# Annual Report
## 2021 - 2022

Manipur Science & Technology Council
Science & Technology Complex, Takyelpat, Imphal-795001
Website: https://mastec.nic.in email:mastec@nic.in

# Annual Report
# 2021 - 2022


**MANIPUR SCIENCE & TECHNOLOGY COUNCIL**
(An autonomous body of the Dept. of Science & Technology, Govt. of Manipur)
Science & Technology Complex, Takyelpat, Imphal - 795001
Phone:0385-2443451; e-mail: mastec@nic.in

# Annual Report 2021-2022
# MANIPUR SCIENCE & TECHNOLOGY COUNCIL

CONTENTS Page

## 1.0 Background:

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

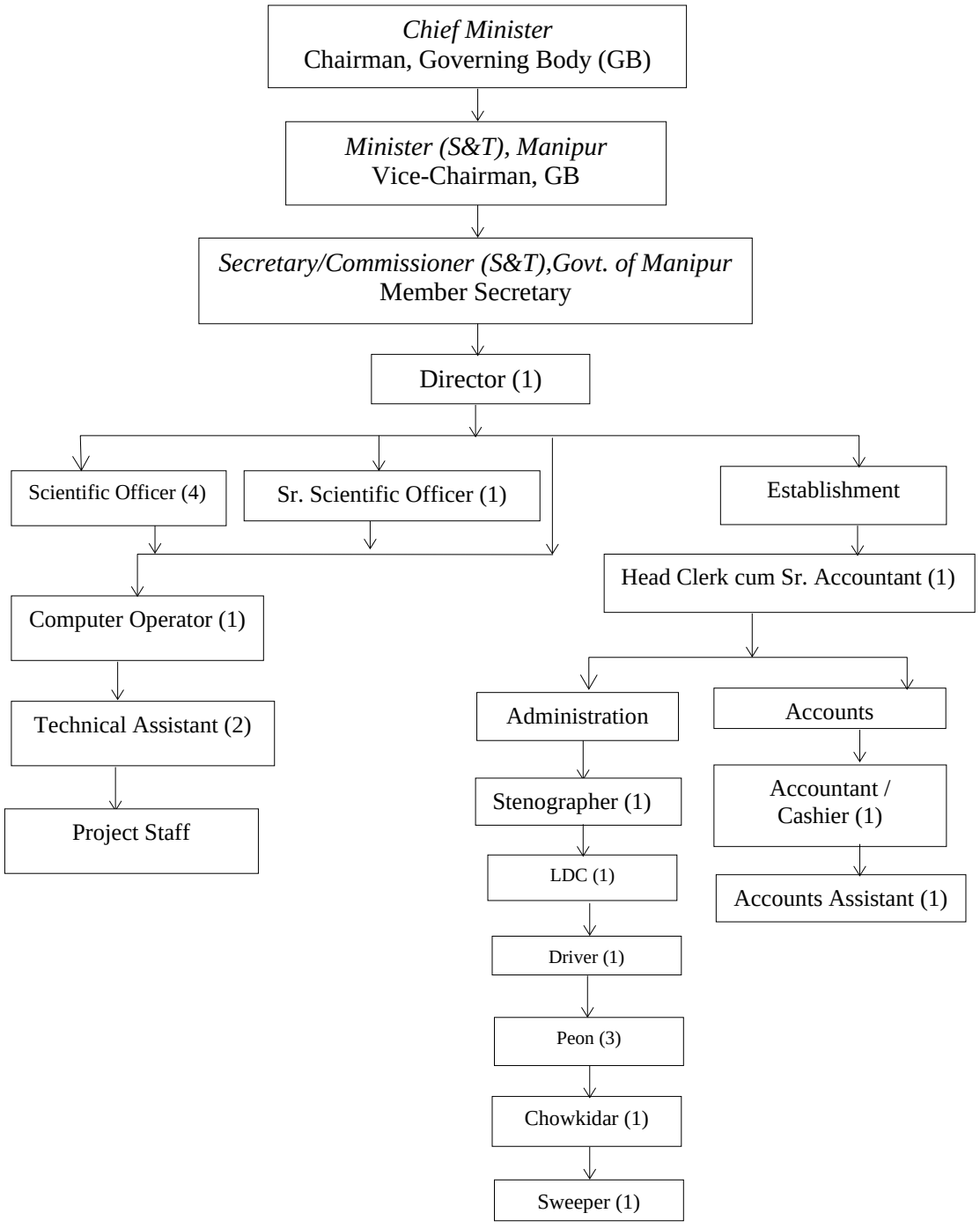
The autonomous Council is served by its own Secretariat of 20 (twenty) manpower supported by the Department of Science and Technology (DST), Government of India. The Council Secretariat operates with the grants received from DST, Government of India, DST, Government of Manipur and the funds received from various agencies through projects and programmes. The Council works in co-ordination with the State Directorate of S&T in various areas of activities.

### 1.1 Objectives of the Council

- To identify areas in which Science, Technology and Environment can be utilised for the achievement of the Socio-economic objectives of the State and in particular, tackling the problems of backwardness and underprivileged sections of Society;
- To advise on policies and measures necessary to promote Science, Technology and Environment and their utilisation for achievement of socio-economic objectives;
- To initiate, support, promote and co-ordinate Research Design and Development projects and programmes, including demonstration projects which are likely to be relevant to the problems, surveys and optimum utilisation of natural resources of the State;
- To promote and undertake activities for the popularisation of Science and Technology and the spread of a Scientific Temper and attitude among the people of the State;
- To supplement and complement the ongoing technical efforts of the State Government;
- To interact with other State, National and International S & T bodies having similar or related objectives;
- To identify priority areas of Science & Technology for long term development of the State;
- To promote, support and undertake the application of renewable sources of energy for the benefit of the people;
- To accept donations and receive grants, and subsidies from Government of India, Government of Manipur and other supportive agencies 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 24 employees (including project staff) in the Council. The Council has an Executive Committee to assist the activities towards achieving the objectives of the Council. The Vice-Chairman of the Governing Body of the Council heads the Executive Committee as its Chairman. The Secretary/Commissioner (S&T), Government of Manipur is the Member Secretary of the Council. The Member Secretary is the Chief Executive of the Council Secretariat. The organisation chart is shown below.



### 1.3 Existing Staff

Altogether 20 manpower (6 Officers including Director, 3 technical staffs and 11 ministerial staffs) supported by DST, Govt. of India are working in the Council. In addition, four project staffs including one Junior Research Fellow (PIC) works in the Council.

## 2.0 Short-term Activities including Science Popularisation:

The Manipur Science and Technology Council (MASTEC) organised various centrally sponsored programmes/workshops/trainings relevant to the state including science popularisation to fulfil the objectives for establishment of the Council. The following were the short-term programmes implemented by the Council during 2021-2022.

### 2.1 Continuing Programme of National Mathematics Day 2020 & National Science Day 2021

Manipur Science & Technology Council (MASTEC), Imphal in association with Science Teachers' Forum Manipur (STFM) and Manipur Science Communicators' Association (MASCA) organised a 4-day continuing programme of Celebration of National Mathematics Day 2020 and National Science Day 2021 during April 17-20, 2021 at MASTEC Complex, Takyel, Imphal. The programme was inaugurated by Prof. H.N.K. Sharma, Former Vice Chancellor, Manipur University, Canchipur as Chief Guest. Smt. Homila Hongrei, Director, Dept. of Science & Technology, Govt. of Manipur was the Guest of Honour and Dr. L. Dinachandra Singh, Director, Manipur Science & Technology Council, Imphal, presided over the Inaugural Function. The dignitaries also opened the Science & Mathematics Model Exhibition stalls.

#### 2.1.1 Activities of Celebration of National Mathematics Day 2020 & National Science Day 2021

The main activities of Celebration of National Mathematics Day 2020 & National Science Day 2021 were Science & Mathematics Model Exhibition-cum-competition, Spot Painting competition, Mathematics Competition, Science Written Quiz competition and Mathematics Written Quiz Competition etc.

#### 2.1.2 Science & Mathematics Model Exhibition-cum-Competition

The competition was organised for students reading in Class VIII – XII. Single student from different schools participated and displayed their Exhibit Models. Due to

***Exhibitors in the Mathematics Models Exhibition-cum-competition***

***Science Models Exhibition in the Celebration of National Mathematics Day 2020 & National Science Day 2021***

COVID-19 pandemic, number of participants was little reduced this time as compare to previous years' Exhibition. However, altogether 35 Mathematics Models and 55 Science Models were exhibited by 90 students from different schools of the State. Experts from various science streams assessed the Science Models for selection of position holders. Also, Mathematics Teachers/professional from different institutions/ organisations assessed the Mathematics Model for selection of position holders. Two best Guide Teachers one each from Mathematics Model Exhibition and Science Model Exhibition were also selected. The results of Science & Mathematics Model Exhibition-cum-Competition of Celebration of National Mathematics Day 2020 and National Science Day 2021 were as below:

**Result of Mathematics Model Competition:**

| **Position** | **Name of the Winners** | **Class** | **Name of the School** | **Title of Mathematics Model** |
|---|---|---|---|---|
| First | Dolly Yensembam | VIII | Catholic School, Canchipur | Parts of the circle |
| Second | Mohamed Sabir Ahmed | X | Manipur Creative School | Multiplication Tool |
| Third | Lenthoibee Laishram | XI | UNACCO School | Integration |
| **Consolations** | | | | |
| 1 | Sunidhi Takhellambam | X | Ananda Purna School of Sciences, Thoubal | Value of Pi ($\pi$) |
| 2 | Sanaren Athokpam | X | St. George High School, Wangkhei | Different shapes of geometrical figure |

**Result of Science Model competition:**

| **Position** | **Name of the Winners** | **Class** | **Name of the School** | **Title of Mathematics Model** |
|---|---|---|---|---|
| First | Thokchom Rezia Devi | X | Oinam Govt. Hr. Sec. School, Oinam | Bio-degradable Nursery Plat Pot |
| Second | Lanchenbi Angom | IX | Brighter Academy Khumbong | Eradication of mosquito larvae in scientific way. |
| Third | Sania Ahmed Tampak | VIII | Manipur Creative School | Low-Cost Periscope |
| **Consolations** | | | | |
| 1 | Irashini Laiphrakpam | IX | Diligent Public School, Moirang | Charcoal Thermo Heater |
| 2 | Yengkhom Jessica Devi | X | Brighter Academy Khumbong | Drip Irrigation without Electricity |

### 2.1.3 Spot Painting Competition

The spot painting competition was organized on the 1st day of the45-day programme. The competition was organised in 3 (three) categories/groups viz., i) Sub-


***Participants in the Spot Painting Competition in the Celebration of National Mathematics Day 2020 & National Science Day 2021***

Junior Group (Class III—V), ii) Junior Group (Class VI-VIII) and iii) Senior Group (Class IX-X). Altogether 60 students from 48 schools, 82 students from 74 schools and 52 students from 45 schools participated in the competition of the Sub Junior, Junior and Senior Category respectively. The following were the winners of the competition.

**Sub-Junior Group (Class III – V)**

| **Position** | **Name of the Winners** | **Class** | **Name of the School** |
|---|---|---|---|
| First | Brikrama Lourembam | V | Comprehensive School, Oinam |
| Second | Sharungbam Kundan Singh | IV | M.I. Academy |
| Third | Rex Sharungbam | IV | Little Master English School, Samurou |
| **Consolations** | | | |
| 1 | Siddhartha Haobijam | IV | St. Joseph's Hr. Sec. School, Imphal |
| 2 | Pheedam Sinam | V | Ramkrishna Mission School, Imphal |

**Junior Group (Class VI – VIII)**

| **Position** | **Name of the Winners** | **Class** | **Name of the School** |
|---|---|---|---|
| First | Angela Heikrujam | VI | K.V. No.1 |
| Second | Julian Loitongbam | VIII | K.V. No.2 |
| Third | Lanleiba Sinam | VIII | Ramkrishna Mission School, Imphal |
| **Consolations** | | | |
| 1 | Sunaina Saikhom | VI | K.V. No.1 |
| 2 | Sharungbam Echan Devi | VI | J.N.V. Khumbong |

**Senior Group (Class IX – XII)**

| **Position** | **Name of the Winners** | **Class** | **Name of the School** |
|---|---|---|---|
| First | Yaikhombi Loitongbam | X | K.V. No.1 |
| Second | Venish Keisham | XII | K.V. No.2 |
| Third | Daulas Lambamayum | X | St. George High School, Wangkhei |

| Consolations | | | |
|---|---|---|---|
| 1 | Presila Heikrujam | IX | K.V. No.1 |
| 2 | Julie Ngangbam | X | Wangkhei High School |

### 2.1.4 Mathematics Competition

The Mathematics Competition was organized for students of three different classes viz., i) Class VI, ii) Class VII and iii) Class VIII. Altogether 150 students from 122 schools, 110 students from 95 schools and 180 students from 144 schools participated in the


***Students taking part in the Mathematics Competition in the Celebration of National Mathematics Day 2020 & National Science Day 2021***

Mathematics Competition for Class V, Class VII and Class VIII respectively. The competition was held on the 2nd day of the 4-day programme at Model Higher Secondary School, Imphal. The following were the winners of the competition.

**Class VI**

| Position | Name of the Winners | Class | Name of the School |
|---|---|---|---|
| First | Valentina Laishram | VI | Regular English High School, Imphal |
| Second | Sharungbam Echan Devi | VI | J.N.V. Khumbong |
| Third | Thangjam Dayapati Devi | VI | M.I. Academy |
| **Consolations** | | | |
| 1 | Sharungbam Rishika Devi | VI | M.I. Academy |
| 2 | Kiranbala Sinam | VI | S.K. Ideal High School, Ngairangbam |

**Class VII**

| Position | Name of the Winners | Class | Name of the School |
|---|---|---|---|
| First | Leimapokpam Loyangamba Meitei | VII | Leimapokpam Muhindro High School |
| Second | Soibam Aaron Singh | VII | Tiny Tots' Unique School, Imphal |
| Third | Dushant Moirangthem | VII | Pitambara English School |
| **Consolations** | | | |
| 1 | Merina Chirom | VII | Nirmalabas High School, Imphal |
| 2 | Laipubam Margarita Devi | VII | Little Flower School, Gorakpur, Uttar Pradesh |

**Class VIII**

| Position | Name of the Winners | Class | Name of the School |
|---|---|---|---|
| First | Shoibam Apson | VIII | UNACCO School |
| Second | Anchana Ningthoujam | VIII | The K.M. Blooming Hr. Sec. School, Khangabok |
| Third | Nepoliyan Thokchom | VIII | The K.M. Blooming Hr. Sec. School, Khangabok |
| **Consolations** | | | |
| 1 | Md. Danish Hussain | VIII | J.N.V. Yaralpat, Imphal East |
| 2 | Khundrakpam Tompok Meitei | VIII | The K.M. Blooming Hr. Sec. School, Khangabok |

### 2.1.5 Science Written Quiz Competition

The competition was organised for students reading in Class IX-XII Science. Altogether 164 students from 146 schools were enrolled for the competition. The competition was held on the 3rd day of the 4-day programme. The following were the winners of the Science Written Quiz competition.

***Students taking part in the Science Written Quiz Competition in the Celebration of National Mathematics Day 2020 & National Science Day 2021***

| Position | Name of the Winners | Class | Name of the School |
|---|---|---|---|
| First | Kelvin Singh Naorem | IX | Dilligent Public School, Moirang |
| Second | Moirangthem Albert Singh | IX | The K.M. Blooming Hr. Sec. School, Khangabok |
| Third | Moirangthem Robinson Singh | IX | J.N.V. Yaralpat, Imphal East |
| **Consolations** | | | |
| 1 | Yumnam Apanba | XII | Kendriya Vidyalaya, Lamphelpat |
| 2 | Aditi Prasad | XII | Assam Rifles Public School, Mantripukhri |
| 3. | Rishika Shah | XII | Assam Rifles Public School, Mantripukhri |
| 4. | Khongbantabam Chusin Singh | IX | Kendriya Vidyalaya, Langjing |

### 2.1.6 Mathematics Written Quiz Competition

The competition was organised for Class IX-XII Science on the last day of the 4-day programme. Altogether 186 students from 174 different schools participated in the competition.


***Students in the Mathematics Written Quiz Competition in the Celebration of National Mathematics Day 2020 & National Science Day 2021***

The following were the winners of the Mathematics Written Quiz competition.

| **Position** | **Name of the Winners** | **Class** | **Name of the School** |
|---|---|---|---|
| First | Moirangthem Albert Singh | IX | The K.M. Blooming Hr. Sec. School, Khangabok |
| Second | Yaichenbi Leishangthem | X | Shishu Nistha Niketan, Imphal |
| Third | Kelvin Singh Naorem | IX | Diligent Public School, Moirang |
| **Consolations** | | | |
| 1 | Laishram Chandrakanta Singh | IX | The K.M. Blooming Hr. Sec. School, Khangabok |
| 2 | Rajiv Sah | X | Assam Rifles Public School, Mantripukhri |

### 2.1.7 Science/Mathematics Film Shows

During the 4-day Celebration of National Mathematics Day 2020 & National Science Day 2021 about 10 Science films were also shown for one hour duration on all 4 days. These science films were the collections of MASTEC and Vigyan Prashar, New Delhi. A few scientific films screened during the Meet were Earthquake Disaster & its Management, Solar Eclipse, Orchids of Manipur, the man who discovered infinity, Time Travels, A Brief History of Time, Waterworks, Oyster Mushroom, Transit of Venus etc.

### 2.1.8 Mathematics Puzzle

Demonstration and explaining Mathematics Puzzles was one of the activities of the Celebration of National Mathematics Day 2020 & National Science Day 2021. Resource Persons demonstrated various Mathematics puzzle items and explained the reason behind every Mathematics puzzle. As a part of the Mathematics Puzzle some popular Films/Theatre Artists/Actors of Manipur performed some of the Mathematics Magic supported by entertainment programme.

### 2.1.9 Mathematics/Science Lecture-cum-Demonstration

As one of activities of Celebration of National Mathematics Day 2020 & National Science Day 2021 Resource persons delivered lectures and demonstrated some interesting

topics of Mathematics and interacted with the students. Shri Sh. Tomba Singh, Education Officer, Churachandpur and Shri H. Jayenta Kumar Singh, Former, Head, Dept. of Mathematics, D.M. College of Science, Imphal delivered Mathematics lectures and interacted with the students. Dr. Ch. Indira Devi, Lecturer, Johnstone Higher Secondary School, Imphal and Shri N. Shyamkishore Singh, Science Graduate Teacher, St. George High Schhol, Imphal performed hands on demonstration of various scientific items particularly on Chemistry and Physics to the participants.

### 2.1.10 Valedictory and Prize Distribution Function

The 4-day Celebration of National Mathematics Day 2020 & National Science Day 2021 was concluded on April 20, 2021. Shri Th. Biswajit Singh, Hon'ble Minister (Works,



***Distribution of Prizes for various competitions in the Celebration of National Mathematics Day 2020 & National Science Day 2021***

Power and RD&PR), Manipur was the Chief Guest, Shri Devesh Deval, IAS, Commissioner (Science & Technology), Govt. of Manipur was the President and Smt. Homila Hongrei, Director, Dept. of Science & Technology, Govt. of Manipur was the Guest of Honour of the Closing & Prize Distribution Function. Cash Prizes and Citations were distributed to the prize winners of various competitions of the 4-day programme of Celebration of National Mathematics Day 2020 & National Science Day 2021.

## 2.2 Science Model Exhibition/Competition

The Science Model Exhibition for the students reading in Class VIII to Class X was held during December 20-23, 2021 at the MASTEC Complex, Takyelpat, Imphal West. Altogether 46 science models on the theme: COVID-19 were displayed by students from

*Science Model Exhibition Hall constructed at MASTEC Complex, Takyelpat, Imphal West*

*A student displaying her science model*

different schools. Each student was allowed to exhibit one model. Three models were selected as the First, second and third winner with two consolation prizes.

## 2.3 Science Short Play Competition

The Science Short Play competition for students reading in Class VI – X were held on December 20 &22, 2021 at the Training Hall of MASTEC. Altogether 13 teams of students from 12 schools took part in the competition. Three schools were selected as the first, the second and the third winners of the competition.

On 23rd December 2021, cash prizes and certificates were distributed to the winners of the competitions at the Training Hall of MASTEC at Takyelpat, Imphal.

## 2.4 Celebration of National Mathematics Day 2021:

Manipur Science & Technology Council (MASTEC), Imphal organised Celebration of National Mathematics Day 2021 on December 22, 2021 at Manipur Science & Technology Complex, Takyelpat, Imphal. The programme was catalysed and supported by National Council for Science & Technology Communication (NCSTC), Department of Science & Technology, Government of India, New Delhi.

The main feature of the 1-day programme was Lecture-cum-interaction. Professor Sh. Dorendrajit Singh, Dept. of Physics, Manipur University, Canchipur, Imphal while delivering a lecture on "Life and works of Srinivasa Ramanujan, the Great Indian Mathematician" highlighted the objectives & importance of celebration of National Mathematics Day followed by interaction session with students. About 200 students from different schools in the state participated in the celebration.

*Prof. Sh. Dorendrajit Singh delivering lecture in NMD 2021 celebration*

## 2.5 Spot Painting Competition:

A Spot Painting Competition was held on December 21, 2021 as part of activities on Year of Awareness on Science & Health (YASH) focusing COVID-19. Competition was held in 3 (three) groups: Sub-Junior (Class III–V), Junior (Class VI-VIII) and Senior (Class IX – X).

For the Sub-Junior Group, the Painting was done with Crayon/Wax Colour and with Water Colour for Junior and Senior Groups. Topics for each category based on the main theme COVID-19 were announced on the spot. Altogether, 47 students were enrolled for the competition for Sub-junior category. 72 students registered for Junior (Class VI-VIII) and 75 students registered for the competition for Senior category.

## 2.6 Written Science Quiz

The written science quiz was held for the students reading in class IX-X on 23rd December 2021 at three different rooms at MASTEC complex, Takyelpat. Altogether 196 students registered for the competition.

## 2.7 The 7th State Level Aquarium Exhibition-cum-Flower Show

The 7th State Level Aquarium Exhibition-cum-Flower Show was organized during February 10 – 16, 2022 at Manipur Science Aquarium, D. M. College Campus, Imphal in association with 13 aquarium and 11 floriculture entrepreneurs.

During the exhibition, Manipur Science Aquarium along with the 13 local entrepreneurs displayed around 25 local and 60 exotic fish species. The local indigenous fishes were collected from different water bodies of the state including hill streams. Many of these fishes are in the export list of fresh water ornamental fishes of India, published by the Marine Products Export Development Authority (MPEDA), under the Ministry of Commerce and Industry, Govt. of India.

*Visitors at the Flower Show*

There were 11 exhibitors for floriculture section. This year, 145 flower/plant species, 30 bonsai plants and dry ornamental items made from used cocoons were exhibited/displayed. They also exhibited a wide range of design, size, made of different material flower pots, various design of garden tools, medicines, plant hormones, insecticides and both inorganic and organic fertilizers.

On an average 300 visitor per day - students and teachers of various schools, officials of different government departments, research scholars and general public were visited during the 7-day long exhibition.

### 2.7.1 Spot Painting Competitions

As a part of the exhibition, on February 13, 2022 Spot Painting Competitions in three categories - Sub-Junior (Class III-V), Junior (Class VI-VIII) and Senior (Class IX-X) students were organised at the programme venue. The results are:

**Sub-Junior Category (Class III-V)**

| Position | Name of the Student | Class | Name of the School |
|---|---|---|---|
| First | Brikrama Lourembam | V | The Comprehensive School, Oinam |
| Second | Kelvin Elangbam | V | Pitambara English School, Kwakeithel |
| Third | Minerva Thoidingjam | V | Kendriya Vidyalaya No. 2, Langjing |
| Fourth | Lanngamba Ngangom | III | Diligent Public School, Moirang |
| Fifth | Pheedam Sinam | V | Ramakrishna Mission School |

**Junior Category (Class VI-VIII)**

| Position | Name of the Student | Class | Name of the School |
|---|---|---|---|
| First | Glorie Gurumayum | VIII | Nirmalabas High School |
| Second | Pahelli Nongthombam | VIII | Little Flower School |
| Third | Lanleiba Sinam | VIII | Ramkhrisna Mission School |
| Fourth | Julian Loitongbam | VIII | Kendriya Vidyalaya No. 2, Langjing |
| Fifth | Sunaina Saikhom | VI | Kendriya Vidyalaya No. 1, Lamphelpat |

**Senior Category (Class IX-X)**

| Position | Name of the Student | Class | Name of the School |
|---|---|---|---|
| First | Presila Heikrujam | IX | Kendriya Vidyalaya No. 1, Imphal |
| Second | Daulas Lambamayum | IX | St. George High School, Wangkhei |
| Third | Toijam Ghanashyam Singh | X | Bal Vidya Mandir, Palace Compound |
| Fourth | Khumukcham Angelika Devi | IX | Kendriya Vidyalaya No. 1, Lamphelpat |
| Fifth | Yaikhombi Loitongbam | X | Kendriya Vidyalaya No. 1, Lamphelpat |

### 2.8 Webinar

The Council, in association with Vigyan Prasar, Noida, DST, Govt. of India organised a Webinar on Fungus Overriding the Virus - Black Fungus (Mucormycosis) Post Covid Pandemic in India on 6th July 2021 to give awareness on Black Fungus to the masses/public.

## 3.0 Projects:

MASTEC implements time bound research as well as technology transfer projects and entrepreneurship programmes funded by various organisations. The following projects are being carried out during the year 2021-2022.

3.1 Common Facility Cum Demonstration Centre for Food Processing supported by DST, Govt. of India.
3.2 Mapping of S&T Needs in the State supported by DST, Govt. of India.
3.3 Capacity building awareness programme on climate change issues and production/broadcast of Radio Serial on Traditional Knowledge System in three languages/dialects- A Joint Programme with Vigyan Prasar, DST, GoI.
3.4 Artificial Intelligence: 52 – Episode Radio Serial.
3.5 Patent Information Centre supported by DST, Govt. of India.
3.6 Capacity building awareness programme on climate change issues.
3.7 Manipur Science Aquarium supported by DST, Govt. of Manipur.
3.8 Vigyan Prasar EduSat Centre.
3.9 Year of Awareness on Science & Health (YASH) supported by DST, Govt. of India.
3.10 Development of three Integrated Model Villages in Manipur supported by DST, Govt. of India.

## Project Progress Report:

### 3.1 Common Facility cum Demonstration Centre for Food Processing

#### 3.1.1 Skill Development Training programme on food processing

Under the project “Common facility cum demonstration for food processing” skill development training on food processing with emphasis on value addition on fruits and vegetables, soy milk and paneer production, spices and bakery products of 7 days duration was organized during December 3 – 9, 2021 at the Common facility cum demonstration Centre and 28 trainees attended the training programme. A training manual (booklet) on “Processing of different value-added fruits and vegetables, spices and soy milk products” was published and distributed to all the participants.

*Closing function of the 2nd training programme*

*Trainees during the skill upgradation training*

2 (two) skill up-gradation training programmes were also organized under the project. The first skill upgradation training on food processing for the students of B. voc students of Manipur University was organized during January 5 – 7, 2022 at the centre and 15 students attended the training. The 2nd skill upgradation training programme on soy milk and allied products processing was organized during January 12- 13, 2022 at the centre and 10 people attended.

During the training course, the trainees prepared various food items such as - Soya milk, soya paneer, soya curd, rasgulla, besan, squash – lemon, orange, pineapple, Jam – plum and other wild fruits, candy - ginger, pineapple, kiwi, wild fruits, pickles – mix vegetables, fish, chicken, lemon, king chilli, mushroom, bamboo shoot, olive, papaya tutti-fruity, garam masala, fish masala, chicken masala, cake, bread etc.

*Students of B.voc students during the training*

*Felicitation of ex-trainees who received grants under Start up scheme*

In order to sensitize people about the role of food processing industries in income generation, a documentary on food processing had been produced and telecast on DDK, Imphal and the same uploaded on You Tube for mass awareness. Some of the ex-trainees had already set up their own enterprises and among these ex-trainees, 9 (nine) had received grants from the state government under the Start-up Scheme. All the 9 entrepreneurs were felicitated by MASTEC.

## 3.2 Mapping of S&T Needs in the State

The Project engages in the identification of areas in different sectors such as agriculture, fishery, industry, education, health care, water & sanitation etc. for intervention of science & technology. This may lead to sustainable development of the society and create a spatial database, linking with socio-economic & demographic data. Then, the data can be stored, retrieved, analysed as and when required for future development planning. The mapping exercise would be carried out from State Level to District Level.

**Objectives:**

i) Identification/Inventorisation of S&T needs in different sectors (SDG wise)
ii) Creation of spatial & non spatial database in GIS platform & make the data available to the stakeholders & interested organisations

**Work so far done:**

1. *Literature Survey*

   The project team has consulted some literatures and also Manipur Vision 2030 volume published by State Govt. to be the back bone of the project.

2. *Selection of SDGs*

   The project team is working on the identified/selected areas such as i) SDG-2 (Zero Hunger), ii) SDG-3 (Good Health & Wellbeing), iii) SDG-4 (Quality education) and iv) SDG-6 (Clean water & Sanitation).

3. *Activities during First wave of COVID-19 pandemic*

As part of the Project & as advised by DST, GoI, the Council contributed some S&T inputs in the COVID-19 management to stop spread of the pandemic disease in the state. The Council, in association with the North East Institute of Science & Technology (NEIST), CSIR, Imphal Unit developed Alcohol based Herbal Hand Sanitizer and distributed to members of various communities in the state. In addition, the sanitizers were also distributed to all the employees working at the Council and interested individuals. The sanitizers were also kept at the entry point of the council office and the visitors/employees used it before entering the office.

Altogether, 40litres (40,000 ml.) of MASTEC-CSIR, NEIST prepared hand sanitizers, have been distributed to different sections of the community.

4. *Infrastructure Set up*

A minimum GIS infrastructure has been set up with purchase of one Arc GIS from ESRI (Environmental Systems Research Institute) India Technologies Pvt. Ltd. who are the authorised manufacturer/distributer of ArcGIS suite of Software in India. The system has already been installed and become operational for GIS applications.

5. *Data Collection*

As the COVID-19 first wave pandemic was in a better scenario in the state, the project team has started visiting some govt, organizations for discussion and collection of published data/information including Economics & Statistics Department, Govt. of Manipur, Department of Census, Govt. of India.

Data collection has been completed after a brief slowdown during the 2nd wave of COVID-19. Analysis of data has also been completed and compilation of report is going on.

## 3.3 Capacity building awareness programme and production/broadcast of Radio Serial on Traditional Knowledge System in three languages/dialects

Under the project, the Council started producing and broadcasting Radio Serial through All India Radio, Imphal in Manipuri language, Thadou/Kuki and Tangkhul dialects. The programme was taken up to sensitise people about the traditional knowledge and about the role of the government in taking up administrative reforms/planning in validating the traditional knowledge and because of its vast coverage, radio has been chosen as medium for assimilating traditional knowledge.

**Radio Serial on Traditional Knowledge System:**

Manipur Science and Technology Council (MASTEC), Imphal and Vigyan Prasar, Noida with the objectives of creating awareness about the traditional knowledge and to involve the local people in respecting, protecting and maintaining traditional knowledge for conservation and promote its wider application had produced radio serial on traditional knowledge system in Manipuri language, Thadou and Tangkhul dialects.

The broadcast of the serial in Manipuri language and Thadou/Kuki dialects had already been completed. Broadcast of some episode in Tangkhul dialect was made in the last year and the remaining 16 nos. of episodes in Tangkhul dialect had been broadcast from April 7 to August 21, 2021 from AIR, Imphal. The duration of each episode was 15 minutes and the broadcast was made on every Wednesday at 5.50 p.m. from AIR, Imphal.

## 3.4 Artificial Intelligence: 52 Episode Radio Serial

Manipur Science and Technology Council, Imphal under the catalyzation and support of Vigyan Prasar, Noida and in association with All India Radio, Imphal has started

broadcasting the 52-episode radio science serial on Artificial Intelligence (AI) titled "Hayengdi Youraklani". Of the 52 episodes, 45 episodes are drama format and the remaining 7 episodes comprise of curtain raiser, interactive, summing up and conclusion session. MASTEC being the co-ordination agency has to supply scripts to AIR and submit report to Vigyan Prasar. The Science serial on AI in Manipuri language was launched on February 28, 2021 in both Kangla and Sangai Channel of All India Radio, Imphal and will continue on every Sunday at 7.00 a.m. in both the channels. For wide publicity of the serial, promos were made to attract listeners. During the year 2021 – 2022, 36 episodes had been broadcast on radio and each episode had also been uploaded in the youtube channel to cover maximum listeners. All the 45 scripts for the drama had been developed and supplied to AIR, Imphal.


*Serial uploaded on You tube*


*Mrs. Keisham Kabita (Producer) with the artists during recording*

After each episode, one question related to the particular episode was put to the listeners and the answers were received through a designated e-mail ID and of the correct answers received, two winners were selected by drawing lottery and prizes consisting of Books, CD, Kits etc. were provided to them.

## 3.5 Patent Information Centre (PIC)

Today, 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 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 following objectives:

1. Introduce patent information as a vital input in the process of promotion of R&D programmes.
2. Provide patenting facilities to scientists and technologists in the country for Indian and foreign patents on a sustained basis.
3. Keep a watch on developments in the area of IPR and make important issues known to policy makers, scientists, industry etc.
4. Create awareness and understanding relating to patents and the challenges and opportunities in this area including arranging of workshops, seminars, conferences etc.

**Patent Granted**

- Title: TRICYCLE THRESHING MACHINE

- Patent No.: 366221
- Date of Grant: 06/05/2021

**Patent Application Received:**

- Microbial species as culture for fermentation of dry fish

**Patent searches:**

- Microbial species as culture for fermentation of dry fish

**Trade Mark Searches:**

- MACHII
- WANGLEI
- KUMSHUNG
- NUJA

**Trade Mark Registration Filed:**

| S N | Name of TM | Application No. | dated | Class | Logo |
|---|---|---|---|---|---|
| 1. | Machii | 5077213 | 06/08/2021 | 30 | |
| 2. | WANGLEI | 5139159 | 20/09/2021 | 33 | |
| 3. | KUMSHUNG | 5241077 | 09/12/2021 | 03 | |
| 4. | NUJA | 5281794 | 12/01/2022 | 30 | |

**Published in Trade Mark Journal:**

| S N | Name of TM | Journal No. | Date of Publication | Class | Logo |
|---|---|---|---|---|---|
| 1. | KANGLLEISIL | 2003 | 07/06/2021 | 22 | |
| 2. | MACHII | 2025 | 08/11/2021 | 30 | |

| | | | | | |
|---|---|---|---|---|---|
| 3. | KUMSHUNG | 2036 | 24/01/2022 | 03 | |
| 4. | NUJA | 2041 | 28/02/2022 | 30 | |

**Trade Mark Registered:**

| S N | Name of TM | Registration No. | Date | Class | Logo |
|---|---|---|---|---|---|
| 1. | EERIK | 4859932 | 12/07/2021 | 32 | |
| 2. | EMALEIBAK | 4740028 | 08/05/2021 | 03 | |
| 3. | KANGLEISIL | 4194042 | 23/10/2021 | 22 | |

**Lectures on IPRs:**

| Sl No. | Name of Awareness Programme | Date | Venue & Organiser | Name of PIC Official |
|---|---|---|---|---|
| 1 | One day workshop/ seminar (ST artisans) | 27-09-21 | Nongmeibung Imphal East<br><br>Handicrafts Service Centre, D C Handicrafts, Ministry of Textile | Dr. R. K. Pritamjit Singh |
| 2 | 7-day training programme on skill development (food processing) | 03-12-21 | Takyelpat, Imphal<br><br>Manipur Science & Technology Council, Imphal | L. Surjit Singh |

**Meeting/Training Attended**

| Sl. No. | Name of the Programme | Date | Organiser |
|---|---|---|---|
| 1. | Patent searches and analysis | September 20 - 24, 2021 | PFC, TIFAC, New Delhi |
| 2. | IBSD Patent Cell Committee Meeting for PCT Filling | December 16, 2021 | IBSD, Takyelpat |

| | | | |
|---|---|---|---|
| 3. | Technical Committee Meeting on registration of GI | March 01, 2022 | Directorate of Handloom & Textiles, Govt. of Manipur |

## 3.6 Capacity Building and Awareness Campaign on Climate Change Issues in Manipur

Capacity Building and Awareness Workshop on Climate Change is one of four components of a multifaceted programme "Radio Programme on Traditional Knowledge System, Brain Storming and Capacity Building on Climate Change Issues in Manipur and Nature Camps" implemented by Manipur Science & Technology Council, Science & Technology Complex, Takyelpat, Imphal. The programme is supported of Vigyan Prasar, Department of Science and Technology, Government of India, Noida. This programme is to be conducted in the hill districts of the state. The main objectives of the programme are;

1. To bring awareness amongst farmers, women, panchayat members, officials and students about climate change related issues;
2. Capacity building and training on environment, dynamics of nature including climate change to various stake;
3. To teach how to reduce and to adapt to the changing climatic conditions;
4. Preparation of resource material on climate change and related issues;
5. Involving students and teachers in hands-on-activities on understanding dynamics of nature and climate change.


During the programme conducted during March-April 2022 in the four hill districts of Manipur, Resource Persons explained different issues and measures of Climate Change in the State. One experimental kit "Learning by Doing" having 14 activities was also demonstrated to the participants by Shri N. Shyamkishore Singh, Science Communicator. Dr. L. Sanjoy Meitei, Lecturer, D.M. College of Science, Imphal also delivered lecture on Climate Change Issues in Manipur. A set of 6 posters, an Activity Booklet developed by Dr. Ch. Indira Devi, Lecturer, Dept. of Chemistry, CC Higher Secondary School, Booklet of Experimental Kit and a DVD containing all the resource materials including Power Point Presentations on various issues of Climate Change & Global Warming were also distributed to the participants. The participants will use these software in disseminating the knowledge they learnt from this programme in their locality, institutes, and family. One experimental kit was also handed over to each local organiser. The details of the four hill district programmes are:

| Sl. No. | Name of the local Organiser | Name of the Hill District |
|---|---|---|
| 1. | Namkalong Farmers Development Society, Khoupum | Noney District |
| 2. | M Canaanphai Youth Club, Sagang | Churachandpur District |
| 3. | Somdal Village Authority, Somdal | UkhrulDistrict |
| 4. | Wainem Youth Club, Bungte | Kangpokpi District |

## 3.7 Manipur Science Aquarium

The first aquarium display was opened to the public in 1853 at Regent's Park in London and followed by Berlin, Naples, and Paris. Nowadays, hobbyists could keep fish as well as corals etc. in aquarium successfully. The Greek philosopher Aristotle (384-322 B.C.) started documenting the science of fish by studying their structure and other characteristics. He carefully recorded accurate information on 115 species of fish. Today, scientists have classified more than 20,000 species of fish around the world. The world's best aquarium is in San Francisco. The best one in India is the Taraporevala Aquarium at Mumbai.

Manipur Science and Technology Council (MASTEC), Imphal with the support of Department of Higher Education, Govt. of Manipur established the one and only Centre of the state - Manipur Science Aquarium in the premises of D.M. College Campus, Imphal and it was inaugurated on 31st March 2011. But now this Centre is maintained by MASTEC with the support of Department of Science & Technology, Govt. of Manipur. The centre is open on all working days for the general public.

Apart from the normal visitors, students and faculty members of various institutions of the state also visited the Centre for their academic purposes. Officials of the Centre demonstrate and explain the scientific aspects - such as physio-chemical parameters, classification, food and feeding, breeding habits, diseases, behaviour etc. of different fish species (exotic and indigenous) available in the centre.

## 3.8 Vigyan Prasar EduSat Network

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) of Indian Space Research Organisation (ISRO) has established Satellite Interactive Terminals (SITs) in the country. SIT is a two-way audio-video interactive network for science & technology communication using EduSat – the satellite for Education, Science & Technology launched by ISRO in 2004. MASTEC was recognised as one of the SITs and installed at MASTEC Complex, Takyel for the first time of such network in the state. The mode of the interaction is:

- Experience sharing – amongst the SITs in the Country
- Training – using distance education mode
- Access to quality – interaction with the experts/scientists at one end and teachers, students etc. on the other end 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 are

- Science clubs, teachers
- School students & children
- Young adults (College students and higher/technical/university students)
- General public for awareness programmes

So far, we have conducted quizzes, trainings, summer science festivals, lectures etc. regularly on various topics from time to time round the year and benefitted students, teachers, science activists etc. of the state. The distance learning training programme on Remote

Sensing, GIS and GPS under the Indian Institute of Remote Sensing (IIRS), Dept. of Space, Dheradun was also conducted regularly.

## 3.9 Year of Awareness on Science & Health (YASH)

With the arrival of COVID-19 in India, NCSTC, DST, GoI had launch the programme on health and risk communication "Year of Awareness on Science & Health (YASH)" with focus on COVID-19.

MASTEC took part in the venture by implementing the project entitled "Year of Awareness on Science & Health (YASH)" supported by NCSTC, DST, Govt. of India.

The activities of the project "YASH" comprised of three parts viz.,

Part-A: Students' Essay Writing competition, Declamation contest, Science short play competition, Science exhibition, Best Guide Teacher selection, Invited talk, Science Quiz,Spot painting for different categories;

Part-B: Children Centric Outreach activity – Awareness lectures series on COVID-19;

Part-C: Workshop for Science communicators.

### 3.9.1 PART – A

**Science Model Exhibition/Competition**

The Science Model Exhibition on the theme: COVID-19 was held during December 20-23, 2021 for the students reading in Class VIII to Class X at the MASTEC Complex, Takyelpat, Imphal West. Altogether 46 science models were displayed by students from different schools. Three models were selected as the first, the second and the third winner along with two consolation prizes.

The following students were selected as the winners of the competition.

| Rank | Name of School | Class | School |
|---|---|---|---|
| 1st | Naorem Benson | IX | Mother's Pride Academy |
| 2nd | Oinam Sweety Devi | VIII | Mother's Pride Academy |
| 3rd | Athokpam Abhijeet Luwang | X | Wangkhei High School |

Consolation prize:

| | | | |
|---|---|---|---|
| 1. | Kshetrimayum Arisia | IX | S.C.M. English School |
| 2. | Laitonjam Bandana Chanu | X | Praja Hr. Sec. School |



*Science Model Exhibition in progress at MASTEC Complex, Takyelpat, Imphal West*

*Students interacting with the visitors during the Science Model Exhibition at Takyelpat, Imphal West*

**Best Guide Teacher Award**:

Selection of a Best Guide Teacher Award from amongst the teachers who guided students in making science models for the exhibition cum competition was one of the activities of the Programme. Miss Sophiya Laishram of Mothers Pride Academy, Kwasiphai, Bishnupur District has been selected for the Best Guide Teacher Award 2021.

**Science Short Play Competition**

The Science Short Play competition for students reading in Class VI – X were held on December 20 & 22, 2021 at the Training Hall of MASTEC. Altogether 13 teams of students

*Students' Science Short Play performance on the theme: COVID-19*

from 12 schools viz., (i) Keishamthong High School, (ii) St. George High School, (iii) Wangkhei High School, (iv) Little Flower School, (v) Manipur Creative School, (vi) Paree Imom Sindam Sang, (vii) Praja Hr. Secondary School, (viii) Model Hr. Sec. School, (ix) Leimapokpam Hr. Secondary School, (x) Mothers' Pride Academy and (xi) Diligent Public School, Moirang and (xii) New Public Hr. Sec. School, Khangabok competed for the competition.

The following Schools have been selected as winners of the competition:

| **Rank** | **Name of School** | **Name of Play** |
|---|---|---|
| 1st | Wangkhei High School, Wangkhei | Eikhoi Lantheng Khanglashi |
| 2nd | Manipur Creative School, Dewlahland | Thawaigi Marup COVID-19 |

| | | |
|---|---|---|
| 3rd | Mother's Pride Academy, Kwasiphai | Cheksinbana Saphare |

The cash prizes and certificates were distributed to the winners of the competitions on 23rd December 2021 at the Training Hall of MASTEC at Takyelpat, Imphal at 2.30 p.m.

**Spot Painting Competition:**

The Spot Painting Competition was held for 3 (three) groups: Sub-Junior (Class III–V), Junior (Class VI-VIII) and Senior (Class IX – X).

*Spot Painting Competition (Sub Junior, Junior and Senior Category) in progress*

For the Sub-Junior Group, the Painting was done with Crayon/Wax Colour and with Water Colour for Junior and Senior Groups. Topics for each category based on the main theme COVID-19 were announced on the spot. Altogether, 47 students were enrolled for the competition for Sub-junior category. 72 students registered for Junior (Class VI-VIII) and 75 students registered for the competition for Senior category. On the basis of their performance, the following students were selected for first, second, third and consolation prizes respectively. Winners for the 3 (three) categories are listed below.

**Winners of the Senior Category (Class IX-X)**

**Topic: Unity Against COVID-19**

| Rank | Name | Class | School |
|---|---|---|---|
| 1st | Daulas Lambanmayum | IX | St. George High School, Wangkhei |
| 2nd | Presila Heikrujam | IX | Kendriya Vidyalaya No.1, Lamphelpat |
| 3rd | Yaikhombi Loitongbam | X | Kendriya Vidyalaya No.1, Lamphelpat |
| **Consolation prize** | | | |
| 1 | Ribirthson Maibam | X | Wangkhei High School, Imphal |
| 2 | Juliana Loitongbam | IX | Kendriya Vidyalaya No.1, Lamphelpat |

**Winners of the Junior Category (Class VI – VIII)**

**Topic: Awareness of Corona Virus**

| Rank | Name | Class | School |
|---|---|---|---|
| 1st | Anjela Heikrujam | VI | Kendriya Vidyalaya No.1, Lamphelpat |
| 2nd | Julian Loitongbam | VIII | Kendriya Vidyalaya No.2, Langjing |
| 3rd | Rajluxmi Moirangthem | Class VII | Diligent Public School, Moirang |
| **Consolation prize** | | | |

| | | | |
|---|---|---|---|
| 1 | Sunaina saikhom | Class VI | Kendriya Vidyalaya No.1, Lamphelpat |
| 2 | Yaiphaba Ningthoujam | Class VII | Wangkhei High School, Imphal |

**Winner of the Sub Junior Category**

**Topic: COVID-19**

| Rank | Name | Class | School |
|---|---|---|---|
| 1st | Brikrama Lourembam | V | Comprehensive School, Oinam |
| 2nd | Irungbam Arbin Meitei | V | Mothers' Pride Academy, Kwasiphai |
| 3rd | Minerva Thoidingjam | V | Kendriya Vidyalaya No.2, Langjing |
| **Consolation prize** | | | |
| 1 | Kh. Chaoremba Singh | V | Kendriya Vidyalaya No.1, Lamphelpat |
| 2 | Aheibam Suriya | V | Little Flowe School |

**Written Science Quiz**

The written science quiz was held for the students reading in class IX-X on 23rd December 2021 at three different rooms at MASTEC complex, Takyelpat. Altogether 196 students registered for the competition.

On the basis of their performance, the following students were selected as the winner of the competition.

| Rank | Name | School |
|---|---|---|
| 1st | Elangbam Boris Singh | New Public Hr. Sec. School |
| 2nd | Chongtham Linson | New Public Hr. Sec. School |
| 2nd | Mayarani Yumlembam | Paree Imom Sindam Sang |
| 2nd | Nivarani Laishram | New Public Hr. Sec. School |
| 3rd | S. Galaxy Chanu | Paree Imom Sindam Sang |
| 3rd | Anjana Thokchom | Paree Imom Sindam Sang |

**Prize Distribution/Closing Function**

The prizes and certificates were distributed on 23rd December 2021 with a function with Shri Devesh Deval, IAS, Commissioner (S&T), Govt. of Manipur as the Chief Guest. Dr. L. Dinachandra Singh, Director, MASTEC presided over the function. Smt. Homila Hongrei, Director, DST, Govt. of Manipur, Shri Y. Nabakumar Singh, Vice President, Science Teachers Forum Manipur and Shri L. Somarjit Singh, Secretary, Manipur Science Communicators' Association attended the function as Guest of Honour and took part in prize distribution to the student winners.

*Commissioner(S&T) Govt. of Manipur giving citation & prize to the winners*

*Commissioner(S&T) Govt. of Manipur giving Best Teacher Guide prize & citation*

*A dignitary giving citation & prize to the student winners* of science short play


*Dignitaries at the Dais during Closing/Prize distribution function*

### 3.9.2 PART – B

**Children Centric Outreach activity – Awareness lectures series on COVID-19**

As part of the activities of Year of Awareness on Science & Health (YASH), MASTEC had organized a series of awareness lectures during December 29, 2021 to February 23, 2022 in different schools at different places mostly in rural/hill areas with an objective to give awareness about the science of COVID-19 such as basics of COVID-19, preventions & Precautions including importance of vaccination among the school students so that they are fully prepared themselves to take precautions to prevent from the COVID-19 infection. The Awareness lecture focusing COVID-19 was inaugurated on 29$^{th}$ December 2021 at Model Govt. Higher Secondary School, N.C. Road, Takyel, Imphal West with a function with Shri S. Inaobi Singh, Principal, Model Hr. Sec. School as the Chief Guest. The function was presided over by Dr. L. Dinachandra Singh, Director, MASTEC. About 150 students reading in class X – XII (age group 15-18 years) including teachers attended the lecture programme and interacted with the resource person about COVID-19.

*Lecture on basics of COVID-19 & interaction withstudents in progress*

*Lecture series in progress*

Two senior doctors Dr. O. Joychandra Singh, Professor and Consultant, Shija Academy of Health Sciences, Imphal (Former Professor, Jawaharlal Nehru Institute of Medical Sciences, Imphal) and Dr. A. Ritindramohon Singh, Former State Epidemiologist and Former Chief Medical Officer, Govt. of Manipur took part to deliver lectures and interaction with the students. After every lecture, there kept an interaction session during which students asked questions and Doctors clarified their queries.

The COVID vaccination rate was low in the hill districts. Perhaps due to lack of knowledge on COVID-19, they were ignorant of taking themselves vaccinated to prevent from COVID-19 infection. We made best efforts to spread awareness about the COVID 19 pandemic to the school children by arranging awareness lectures. Altogether, 60 lectures have been arranged at different schools covering 12 districts and 4843 (four thousand eight hundred forty-three) students have participated in the lecture series. No. of students who participated in the lecture series from private schools were more in number than the number of students in Govt. Schools.

### 3.9.5 PART – C

**Workshop for Science communicators**

Three-day Workshop for Science Communicators on Script development/Writing focusing COVID-19 was organized during November 9-11, 2021 at the conference hall of Manipur Science Centre, Takyelpat, Imphal. It was held as part of the activities of the project "Year of Awareness on Science & Health" supported by NCSTC, Department of Science & Technology (DST), Govt. of India.


*Inaugural function of the workshop for science communicators on script development/writing*

Shri Y. Joykumar Singh, Hon'ble Dy. Chief Minister, Manipur and Minister in-charge (Science & Technology), Manipur inaugurated the function as Chief Guest on 9th November 2021. Prof. H.N.K. Sarma, Former Vice Chancellor, Manipur University, Imphal attended the function as the Guest of Honour. Mrs Homila Hongrei, Director (Science & Technology), Govt. of Manipur presided over the function. Altogether, 52 participants registered for the programme. However, 46 participants could attend the workshop successfully.

Dr. C. M. Nautiyal, Science communicator & Consultant, Indian National Science Academy (INSA), New Delhi (Former Scientist – F & Head, Carbon Dating Lab, BSIP, DST, GoI, Lucknow) delivered a Key Note Address on the role of science communicators in the society. during the inaugural function. Earlier, while giving a welcome address, Dr. L. Dinachandra Singh, Director, MASTEC highlighted in brief about the programme to the audience.

*A Section of the participants attending the workshop*

During the Technical Session, Dr. C.M. Nautiyal delivered a lecture on the topic "The Art of Writing Science" which covers techniques of writing for various forms of media, topic identification, target group, collection of scientific information etc. and interacted with the participants.

Shri Satyajit Usham News Editor, Peoples' Chronicle delivered a lecture on the topic "*Writing for News Paper and Role of Print Media in popularization of Science*" and interacted with the participants.

Shri A. Gitchandra Sharma, Director in-charge and Programme Head, All India Radio Imphal Station made a presentation on "*Opportunities for Science Writers at All India Radio*

*Imphal"*. He appealed to the delegates to become a science writer and take part in the science programmes of All India Radio, Imphal.

Altogether, 26 scripts were developed by the participants during the course of the workshop and submitted to MASTEC for further compilation work. Some of the scripts have been published in local News Papers (Imphal publication)

## 3.10 Development of Integrated Model Villages (3 Nos.) in Manipur State

### 3.10.1 Introduction:

Manipur is a small state in the North Eastern part of India with a geographical area of 22,327 sq.km. having 28,55,794 population (Census 2011). About 90% of the total geographical area is hilly and the rest is valley. The hilly areas are inhabited by Schedule Tribes and the valley areas are inhabited by General, Schedule Caste, Schedule Tribe and Muslims. The rural hilly areas are remotely located and majority of the people are BPL. The ecology of the area makes it vulnerable to many natural disasters such as landslides, mudslides, flash floods, hailstorms, cloudbursts, earthquakes etc. The status of tribal people is alarmingly grim with respect to their health, education and economic conditions.

The main occupation of the people of Manipur is agriculture. Agriculture in the hilly areas is labour intensive. Farmers have scattered agricultural land and are growing crops in those areas which are proximity to their home or having easy accessibility thereby converting the productive land into barren land. Agriculture being the primary source of livelihood of the hilly people science & technology intervention would help to improve and enhance productivity. To improve agricultural productivity, technological interventions such as quality seed production, cultivation in protected areas, soil/water management practices, value addition on farm products will be useful. Poly house and poly tunnel technologies can be popularized in the hilly areas to enhance the production of off-season vegetables. Fishery in the hills with the intervention of new technologies can be very useful in improving the economy of the rural hilly people.

Horticulture is one of the important activities of the hilly villages. Two major issues demand horticultural inputs i.e., self-consumption and commercial utility. These inputs will help farmers to get better return and could improve their economic status. Horticulture provides the much-needed opportunity for diversification in agriculture especially in the context peculiar topography and agro-climatic conditions of the hill states where the scope for production of conventional field crops is limited. Training and capacity building for better technology interventions for pre harvesting techniques, which includes plucking, storage, transportation and tools/machinery required improved practices of plantation.

Introduction of food processing techniques, value addition process to make ready to eat food. Food processing offers an opportunity for the creation of sustainable livelihoods and economic development for rural community. Pig rearing is an enterprise which has been practiced by a large section of population in rural areas. Introduction of good variety pigs in the rural hilly areas can be very effective in the economic growth. Biomass fuel is the primary source of energy for the rural hilly people. The rural communities are more widely dependent on biomass sourced from the nearby forests. Use of forest litter and weeds as biomass, biogas and briquettes making can bring enormous benefits to the hilly communities.

The project is focused on knowledge and skill upgradation for local resources use aiming to enhance the livelihood. The use of local resources for income generation ensures the sustainability of the project even after completion of the project period. Changes can be noticed in improved agricultural practices, better productivity, better economic returns and comfortable life style.

### 3.10.2 Approved objectives:

i) Development of Model Villages in different agro-climatic zone and social setup.
ii) Integration of technologies available with different institutes in the development of models.
iii) Partner with civil societies as facilitator to connect knowledge with the local community.

### 3.10.3 Methodology:

The whole project is to be implemented at 3 (three) villages of different agro-climatic conditions. Out of the 3 villages 2 are tribal populated village and 1 is non-tribal populated village. Integrated inputs approach missing at present will be restored through appropriate science & technology inputs. Once the model villages are developed, similar models can be replicated and followed by others at other locations in the state. Initial survey and discussions are to be carried out with the local community to develop partnership for "Model Village".

An interface between civil societies and institutions are to be organized to decide different intervention of technology. Some gaps areas identified with civil societies are to be directed to institutes to develop scientific/technical solutions. Series of meetings are to be held with community to thresh out priorities, problems and other related issues. A participatory mechanism is to be developed to establish Common Facility Centre. The Centre is defined as a centre for community for day-to-day knowledge needs and a place where common services can be sourced.

### 3.10.4 Work Plan:

The project is to be implemented in the following phases.

Phase I

a) Survey: A preliminary survey has to be conducted to identify priorities and status of data such as Human Assets, Natural Assets, Physical Assets, Social Assets, Financial Assets, Resource Gaps etc.
b) Interface, discussion and meeting: Series of meetings are to be held with community from all the genders and children to identify their priorities and problems to establish proper understanding and plan accordingly.

Phase II

Common Facility Centre has to be established and training to local community with demonstration of different activities are to be focused. All agri/horti/livelihood, bio-farm, energy etc. are the areas to which communities are to be exposed and trained. The trainings are to be taken both on campus and off campus under certain module. After the training programme, necessary technical backups are to be arranged to start the economic activities.

Phase III and Phase IV

Installation of polyhouse, food processing unit, mushroom unit and various installations and construction works at desired locations through the following institutions/organizations:

i) VPKAS, Almora: Agricultural activities such as Polyhouse, Water Harvesting, Mushroom Cultivation, Bee Keeping, Drudgery Reduction Tools, Improved varieties etc.
ii) HESCO, Dehradun: Energy related activities such as Bio-digester, Stoves, Solar Dryer, Biomass Geyser etc. and Food processing activities such as preservation, value addition, bakery products etc.

iii) DCFR, Bhimtal: Integrated fish farming using polytanks in mid hill region, Backyard ornamental fish farming.
iv) Sophitorium Engineering College, Odhisha: Solar powered drip irrigation.

### 3.10.5 Progress/Achievements:

Under the project Baseline Survey for the 3 (three) villages have been conducted and interface, discussion and meetings with the community (village authority) already held for 2/3 times. Memorandum of Understandings (MoUs) have been signed between the village authorities and Manipur Science & Technology Council (MASTEC), Imphal for implementation of the project. Buildings for Common Facility Centre at 2 villages have already been constructed and for the third village it is under process. Construction of Mushroom Huts for 2 villages have been completed. Construction of Poly House at 2 villages have been completed.

Online trainings on Fish farming have been conducted by Directorate of Cold Fisheries Research (DCFR), Bhimtal. Also, online training on Biomass Geyser, Daksh Chulha, Briquetting Machine, Fruit Processing etc. have been organised by Himalayan Environmental Studies and Conservation Organisation (HESCO), Dehradun. Quotations for Biomass Geyser and Daksh Chulha have been obtained from a firm identified by HESCO and procurement is under process. Trainings on Mushroom Cultivation for the 3 villages are planned to be organized in summer of 2022.

### 3.10.6 Works remains to be done:

Installation/creation of technologies/equipment related to agriculture (improved variety of seeds), equipment for small fruit processing unit, Solar Dryer, gravity based micro-irrigation system, solar powered drip irrigation system, introduction of new variety of pigs, poultry (broiler and kuroiler), bee keeping, ornamental fish farming, energy (Bio-gas, Daksh Chulha, Biomass Geyser, Briquetting Machine) etc. are yet to be done under the project. Further, trainings and demonstration on various technologies from source institutions/ organizations are also yet to be carried out under the project.

## 4.0 Meetings attended

| ***Sl. No.*** | ***Name of Officer with designation*** | ***Online Meeting/Brain Storming/ Webinar*** | ***Date*** |
|---|---|---|---|
| 1. | Dr. Kh. Rakesh, Sr. Scientific Officer | Interactive meeting on strawberry cultivation in NE India as part of AZADI KA AMRIT MAHOTSAV. | April 7, 2021 |
| 2. | The Director, MASTEC | 3rd Meeting of the Science & Technology Intervention in NE Region (STINER) Implementation Committee | April 23, 2021 |
| 3. | Officers of MASTEC | Brainstorming Meeting (online) on the topic – "Sci-connect 2021"; organized by Vigyan Prasar, DST, GoI | June 29, 2021 |
| 4. | Dr. L. Minaketan Singh, Senior Scientific Officer | "An online user conference (UC) on ArcGIS" organised by ESRI India. | July 28-29, 2021 |
| 5. | Dr. R.K. Pritamjit Singh, Scientific Officer | -do- | -do- |

| | | | |
|---|---|---|---|
| 6. | Dr. Chongtham Shivaji, Scientific Officer | -do- | -do- |
| 7. | The Director, MASTEC | virtual meeting of the expert committee for establishment of Community Covid Resilience Resource Centre (CCRRC) in the states organised by DST, Govt. of India | August 19, 2021 |
| 8. | Dr. R.K. Pritamjit Singh, Scientific Officer | Webinar- "TIFAC TECH TALK 3 - Energy Security & Sustainability in India" organised by TIFAC, DST, Govt. of India | August 24, 2021 |

## 5.0 Visiting Scientists to MASTEC

| Sl. No. | Name & Designation | Organization | Purpose of visit & Date |
|---|---|---|---|
| 1. | Dr. C.M. Nautiyal, Consultant Science Communication | Indian National Science Academy, New Delhi | Resource person of the State Level Training Workshop for Science Communicators on Script Development focusing COVID-19, November 9-11, 2021 |
| 2. | Dr. S.K. Rathore, Chief Scientist and Head | Planning and Performance Division & Secretary, Research Council, CSIR-Advanced materials and Processes, Research Institute (AMPRI) | Discussion for a collaboration Project with MASTEC, October 29, 2021 |

## 6.0 Library

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