relevant to the state including science popularisation to fulfill the objectives for establishment of the Council. The following are the programmes so far implemented by MASTEC during the past one year i.e. 1999-2000

Member Secretary and Executive Director, MASTEC inspecting Green experiment

1. **State Level Nature Orientation Workshop for master resource persons** was organised **at Loktak lake** during April 8-22,1999. Fifty participants (mostly students, teachers, representatives of the NGOs and interested individuals from different corners of the state) and seven resource persons including Shri N.M. Pattan aik and Mrs Pushpashree from SRUJANIKA, Bhubaneshwar, Orissa and Mr. B.K. Tyagi from DST, Government of India joined the camp. The local resource persons included Dr. P.K. Singh, Dr. Yadav, and Dr. B. Manihar Sharma from Manipur University, Dr. Kh. Shamungou Singh of D.M. College of Science, Imphal and Kh. Rakesh of MASTEC, Imphal During the workshop, a module of teaching based on songs, kits, play, lectures, slides/video shows etc. was developed to educate the children and the youth about the nature. The trainee resource persons found it interesting and could easily grasp the benefit of such module for nature orientation studies. The five day long programme was catalysed and supported by NCSTC, DST, New Delhi as part of their science popularisation programme.

Campers on a boat during the field trip

2. **Sensitisation workshop on S&T Popularisation** organised during April 23-24, 1999 received overwhelming response from the participants from various organisations in



Dr. V.B. Kamble and B.K. Tyagi from NCSTC, DST in the workshop

A section of the sensitisation workshop

the state. Forty-five participants including media professionals, doctors, NGOs etc. attended the workshop. The main objective of the programme was to sensitise the people about S&T popularisation . The officials from DST, Govt. of India highlighted about the programme and thrust areas of S&T popularisation which are being encouraged and supported by NCSTC, DST, Govt. of India. Six resource persons including Dr.V.B.Kamble, Dr. B.K. Tyagi, scientists from NCSTC, DST, Govt. of India, New Delhi interacted with the participants during the technical sessions.

A calendar of activities on science popularisation to be taken up by MASTEC during 1999-2000 was also identified during the workshop. The two day programme was supported by NCSTC, DST, Govt. of India.

3. **Science Meet 99** in connection with **National Science Day** was organised by Manipur Science and Technology Council (MASTEC) in association with the Manipur Association for Science and Society(MASS), a local science body, at the Sports Authority of India Complex , Takyelpat, Imphal during May 10-13, 1999. Shri W. Nipamacha Singh, Chief Minister, Manipur inaugurated the four day SM 99. Various activities of the meet were science model exhibition, science popular

Competitors at work during SM-99


The majestic SAI Indoor Stadium, the venue of SM-99


The house packed with students during SM-99

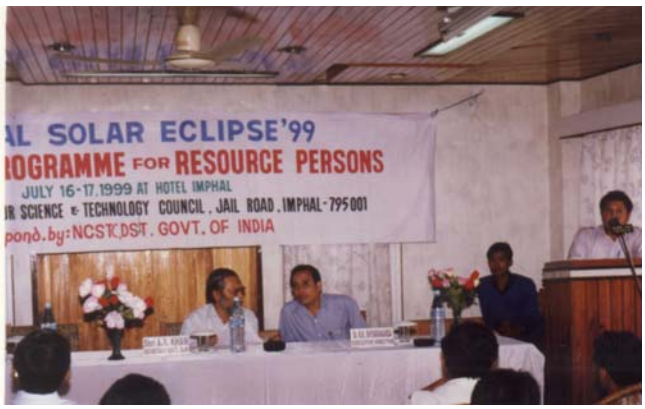
talks, science quiz competition, painting, scientific film shows, explaining science behind miracles, street play etc. The local private organisations such as Sharma Bros. & Instrumentation Centre, Imphal; Babina Diagnostic centre, Imphal; DELBROS, Imphal etc. donated some students prizes for the SM99. About 2000 students from various schools and colleges participated and witnessed the programme. Mr. Nimaichand Singh of St.

Edmund College, Shillong was given the Best Appreciation Award for SM 99. A seminar on Information Technology was conducted on the first day of the Science Meet 99. Prof. R. Subramanian, Director, Birla Planetorium, Calcutta, Mr. M.M. Khurana, Addl. Director, Department of Electronics, New Delhi and Dr. Kh. Khomdon Singh, Director, Manipur AIDS Control Society delivered lectures as key resource speakers. The programme was sponsored by NCSTC, DST, Govt. of India.

4. One day State level seminar on **Fishing Crafts & Gears for Inland Capture Fisheries** was organised on May 28, 1999 at Imphal. Sixty five registered participants including ten lady participants participated in the workshop. Nine resource persons from ICAR,Manipur University, State Fisheries department, including one scientist from CIFRI, Guwahati delivered lectures during the course of the technical sessions. The programme was taken up as part of the project on " Survey Documentation & Validation of Infra - technology of Fishing Crafts and Gears in Manipur " supported by DST, Govt. of India.

Dr. R.K.Shyamananda Singh, Executive Director, MASTEC conducting the group interaction

5. **Total Solar Eclipse Programme : MASTEC** sent three selected college teachers (physics) to Bhubaneshwar (Orissa) for training to become resource persons in the field of total solar eclipse under the sponsorship of NCSTC, DST. And **a Training Programme for Master Resource Persons** was organised during July 16-17, 1999 in which those who were trained at Bhubaneshwar were utilised as resource persons. Twenty five participants (teachers and NGOs) attended the programme. The programme was organised with the main objectives to remove superstitious beliefs about the solar eclipse from the innocent minds of the students. The master resource persons as well as the resource persons trained in the state level training workshop conducted series of lectures on

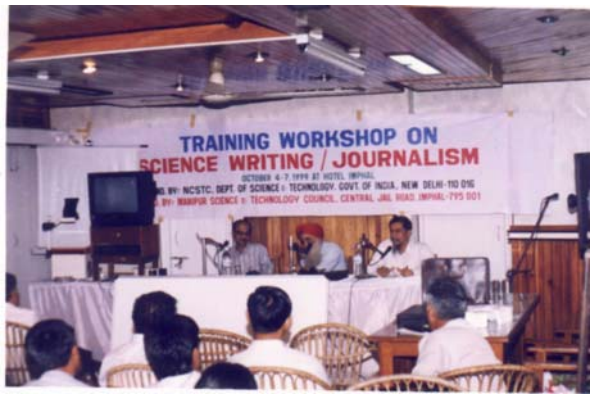


Shri A.R. Khan, Member Secretary and Dr. R.K. Shyamananda Singh, Executive Director at Inaugural Function of TSE, Resource Persons Training Workshop

solar eclipse during July 1- August 10, 1999. The lecture programme covered almost 90 schools in various districts in the state. A state level essay competition for School Children on **total solar eclipse** was held on July 25, 1999 from which three best students were selected. The selected school students led by one official from MASTEC joined the **Total Solar Eclipse** viewing programme on August 11, 1999 at the Bhuj under the sponsorship of NCSTC, DST, Govt. of India.

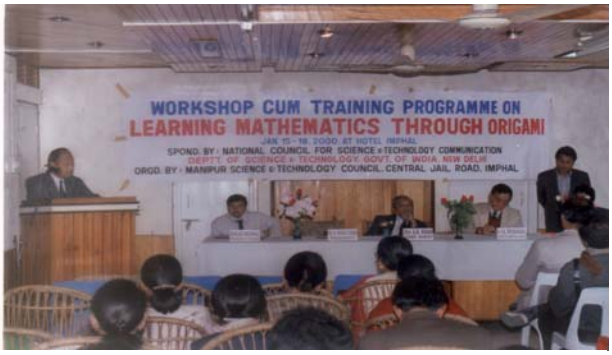
A Student sponsored by MASTEC at Bhuj, (*Gujarat) viewing TSE 99*

6. The state level - **Training workshop on Science Writing/ Journalism** organised by MASTEC during October 4-7, 1999 was sponsored by NCSTC, DST, Govt. of India. Thirty seven participants including five lady science communicators representing academia, scientific professionals, teachers, science NGOs etc. participated in the workshop. During the course of the workshop, eleven resource persons imparted in-depth training on various aspects of science communication The participants prepared and presented scripts (for radio, television, film, news papers etc.) on various themes of topical importance for print and electronic media. The registered participants on the last day of the four day training programme, decided to form one Asso ciation for Science Writers in the state. And Later, the association has been named 'Manipur Science Communicators Association (MASCA)'.



Noted Science Communicators - (Left) Dr. D.C. Goswami, Prof Manmohan Singh (Centre), R.K. Ranendrajit, Editor, the Freedom (right) addressing participants

7. A state level **Training workshop on learning mathematics through origami** was held during January 15-18, 2000 at Hotel Imphal. Thirty five participants were present in the training. Two resource



Inaugural Session of origami workshop

persons (Mr. Asis Karak & Ranjan Maishal) from Science Centre, Midnapur, West Bengal imparted in depth training to the participants.

8. Nature Orientation Camp for the children of the Imphal East District was organised during March 13-16, 2000 at Porompat, Imphal. Seventy participants representing sixty students and ten teachers from ten schools participated in the programme. The activities during the camp included lectures, field surveys, practical demonstrations in the field using low cost equipments. The camp was catalysed and supported by NCSTC, DST, Govt. of India.

Dr. Khashim Ruivah, Minister (S&T) inaugurating the nature camp

9. **Training in Rabbit and Japanese Quail Production** was organised during March 27-29, 2000. Altogether 30 registered participants attended the training programme. The main objective of the programme was to impart training to the farmers/unemployed youths about quail and rabbit production and generate self employment by setting up small scale cottage units in the state of Manipur. Four resource persons including three from CSIR (Dr. M.S. Virdi, Head, PTC, Bhopal and two scientists led Dr. V.K. Gupta from RRL, Jammu)) imparted in-depth training to the participants. The programme was catalysed by Polytechnology Transfer Centre (PTC), Bhopal and RRL, Jammu and sponsored by CSIR, New Delhi.

10. **MASTEC** in association with Manipur Science Communicators Association (MASCA), a local science body organised a **Millenium Science Seminar** on December 31, 1999 at the campus of the Modern College, Imphal to observe the new millenium year. Prof. H.N.K. Sarma, Physics department, Manipur University and Dr. T. Meinya Singh, Astro- Physicist, President, MASCA delivered lectures.

1.6 MEETINGS / CONFERENCES ORGANISED :

MASTEC organised a Meeting of the High Level Team of Scientists from CSIR (led by Dr. H.R. Bhojwani, Science Secretary and Head, H.U. Unit) & DST, Govt. of India (led by Dr. Laxman Prasad, Advisor) with state officials (led by Deputy Chief Minister of the Govt. of Manipur on Nov 15, 1999 at the C.M.'s Secretariat Conference Hall and with NGOs on Nov. 16, 1999 at the State Guest House on the main objectives of

activating the Regional Research Laboratory (RRL) Sub-station under CSIR at Imphal established in the year 1972 . Earlier, The CSIR and DST. Govt. of India team paid an inspection visit to the RRL Sub- Station Campus at Lamphel, Imphal. The Deputy Chief Minister chaired the meeting. Prof. Gangmumei Kamei, Minister, Law and Forest & Environment, E. Kunjeshwar Singh, Minister, Revenue, Morung Makunga, Minister

Meeting of State Officials led by Dr. L. Chaandramani Singh, Dy. Chief Minister, Manipur, Prof. Gangmumei Kamei, Minister (Forest & Env.), Morung Makunga, Minister(S&T), E.K.Singh Minister (Revenue & Planing), Prof. I.S. Khaidem, Chairman, MPSC, Manipur with CSIR & DST, Govt. of India Officials

(S&T), Chairman, Prof. M.Horam, Hill Areas Committee of the government of Manipur were also present in the meeting. Among others the Vice-Chancellors of the Central Agricultural University, Imphal, Manipur University, Imphal and the Chairman, Manipur Public Service Commission, Imphal were present in the interaction. A number of recommendations were made in the meeting as follows :

i) Upgradation of RRL Sub-station Imphal with compound wall, laboratory infrastructure and more scientific manpower;

ii) Opening of a Technology Demonstration Centre at MASTEC;

iii) Empowering MASTEC as CSIR window organisation.

1.7 MEETINGS/CONFERENCES / WORKSHOPS ATTENDED :

Dr. Shyamananda Singh attended an International Symposium on Efficient Water use in Urban Areas held during June 8-10, 1999 in the Kobe City of Japan. He visited IIT Kharagpur (West Bengal) during October 25-26, 1999 for a consultation meeting on Fishing Crafts and Gears. He also visited CIFE, Mumbai and CIFRI, Barrackpore in connection with the project on Fishing Crafts and Gears.

Th. Surendranath Singh, Senior Scientific Officer participated in the India International Trade Fair during November 14-24, 1999 during which the prototype Pedal Operated Rice Mill (National Invention Award Winner) developed by MASTEC was exhibitted. Shri Surendranath Singh participated in the review meeting on science and

society projects held during November 25-26, 1999 at Lucknow. He was involved in the Video/Film shooting at Delhi on Intellectual Property Rights organised by TIFAC, DST ,Govt. of India during February 17-19, 2000. He attended a training on improved pottery practice with three local skilled artisans during March 6-15, 2000 at Central Glass and Ceramic Research Institute (CGCRI), Calcutta.

Dr. L. Dinachandra Singh, Scientific Officer attended a Review Meeting of the Flood Hazard Zonation Project sponsored by NRDMS Division of DST, Govt. of India held on July 22, 1999 at New Delhi

Dr. L. Minaketan Singh, Scientific Officer attended a Workshop on Application of Radio Isotopes and Radiation in Society organised by NEHU jointly with Meghalaya S&T Council and Bhaba Atomic Research Centre (BARC), Mumbai during Nov 26-27, 1999 at Shillong. The programme aimed at spreading awareness about uses of radiation and radio isotopes in various fiels such as medicine, agriculture, food processing etc.. Dr. Minaketan Singh also attended a 5 day Science motivation programme at RRL Jorhat (Assam) during February 7-11, 2000 with a team of 21 students and 5 science teachers from 6 different schools in the state.

Kh. Rakesh, Scientific Officer attended a Seminar on Patenting in Biotechnology held on Nov. 12, 1999 at Guwahati.

1.8 SCHEMES

MASTEC - RSIC Assistance Programme: The Regional Sophisticated Instrumentation Centre (RSIC) , Shillong is one of the seven centres in India where expensive sophisticated analytical instruments are made available to scientists/research scholars under one roof under a nationwide mission of the Department of science and Technology , Govt. of india. Very few scientists/researchers from Manipur have used the facilities at RSIC, Shillong in the past 12 years of its existence.

Realising the importance of precision data in today's research world and with an intention to assist the scientists in the state to get an assess to it. MASTEC and RSIC, Shillong have jointly launched a programme under which all the instruments at RSIC, Shillong are made available to the scientists from Manipur free of cost.

FACILITIES :

1. UV-VIS-Spectrophotometer, 2. Infrared Spectrophotometer, 3. FTIR Spectrophotometer (i) DA-3.16, (ii) DA-8, 4. Nuclear Magnetic Resonance (NMR), 5. FTNMR (300) Mhz, 6. Electron Microscope (i) SEM, (ii) TEM, 7. Atomic Absorption Spectrophotometer, 8. Inductively Coupled Plasma (ICP) Emission Spectrophotometer, 9. C-H-N-O-S Analyser, 10. DMRX Universal High Resolution Optical Microscope with image Analyser System

Seven researchers have been benefited by the scheme during the year 1999-2000

1.9 PROJECTS :

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 central government agencies/organisations and** being implemented by the professional manpower of the Council

1. Augmentation of productivity and quality of rural pottery and diversification
2. Flood Hazard Zonation of Manipur Valley
3. Sustainable cropping of Ginseng and Thalictrum
4. Solar Passive Demonstration Building
5. Association of Women in Wasteland development in Taretkhul, Imphal East District, Manipur
6. Manual Rice Transplanter
7. Dialong Micro Hydel Project

1.91 HIGHLIGHTS OF THE PROJECTS :

A. Completed Projects:

1. Hydromorphogeological Investigations in and around Jiribam, Manipur :

Salient Findings : On the basis of lithology, structure and degree of denudational processes, the study area has been hydromorphogeologically classified into the units viz. 1. Alluvial Plais 2. Denudational hill (Residual Hill) and 3. Structural hill. The units such as structural hill and residual hill (denudational hill) act as run off. Degraded forest and shifting cultivation practice on the moderately steep slopes of structural hills cause more erosion. Recharge through weathered, jointed rocks are limited. Chances of ground water occurrence in this zone are very poor. Some springs occurring at the foot of these hills can be profitably utilised for limited domestic needs. About 120 lineaments were picked up out of which some lineaments could have geological impact over ground water occurrence for which further study is required.

Alluvial plains are the prospective zone in the area of study.. These zones consist of unconsolidated deposits comprising of gravel, fine sand, mixed with silt/clay favouring good scope for occurrence of ground water resources. Ground water occurs under unconfined aquifer system. Field Data collected from twenty nine inventoried dug wells reveals that the water table varies in the dug well varies from place to place in the study area. In the plains the water level varies from 1 m to 3m below ground level (b.g.l) where as in the slightly higher plains it varies from 3 to 6.6 m b.g.l. Some wells have direct intergrannular link with the River environment i.e. when the level of the Jiri River goes down, the water level in the wells also goes down and vise versa . The fluctuation of water in such well goes upto 8.04 m. Most of the dug wells are shallow. Hence, water in the lean season is dry or lie at the nearest bottom of the well.

Suggestions and recommendations :

i. The data generated during the two years project period was not sufficient to pin point the target area for tapping of ground water. However, the study could identify the broad prospective zones for ground water exploration. The area has good scope for development and exploration of ground water resources.

ii. The depth of the wells could be increased provided unconsolidated deposits exist further downwards so that water would always be available in the wells during the lean period. Dug cum bore well can also be encouraged.

iii From the survey experience of the PI, it was observed that the practice on safe groundwater utilisation in the area was almost nil . Awareness on use of safe drinking water for health was yet to be spread among the people particularly in the areas away from the Jiribam Town.

iv. Yield of local springs have tremendously decreased as per villagers information. This will be perhaps due to excessive activities along the slopes thereby reducing recharge and increasing erosion. Programmes to conserve spring sanctuary are required.

v Further research oriented study in the field is required to generate more geoscientific data for future planning of the area.

2. Pedal Operated Rice Mill :

Salient Achievements :

Ten numbers of the prototype Pedal Operated Rice Mill (Cover page) have been developed and tested its efficiencies. The Mills were exhibited at the India International Trade Fair in New Delhi in the year 1999. The Patent file has been made for invention of the Mill. The National Invention Award was conferred to the P.I. of the project in honour of the prestigious invention of the Mill and the Award was distributed by MM Joshi, Union Minister, Human Resources on the observation day of the National Technology Day, May 11, 1999 at New Delhi.

3. **Survey, Documentation and Validation of Infra-technologies for fishing crafts and gears in Manipur.** :

Salient Achievements :

Manipur is endowed with rich water resources as hill streams, rivers, lakes and wetlands. The biggest freshwater lake of India, the Loktak Lake (289 sq. km.) is situated in Manipur Valley along with numerous other wetlands covering an area of about 550 sq. Km. ture fishery in the hill streams is practiced through many harmful devices like poison and explosives. Both Culture and Capture Fishery in the Valley of Manipur are very active. However, the Capture Fishery in Manipur still remains a subsistence occupation due to unscientific methods. When there is a potential of landing 60,000 tonnes of fish in a year, the present landing is 15,000 tonnes against the demand of the state figuring above 22,000 tonnes.

Dug out canoes used in capture fishery in Manipur

Suggestions and Recommendations : The main aspects of craft and gears that need scientific attention are :

1. To give more stability and proper size and shape to the existing wooden dugout canoes for working in all weather conditions and with greater efficiency
2. Promotion of plank-canoes and boats to gradually replace the dugout canoes
3. Introduction of crafts of other materials like FRP
4. Causing a fishing gear revolution through changes in the crafts performance so that many of the present harmful methods and gears may be checked

B Ongoinig Projects :

1 **Augmentation of productivity and quality of rural pottery and diversification** :

The project aims at

- bringing about an overall improvement in the productivity and quality of existing rural pottery which are unglaged, porous and fragile.
- diversification of product range especially in the production of Glazed Terracotta for creating new avenues for sustenance of rural pottery
- transfer of technology package to the village potters for the overall benefit of rural potters.

2. Flood Hazard Zonation of Manipur Valley :

The project covers identification and mapping of flood prone areas and generation of a data base for use in landuse and flood management in Manipur Valley and suggestion of remedies to the present flood problems in the valley.

3. Sustainable cropping of Ginseng and Thalictrum :

The project aims at saving Ginseng in its natural habitat in Manipur from uprooting by the ignorant tribal folks through introduction of scientific farming in a lab-to-land practice. Micro-propagation of ginseng through tissue culture and intercropping with another medicinal Thalictrum will be involved. The project involves distribution of Ginseng seedlings to groups of tribal farmers for plantation in micro-watersheds on the hills of Manipur.

Panax pseudo-ginseng found in Manipur

4. **Solar Passive Demonstration Building** :

The project aims at reducing dependence on electrical energy for building to half through systems integration of solar passive architectural designs in public and private buildings. The components of the project include 1. Training workshop for engineers and architects about energy efficient buildings and 2. Construction of a demo building with solar passive architecture at Imphal which will be used later as office by MASTEC.

Dr. Khashim Ruivah, Minister (S&T) laying the foundation stone of the Passive Solar Demo Building at Imphal

5. Association of Women in Wasteland development in Taretkhul, Imphal East District, Manipur : The objectives of the project are

- to create awareness amongst the villagers about the ecological imbalance due to mass felling of trees for firewood, charcoa and shifting cultivation
- to impart technical knowledge to the villagers and village women about preventing the expansion of wasteland through classroom type teaching, field works, film shows etc.
- to demonstrate the success of afforestation projects operated through peoples participation, particularly women.
- To make the area evergreen and nature friendly through afforestation
- To supplement income through plantation and nursery seedlings
- Utilise of degraded land for plantation of trees over the next 4 years to reclaim the degraded community reserve land.

6. Manual Rice Transplanter :

The main objectives include

. To introduce a new technology of manual rice transplanter in the state.
- To have a clear weed free environment of plantation.
- To obtain recommended row to row and plant to plant spacing plantation

7. Dialong Micro Hydel Project :

The objectives of the project are as follows :

-- to demonstrate the use of the cross flow turbine developed by Indian Institute of Science (IIS) under DST, Govt. of India project in micro-hydel generation.

-- to seek people's participation in micro-hydel project implementation and management

-- to generate people's income through power dependent home scale industries difficult tribal areas.

1.10 INFRASTRUCTURE DEVELOPMENT :

MASTEC has been equipped with the following items.

1. Pentium 75 MHZ	1 (one)
2. Pentium 200 MHZ	1 (one)
3. Pentium II	2 (two)
4. Pentium III	1 (one)
5. Desk jet Printer	2 (two)
6. Dot Matrix Printer	1 (one)
7. UPS (1KVA)	1 (one)
8. Fax	1 (one)
9. Video camera	1 (one)
10. VCR	1 (one)
11. Slide projector	1 (one)
8. Overhead projector	1 (one)
9. Scanner Umax	1 (one)
10. Light table	1 (one)
11. E-mail	
12. Internet	

1.11 **LIBRARY** : MASTEC has made a modest attempt to built up its own library. The collection is about 300 (three hundred) volumes of various disciplines. In addition, a number of periodical journals, newsletters, bulletins, local papers, science pubications etc. are received regularly. MASTEC aims at strengthening the library of the Council.

1.12 AWARDS :

Th. Surendranath Singh, Senior Scientific Officer was conferred the **National Invention Award on May 11, 1999 (National Technology Day) for his prestigious invention of a prototype Pedal Operated Rice Mill**, a project supported by Science and Society Division, DST, Govt. of India, New Delhi. The award carries a cash amount of Rs 25000/- with a citation and Free Travel expenses. The National Research and Development Corporation (NRDC) Delhi sponsored the award.

Th Surendranath Singh receiving
NATIONAL INVENTION AWARD
from Dr. MM Joshi, Union Minister for Science & Technology
at Hotel Ashok, New Delhi

1.6 LIST OF VISITORS

Sl. No.	Name	Designation & Organisation	Purpose / programme for which visited
1.	B.K. Tyagi	Scientist C NCSTC, DST, New Delhi	Nature Orientation Camp
2.	Dr. V.B. Kamble	Scientist F NCSTC, DST, New Delhi	Sensitisation workshop on S&T popularisation
3.	Prof. R. Subramanian	Director Birla Planetorium, Calcutta	Science Meet 99
4.	M .M. Khurana	Addl. Director Department of Electronics, Govt. of India, New Delhi	Science Meet 99
5.	Dr. Manoj Patairiya	Scientist D NCSTC, DST, New Delhi	Training Workshop on Science Writing/Journalism
6.	Dr. D,C. Goswami	Scientist F RRL, Jorhat	Training Workshop on Science Writing/Journalism
7.	Dr. C.M. Nautiyal	Scientist Birbal Sahni Institute of Paleobotany, Lucknow	Training Workshop on Science Writing/Journalism
8.	Prof. Manmohan Singh	Head, Regional Science Centre,	Training Workshop on Science Writing/Journalism
9.	Asis Karak	Science Centre, Midnapur, W.B.	Workshop on Learning Mathematics through origami
10.	Ranjan Maishal	Science Centre, Midnapur, W.B.	Workshop on Learning Mathematics through origami
11.	M.S. Virdi	Head Polytechnology Transfer Centre, Bhopal	Training in Rabbit and Japanese Quail Production
12.	Dr. V. K. Gupta	Scientist, RRL, Jammu	Training in Rabbit and Japanese Quail Production
13.	Hariom Nanda	Director , Matronics India Limited, New Delhi	Micro Hydel Project
14.	Mr. Anil Misra	Fellow, Tata Energy Research Institute, New Delhi	Solar Passive Building Consultation
15.	Dr. Laxman Prasad	Advisor DST, GoI, New Delhi	CSIR-DST meeting with State Officials
16.	Dr. H.R. Bhojwani	Science Secretary CSIR, New Delhi	CSIR-DST meeting with State Officials
17.	Dr. H.K. Gupta	Director NGRI, Hyderabad	CSIR-DST Meeting with State officials
18.	Dr. A.K.Verma	Scientist CSIR, New Delhi	CSIR-DST Meeting with State Officials
19.	Dr. A.K. Bhatia	Scientist CSIR, New Delhi	CSIR-DST Meeting with State Officials

20.	S.K. Ghosh	Scientist CGCRI, Calcutta	CSIR-DST Meeting with State Officials
21.	S. Chakraborty	Scientist CGCRI, Calcutta	CSIR-DST Meeting with State Officials
22.	Dr. R.R. Rao	Scientist, NBRI, Lucknow	CSIR-DST Meeting with state officials
23.	Dr. T.C. Sharma	Scientist, RRL, Jorhat	CSIR- DST meeting with state officials
24.	Dr. R. Rajendran	Scientist, Leader Research Institute., Chennai	CSIR- DST meeting with state officials
25.	Ravi Kumar	Scientist, RRL, Trivandrum	CSIR- DST meeting with state officials
26.	Dr. Narendra Verma	Scientist, CBRI Roorkee	Meeting on low cost building material in Manipur
27.	Ashok Kumar	Architect, CBRI Roorkee	Meeting on low cost building material in Manipur
28.	V.K. Gupta	Scientist, CBRI Roorkee	Meeting on low cost building material in Manipur