सत्यमेव जयते

Government of Mizoram

DIRECTORATE OF SCIENCE & TECHNOLOGY

ANNUAL REPORT

2017 - 2018

DIRECTORATE OF SCIENCE & TECHNOLOGY
MIZORAM SCIENCE, TECHNOLOGY & INNOVATION COUNCIL
MIZORAM REMOTE SENSING APPLICATION CENTRE
MIZORAM SCIENCE CENTRE

Science & Technology for Sustainable Development

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FOREWORD

Developments in science and technology are fundamentally altering the way people live, connect, communicate and transact, with profound effects on economic development. Science and technology are key drivers to development, since technological and scientific intervention brings in economic growth in almost all spectrums of governance and society.

The Directorate of Science & Technology, Govt. of Mizoram in its endeavor to bring about inclusive growth in governance of the state has made a number of worthwhile contributions for the successful planning and execution of state level and national schemes. It is also noteworthy for the state government that these contributions are at par with the technological advances happening at the national level which boosts the socio-economic development and well being of the society.

I am sure that whatever technological advancements that are achieved at this moment will go a long way in accomplishing our goals for future development of the state. I sincerely appreciate all the hard work that has gone into the preparation of the Annual Report of Science & Technology (third edition) which highlights the valuable activities and contributions made by the Directorate of Science & Technology towards socio-economic development in the state. I also hope that this report would be a valuable document for various stakeholders of the Government.

Dated Aizawl
the 25th July, 2018

(Dr. C. VANLALRAMSANGA)

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PREFACE

The Directorate of Science and Technology since its inception has strived in all spheres of technological advancements and valuable innovative strides that assists in the effective governance and implementation of valuable schemes and projects. It has also enhanced its relevance to societal scientific inputs by focusing on partnership with local research and development institutes of the states to have better impact on the overall economy of the state.

The third edition of the Annual Report of Directorate of Science & Technology 2017-18 presents brief highlights on the recent activities of science & technology in the state for various streams of socio-economic development. It is yet another milestone for the Directorate as a whole to bring out this valuable report which has its roots from the support and enthusiasm extended by the Government of Mizoram. This report is prepared with due diligence to highlight all the commendable development activities executed by the Directorate of Science & Technology, Govt. of Mizoram in different streams of technological, innovation and social aspects.

I would like to extend my sincere thanks to all the officers and staff of the Directorate of Science & Technology inclusive of the Autonomous organizations under its umbrella for their endeavor for bringing out this valuable record. I also hope that this document will be of immense value to line departments of the state, where such interventions can bring about inclusive growth in such sector of governance.

Dated Aizawl
the 25th July, 2018

(Dr. R.K. LALLIANTHANGA)

Contents

Chapter 1

Overview

OVERVIEW OF DIRECTORATE OF SCIENCE AND TECHNOLOGY

The Directorate of Science & Technology, Govt. of Mizoram is the main administrative office of Science and Technology in Mizoram. It was created as a Cell in the year 1986 with a view to utilise Science & Technology inputs for various developmental activities and to take up scientific projects and schemes pertaining to frontier areas of Science. Its status as a Wing under the Planning & Programme Implementation Department was upgraded to the Directorate on 30thAugust, 2011.

At present, there are three autonomous bodies functioning under the aegis of the Directorate of Science & Technology viz., Mizoram Science, Technology and Innovation Council (MISTIC), Mizoram Remote Sensing Application Centre (MIRSAC) and Mizoram Science Centre. The Directorate also houses several centres which play specific role for science and technology promotion and popularisation in various fields such as the State Meteorological Centre, Patent Information Centre and State Climate Change Cell. Besides these Centre, the Directorate also acts as a nodal department for the National Informatics Centre (NIC).

In recent years there have been a lot of development in Science and Technology sector. The Science and Technology Wing under the Planning Department was upgraded and became a full-fledge Directorate. The bodies such as Mizoram Science, Technology and Innovation Council (MISTIC) and Mizoram Science Centre were re-organized. The new Directorate of Science and Technology building was constructed at Mizoram Secretariat Complex, Khatla, and was inaugurated by the Hon'ble Chief Minister Pu Lal Thanhawla in 2016.There are also several upcoming Centres like – Lunglei Science Centre, Digital Planetarium at Lunglei town, Innovation Facility Centre at Aizawl, Innovation Hub & Space Science Education Centre at Berawtlang, Mizoram Bioresource Development Centre (MBRDC) at Mizoram University. MBRDC building foundation stone was laid by Dr. Harsh Vardhan, Union Minister for Science & Technology on 14th February, 2017.

1.1 Vision

Science & Technology for sustainable development.

1.2 Mission

(1) Harnessing potential of science & technology for sustainable development.

(2) Create knowledge based society through innovation and application of science and technology.

1.3 Objectives

(1) To create and develop natural resources' database for planning and development.

(2) To promote applied R&D through universities, R&D institutions and other state, national science & technology bodies.

(3) To identify, demonstrate, replicate and promote technologies relevant to the developmental needs of the state.

(4) To popularize science and spread of a scientific temper and attitude among the people of the state.

(5) To promote innovation and facilitate filing of IPR.

(6) To generate and disseminate meteorological data.

(7) To enhance the capacity of utilizing bio-resources and harnessing the advanced techniques of biotechnology for socio-economic growth.

1.4 Functions

(1) Application of Space Technology viz. Remote Sensing & Geographic Information System for natural resource management, planning and development.

(2) Technology development and demonstration.

(3) Popularisation of science and technology.

(4) Promotion of innovation and facilitation of filing Intellectual Property Right (IPR).

(5) Generation and dissemination of meteorological data.

(6) Scientific study on climate change.

1.4 Allocation of Business

As per the Government of Mizoram Allocation of Business Rules, this new Directorate has many responsibilities for the development of the state.

The business allotted to Directorate of Science & Technology are:-

(1) Promotion and Popularization of Science & Technology.

(2) Remote Sensing, GIS and Space Applications.

(3) Matters relating to Intellectual Property Rights including Copyright Act, 1957; Patent Act, 1970 involving establishment of Patent Information Centre; Design Act,1999; Trademarks Act, 1999; and all Rules/Regulation thereunder.

(4) Meteorology.

(5) Bioresources and Biotechnology.

Chapter 2

Direction & Administration

DIRECTION AND ADMINISTRATION

2.1 Directorate of Science and Technology

The Directorate of Science & Technology is functioning under the Planning & Programme Implementation Department. It has its own building at Mizoram Secretariat Complex which was inaugurated by Pu Lal Thanhawla, Hon'ble Chief Minister of the state of Mizoram on 19th October, 2016. At present, Directorate of Science & Technology is functioning with the Chief Scientific Officer as the head. Other scientific/technical officers include Principal Scientific Officer, Senior Scientific Officers and Scientific Officers.

Under the Directorate of Science & Technology, there are three autonomous body viz. Mizoram Science, Technology & Innovation Council (MISTIC) and Mizoram Remote Sensing Application Centre (MIRSAC) and Mizoram Science Centre (MSC). These bodies act as implementing agencies for various projects under the umbrella of the Directorate. The Directorate is functioning as the administrative office with the Chief Scientific Officer functioning as the Member Secretary in these bodies.

2.2 Mizoram Science, Technology & Innovation Council

The Mizoram Science, Technology & Innovation Council is an autonomous Government body working under the aegis of Directorate of Science and Technology, Govt. of Mizoram. It is the oldest S&T body in the state formed on 12th February, 1985 under the name Mizoram Council on Science, Technology & Environment. It plays an advisory role as well as implementing body for science and technology promotion in the state. In order to make it more effective, it is also registered under the Mizoram Society Registration Act 2005 (Reg. No. MSR-630 of 1.5.2015). The Governing Board constituted by the State Government is the apex body having sole authority over the council. The Governing Board is chaired by the

Chief Minister, Government of Mizoram, while the Executive Committee is chaired by the Secretary, Planning & Programme Implementation Department, Government of Mizoram.

The Council is administering four cells presently, viz. Patent Information Centre, State Climate Change Cell, Research & Development Cell and Innovation Cell. It is undertaking various works like science popularization, innovation, facilitation of intellectual property rights and its management, technology demonstration, replication, and other research & development works and programmes through these centres/cells. The Council also acts as a partner as well as a nodal body of the Department of Science&Technology (DST), Government of India in the state and it receives yearly Grant-in-aid from DST for salary of limited scientific/technical employees as Secretarial support as well as fund for implementing various projects. The State Government also supports the council for salary of administrative staff and for non-salary in the form of GIA for its effective functioning.

2.3 Mizoram Remote Sensing Application Centre

Mizoram Remote Sensing Application Centre (MIRSAC) was initially established in the year 1988 under Science, Technology & Environment Cell, Planning Department, Government of Mizoram. It now functions as an autonomous Government institution under Directorate of Science & Technology, Planning Department, with registration under the Mizoram Society Registration Act 2005 (Reg. No. MSR-30 of 19.1.2007).

The Centre is the nodal agency and apex organization for Remote Sensing and GIS applications in the state. The Centre is administered by Governing Body constituting of member from 16 line Departments under the Chairmanship of the Chief Secretary, Govt. of Mizoram. It is equipped with RS & GIS labs, libraryand hardware/software for executing remote sensing and GIS related works.

The State Govt. supports MIRSAC by providing Grant-in-aid for administration (salary and non-salary).

2.4 Mizoram Science Centre

Mizoram Science Centre is a non-formal science and technology institution which was inaugurated on 26th July, 2003. It helps to develop scientific temper amongst the general public, particularly school children by inculcating a spirit of inquiry and fostering creative talent through activity-based learning process incorporating method of science. It promotes creative activities in school to supplement formal science education. It also develops scientific exhibits, temporary exhibitions, kits and aids for use in the Centre in order to portray the development in science and technology.

The Centre now functions as an autonomous Government institutionunder Directorate of Science & Technology, Planning Department.

OTHER CENTRES/CELLS

2.5 State Meteorological Centre

The Directorate of Science & Technology established a State Meteorological Centre. At present, the State Meteorological Centre is stationed at the top floor of Directorate of Science & Technology office building, Mizoram Secretariat Complex, Khatla. Recording of various meteorological data has been started since the year 1997 with the technical help from Indian Meteorological Department. Besides Aizawl, Automatic Weather Stations have also been installed at Lunglei. The data generated are utilized by various Government Department and agencies, research scholars, journalists, etc.

2.6 Patent Information Centre

Intellectual Property Rights being an important issue, Patent Information Centre (PIC) has been established with the financial support from Department of Science & Technology, Government of India during the financial year 2010-2011. Among the IPR, Copyright Act, 1957; Patent Act, 1970 involving establishment of Patent Information Centre; Design Act, 1999; Trademarks Act, 1999 are allotted to Directorate of Science&Technology. In doing so, it provides awareness on Intellectual Property Rights through seminars, lectures, workshops, etc. It provides assistance for filing of Patent, Trade Mark, Designs, Geographical Indications, etc. Patent and Trade Mark searches for universities, Government institutions, R&D bodies, educational institutions and individuals are also conducted.

2.7 State Climate Change Cell

The Mizoram State Climate Change Cell was created on 3rd March, 2015 with the financial support of Department of Science & Technology, Govt. of India under the National Mission for Sustaining the Himalayan Ecosystem (NMSHE) programme of National Action Plan on Climate Change (NAPCC). It is functioning under the aegis of Mizoram Science, Technology & Innovation Council (MISTIC), Directorate of Science Technology, Govt. of Mizoram. The Cell concentrates in works mainly related to the National Mission for Sustaining the Himalayan Ecosystem under the National Action Plan on Climate Change and Strategic Knowledge Mission under the State Action Plan on Climate Change.

It conducts scientific study of Climate Change and related activities including simulation of climate modelling and prediction of future scenario change in different sectors. It also conducts research on climate change issues for database/information generation for the state. It conducts capacity building and training programmes for different stakeholders especially for adaptation strategies in response to climate change for integration into developmental activities by including policy makers, concerned departments, Government officials, NGOs and the local mass.

2.8 National Informatics Centre

Since inception, Science & Technology is the nodal Department in the state to coordinate and support the establishment of the NIC by providing accommodation and assisting in implementing their programmes and schemes at the state and district level. The NIC‟s Video Conferencing Centre plays a vital role for conferencing various central and state government departments. The fast internet broadband facility which they provide freely to the government departments is without doubt one of the best in the state.

Chapter 3

Natural Resources Database

CREATION AND DEVELOPMENT OF NATURAL RESOURCES DATABASE FOR PLANNING AND DEVELOPMENT

Mizoram Remote Sensing Application Centre started its venture, amongst the other state remote sensing organizations of the country as a small centre under the name of Mizoram State Remote Sensing Centre way back in 1988. The centre was established under the administration of Science, Technology, Planning Department. The centre start off operations in the scientific field as an agency for exploring the natural resources for planning and execution of various developmental activities using remote sensing and GIS technology.

Since its inception the State GIS & Remote Sensing Centre has been providing full spectrum of geospatial services and solutions, application softwares, geospatial data engineering and analytics services to facilitate all line departments, resource managers, planners decision makers for sustainable development planning activities in the state.

Indian Space programme emphasizes on utilization of space technology for the betterment of the society. Towards realizing this objective the centre is acting as an apex body of the state for technology applications such in Remote Sensing, GIS, and GPS.

The center has now become a geospatial resource hub and the repository of various thematic layers; satellite imageries, hardware and software (Image Processing, GIS, GPS/DGPS) installations in addition to a team of scientists and technical staffs.

Digital 3-D Terrain Mapping & Modelling

3.1 Digital 3D Terrain Mapping & Modelling of Eight Districts of Mizoram.

The primary objective of this project is to generate digital elevation models, updation of base topological features and to prepare a digital database for utilization of the data in other allied development projects of the Government. The following geospatial features will be generated– 10 m interval contour of Mizoram, drainage and other topological features. From the extracted digital features, 3D terrain models for eight districts of Mizoram will be generated.

Six districts of Mizoram viz. Champhai, Kolasib, Mamit, and Serchhip have been completed so far. The 3D model of each village in the districts have been prepared which can be panned, zoomed, rotated, and scaled. Thus, the terrain of each village can be visualized in a 3D environment which will help in better understanding of the terrain and planning activities.

Top: Siaha District Terrain Model

Bottom: Bawlte Village, Mamit District Terrain Model

Hazard, Risk and Vulnerability Analysis

3.2 Hazard, Risk and Vulnerability Analysis for Eight District Headquarters of Mizoram

Hazard, Risk & Vulnerability Analysis (HRVA) is a major project sponsored by North Eastern Council (NEC) which involvesmapping the major and prevalent natural hazards and their subsequent analysis in eight (8) districts headquarters of Mizoram. The hazard includes landslides, earthquakes, and wind & cyclone. Hazard mapping and assessment/analysishas been done with co-relational vulnerability and risk analysis. The main objectives of this project is to generate basic data, undertake in-depth analysis and to quantify disaster risk levels and associated causal factors for the eight district headquarters, and propose solutions for reducing the risks. For vulnerability and risk analysis, various physical and socio-economic data such as building type, population density, sex ratio, children and elders' population, low income group, etc have been collected in the field. Vulnerability and risk was assessed for infrastructure and population through socio-economic data using the samples of buildings derived from high resolution data. The use of space technology, especially the high resolution satellite data of Quickbird have made it possible to identify buildings types in the study area.

The hazards maps in terms of high, moderate and low hazard have been prepared based upon scientific and historical analysis. Likewise, vulnerability maps based on physical and socio-economic conditions of the study area, and subsequent risk maps for each of the local/village councils of the respective district headquarters have been prepared. The reports, maps and attribute data generated from this study will be able to help the administrators, planners and other agencies involved in disaster risk reduction programmes in assessing the extent of vulnerability, the exposure of people, infrastructure and economic activities to natural hazards within their respective jurisdictions. Moreover, it will also help in assessing the

degree of risk of all the habitations, and take suitable and appropriate actions to reduce the effects of the impending hazards.

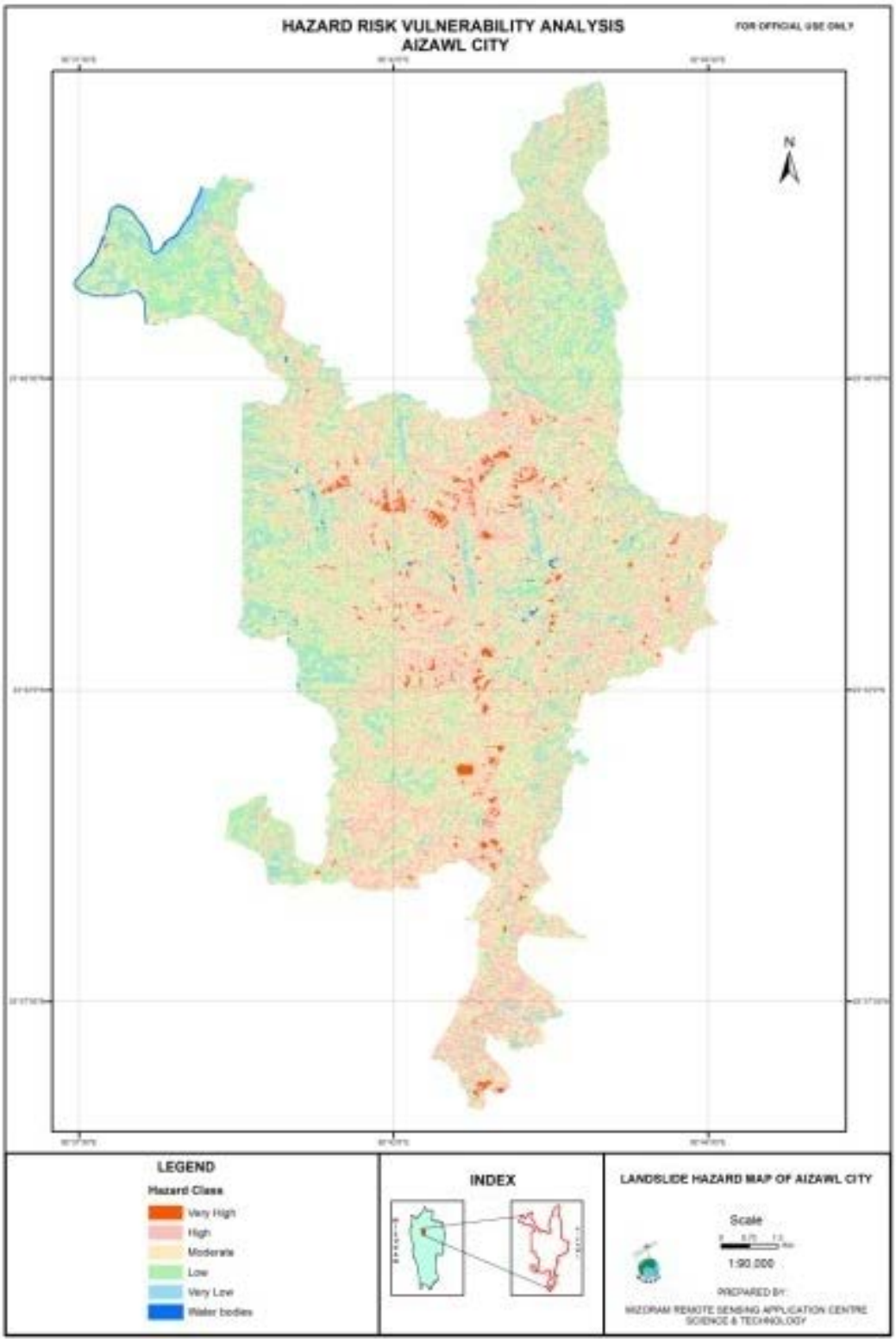


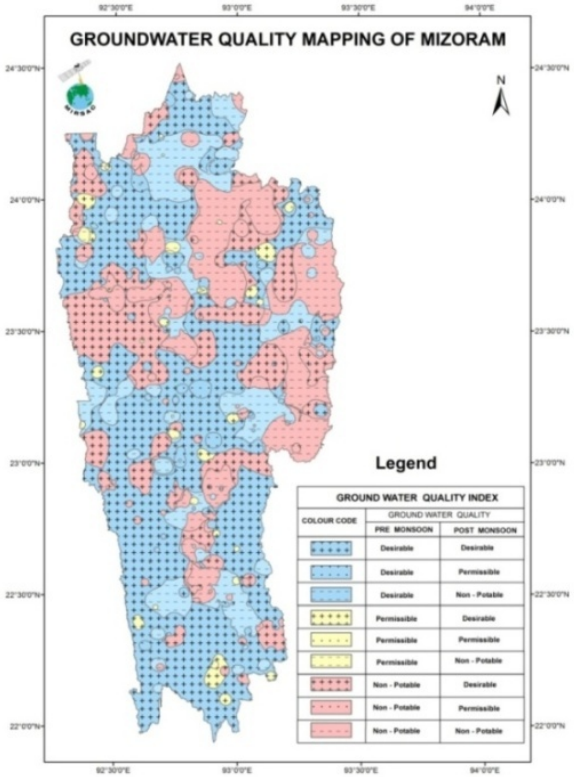
Photo: Sample maps prepared under *HRVA project of Aizawl City*

Ground Water Quality Mapping, Mizoram

3.3 Ground water Quality Mapping, Mizoram

MIRSAC has generated ground water quality maps by interpolation method using the legacy (ground water quality) data obtained from state PHE Department. This is a nationwide project funded by Ministry of Drinking Water & Sanitation through ISRO (Dept of Space) to state's Remote Sensing Centres. MIRSAC has completed this project, and all the spatial and non-spatial data associated with it have been sent to NRSC, Hyderabad. The spatial data (ground water quality maps) thus generated is expected to serve as a critical input for identifying potable drinking water sources to both urban and rural habitations as well as for taking measures to overcome the problem of ground water quality.

This project has been taken up for the entire state of Mizoram is using the legacy data obtained from State PHE Department on 1:50,000 scale. The output map is prepared based on SOI toposheets grids. MIRSAC has completed this project, and all the spatial and non-spatial data associated with it have been sent to NRSC, Hyderabad. The spatial data (ground water quality maps) thus generated will serve as a critical input for identifying potable drinking water sources to both urban and rural habitations as well as for taking measures to overcome the problem of ground water quality.

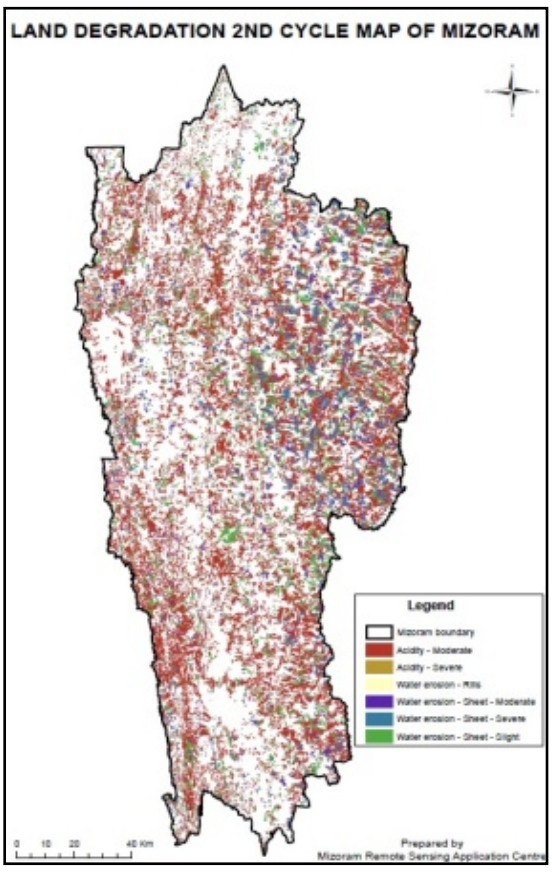


Land Degradation Mapping Mizoram

3.4 Land degradation mapping, Mizoram

The Land Degradation Mapping project is a nationwide mapping project being funded and coordinated by National Remote Sensing Centre (NRSC), Dept. of Space for identifying the extent of various types of degraded lands in the country and to assess the magnitude of changes occurring in degraded lands since the 1st cycle of mapping. The Centre has been engaged in mapping and analysis of degraded lands in Mizoram at 1:50,000 scale and also to assess the extent of degraded lands in comparison to the 1st cycle of mapping.

The main objectives of Land degradation mapping project are – to generate land degradation data base and map for the period 2015 – 2016 using three multi-temporals (Kharif, Rabi & Zaid) IRS LISS III data; to create digital data base on standard NRC – LDM 50K codification and methodology and integration of base details to generate seamless digital data at District and State level, and, to provide Land degradation report for the state and country as a whole which can be valuable input at various levels of planning exercises.The Project has been completed and data submitted to NRSC, Hyderabad.

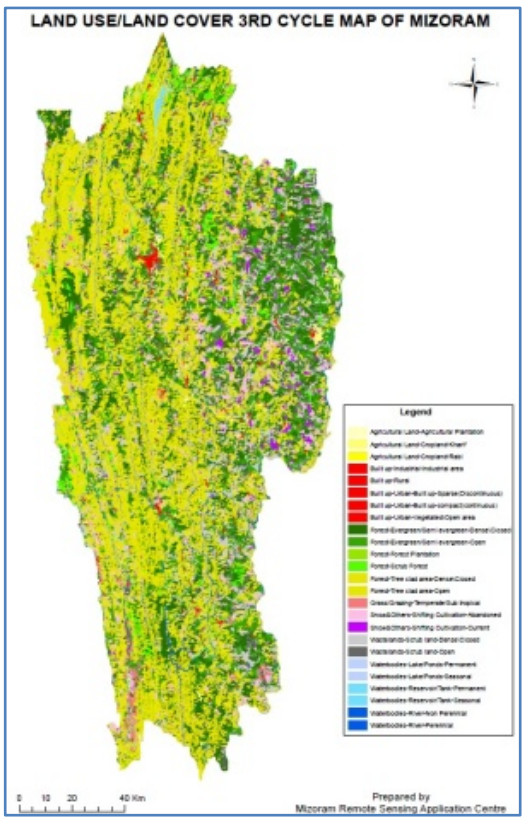


3.5 Land Use Land Cover Analysis, Mizoram

Land use Land Cover Mapping Mizoram

The Land Use Land Cover Analysis for Mizoram is another nationwide project funded and coordinated by National Remote Sensing Centre (NRSC), Dept. of The project aims to generate LULC data base and map for the period 2015-2016at 1:50,000 scale using three multi temporal IRS P6 LISS III satellite data; create digital database on standard NRC-LULC50K codification and methodology; generate seamless digital data at district/state level; provide a land use report for the state and country as a whole and analyze the change pattern in LULC compared to the 2nd cycle LULC mapping.

Land use Land cover is dynamic in nature and requires regular monitoring to understand the rapid change and to ascertain the reasons/drivers for the change. This change can be the result of a number of interacting processes occurring in natural resources. The data base has formed a core base data in most of the projects taken up by line departments of the state as it contains almost all land based spatial information. Further, it will also enable the planers and administrators to initiate appropriate measure for preventing or arresting degradation of natural resources as a whole.

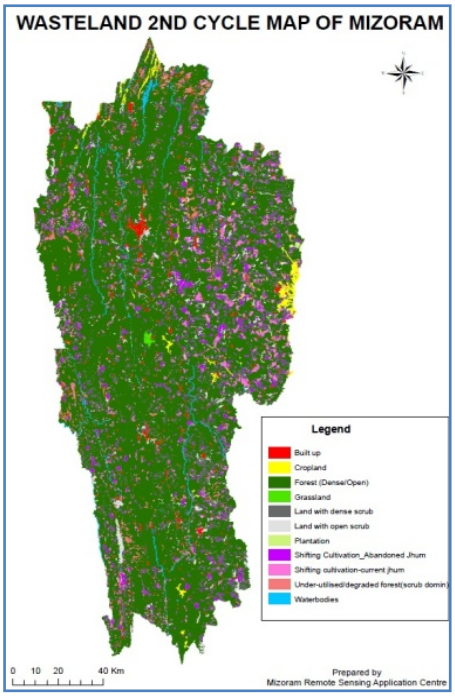


The Project is now completed with spatial data being submitted to NRSC, Hyderabad.

National Wasteland change Analysis, Mizoram

3.6 National Wasteland Change Analysis, Mizoram

The Wasteland Change Analysis project for Mizoram was taken up by the Centre to assess the change in wasteland distribution compared to the previous cycle of mapping. This is also a nationwide project funded by NRSC. The main objective of the project is updating the spatial extent and distribution of waste-lands on 1:50,000 scale and analyzing Mizoram wasteland change matrix with reference to the previous wasteland mapping project using satellite data of 2015-2016. The project also focuses on creation of digital database for incorporation into the nationwide wasteland repository.



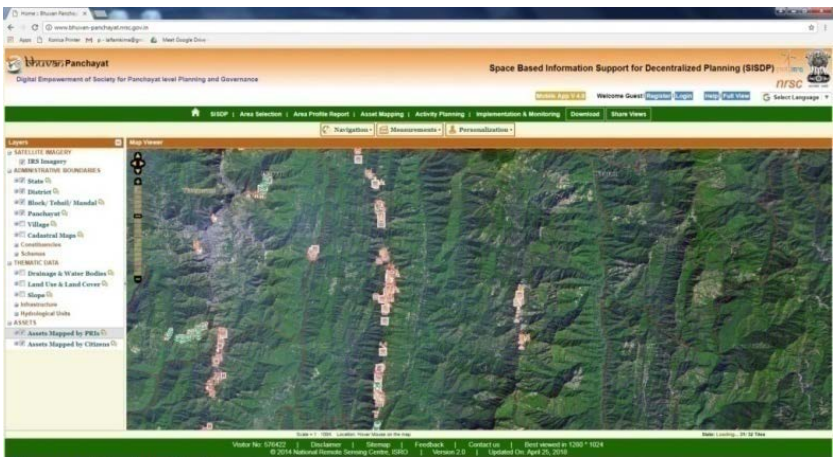
The project is completed and data submitted to NRSC, Hyderabad.

Empowering Panchayati Raj Institutions Spatially

3.7 Empowering Panchayati Raj Institutions Spatially (EPRIS), Aizawl Dist.

Empowering Panchayati Raj Institutions Spatially (EPRIS) is a comprehensive outreach programme initiated by ISRO, DOS with the goal to empower Panchayati Raj Institutions for resource-based and integrated spatial developmental planning for rural areas in a user-friendly enabling environment using space-based inputs. The plan is intended towards the outreach activities that comprises of (i) capacity building of Elected Panchayat Representatives, their support functionaries and facilitators; (ii) asset mapping task; and (iii) activity planning task with the involvement of SRSACs, NIRD, NGOs, academia, etc.

In case of Mizoram, the governance system is not as Panchayati Raj system practiced in other states of India. Due to this difference in governance system, the project implementation is carried out with slight alteration accordingly. EPRIS project was implemented with the support of SRSAC i.e. MIRSAC, NIRD, and Academic Institutions as Partner Institutions (PIs) of NRSC. The project was executed based on a Memorandum of Understanding (MoU) between NRSC and MIRSAC. The project was executed in collaboration with the State Institute of Rural Development (SIRD) and State Panchayati Raj Department. The implementation of outreach activities under EPRIS was supervised by MIRSAC.



Horticulture Assessment and Management Using Geo informatics

3.8 Coordinated Programme on Horticulture Assessment and Management (CHAMAN) using Geoinformatics, Champhai Dist.

Considering the importance of horticulture for nutritional security and improving farmers' income and the need for a more scientific database of horticultural information, the Department of Agriculture, Cooperation & Farmers' Welfare, Ministry of Agriculture & Farmers' Welfare under the Mission for Integrated Development of Horticulture (MIDH) initiated the CHAMAN project. The entire project ideology under the use of Space technology focused on better horticulture inventory and management using Remote Sensing, GIS and collateral field data.

During 2017-2018, the site suitability analysis for Grape was done for entire Champhai district and further narrowed down to Block and village level maps and statistics. A report was and was handed over to the Horticulture Department, Govt. of Mizoram. The report was also released and handed over to the Ministry of Agriculture & Farmers' Welfare, Govt. of India.

Report handed to Ministry of Agriculture & Farmers' Welfare, Govt. of India

National Remote Sensing Day

3.9 National Remote Sensing Day - 2017

The National Remote Sensing Day – 2017 which commemorates the birth anniversary of Dr. Vikram Sarabhai, Father of Indian Space Programme, was observed by the Centre on 11th August, 2017 at Dte. Science & Technology. The celebration function had Pu Lalsawta, Hon'ble Minister, Planning (Science & Technology) as the Chief Guest who also flagged off the Centre's Unmanned Aerial Vehicle (UAV) on the occasion. The function was chaired by Dr. R.K.Lallianthanga, CSO & Member Secy. MIRSAC and a presentation on Applications of Remote sensing & GIS was given by Dr. Lalnunsiama Colney, Principal Scientist, MIRSAC. This was followed by UAV demonstration by Pu C.Vanlalengkima, Scientist.

An exhibition showcasing the basics & types of Remote sensing, its Applications and prominent projects taken up by the centre was also organised within the confines of the venue and as a sideline to the celebration function. The function was attended by Officers from various line departments of the state, NGOs from Science communities, University professors, academicians, scientists, science enthusiasts and Science students from Govt. Mizo Higher Sec. School, Pamphlets about remote sensing/GIS and recent report materials were also distributed to the invitees present at the function.

3.10 Activities of Mizoram Remote Sensing Application Centre.

1. Pu R.Lalfamkima, Scientist & Pu Lalfakawma Royte, Field Assistant were detailed for DGPS ground survey under Digital 3D Terrain modeling project within Lunglei district from 11th April – 1st May, 2017.

2. Pu C.Vanlalengkima, Scientist attended a training course on UAV-Remote Sensing Applications organised by Nagaland GIS & Remote Sensing Centre, Kohima & NESAC, Umiam from 1st May – 12th May, 2017.

3. Pu R. Lalfamkima, Scientist & Pu C. Lalzawngliana, Field Assistant were detailed for DGPS ground survey under Digital 3D Terrain modeling project within Lawngtlai district from 29th May – 20th June, 2017.

4. A Handover Programme of reports prepared under CHAMAN Project – Site Suitability Analysis for Grape crop in Champhai District was organised at DST Conference room, Dte. of Science & Technology, New Secretariat Complex on 11th July,2017.

CHAMAN project function @ DST, Aizawl

5. Pu R. Lalfamkima, Scientist & Pu C. Lalzawngliana, Field Assistant were detailed for DGPS ground survey within Siaha district under the Digital 3D Terrain modeling project during July, 2017.

6. Dr. R.K. Lallianthanga, CSO & Member Secy., Pu Robert Lalchhanhima Sailo & Pu C. Vanlalengkima, Scientists attended the 'Workshop on Applications of Space Technology in Development of North East region' organised by Ministry of DoNER, GoI, NCoG, MeitY, GoI and hosted by Bhaskaracharya Institute of Space Applications &Geoinformatics (BISAG), Ahmedabad from 20th –22nd July, 2017.

7. The Executive Committee meeting of MIRSAC was convened at the office chamber of Secretary, Planning on 20th July, 2017.

8. Pu Vanlalnghaka, Scientist, Pu David Vanlalfela Pachuau, Field Assistant & Pu Lalhriatpuia, Skilled II were detailed for ground data collection within Serchhip district under HRVA Project from 1st – 11th August, 2017.

Ground truthing at Serchhip for HRVA project

09. The National Remote Sensing Day, 2017 was observed by the Centre at Directorate of Science & Technology Office on 11th August, 2017.

10. A Seminar on 'Harnessing the True Value of GIS' was jointly organised with ESRI, India at Aijal Club on 22nd August, 2017.

Seminar on GIS - jointly organised with ESRI at Aijal Club

11. Pu Robert Lalchhanhima Sailo, Scientist attended a project review meeting for CHAMAN at SAC, Ahmedabad from 18th – 23rd September, 2017.C

12. Dr. Lalnunsiama Colney, Principal Scientist and Pu R. Lalfamkima, Scientist attended the 6th Interaction Meeting of SRSACs at NRSC, Hyderabad from 21st – 22nd September, 2017.

13. Pu R. Lalfamkima & Pu C. Vanlalengkima, Scientists, Pi Rosy Lalremruati Pachuau, UDC & Pi Chawngthansiami, LDC attended a training on implementation of ETA module of Public Financial Management System (PEMS) on 26th September, 2017 at NLUP Conference Hall, Aizawl.

14. Pu ZD Laltanpuia, Sr. Scientist attended the Governing Body Council meeting of NESAC, on 4th October, 2017 at NESAC, Dept. of Space, Umiam.

15. Pu C.Vanlalengkima & Pu Vanlalnghaka, Scientists attended a training programme for NESDR Project at NESAC, Umiam from 17th – 18th October, 2017.

16. Dr. Lalnunsiama Colney, Principal Scientist & Pi Vanlalmuansangi, Scientist attended a Two day workshop on 'Effective use of Geospatial Technology in Agriculture & Allied Sectors of North Eastern Region' organised at NESAC, Umiamfrom 21st – 22nd November, 2017. They also attended a meeting for CHAMAN Project at NESAC on 23rd November, 2017.

Meeting with Horticulture Dept. for CHAMAN (2nd Phase) project

17. Pu Robert Lalchhanhima Sailo, Scientist & Pi Rosy Lalremruati Pachuau, UDC attended a Workshop on New Pension Scheme (NPS) for State Autonomous Bodies in North Eastern Statesorganized by PFRDA, Govt. of India & NSDL, Mumbai at AssamAdministrative Staff College, Guwahati on 8th January, 2018.

18. A demonstration of ERDAS Software was jointly organized with Hexagon Geospatial Co. at the Conference room of Dte. of Science& Technology, Govt. of Mizoram on 8th February, 2018.

19. The translated version of ISRO Flyer "Utilization of SpaceTechnology" (Mizo version) prepared by the Centre was released by Pu Lalmalsawma, Chief Secretary& Chairman, MIRSAC atthe Governing Body Meeting at the CS Conference room, MizoramSecretariat Complex, Aizawl on 23rd February, 2018.

ISRO Flyer (Mizo version) released by Pu Lalmalsawma, Former Chief Secretary & Chairman, MIRSAC

20. Pu H. Lalhmachhuana, Scientist and Pu Lalfakawma Royte, Field Assistant were detailed for ground data collection underthe CHAMAN project of Horticulture area mapping in Serchhip district from 28th – 30th March, 2018.

21. Pu Robert Lalchhanhima Sailo, Scientist attended the CHAMAN Workshop and Review Meeting organized by MNCFC, Dept. of Agriculture Cooperation & Farmers Welfare, Govt. ofIndia at Assam Administrative Staff College, Guwahati from 11th– 12th March, 2018.

Chapter 4

Science Popularisation

POPULARIZATION OF SCIENCE, TECHNOLOGY AND SPREAD OF SCIENTIFIC TEMPERAMENT AMONG THE PEOPLE

Science popularization has been one of the main programme organised throughout the years. Every year, a series of programmes such as Workshop, Symposia, Celebration of various International Year, National Science Day and Mathematics Day, Talk Show, Nature study, campaigns, lectures, demonstration, etc. are organised to popularise science among the students and the masses.

4.1 Popularization of science through Mizoram Science Centre

Since its inception to till date, the Centre has incessantly been visited by number of visitors who have curiosity of basic as well as practical scientific knowledge. The category-wise visitor statistic of Mizoram Science Centre during 2017-18 is as given below:

Month	No. of Visitors			
	General	Student	Teacher	*Total*
APRIL	285	39	8	*332*
MAY	469	97	18	584
JUNE	398	289	14	701
JULY	713	20		733
AUGUST	552	75	11	638
SEPTEMBER	539	153	10	902
OCTOBER	436	307	30	773
NOVEMBER	701	1014	118	1833
DECEMBER	514	467	59	1040
JANUARY	520	69	17	606
FEBRUARY	634	501	53	1188
MARCH	1121	115	13	1249
TOTAL	6,882	3,146	351	10,379

Celebration of 14th Anniversary:

The 14th Anniversary of Mizoram Science Centre was celebrated at Mizoram Science Centre Auditorium, Berawtlang on 26th July, 2017. Pu Lalmalsawma, Chief Secretary, Govt. of Mizoram and Chairman of Mizoram Science Centre, graced the function as Chief Guest.

Seminar cum Science Demonstration:

Seminar cum Science Demonstration programme on Science & Technology for Sustainable Future for Mizo Hmeichhe Insuihkhawm Pawl (MHIP) was conducted on 22nd March, 2018.

Innovation Hub

4.2 Innovation Hub and Space Science Education Centre at Mizoram Science Centre, Berawtlang

With the financial and technical support of National Council of Science Museums, Kolkata, Innovation Hub and Space Science Education Centre is being constructed at Mizoram Science Centre, Berawtlang. This Innovation Hub will provide facilities to nurture new ideas and help develop inquisitive perspective among the students. The intention is to provide an open platform to the young people to engage in innovative and creative activities. Here they can experiment and pursue with their innovative ideas to nurture their innovative potential and develop innovation centric mindset.

The following are proposed to invigorate the Innovation Hub:

1. Enhance Interactivity
2. Showcase Innovation
3. The innovation Hub will house the following interactive corners to facilitate its objective:
   a) Discovery Hall
   b) Innovation Resource Centre& Hall of Fame celebrating Inventions & Innovation
   c) Idea Lab
   d) Design Studio

The Innovation Hub of Mizoram Science Centre, Aizawlis on the verge of completion and is expected to be inaugurated soon.

Popularisation through Printed Journals

4.3Science Popularization through Printed Scientific Journals

Support by way of funding have been provided to Science NGOs for publishing of three regular Scientific Journals. The magazines are Meithallawn (with Mizoram Science Society), Science Vision (with Mizo Academy of Sciences) and Mizoram Science Journal (with Science Teachers Association Mizoram). The journals are widely circulated in educational institutions from Primary level to University students all over the state and it also reaches the general masses. The toils, hard work and sincerity of the three Science NGOs paid off as can be seen from the rising demands for these science magazines.

The number of issues of Scientific Journals published during the year 2017-2018 is 20. (MSJ – 10 issues, MTL – 6 issues, SV – 4 issues)

Mizoram Science Journal is mainly intended for young scholars and school children. Vision is mainly research oriented and it includes original research papers and valuable scientific articles. Meithallawn magazine focus mostly on science popularization.science with applied aspects and its contents fits for all sections of people.

National Technology Day

4.4 Celebration of National Technology Day 2017

National Technology Day 2017 Celebration programme was organised at I&PR Auditorium, Aizawl, Mizoram on 11th May, 2017. Dr. C. Vanlalramsanga, Secretary (Planning – Science & Technology) was the Chairman and Shri H. Liansailova, Vice Chairman, State Planning Board was the Chief Guest. Dr. R.K. Lallianthanga, Chief Scientific Officer gave a presentation on project 'Development of Indigenous Technological Innovations in Mizoram '(DITIM). The programme was attended by students from NIELIT, Women Polytechnic, ITI-Aizawl, Science NGOs, Local innovators and local renowned persons in science and technology fields and other officials.

Few Science NGOs of the state and the following persons werefelicitated for their pioneering works and contribution to promotion of science and technology of the state.

Dr. L.N.Tluanga, Mission Veng
Dr. R. Kapthuama, Khatla.
Er. Dunglena, Laipuitlang and
Dr. Vanlalzara, Khatla

Science Exposure Tour

4.5Science Exposure Tour

Mizoram Science, Technology & Innovation Council (MISTIC) organized Science Exposure Tour on 23rd& 24th August 2017. The tour was conducted for science students of class XI within Mizoram. The tour was flagged off by Dr. R.K. Lallianthanga, Chief Scientific Officer & Member Secretary, MISTIC on 23rd August, 2017 after a brief function at the office of Directorate of Science & Technology.

A total of 35 participants attended and participated in the programme. The participants are selected from secondary school of different districts within Mizoram having science Stream. Fourstudents along with oneaccompanying teacher are selected from seven schools.

The two day tour started with a visit of the Directorate of Science & Technology, Mizoram Secretariat Complex, Khatla, Aizawl. Here the participants toured the whole office wherein demonstration of Google-earth software, etc. and remote controlled drone was conducted. A brief explanation of the weather station under Mizoram Meteorological Center was also given with thorough

Participants of ScienceExposure Tour

explanation of different parameters like rain gauge, wind speed & direction, etc.

Mizoram Poultry Development Farm, Tanhril which is under Department of Animal Husbandry & Veterinary Science, Govt. of Mizoram was also visited. Here, scientific management of poultry farming was explained and demonstrated for participants. Techniques like egg incubation, brooding, breeding, inoculation/vaccination, feeding, etc. was demonstrated and visually shown to the students.

The first day of the tour ended with a visit of Mizoram University campus. Different departments of science stream like Biotech Department, Environmental Science, Geology, Botany, Zoology and Library were visited. A thorough visit of each department along with respective laboratories was done where a brief lecture on specific topic with visual demonstration was conducted by respective professors of each department. Different equipment were also shown and explained to the participants.

Explanation & Demonstration of UAV

The second day of Science Exposure Tour, 2017 started with a visit to Pachhunga University College (PUC), College Veng, Aizawl. A brief introduction of the college was given by Dr.Tawnenga, Principal of PUC. A tour within the campus was guided by Dr. K. Vanlaldinpuia, Assistant

Professor of Chemistry Department. Science departments like Chemistry, Physics, Botany, Zoology and Biotechnology were visited where different lectures, experiments and details of each department were studied.

Regional Institute of Paramedical and Nursing Sciences (RIPANS), Zemabawk was visited during the tour wherein activities of different departments of the Institute were explained with its admission criteria. Mrs. Lalmawizuali, Demonstrator of Nursing Department guided the participants to different departments and gave some experiment at nursing laboratory like working of electrocardiogram (ECG), ward management by Nurse, blood pressure test, etc.

The final destination of the tour was Mizoram Science Center (MSC) which is located at Berawtlang, Aizawl. Mr. Lalrammawia, Education Assistant of MSC performed some Chemistry experiments as a part of welcoming function of the center.The Officials then guided the participants to different galleries of the center with explanation of different exhibits. Different questions are raised by the participants at different exhibits which were eagerly promptly replied by the guides. A 3D show, fountains and different outdoors exhibits within the campus of the center were also thoroughly observed and enjoyed by the participants.

The valedictory function of the Tour was held at Youth Hostel Conference Hall, Luangmual. The function was presided over by Mr. Davy Lalruatliana, Scientific Officer. Dr. R.K. Lallianthanga, Chief Scientific Officer was the Chief Guest of the function, who was accompanied by Mr. Lalsawmliana, Principal Scientific Officer. A brief report of the tour report was given by Mr. Samuel Lalmalsawma, Senior Scientific Officer. Feedbacks were given by participants who emphasised on the importance of the tour for career guidance as well as exposure for further studies and stated that such programme should be held every year. Participation certificates and T-shirts were distributed to each participants. The function ended with a vote of thanks from the Principal Scientific Officer followed by a grand dinner.

Mega Science, Technology & Industry Expo, India

4.6 Participation in Mega Science, Technology & Industry Expo, India International Science Festival 2017

MISTIC participated and exhibited a stall at the Mega Science, Technology & Industry Expo, India International Science Festival 2017 held at Chennai, the capital of Tamil Nadu during 13th–17th October 2017 with a theme of'Science for New India'. The team comprised of three personnel, Pu Samuel Lalmalsawma, SSO, Pu P.C. Lalngilneia, SO and Pu John LalchhuanawmaSailo, TA.

The Science Festival was inaugurated by Hon'ble Minister for Science & Technology, Environment Forests & Climate Change and Earth Sciences, Dr. Harsh Vardhan in presence of senior science ministry officials, foreign dignitaries and numerous enthusiastic audiences.

The event lasted for four days and was held at IIT Madras, Anna University, Central Leather Research Institute (CLRI), Structural Engineering Research Centre (SERC) and National Institute of Ocean Technology (NIOT). The organisers were Ministry of Earth Sciences, Ministry of Science and Technology, Vijnana Bharati (VIBHA) and National Institute of Ocean Technology. Top organisations like CSIR, DRDO, ICAR, IMD, ICFRE, etc. and State S&T, Councils participated in the expo. The Hon'ble Vice President of India, Shri Venkaiah Naidu, Shri Yeafesh Osman, Science & Technology Minister, Bangladesh and Shri Abdul Latif Roshan H&TE Minister, Afghanistan also participated in the event.

Exhibiting the programmes and activities of S&T

STINER

Walk-Through Exhibition

4.7 Participation in STINER walk-through exhibition of the DONER

MISTIC arranged showcasing of the technologies under the ambit of S&T Mizoram in the STINER walk-through exhibition of the DONER programme during Hon'ble Prime Minister Mr. Narendra Modi's visit to Mizoram on 16th December 2017. Necessary assistance was extended to Dr. (Mrs.) Ketaki Bapat, Scientist 'F', Office of the Principal Scientific Adviser to GoIin arranging the exhibition. The programme was held at Assam Rifle Ground (Lammual), Aizawl.

During this period of PM Modi's visit to Mizoram, local innovators from various parts of Mizoram, viz. Aizawl, Chhungte Champhai, Haulawng and Hualngohmun were invited and assisted in exhibition of their innovations and technologies. The Prime Minister and his team visited all the stalls and were much impressed by the Mizo innovators and their fascinating inventions.

Photo with Local Innovators

State Level Mathematics Competition

4.8 State level Mathematics Competition

State level Mathematics Competition was organized in collaboration with Mizoram Mathematics Society on 9th December, 2018 at six (6) different centers viz. Aizawl, Lunglei, Serchhip, Champhai, Saitual and Kolasib.

The top prize winners of the State Level Mathematics Competitionin different classes are as follows:

Class V

1. H. Malsawmdawngzuala
2. Wahengbam Mythsna
3. Lalruattluangi
4. Zomawii Renthlei
5. R. Lalduhawmi
6. Sylvester Lalngheta
7. Heidi Vanlalruati Hrahsel
8. Pinky Beiryuso Chozah
9. Vanlaltlanthanga Ngente

Class VII

1. Vanlalruata Fanai
2. H. Vanlalpeki
3. Malsawmsanga
4. Suhail Ferdous Choudhury
5. Lalnunpuii Pachuau
6. Joseph Zodinpuia
7. Singokhai Chozah
8. Stephen Lalzahawma
9. Lalnunfela Sailo
10. Lalhmingmawia

Class X

1. Swagatalokhi Bhattacarya
2. Ashish Chauhan
3. Lalremsiama Darchhun
4. Lalthlamuanpuii
5. Rosangzuala Ralte
6. Lalhruaizela Chhangte
7. Malsawmtluanga
8. Abraham Lalhruaitluanga
9. Lalhruaitluangi Sailo
10. K Lalnunmawia

Class XII

1. Lalsanglura
2. Nongmaithem Sneeha Devi
3. Ruth Lalrinawmi
4. Lallawmzuala Tochhawng
5. Anamika Dey
6. Lalhriatzuala
7. C. Lalhmachhuana
8. Nafisa Barlaskar
9. Zawlhmingthanga
10. Timothy Lalsiamlen

National Mathematics Day

4.9 National Mathematics Day 2017

Under the collaborative effort of Mizoram Science, Technology & Innovation Council (MISTIC) and Mizoram Mathematics Society (MMS), and catalysed by National Council for Science & Technology Communications (NCSTC), DST, the National Mathematics Day 2107 was observed and celebrated in Mizoram at the Seminar Hall of Pachhunga University College, Aizawl on 22nd December, 2017. The function was presided by Dr. R. K. Lallianthanga, CSO &and Member Secretary, MISTIC and was graced by Chief Guest Shri Lalsawta, Hon'ble Minister, Planning Department, Govt. of Mizoram and Guest of Honour Dr. L. N. Tluanga, Adviser, Mizoram Mathematics Society. A special item 'Fun with Numbers' was performed by Pu P.C. Lalngilneia, Scientific Officer, Mizoram Science, Technology & Innovation Council (MISTIC).

Prizes were given away to the winners of the 9thState Level Mathematics Competition, 2017 held on 9thDecember, 2017 at six (6) different centers viz. Aizawl, Lunglei, Serchhip, Champhai, Saitual and Kolasib. The total number of participants for the year's competition totaled 3100 students. All the participants belong to classes V, VIII, X and XII respectively.

National Mathematics Day 2017& Prize distribution at PUC Seminar Hall

Mathematics Summer Camp

4.10 Mathematics Summer Camp (2018)

The 3rd Mathematics Summer Camp was organized during 19th to 23rd March, 2018 at Pachhunga University College, Aizawl by Mizoram Science Society and Mizoram Science, Technology & Innovation Council. The objective of the Summer Camp was to induce Mathematical aptitude to the school students of Mizoram. The focus group of the program was current students studying in classes X and XII. The camp was held during school break so as to get maximum benefit and whole hearted participation by the students. The summer camp was attended by 75 students from class X and 25 students from class XII totaling to 100 students.

National Science Day

4.11 National Science Day

Under the aegis of NCSTC, New Delhi, National Science Day 2018 was observed with the theme 'Science and Technology for a sustainable future' at different places in Mizoram.

The grand celebration of National Science Day 2018 in Mizoram was held at Conference Hall, Assembly Annexe Building.

The function was graced by Chief Guest Shri H. Liansailova, Vice Chairman, Mizoram State Planning Board. The chairman was Dr. R. K. Lallianthanga, Chief Scientific Officer and Member Secretary, MISTIC. The function was attended by students and faculties of ITI, Women Polytechnic, DIET, Science NGOs and others Dr. R. K. Lallianthanga, Chairman gave the keynote address. Mr. Samuel Lalmalsawma, Senior Scientific Officer, MISTIC gave a

Special lecture and a view of audience during NSD-2018 celebration at Aizawl.

presentation on how National Science Day has been celebrated in the state of Mizoram under the aegis of NCSTC over the past years. A presentation on the year's theme was given by Dr. Lalnunsiama Colney, Principal Scientist, MIRSAC Science demonstration was carried out by Mr. Lalrammawia, Education Assistant, Mizoram Science Centre. Beautiful songs

were presented by Mission Veng YMA Choir and Ms. Zualbawihi, one of the top local singer of the state.

National Science day was also celebrated at district headquarters of Mizoram.

NSD celebration at Champhai

NSD celebration at Lunglei

NSD celebration at Kolasib

NSD celebration at Serchhip

NSD celebration at Mamit

NSD celebration atLawngtlai

Science & Technology for a Sustainable Future

and Science Demonstration

4.12 Seminar on Science & Technology for a Sustainable Future and Science Demonstration Programme

As part of the National Science Day Celebration, Seminar on Science & Technology for a Sustainable Future cum Science Demonstration was organized in collaboration with Mizoram Science Centre at Mizoram Science Centre, Berawtlang, Aizawl on 22nd March, 2018.

The celebration event was also joined by Mizo Hmeichhe Insuihkhawm Pawl (MHIP), which is the largest women association (NGO) of Mizoram. The function was graced by Dr. C. Vanlalramsanga, Secretary, Planning, Govt. of Mizoram as Chief Guest and presided by Dr. R. K. Lallianthanga, Chief Scientific Officer and Member Secretary, Mizoram Science, Technology & Innovation Council.

Pi Lalrinnungi, Education Assistant gave a presentation on the theme 'Science & Technology for a Sustainable Future.' Science Demonstration was performed by Pu Lalrammawia, Education Assistant, Mizoram Science Centre.

Apart from this,Science Demonstration programme was also organised at five selected Higher Secondary Schools of Aizawl which are – Govt. Zemabawk Higher Secondary School, Govt. Republic Higher Secondary School, Govt. K.M. Higher Secondary School, Govt. Chaltlang Higher Secondary School and Govt. Mizo Higher Secondary School

105th Indian Science Congress

4.13 Participation in 105th Indian Science Congress

MISTIC participated and exhibited items in the Pride of India Expo, 105th Indian Science Congress held at Manipur University, Imphal during March 16-20, 2018.Prime Minister of India, Shri Narendra Modi inaugurated the 105th Indian Science Congress on 16th March (Friday) at the Manipur University. The focal theme of this year's congress is "*Reaching the Unreached through Science and Technology*." In his speech, the Prime Minister urged the community to inculcate a scientific temper among the youth, and stressed that the Indian government has come up with new initiatives to promote research and development.

The event lasted for four days and was held at Manipur University campus. More than 5000 scientists, senior science ministry officials, scholars, students and numerous enthusiastic audiences participated in the 105th Indian Science Congress.

The five day-long event includes various activities like symposiums, posters and oral presentations, workshops, lectures and cultural events. Also, numerous numbers of stalls were set-up, exhibiting the various works carried out by different departments and organizations around the country. The Mizoram team comprised of Pu Davy Lalruatliana, SO and Pu John Lalchhuanawma Sailo, TA and local innovator.

MISTIC exhibiting items at 105th Indian Science Congress

Science and Technology Mass Awareness

4.14 Science & Technology Mass Awareness Programme

The project entitled Science and Technology Mass Awareness Programme amongst the Tribal/Rural Population in Aizawl and Lunglei Districts was started during April 2017. A booklet was prepared for distribution. The programme covered topics like:

1. Science and Superstition
2. Career in Science & Technology
3. Health and Personal Hygiene
4. Cultivation and Agriculture

The topics were taught to the students using a powerpoint presentation. Impact of the campaign/programme is assessed by means of questionnaire.

Objective of the project

The main objective of the project is to inculcate the importance of science and technology among students of the rural areas. The main points are as below:-

a) To organize scientific awareness amongst tribal population in the two districts viz., Aizawl and Lunglei districts of Mizoram with the topics viz., Science and Superstition, Career in Science & Technology, Health and Personal Hygiene, Sustainable Agriculture.

b) To inculcate scientific temper amongst students and public.

c) To promote an innovative thinking amongst young student.

Methodology

(i) The methodology of carrying out the awareness campaign programme is by visiting the selected institutions in their respective places.

(ii) The selection of the campaign destination has been done by prioritizing underprivileged and remote areas where modern scientific facilities seldom reach.

(iii) Area specific problem of the selected places were assessed before commencing of the programme.

(iv) Twenty institutions each had been selected from Aizawl and Lunglei districts and the total number of institutions covered becomes forty.

The total number of students attending the mass awareness programme is shown as below

Name of District	No of schools visited	No of students
Aizawl	20	7256
Lunglei	20	4794
TOTAL	40	12050

Results and outcomes of the project

The Programme was successfully held in 40 selected institutions of Aizawl and Lunglei district, Mizoram. The programme covers more than 10,000 students over the two selected districts of Mizoram. Not only the students, but also the village people were made aware of the importance of maintaining health and personal hygiene. The success of the programme can be seen with the minimizing of false notion and superstition among the students of the rural areas. Through the project the talented young students of the rural areas were encouraged to take up career in science and technology. A booklet on Science and Technology Mass Awareness Programme was distributed to the students for their future references. The booklet contains detail information on the topic such as Sustainable Agriculture, Health and Personal Hygiene, Science and Superstition, Career in Science and Technology.

The project was completed in the month of October, 2017 and report in book-form was prepared and submitted to Department of Science & Technology, Govt. of India on 13.10.2017. PCR was sent to DST on 2.2.2018.

PHOTO GALLERY OF MASS AWARENESS ON SCIENCE & TECHNOLOGY

Sci-Connect

4.15 Sci-Connect of North East Programme

"Sci-Connect" Connecting Science with Young Talents with science is a program initiated by the Vigyan Prasar especially for children in North-Eastern States of India, i.e., Assam, Mizoram, Nagaland, Tripura, Manipur, Sikkim, Meghalaya and Arunachal Pradesh. The Programme in Mizoram was taken up by MISTIC.

The Sci-Connect programme was divided into three stages - Screening Examination, State Level Quiz and Final Quiz Competition. The written screening examination was organized at each of the Districts in Mizoram during the month of March. The top 15 candidates were selected from the screening examination and were divided into 5 groups consisting of 3 students each. The 5 teams competed among themselves in the State Level Quiz held at Aizawl. The winner of the State Level Quiz represented Mizoram state for the Final Quiz Competition and competed with other North-Eastern States.

The Final Quiz Competition was held at Guwahati on 14th and 15th November, 2017. Mizoram team was represented by Lalremsiama Darchhun, P.C. Lalchhuanawma and Lalthlamuani, all from St. Paul's Higher Secondary School. The students were accompanied by Mr. Davy Lalruatliana, Scientific Officer and Mr. John Lalchhuanawma Sailo, Technical Assistant from MISTIC.

On the first day, i.e. 15th November, a semi-final round was conducted. The teams were divided in to 2 groups consisting of 4 teams. Out of the 8 teams that participated, 3 were eliminated and 5 teams advanced to the Final round. In the semi-final round Mizoram team scored the highest points.

On the second day, i.e. 16th November, the Grand Final was organized and teams from Tripura, Nagaland, Mizoram, Meghalaya and Sikkim competed for the coveted trophy. Tripura and Mizoram performed well in

the first 4 rounds with both teams scoring the same points while the other three teams were lagging behind. It was a tight encounter between the two.

In the final round i.e. Rapid Fire Round, Tripura team managed to correctly answer 5 questions out of 8 while Mizoram only managed to give 3 correct answers. Eventually, Tripura team emerged victorious with the Mizoram team securing 2nd place and Sikkim at the 3rd position.

PHOTO SECTION OF SCI-CONNECT 2017

Chapter 5

Research and Development

PROMOTION OF APPLIED RESEARCH & DEVELOPMENTAND INNOVATION

The widening economic gaps between nations is directly linked to corresponding gaps in science and technology (S&T). To be effective, S&T needs to maintain relevance and have a sufficient resource base. In order to maintain relevance and garner support from influential sectors, S&T research and development (R&D) agendas need to be set locally.

A fundamental need for development of S&T is to have partnerships for exchange of people, ideas, and support facilities. The Directorate of Science and Technology enhance their relevance to society by developing partnerships with the local community and educational institutions. To meet the needs of the local industries, local R&D programs are selected as far as possible in order to avoid mis-management of limited funding. Over the years, the role of local innovators in evolving small or mini-innovative projects have become more and more intense. Funding support for such technovations, which were almost zero in the recent past has now ascended to a certain level that could meet a lot of the expenses incurred in local innovations. In-depth and more extensive researches needed to be accomplished in several sectors especially technological innovations and biodiversity where the state has greater potential owing to its strategic location.In order to achieve the mission and objectives of the Directorate of Science and Technology several activities were carried out by different centres and cells, some of which are highlighted in this chapter.

Towards research and developmental endeavor, several activities are annually taken up. Different projects and programmes are formulated with successive implementation. Different supporting and funding agencies are approached such as the Department of Science & Technology, Govt. of India (various divisions), National Council for Science and Technology Communications (NCSTC), Vigyan Prasar, North Eastern Council (NEC), National Council of Science Museums (NCSM), etc. and the State Government.

Financial Assistance to Scientific Research

5.1 Financial Assistance to Scientific Research

The main objective of the scheme is to meet an expenditure incurred on research work from scientists working in the Research & Development Institutions, science based NGO's and innovators in the form of grant with a view to promote research and education in the field of science & technology in Mizoram.

Guidelines for grant of financial assistance under the Scientific Research & Technological Innovation project' was approved by the Government vide No. G.28014/04/04-PLG (part III) dt. 18/10/2017 which was vetted by the Finance Department vide I.D. No. FIN (EC) 817/2017-PLG dt. 13/10/2017. Selection Committee for Scientific Research & Technological Innovation project was constituted under the chairmanship of Secretary, Planning & Programme Implementation Department vide Notification No. G. 29012/1/2017-PLG dt. 15/12/2017. The Selection Committee, after careful consideration of the Expert Evaluation Report selected the following project proposals for grant of financial assistance during the year 2017-2018:

Sl. No.	Broad Area	Project title	Name of Principal Investigator
1.	Zoology	*Molecular and biochemical characterization of symbiotic bacteria associated with entomopathogenic nematodes*	Dr. Lalramliana, Department of Zoology, PUC
2.	Botany	*Documentation of tree species within Mizoram Science Centre, Berawtlang, Aizawl*	Renthlei Hnuna Curator Mizoram Science Centre
3.	Technological Innovation	*Black annealed wire twisting machine*	C. Lalnuntluanga, Local Innovator, Mission Veng,

International Travel Support Scheme

5.2 Science and Technology International Travel Support Scheme

The main objective of the scheme is to provide financial assistance for presenting a research paper or chairing a session or delivering a keynote address in an international scientific event (conference/ seminar/ symposium/ workshop, etc.) organized by institutions/ organizations abroad. The scheme enhance scientific researchers' experience, qualitatively foster their enthusiasm and make further progress for the advancement of scientific research and development in Mizoram.

Directorate of Science & Technology prepared the Guidelines for Science & Technology International Travel Support Scheme. It was then approved by the Government and the same was notified under Planning & Programme Implementation Department Notification No. D.12019/2/2015-PLG date 19th February 2018. The same was vetted by the Finance (EC) Department vide their I.D. No. FIN (EC) 134/2017-PLG Dt. 09/02/2018.

As insisted in the approved guidelines, the Selection Committee for Science & Technology International Travel Support Scheme was constituted under the chairmanship of Secretary, Planning & Programme Implementation Department vide Notification No. D. 12019/2/2015-PLG Dt. 28/02/2018.

The Selection Committee selected the following scientific researchers for grant of financial assistance during the year 2017-2018:

Sl. No.	Name & address of the Scientific Researcher	Title of the paper	Event Organiser, Venue & Country
1.	Dr. H. Lalthanzara, Assistant Professor, Dept. of Zoology, Pachhunga University College	*Exploration of Earthworm Species Composition in Mizoram, Northeast India*	Shanghai Jiao Tong University, China Agriculture University & Shanghai Dangfang Earthworm Biotechnology Research Institute; Shanghai, China
2.	Dr. Lalrokima Chenkual, Assistant Director (Trg), Disaster Management & Rehabilitation	*Community Based Disaster Risk Reduction in Mizoram, India*	The World Academy of Science, Engineering and Technology; London, UK
3.	Dr. Laldinpuia Assistant Professor, Dept. of Geology, Pachhunga University College	*Cut Slope Stability Analysis of Rangvamual landslide along Aizawl airport road, Northeast India*	The Egyptian Housing and Building National Research Centre; Cairo, Egypt

5.3 R&D Projects formulated & submitted during 2017-2018

SN	Name of Project	Submitted to	Submitted on	Estimated Cost (In Lakh)
1.	Promotion of Science and Mathematics Education through Mizoram Science Club Network at Secondary Schools in Mizoram	State Government – NEC	May 2017, Revised submitted on May 2018	353.95
2.	Women Technology Park in Mizoram	SEED Division, DST, GoI	July 2017	30.32
3.	Solar Driven Hybrid Dryer	SSTP, DST, GoI	July 2017	7.53
4.	Phytochemical Screening and Identification of Secondary Metabolites and Nutritional Profiling of *Alocasia fornicata*	SSTP, DST, GoI	July 2017	7.50
5.	Development of Portable Agarbati Round Stick Producing Machine	SSTP, DST, GoI	July 2017	5.99
6.	Development of Motor Cycle Trailer Suitable for Hilly Area	SSTP, DST, GoI	July 2017	3.00
7.	Portable Low-cost Induction Heater	SSTP, DST, GoI	July 2017	0.98
8.	Establishment of Mizoram Bioresources Development Centre (MBRDC)	Department of Biotechnology, GoI	August 2017	1845.00
9.	National Mathematics Day 2017 and National Science Day 2018	NCSTC, DST, GoI	September 2017	23.00
10.	Development of Sawdust Briquetting and Charcoal Plant at Chhuanthar Tlangnuam, Baktawng	NEDP, GoM	October 2017	38.00
11.	Construction of approach road for Digital	NEDP, GoM	December 2017	44.21

	Planetarium/Science Centre, Lunglei			
12.	Installation and systematic study of plasma nitriding plant in Mizoram for improvement of agricultural tools and implements	SSTP, DST, GoI	November 2017	129.10
13.	Development of medicinal plant database of Mizoram	SSTP, DST, GoI	November 2017	48.46
14.	Establishment of Technology Demonstration Centre (TDC) in the state of Mizoram	SSTP, DST, GoI	February 2018	500.00

5.4 Ongoing and completed R&D Projects (2017-2018)

SN	Name of Project	Status
1.	Solar Driven Hybrid Dryer	Ongoing
2.	Phytochemical Screening and Identification of Secondary Metabolites and Nutritional Profiling of *Alocasia fornicata*	Ongoing
3.	Development of Portable Agarbati Round Stick Producing Machine	Ongoing
4.	Development of Motor Cycle Trailer Suitable for Hilly Area	Ongoing
5.	Portable Low-cost Induction Heater	Ongoing
6.	Development of Indigenous Technological Innovation (DITIM)	Ongoing
7.	Development of Sawdust Briquetting and Charcoal Plant at Chhuanthar Tlangnuam, Baktawng	Ongoing
8.	Digital Planetarium at Lunglei	Ongoing
9.	Construction of approach road for Digital Planetarium/Science Centre, Lunglei	Ongoing
10.	State Climate Change Centre	Ongoing
11.	Assessment of Vulnerability to Climate Change in Mizoram on Integration of Bio-physical and Socio-economic sectors	Ongoing

12.	Patent Information Centre	Ongoing
13.	Preliminary study for scouting of indigenous grass root innovators and technologies of Mizoram	Completed
14.	National Mathematics Day 2017 and National Science Day 2018	Completed
15.	Hand-pressing phone charger	Completed
16.	La hlumna/Multiple spindle	Completed
17.	Power hammer	Completed
18.	Rolling shutter controller machine	Completed
19.	Torsion machine	Completed
20.	Tuitha chakna hmanga hmun sang zawka tuilakna	Completed
21.	Installation of micro solar dome (demo)	Completed
22.	Survey of Mamit district (aspirational district) to assess the technological gap, introduction of appropriate products/projects etc. for doing S&T intervention.	Completed
23.	Demonstration of self-water pumping system using force of running water developed by Stephen Sangluaia, local innovator	Completed

To delve into new area of research in Bio-Systematics, a seminar on "Challenges in Bio-Systematics in Mizoram & Felicitation of Mizo Scientists" was conducted at Pachhunga University College on 29th September 2017. On this occasion, Certificate of Appreciations were awarded to the following Scientists and researchers from Mizoram who are involved in discovery of new species from Mizoram:-

SCIENTIST INVOLVED IN DESCRIPTION OF NEW SPECIES OF ANIMAL AND PLANT

H. LALTHANZARA
Earthworm
Eutyphoeusmizoramensis, Megadrilogica, Canada (2005)
Fish
1. *Olyrasaginata,* Zootaxa, 2014
2. *Schisturamizoramensis,* Ichthyological Exploration of Freshwaters, 2012

LALRAMLIANA
Fish
1. *Channaaurantipectoralis,* Zootaxa, 2016
2. *Eutropiichthyscetosus,* Journal of Threatened Taxa, 2014
3. *Exostomasawmteai,* Ichthyological Exploration of Freshwaters, 2016
4. *Garradampaensis,* Journal of Threatened Taxa, 2013

5. *Glyptothoraxmaceriatus,* Zootaxa, 2012
6. *Glyptothoraxradiolus,* Zootaxa, 2013
7. *Glyptothoraxscrobiculus,* Ichthyological Exploration of Freshwaters, 2012
8. *Laubukaparafasciata,* Zootaxa, 2017
9. *Monopterusichthyophoides,* Zootaxa, 2011
10. *Olyrasaginata,* Zootaxa, 2014
11. *Pethiarutila,* Zootaxa, 2014
12. *Physoschisturachhimtuipuiensis,* Zootaxa, 2016
13. *Pseudolaguviafucosa,* Zootaxa, 2016
14. *Pseudolaguvianubila,* Zootaxa, 2014
15. *Pseudolaguviaspicula,* Zootaxa, 2010
16. *Pseudolaguviavirgulata,* Zootaxa, 2010
17. *Psilorhynchuskaladanensis,* Zootaxa, 2015
18. *Psilorhynchuskhopai,* Zootaxa, 2014
19. *Schisturaaizawlensis,* Ichthyological Exploration of Freshwaters, 2012
20. *Schisturaandrewi,* Zootaxa, 2014
21. *Schisturamaculosa,* Zootaxa, 2013
22. *Schisturamizoramensis,* Ichthyological Exploration of Freshwaters, 2014

Nematode
1. *Chordodestjorvenae,* Zootaxa, 2016
2. *Chordodesmizoramensis,* ZooKeys, 2011

H.T. LALREMSANGA
Amphibian
Leptolalaxtamdil, Zootaxa 2406: 57–68 (2010)
Fish
Monopterusichthyophoides, Zootaxa, 2011
Reptile
Blythiahmuifang, Zootaxa, New Zealand (2017)

SAIPARI SAILO
Amphibian
Leptolalaxtamdil, Zootaxa 2406: 57–68 (2010)

V.L. HRIMA
Reptile
Blythiahmuifang, Zootaxa New Zealand (2017)

JOHN ZOTHANZAMA
Fungi (Plant)
Ganodermamizoramens, Persoonia, Netherlands (2017)

SAMUEL LALRONUNGA
Fish
1. *Channaaurantipectoralis,* Zootaxa, 2016
2. *Eutropiichthyscetosus,* Journal of Threatened Taxa, 2014
3. *Exostomasawmteai,* Ichthyological Exploration of Freshwaters, 2016
4. *Garradampaensis,* Journal of Threatened Taxa, 2013
5. *Pseudolaguviafucosa,* Zootaxa, 2016
6. *Pseudolaguvianubila,* Zootaxa, 2013
7. *Psilorhynchuskaladanensis,* Zootaxa, 2015
8. *Psilorhynchuskhopai,* Zootaxa, 2014
9. *Schisturaandrewi,* Zootaxa, 2014
10. *Schisturamaculosa,* Zootaxa, 2013
11. *Schisturamizoramensis,* Ichthyological Exploration of Freshwaters, 2014

LALNUNTLUANGA
Fish
1. *Eutropiichthyscetosus,* Journal of Threatened Taxa, 2014
2. *Exostomasawmteai,* Ichthyological Exploration of Freshwaters, 2015
3. *Garradampaensis,* Journal of Threatened Taxa, 2013
4. *Pseudolaguvianubila,* Zootaxa, 2013
5. *Psilorhynchuskaladanensis,* Zootaxa, 2015
6. *Psilorhynchuskhopai,* Zootaxa, 2014
7. *Schisturaandrewi,* Zootaxa, 2014
8. *Schisturamaculosa,* Zootaxa, 2013

BEIHROSA SOLO
Fish
1. *Psilorhynchuskhopai,* Zootaxa, 2014
2. *Physoschisturachhimtuipuiensis,* Zootaxa, 2015
3. *Schisturaandrewi,* Zootaxa, 2014

DENIS VAN LALHLIMPUIA
Fish
1. *Channaaurantipectoralis,* Zootaxa, 2016
2. *Laubukaparafasciata,* Zootaxa, 2017
3. *Physoschisturachhimtuipuiensis,* Zootaxa, 2015

VANRAMLIANA
Fish
1. *Schisturamizoramensis,* Ichthyological Exploration of Freshwaters, 2014
2. *Physoschisturachhimtuipuiensis,* Zootaxa, 2015

LALTLANHLUA ZATHANG
Fish
Pethiarutila, Zootaxa, 2014

LALROTLUANGA
Fish
Monopterusichthyophoides, Zootaxa, 2011

H. LALRAMNGHINGLOVA
Plant (Zingiber)
1. *Amomumdampuianum*, Nordic Journal of Botany, 2013
2. *Amomummizoramense*, Nordic Journal of Botany, 2013

सत्यमेव जयते

Certificate of Appreciation

This certificate is awarded to

LALRAMLIANA

for his contributions towards discovery of new species from Mizoram, India.

(Dr. R.K. LALLIANTHANGA)
Chief Scientific Officer
Directorate of Science & Technology
Govt. of Mizoram

29.9.2017

(Dr. C. VANLALRAMSANGA)
Secretary
Planning Dept. (Science & Technology)
Govt. of Mizoram

FISH

Channa aurantipectoralis - Zootaxa (2016)
Eutropiichthys cetosus - Journal of Threatened Taxa (2014)
Exostoma sawmteai - Ichthyological Exploration of Freshwaters (2016)
Garra dampaensis - Journal of Threatened Taxa (2013)
Glyptothorax maceriatus - Zootaxa (2012)
Glyptothorax radiolus - Zootaxa (2013)
Glyptothorax scrobiculus - Ichthyological Exploration of Freshwaters (2012)
Laubuka parafasciata - Zootaxa (2017)
Monopterus ichthyophoides - Zootaxa (2011)
Olyra saginata - Zootaxa (2014)
Pethia rutila - Zootaxa (2014)
Physoschistura chhimtuipuiensis - Zootaxa (2016)
Pseudolaguvia fucosa - Zootaxa (2016)
Pseudolaguvia nubila - Zootaxa (2014)
Pseudolaguvia spicula - Zootaxa (2010)
Pseudolaguvia virgulata - Zootaxa (2010)
Psilorhynchus kaladanensis - Zootaxa (2015)
Psilorhynchus khopai - Zootaxa (2014)
Schistura aizawlensis - Ichthyological Exploration of Freshwaters (2012)
Schistura andrewi - Zootaxa (2014)
Schistura maculosa - Zootaxa (2013)
Schistura mizoramensis - Ichthyological Exploration of Freshwaters (2014)

NEMATODE

Chordodes tjorvenae - Zootaxa (2016)
Chordodes mizoramensis - ZooKeys (2011)

Research & Development

VARIOUS CENTRES

MIZORAM SCIENCE CENTRE is a non-formal science and technology institution which was inaugurated on 26th July, 2003.

SCIENCE CENTRE helps to develop scientific temper amongst the general public, particularly school children by inculcating a spirit of inquiry and fostering creative talent through activity- based learning process incorporating method of science.

SAWDUST BRIQUETTING & CHARCOAL INDUSTRY AT BAKTAWNG

Main product : Saw -dust & charcoal briquettes which may be used as firewoods for various purposes especially aluminium industries

INNOVATION HUB & SPACE SCIENCE EXPLORATION THEATRE (Nearly ready for commissioning)

Innovation Hub is a place which provides facilities to nurture new ideas and help develop inquisitive perspective in youths. It will have Discovery hall, Innovation Resiurce Centre and hall of fame, Idea Lab, and Design Studio.

INNOVATION FACILITY CENTRE (Under Construction)

It will be the hub of grassroot technological innovation activities in the state. Main objective are:-

- To foster and nurture the skills of indigenous innovators for inclusive growth.

- To provide institutional support mechanism to innovators and helps in technology upgradation and promotion.

MIZORAM BIORESOURCE DEVELOPMENT CENTRE (Foundation stone laid by Dr. Harsh Vardhan, Union Minister for S&T on 14th Feb, 2017)

The project will focus on development of a Bioresources Centre for the state of Mizoram where major aspects of biotechnology and its allied techniques will be harnessed for more productive bioresources output keeping in mind the need for sustained utilization and economic conservation of these resources.

The Centre will have state-of-the-art biotechnology laboratories and other facilities to carry out research and development projects as well as assist in further cataloging the immense bioresources of the state.

DIGITAL PLANETARIUM AT LUNGLEI (Seating capacity - 50) (Under Construction)

Planetarium will provide a platform to inculcate a spirit of inquiry, foster creative talent and create scientific temper in the community as a whole. It will not only function as an astronomy theatre, it will be utilized for conducting various level astronomy popularization and awareness programmes like seminar, workshop, etc. It will, therefore, play an important role for science education in the southern part of Mizoram.

OTHER CENTRES ON THE PIPELINE

Science Centre at Lunglei
Technology Demonstration Centre
Women Technology Park

Research & Development

INDIGENOUS TECHNOLOGY

PROMOTION/ASSISTANCE OF SCIENTIFIC RESEARCH/INNOVATION

Micro solar dome installed at selected houses in Kelsih village

Wind blade design suitable for hilly areas

Hydro powered water pumping device

Hand-pressing phone charger

Demonstration/Testing of self-water pumping system using force of running water at Tuirial river

Improved Multiple spindle

Rolling shutter controller machine

Power hammer

Torsion machine

Innovation Facility Centre

5.5 Development of Indigenous Technological Innovations in Mizoram through Establishment of Innovation Facility Centre and Enhanced Protection of Ownership

Under the project "Development of Indigenous Technological Innovations in Mizoram" first sitting of the Implementation Committee was held on May 2017. Revised DPR with component-wise budgeting was prepared and submitted to NEDP Core Committee for approval. Architectural drawing, structural drawing and detailed cost estimates were finalized during July 2018. Permission for construction of Innovation Facility Centre building under the project was obtained from Aizawl Municipal Corporation during September 2017. Tender/ Expression of Interest for construction of Innovation Facility Centre building was called from the empanel list of Finance Department, Govt. of Mizoram through widely circulated Newspapers and opening of technical bids was held on 21st November, 2017. L.B. Associates, Contractor, Bungkawn, Aizawl were selected to construct the building. Work order for construction of Innovation Facility Centre building at Mizoram Secretariat Complex, Khatla, Aizawl was given to M/S L.B. Associates on 8th January, 2018.

The Centre building is now under construction

Digital Planetarium at Lunglei

5.6 Digital Planetarium at Lunglei

Mizoram is a small state in the remote corner of North East India having its full-fledged statehood on the 20th February 1987. In spite of poor infrastructure facilities and uncomfortable socio-political situation in the northeast region, a gradual improvement in the situation is showing positive signs for the development of the region. Since Mizoram is the most peaceful state of India today with second highest literacy rate in the country, the state has great potential for socio-economic development.

A Digital Planetarium will provide a platform to inculcate a spirit of inquiry, foster creative talent and create scientific temper in the community as a whole. It will not only function as an astronomy theatre, it will be utilised for conducting various level astronomy popularisation and awareness programmes like seminar, workshop, etc. It will, therefore, play an important role for science education in the region.Planetariums provide a unique opportunity for student community and common people to entertainingly inform, educate and enlighten on various aspects of astronomy, including our own planet 'Earth' and the solar system by simulating a dynamic sky and the celestial environment inside a dome with minute details and accuracy of scales. People actually get to see the performance of nature on its own cosmic stage, rather than being told about it. The impact and the learning outcome from planetarium show are therefore well accepted and validated universally. But, establishing planetariums and successfully operating them usually require a large plot of land, substantial capital investment and technical expertise. These constraints have till now limited the number of planetariums in the country. National Council of Science Museums, the organization running science centres/museums in the Country, could till now have only handful of planetariums in its network. However, the advent of 'Digital Planetariums' lately, has eliminated some of the problems encountered on setting-up conventional planetarium.

A Digital Planetarium would report about the latest status of research in the field of astronomy and astrophysics. The scientific contribution in these aspects, pre-processed in a comprehensive way will be presented to the people. It will open the door to universe/space for the people especially the school-going groups. Since astronomy is part of the scientific education, special lectures prepared will directly benefit the students. Children would learn about the universe they live in and would incite to an interdisciplinary perception. The planetarium will arouse interest in different issues from many fields of knowledge.

Action taken

1. Action was taken for the release of fund for construction of Digital Planetarium at Lunglei Zohnuai.
2. A detailed site surveying was done and widening of approach road is proposed.
3. The estimated amount of Rs. 44.21 Lakhs for widening of approach road is approved by the State Government through NEDP. The work has been given to the PWD, Lunglei Division.
4. The Village Council Members and NGOs of Lunglei Zohnuai were negotiated for land acquisition and widening of the approach road. MOU has been signed.

Chapter 6

Intellectual Property Rights

PROMOTION OF INTELLECTUAL PROPERTY RIGHTS

The role of technological innovation for the upliftment of nations is immeasurable. Developed nations have evolved out of a good system of innovation and technology race coupled with advanced IP protection system. Our young and remote state needs to run this race as fast as we could, irrespective of our late entry, and looking beyond the existing hurdles. Only then wewill be able to achieve a sustainable development goal.

The Patent Information Centre was started during 2010-2011 and is working now with well-equipped rooms and manpower.

The following programmes were organized for promotion of innovation and facilitation of intellectual Property Rights.

6.1 Awareness on Intellectual Property Rights (IPR)

1. Workshop on Intellectual Property Rights and Grassroot innovation was conducted at ICFAI University, Mizoram on 21st April, 2017 in collaboration with the institution.Mr. P.C. Lalngilneia, Scientific Officer, Mr. C. Laltlanzuala, Project Scientist, Mizoram Science, Technology & Innovation Council (MISTIC) were the resource persons. Mr. P.C Lalngilneia, Scientific Officer delivered power point presentationon 'Innovation and its Impact on Society' and Mr C. Laltlanzuala, Project Scientist delivered power point presentation on 'Intellectual Property Rights with Special Emphasis on Patent'.

2. World Intellectual Property Day was observed at Science & Technology office, Mizoram on 26th April, 2017. The function was chaired by Mr. Samuel Lalmalsawma, Senior Scientific Officer. Mr. C.

Laltlanzuala, Project Scientist gave paper presentation on the theme of 'Innovation-Improving Lives'. The presentation was followed by group discussion.

3. Workshop on Intellectual Property Rights was organised byMizoram Science, Technology & Innovation Council (MISTIC) and IPR Cell of Mizoram University at Academic Conference Hall, Mizoram University, Tanhril, Aizawl on 19th May, 2017. Mr. C. Laltlanzuala, Project Scientist and Mr. R. Vanneihtluanga, Technical Assistant, Mizoram Science, Technology & Innovation Council (MISTIC) were the resource persons. Mr. C. Laltlanzuala, Project Scientist delivered presentation on 'Intellectual Property Rights with Special Emphasis on Patent' and Mr. R. Vanneihtluanga, Technical Assistant delivered presentation on the topic 'Overview of Copyright'.

4. Workshop on Innovation and Intellectual Property Rights was held at NIELIT, Aizawl in collaboration with IPR Cell, NIELIT on 31st August, 2017.Mr. P.C. Lalngilneia, Scientific Officer, Mr. C. Laltlanzuala, Project Scientist and Mr. R. Vanneihtluanga, Technical Assistant, Mizoram Science, Technology & Innovation Council (MISTIC) were the resource persons. Mr. P.C. Lalngilneia, Scientific Officer delivered power point presentation on 'Innovation and Its Impact on Society.'Mr. C. Laltlanzuala, Project Scientist delivered power point presentation on 'Intellectual Property Rights with Special Emphasis on Patent' and Mr. R. Vanneihtluanga, Technical Assistant gave power point presentation on 'Overview of Copyright and Case Studies'.

5. Workshop on Biopiracy and Patent was organized for students of Biotechnology Department, Pachhunga University College on 4th September, 2017 at DST Conference room.Mr. Davy Lalruatliana, Scientific Officer and Mr. C. Laltlanzuala, Project Scientist, Mizoram Science, Technology & Innovation Council (MISTIC) were the resource persons. Mr. Davy Lalruatliana, Scientific Officer gave power point presentation on the topic of 'Bio-Piracy' and Mr. C. Laltlanzuala, Project Scientist gave power point presentation on the topic of 'Intellectual Property Rights with Special Emphasis on Patent'.

6. Invited Lecture on the topic 'Intellectual Property rights with Special Emphasis on Patent' was given by the resource person Mr. C. Laltlanzuala, Project Scientist, Patent Information Centre, Mizoram Science, Technology & Innovation Council (MISTIC) at Department of Botany, Pachhunga University College on 28th September, 2017.

7. Seminar on Intellectual Property Rights and Trademark was held at Govt. Hrangbana College on 6th October, 2017 in collaboration with Innovation club of the college. Mr. P.C Lalngilneia, Scientific Officer and Mr. C. Laltlanzuala, Project Scientist, Mizoram Science, Technology & Innovation Council (MISTIC) were the resource person. A fruitful presentation on the topic of 'Innovation' and 'Intellectual Property Rights with Special emphasis on Paten' were delivered by the resource persons.

Special lecture and a view of audience during IPR Workshop at Govt. Hrangbana College Hall

8. Awareness on Geographical Indication with special emphasis on Mizo traditional Puan was given at the Hastkala Sahyog Shivir programme held at Aibawk village on 11.10.2017. The programme was organised by Mizoram Apex Handloom and Handicraft Co-operative Society Ltd. (MAHCO) and Ministry of Textiles, Govt. of India. Mr. Davy Lalruatliana, Scientific Officer, Mizoram Science, Technology & Innovation Council (MISTIC) was the resource person and he delivered presentation on the topic

Chief Guest Shri. K. Sangthuama, MLA visiting a stall during awareness campaign

'Intellectual Property Rights with Special Emphasis on Geographical Indication'.

9. Awareness on Geographical Indication with special emphasis on Mizo traditional Puan was given at the Hastkala Sahyog Shivir programme held at Hualngohmun village on 13.10.2017. The programme was organised by Mizoram Apex Handloom and Handicraft Co-operative Society Ltd. (MAHCO) and Ministry of Textiles, Govt. of India. Mr Davy Lalruatliana, Scientific Officer, Mizoram Science, Technology & Innovation Council (MISTIC) was the resource person and he delivered presentation on the topic 'Intellectual Property Rights with Special Emphasis on Geographical Indication'.

Resource person while giving a lecture on 'Geographical Indication' at Hualngohmun

10. Awareness on Geographical Indication with special emphasis on Mizo traditional Puan was given at the Hastkala Sahyog Shivir programme held at Samlukhai village on 16.10.2017. The programme was organised by Mizoram Apex Handloom and Handicraft Co-operative Society Ltd. (MAHCO) and Ministry of Textiles, Govt. of India. Mr Davy Lalruatliana, Scientific Officer, Mizoram Science, Technology & Innovation Council (MISTIC) was the resource person and he delivered presentation on the topic 'Intellectual Property Rights with Special Emphasis on Geographical Indication'.

Resource person while giving a lecture on 'Geographical Indication' at Samlukhai Village

11.A roundtable discussion on "The enforcement of Intellectual Property Rights in Mizoram and Trade in Counterfeit Products in Context of India's Act East Policy" was organised at the Secretariat Conference Hall, New Capital Complex, Aizawl on January 30, 2018. The programme was organized in collaboration with Universe Research Foundation, United States Patent & Trade Mark Office (USPTO) and PLR Chambers, New Delhi.The programme was chaired by Dr. C. Vanlalramsanga, Secretary, Planning (Science & Technology) Department and Mr. John Lalnunkima Khiangte, Director, PLR Chambers gave the introductory remarks.

A fruitful discussion was held that emphasized on the importance of intellectual property rights and its role for growth of industry in Mizoram state, enforcement of anti-piracy law in the state and best practices adopted by other states and countries. The prospect of film industry in the state and the numerous positive impacts it could bring on improvement of allied industries including job creations, improvement of infrastructure facility that would promote intellectual property arising from the state including filming industry and policy measures that could be adopted by the state were a part of the deliberation. The discussion ended with a brief vote of thanks proposed by Mr. Samuel Lalmalsawma, SSO, MISTIC.

The programme was attended by 45 participants from various Government Departments such as Commerce & Industries, Home Department, Art & Culture, Customs; Head of Commerce Departments from various institutions like Govt. Hrangbana College, Govt. Aizawl College and Pachhunga University College; coordinator of Intellectual Property Right Cell of Mizoram University, Pachhunga University College, National Institute of Electronics & Information Technology – Mizoram (NIELIT), Institute of Chartered Financial Analysts of India (ICFAI) and Govt. Zirtiri Residential Science College; and NGOs such as Mizo Zaimi Insuikhawm (MZI), Mizoram Film Promotional Society (MFPS) and Mizo Photographers' Association (MPS).


IPR
Awareness
IPR AWARENESS WORKSHOP 2017-2018
At Govt. Kolasib College
At Govt. Lawngtlai College
At Govt. Champhai College
Biopiracy & Patent at DST
At Lunglei Govt. College
At Thenzawl YMA Hall
At Govt. Siaha College
Roundtable on IPR
At Pachhunga University College with IPR Cell
At NIELIT, Zuangtui with IPR Cell
Roundtable on IPR Enforcement
Patent Awareness with Botany Dept., PUC

IP Filing / Assisted

6.2 List of persons/inventions/ IP assisted

1. Geographical Indication of one indigenous clothes viz. Mizo Puanchei was finally filed at Geographical Indication Registry at Chennai on 20.6.2017. GI Application number is No. 583. This is a collaborative effort of Art & Culture Department, Govt. of Mizoram and the Council.
2. Geographical Indication of one indigenous clothes viz. Tawlhlohpuan was finally filed at Geographical Indication Registry at Chennai on 20.6.2017. GI Application number is No. 582. This is a collaborative effort of Art & Culture Department, Govt. of Mizoram and the Council.
3. Geographical Indication of one indigenous clothes viz. Pawndum was finally filed at Geographical Indication Registry at Chennai on 30.8.2017. GI Application number is No. 586. Reply to Formality Check Report was prepared and sent to Geographical Indication Registry on 28th February, 2018. This is a collaborative effort of Art & Culture Department, Govt. of Mizoram and the Council.
4. Geographical Indication of one indigenous clothes viz. Ngotekherh was finally filed at Geographical Registry at Chennai on 30.8.2017. GI Application number is No. 587. Reply to Formality Check Report was prepared and sent to Geographical Indication Registry on 28th February, 2018. This is a collaborative effort of Art & Culture Department, Govt. of Mizoram and the Council.
5. Geographical Indication of one indigenous clothes viz. Hmaram was finally filed at Geographical Indication Registry at Chennai on 30.8.2017. GI Application number is No. 588. Reply to Formality Check Report was prepared and sent to Geographical Indication Registry on 28th February, 2018. This is a collaborative effort of Art & Culture Department, Govt. of Mizoram and the Council.
6. Patent specification writing for one application of Pu H.V. Lalzuimawia, local innovator was started during June 2017.

7. Patent Search for 'New type of wind blade design' proposed by Pu Ramhlun Edena was completed. Technical assistance was also given to him in writing project details of his innovation. (July 2017)
8. Trade Mark application namely 'Occasional Nerd (word)' was processed for filing in October 2017. It was filed in Trade Mark Office Kolkata on 8.12.2017. Application Number is 3698547 in Class 35.
9. Trade Mark application namely 'Occasional Nerd (Logo)' was processed for filing in October 2017. It was filed in Trade Mark Office Kolkata on 8.12.2017. Application Number 3698548 is in Class 35.
10. Trade Mark application namely 'Elevation Motion & Graphic' (label) was processed for filing in October 2017. It was filed in Trade Mark Office Kolkata on 8.12.2017. Application Number is 3698549 in Class 42.
11. Patent search for application received from Dr. Lalhmingliana Hnamte, Govt. Zirtiri Residential Science College was done during November-December, 2017.
12. Patent Search was done for technological innovation namely 'Power Hammer' innovated by Mr. J.H. Lalramzauva, Lunglei in February 2018.
13. Patent Search on two new patent applications of Mr.Roystan Vijay Castelino, M.Tech student, National Institute of Technology Mizoram was started on 28th March, 2018.
14. Trademark application of Pu Malsawmtluanga Chhangte, Managing Director AAWB Internet Pvt. Ltd. was processed. (March 2018)

IPR Filing

Trademark : Three Trademarks were filed during 2017-2018 :

Applicant/Trademark	Appl. number	Filing Date	Class	Status
Occasional Nerd (word)	3698547	8.12.2017	35	Registration granted on 25.5.2018
Occasional Nerd (Logo/device)	3698548	8.12.2017	35	Registration granted on 31.5.2018
Elevation Motion & Graphic (label)	3698549	8.12.2017	42	Ready for hearing

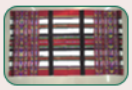
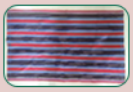
Other three Trade Marks filed during 2016-2017 were **granted registration** during 2017-2018.

Applicant/Trademark	Appl. number	Filing Date	Class	Status
Folkland (Black font, white background) FOLKLAND	3457940	16/01/2017	41	Registration granted on 19/12/2017
Folkland (White font, black background) FOLKLAND	3457941	16/01/2017	41	Registration granted on 19/12/2017
Folkland (Logo/Symbol)	3457942	16/01/2017	41	Registration granted on 19/12/2017

IPR Filing

Geographical Indication

Five Mizo traditional dress (Puan) were filed under Geographical Indications Registry, Chennai after extensive research done to ascertain their proof of origin, descriptions, detailed specifications, uniqueness, geographical area of production, etc. MOU was signed with the Art & Culture Department.

Item	Appl. number	Filing Date	Class	Status
Tawlhlohpuan 	582	20. 6. 2017	24, 25	Examination
Mizo Puanchei 	583	20. 6. 2017	24, 25	Examination
Pawndum 	586	30.8. 2017	24, 25	Pre Examination
Ngotekherh 	587	30.8. 2017	24, 25	Pre Examination
Hmaram 	588	30.8. 2017	24, 25	Pre Examination

Preliminary Studyfor

Scouting of Indigenous Grassroot Innovators& Technologies

6.3Preliminary Study for Scouting of Indigenous Grassroot Innovators and Technologies of Mizoram

The project 'Scouting of indigenous grass-root technological innovations in Mizoram' was undertaken covering all the districts of Mizoram to identify the local innovators and their innovative ideas and prototypes. The report was submitted to Department of Science & Technology, Govt. of India on 3.8.2017. The 5th meeting of the Core Group on State S&T programme (SSTP) / Tier 2 Screening Committee on SSTP related to Location Specific Research & Technology Development and Demonstration (LSR&TDD) held at Chennai during 7th-8th September 2017 reviewed the project and found it very good and further rated it 8 on the scale of 10.

The main objective of this project is to extend assistance to budding innovators, to promote and nurture their inventions. The main points are as below:-

1) Scouting of grass-root technological innovators and innovations that could arise from the state.
2) Assess current innovation scenario in the context of inventions.
3) Capacity building of inventors, innovators and stakeholders.
4) Spreading of Intellectual property awareness.
5) To recognize and rewards the deserving and best innovations.
6) To create good innovation ecosystem or network.

Intensive field visit method was used for conducting comprehensive scouting of the grass root innovators. During every visits, Village Council or NGO especially Young Mizo Association leaders were approached firstly most of the time. Through these visits, relationship was built up with the innovators and an open and trusting partnership was built up. The list of cities, villages and towns visited and covered were:-

District	Villages or Towns
Aizawl	Aizawl, Hualngohmun, Kelsih, Aibawk, Sialsuk, Tachhip,Maubuang, Muallungthu, Keifang, Thiak, Tachhip, Sateek, Chamring, Sairang, Sihphir
Kolasib	Kolasib, Bilkhawthlir, Vairengte, Kawnpui, Zanlawn, Bualpui, Serkhan, Sentlang, Lungdai
Mamit	Mamit, Dampui, Luangpawl, Darlak, Tuidam, Dapchhuah, Kawrtethawveng, Suarhliap
Champhai	Champhai, Chhungte, Khawzawl, Dulte, Tuipui, Vapar, Kawlkulh, Hnahlan, Mualthuam, Kelkang, Zokhawthar, Ngur
Lunglei	Lunglei, South Kanghmun, North Mualthuam, Haulawng, Tawipui North, Sekhum, Tawipui South
Lawngtlai	Lawngtlai, Thingkah, Sangau, Bualpui NG, Lungzarhtum, South Lungpher, Cheural
Saiha	Kawlchaw, Saiha, Zero point
Serchhip	Khumtung, Chhingchhip, Chhiahtlang, Thenzawl, Serchhip

Meets/seminars/workshops/press conference, etc. were organized for the innovators as well as stakeholders to help build their capacity as well as in Intellectual Property Rights protection. This also helped in establishing better innovators-network and collaboration. Small meetings were organized at selected villages covered. The routine adopted at each village or town was by approaching firstly the village heads such as Village Council President or Secretary, Young Mizo Association President, Secretary or other committee members who seems to know their subjects well. Further actions were taken mostly as per instructions received from them. There were several occasions where the opinion of shopkeepers or roadside vendors as well as ordinary housewives were also taken.

The total number of grass root innovators identified through this project were 50 in numbers, and district-wise number is as below:-

Name of Districts	No. of Grass-root innovators identified	Name of Districts	No. of Grass-root innovators identified
Aizawl	25	Serchhip	2
Kolasib	11	Lunglei	4
Champhai	5	Lawngtlai	1
Mamit	2	Saiha	0

PHOTO GALLERY OF SCOUTING OF GRASSROOT INNOVATION


Kawnpui Venglai, Kolasib District


Kawnpui Bazar, Kolasib District


Lungdai Sentlang, Kolasib District


Suarhliap, Mamit District


Haulawng, Lunglei District


Lunglei, Lunglei District


Serchhip Bazar Veng, Serchhip District


Thenzawl, Serchhip District


Chhungte, Champhai District


Tuipui khua, Champhai District


Hnahlan khua, Champhai District


Champhai Bethel, Champhai District


Bualpui Ng., Lawngtlai District


Lungzarhtum., Lawngtlai District

Chapter 7

Meteorology

GENERATION AND DISSEMINATION OF METEOROLOGICAL DATA

The State Meteorological Centre was established in the year 2005 under Directorate of Science & Technology, Govt. of Mizoram. At present, the State Meteorological Centre is stationed at the top floor of Directorate of Science & Technology office building, Mizoram Secretariat Complex, Khatla.

The Centre is responsible for meteorological observations and weather forecasting. The main mission is to generate reliable information related to weather and climate of Mizoram. In order to achieve these, the Centre runs its own Weather Station at Cherry Blossom Avenue, Mizoram Secretariat Complex, Khatla. Apart from this, two Automatic Weather Stations are being monitored – one in Aizawl and another in Lunglei. Daily weather data such as Rainfall, Temperature, Relative Humidity, Wind Speed & Direction, Baromatic Air Pressure are generated from monitoring of the Weather Stations.

The State Meteorological Centre collaborates with other agencies like Regional Meteorological Centre (RMC), India Meteorological Department (IMD), Guwahati and Pushpak (Zemabawk). The daily weather data and forecasts from these agencies are being updated and distributed to different Government Departments and are also

being sent to private individual upon special requests.

A booklet on Meteorological data of Mizoram was published on 29th June, 2016 where Rainfall, Temperature and Relative Humidity of eight Districts of Mizoram were represented in a tabular and graphical form.

7.1 Data Acquiring Procedure

The meteorological data like Temperature, Rainfall, Humidity and Wind speed are collected from the department's Meteorological Observatory located at Tlaizawng Mual (Cherry Blossom Avenue) near Mizoram Secretariat Main Building, New Secretariat Complex, Khatla. In collecting the meteorological data, the collection procedure of IMD (Indian Meteorological Department) is followed and the data is collected twice a day i.e. at 8:30 am in the morning and at 2:30 pm in the afternoon on a daily basis.

The raw data collected are then stored in soft copy, analyzed as per the requirement of the users, and then disseminated to various users like research fellows, various government departments, NGOs and other private entrepreneurs etc.

The following are some of the instruments used for recording daily weather data:-

Self-Recording Rain Gauge

Recording rain gauges are used to obtain a continuous record of daily or weekly rainfall. It works on natural siphon principle. It consists of a funnel-shaped collector at the top of the gauge and a float siphon chamber and recording mechanism just below it. The water enters into the float chamber through the funnel; the float rises with water level. The float is having a central stud on which a pen assembly is fixed. The pen is moving over a daily chart wound over a clock drum.

After every 10 mm of rainfall siphoning occurs and recording of rain starts afresh.

Thermometer Screen

A Thermometer screen (Stevenson Screen)is a stand and shelter (from rain, snow and high winds, but also leaves and animals) for meteorological instruments, particularly bulb thermometers like maximum and minimum thermometers, dry bulb and wet bulb thermometers used to record air temperature and humidity.

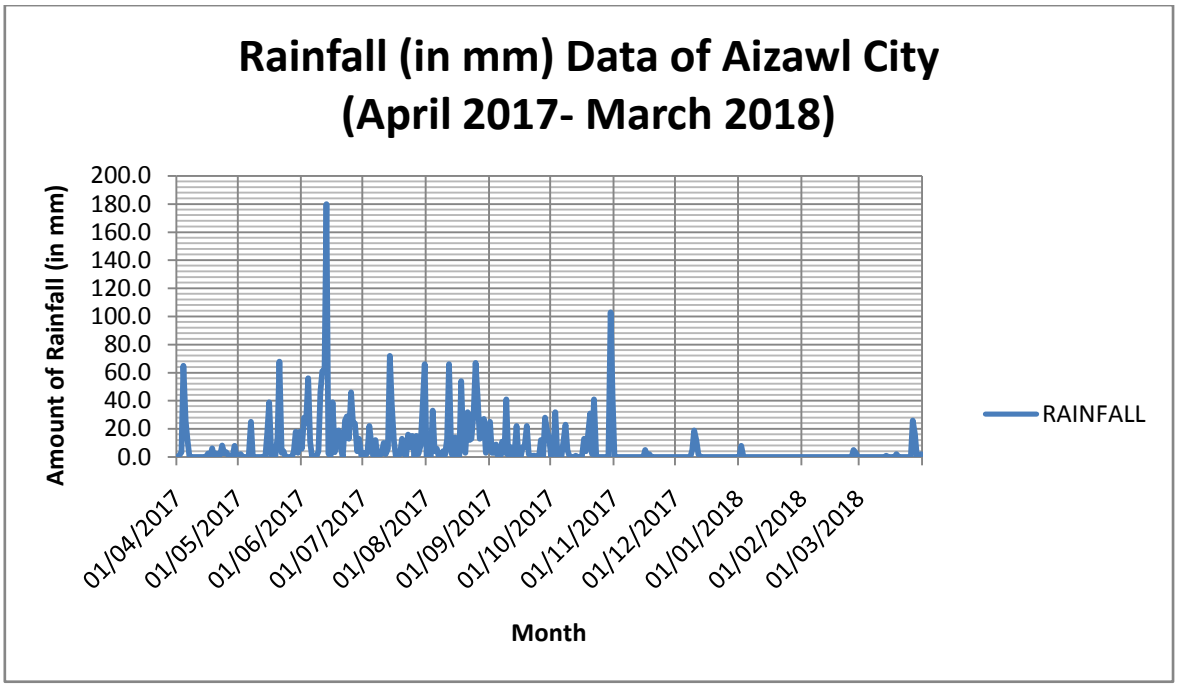
It is kept 1.25m/4.1ft above the ground by legs to avoid strong temperature gradients at ground level, has louvered sides to encourage the free passage of air, and is painted white to reflect heat radiation, since what is measured is the temperature of the air in the shade, not of the sunshine.

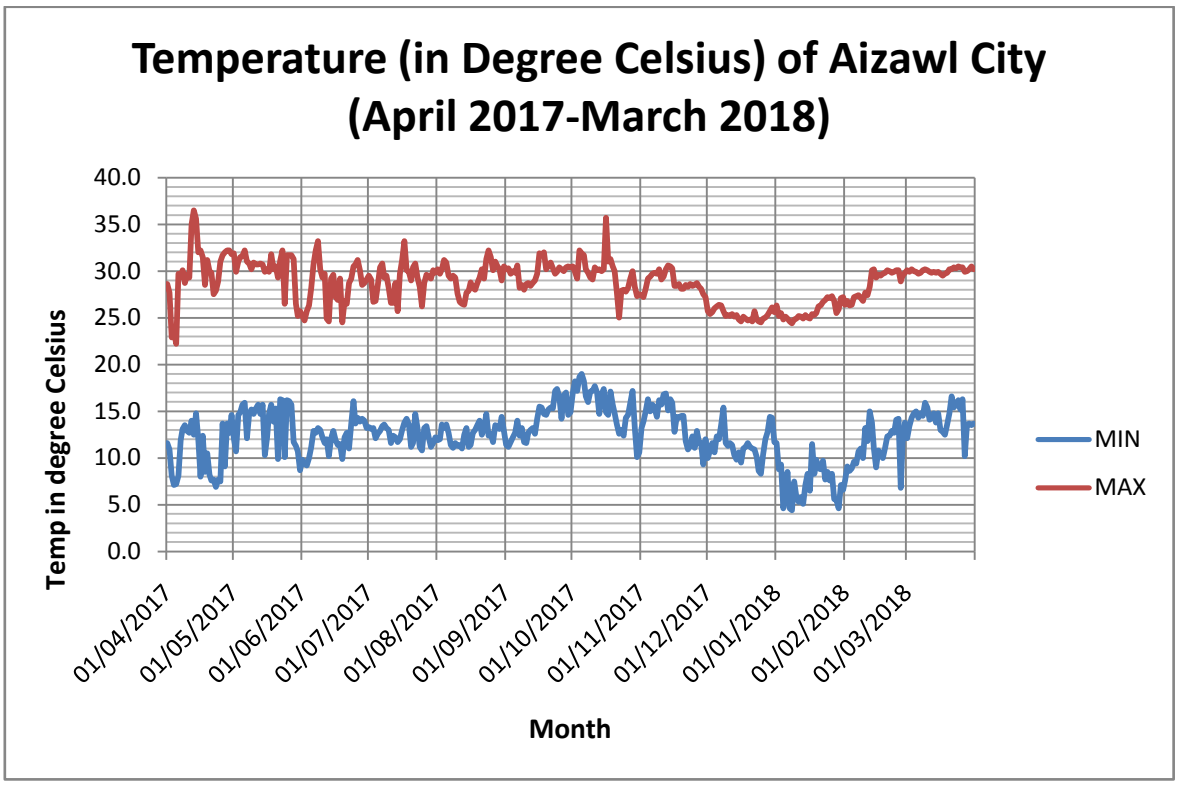
Anemometer Cup Counter

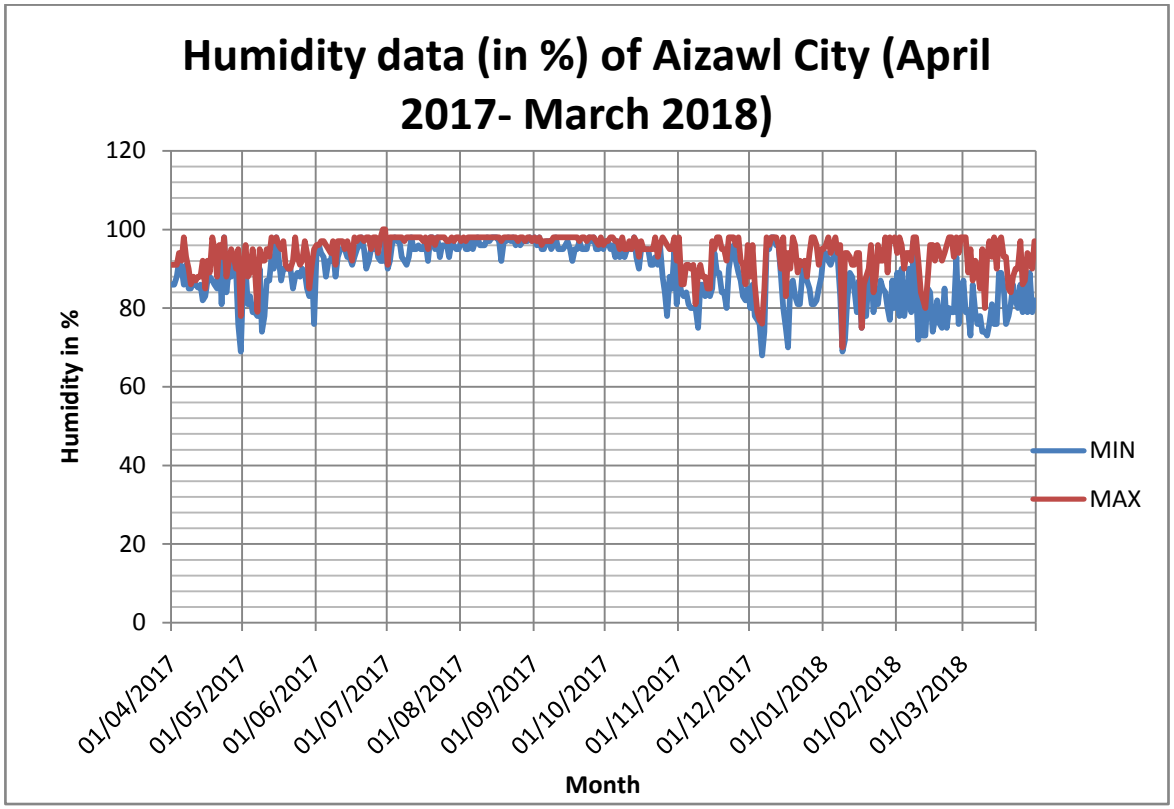
The Anemometer Cup Counter measures the run of wind past the Instrument over a period. They generally consist of some form of weather vane with cups or other devices on the ends. These cups are designed to catch the wind and spin the entire setup. A magnet is built into one of the arms and causes a pulse when it passes the reed switch at a certain position. These pulses are recorded and the time between them gives a very accurate estimate of the speed that the wind is moving.

7.2 Data Processing

The Following graphs are the annual reading of Rainfall, Temperature and Humidity respectively.







7.3 Data Dissemination

Following are the list of some of the Offices/ Organisations/ Individuals to which the daily Meteorological data are being disseminated:

1. Secretary to the Governor of Mizoram.
2. P.S. to the Chief Minister of Mizoram.
3. P.S. to the Minister, Home etc, GoM.
4. P.S. to the Minister, Planning etc, GoM.
5. P.S. to the Minister, Disaster Management and Rehabilitation, Government of Mizoram.
6. P.S. to the Vice Chairman, State Planning Board, GoM
7. Sr. P.P.S. to the Chief Secretary, GoM.
8. P.S. to the Secretary, Planning Department (S&T), GoM P.S. to the Secretary, Disaster Management & Rehabilitation, GoM Deputy Commissioner, Aizawl, GoM.
9. P.A. to the Director, Disaster Management & Rehabilitation, GoM.
10. Zonet Cable TV
11. LPS Cable TV StationDirector, AIR Aizawl

Chapter 8

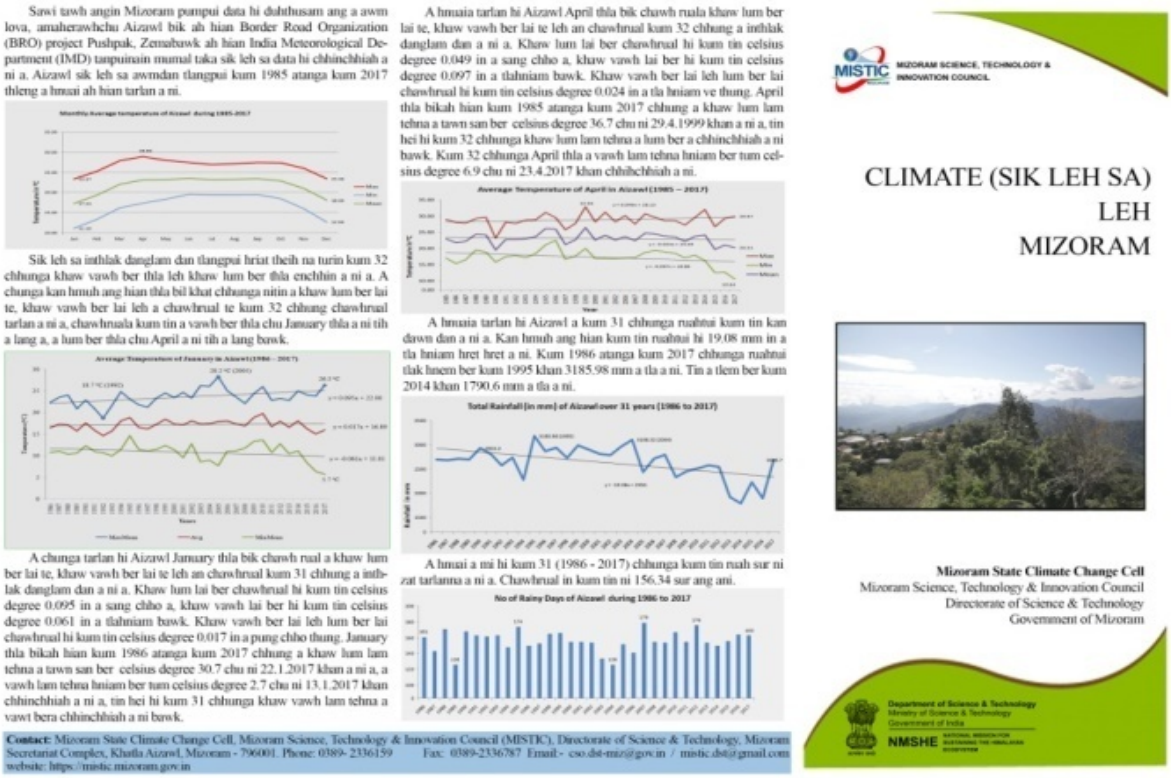
Climate Change Study

CLIMATE CHANGE STUDIES

The project viz. 'Vulnerability Assessment on Socio-economic Sector' was started under Climate Change Programme during June 2017. Collection of data from various sources was done. The data collected were:-

8.1 Meteorological Data Analysis

Meteorological data (temperature, rainfall) collected from various sources for each eight (8) districts of Mizoram were analyzed and compiled in a leaflet Climate (Sik leh sa) leh Mizoram for awareness material to the general public.


Sawi tawh angin Mizoram pumpui data hi duhthusam ang a awm lova, amaherawhchu Aizawl bik ah hian Border Road Organization (BRO) project Pushpak, Zemabawk ah hian India Meteorological Department (IMD) tanpuinain mumal taka sik leh sa data hi chhinchhiah a ni a. Aizawl sik leh sa awmdan tlangpui kum 1985 atanga kum 2017 thleng a hmuai ah hian tarlan a ni.

Sik leh sa inthlak danglam dan tlangpui hriat theih na turin kum 32 chhunga khaw vawh ber thla leh khaw lum ber thla enchhin a ni a. A chunga kan hmuh ang hian thla bil khat chhunga nitin a khaw lum ber lai te, khaw vawh ber lai leh a chawhrual te kum 32 chhung chawhrual tarlan a ni a, chawhrualа kum tin a vawh ber thla chu January thla a ni tih a lang a, a lum ber thla chu April a ni tih a lang bawk.

A chunga tarlan hi Aizawl January thla bik chawh rual a khaw lum ber lai te, khaw vawh ber lai te leh an chawhrual kum 31 chhung a inthlak danglam dan a ni a. Khaw lum lai ber chawhrual hi kum tin celsius degree 0.095 in a sang chho a, khaw vawh lai ber hi kum tin celsius degree 0.061 in a tlahniam bawk. Khaw vawh ber lai leh lum ber lai chawhrual hi kum tin celsius degree 0.017 in a pung chho thung. January thla bikah hian kum 1986 atanga kum 2017 chhung a khaw lum lam tehna a tawn san ber celsius degree 30.7 chu ni 22.1.2017 khan a ni a, a vawh lam tehna hniam ber tum celsius degree 2.7 chu ni 13.1.2017 khan chhinchhiah a ni a, tin hei hi kum 31 chhunga khaw vawh lam tehna a vawt bera chhinchhiah a ni bawk.

A hmaia tarlan hi Aizawl April thla bik chawh ruala khaw lum ber lai te, khaw vawh ber lai te leh an chawhrual kum 32 chhung a inthlak danglam dan a ni a. Khaw lum lai ber chawhrual hi kum tin celsius degree 0.049 in a sang chho a, khaw vawh lai ber hi kum tin celsius degree 0.097 in a tlahniam bawk. Khaw vawh ber lai leh lum ber lai chawhrual hi kum tin celsius degree 0.024 in a tla hniam ve thung. April thla bikah hian kum 1985 atanga kum 2017 chhung a khaw lum lam tehna a tawn san ber celsius degree 36.7 chu ni 29.4.1999 khan a ni a, tin hei hi kum 32 chhunga khaw lum lam tehna a lum ber a chhinchhiah a ni bawk. Kum 32 chhunga April thla a vawh lam tehna hniam ber tum celsius degree 6.9 chu ni 23.4.2017 khan chhihchhiah a ni.

A hmuaia tarlan hi Aizawl a kum 31 chhunga ruahtui kum tin kan dawn dan a ni a. Kan hmuh ang hian kum tin ruahtui hi 19.08 mm in a tla hniam hret hret a ni. Kum 1986 atanga kum 2017 chhunga ruahtui tlak hnem ber kum 1995 khan 3185.98 mm a tla a ni. Tin a tlem ber kum 2014 khan 1790.6 mm a tla a ni.

A hmai a ni hi kum 31 (1986 - 2017) chhunga kum tin ruah sur ni zat tarlanna a ni a. Chawhrual in kum tin ni 156.34 sur ang ani.

Contact: Mizoram State Climate Change Cell, Mizoram Science, Technology & Innovation Council (MISTIC), Directorate of Science & Technology, Mizoram Secretariat Complex, Khatla Aizawl, Mizoram - 796001. Phone: 0389- 2336159 Fax: 0389-2336787 Email:- cso.dst-mz@gov.in / mistic.dst@gmail.com website: https://mistic.mizoram.gov.in

MIZORAM SCIENCE, TECHNOLOGY & INNOVATION COUNCIL

CLIMATE (SIK LEH SA)
LEH
MIZORAM

Mizoram State Climate Change Cell
Mizoram Science, Technology & Innovation Council
Directorate of Science & Technology
Government of Mizoram

8.2. Preliminary Assessment of Vulnerability and Risk Associated with Climate Change on Water Resource and Human Health in Mizoram

Top down preliminary assessment of vulnerability assessment of Water Resources and Human Health Sector was started in 2016 and completed in 2017. Significant results brought out as a part of the project are:-

- Vulnerability maps and tables were generated for both the sectors for two future scenarios (2050 and 2100).

- Report Preliminary Assessment of Vulnerability and Risk Associated with Climate Change on Water Resources Sector and Human Health in Mizoram was published internally on 29th May 2017

8.3 Brochure of Mizoram State Climate Change Cell

Individual Brochure of Mizoram State Climate Change Cell was prepared and published in November 2017 which consists of the general information of the NMSHE programme and the establishment of Mizoram State Climate Change Cell, the broad objectives and progress of the project activities were highlighted.

8.4 Sensitization Workshop on Climate Change in Mizoram

Sensitization Workshops were conducted on three districts; at Lunglei on 12th April 2017, at Kolasib on 20th April 2017 and at Champhai on 16th February, 2018 respectively. They were organized in collaboration with Government Colleges of each districts and seminar hall of each colleges were used for the venues.

There were 107 participants at Lunglei, 109 at Kolasib and 137 at Champhai, who were Faculties, Students and Staffs from State Climate Change Cell.

Sensitization Workshop on Climate Change in Mizoram

8.5 Media Workshop on Climate Reporting in Himalayas

In collaboration with Center for Media Studies (CMS), New Delhi through the support of DST-SDC-IHCAP, media workshop for Journalists was organized on 13th and 15th September 2017 at Aijal Club, Aizawl, Mizoram.Hon'ble Governor of Mizoram was the Chief Guest.

8.6 Level II Training Programme for the State Level Officials on Capacity Building Programme for Climate Change Adaptation Planning

- On 31st October, 2017, a one day Level 2 training programme for state level officials on capacity building programme for climate change adaptation planning was organized at Secretariat Conference Hall, Mizoram Secretariat Complex, Khatla, Aizawl, Mizoram.
- Total of 30 participants from different line departments, invited speakers, delegates, IHCAP, NABCONS and NABARD (Aizawl) representatives attended the programme

(Center) Chief Guest Pu Lalmalsawma, Chief Secretary, Govt. of Mizoram

Participants of Climate Change Level II

8.7 Level I Orientation Programme for Legislatures and Bureaucrats on Capacity Building Programme for Climate Change Adaptation Planning

- On 20th October, 2017, a half day Level 1 Orientation programme for Legislatures and Bureaucrats on Capacity Building programme for climate change adaptation planning was organized at Aijal Club, Aizawl, Mizoram. Hon'ble Chief Minister of Mizoram, Pu Lal Thanhawla was the Chief Guest.

Hon'ble Chief Minister of Mizoram delivering his speech

- Total of 48 participants from government legislatures and bureaucrats, invited speakers, delegates, IHCAP, NABCONS and NABARD (Aizawl) representatives attended the programme.

Pu Lalsawta, Hon'ble Minister, Planning, Govt. of Mizoram delivering his speech

8.8 Memorandum of Understanding between State Climate Change Cell and Administrative Training Institute

MoU for Organizing Capacity Building Programme on Climate Change Adaptation planning in Mizoram was signed on 26th April 2018 between State Climate Change Cell and Administrative Training Institute. The signatories are Shri Arvind Ray, Chief Secretary, Govt. of Mizoram and Dr. R.K. Lallianthanga, Chief Scientific Officer and Member Secretary, MISTIC.

ihcap.in/events

IHCAP Indian Himalayas Climate Adaptation Programme

First MoU signed for institutionalisation of training programmes in Himalayas

26 April 2018; Aizawl

Mizoram has become the first state to sign a Memorandum of Understanding (MoU) for institutionalizing trainings on climate change adaptation. An MoU was signed between Mizoram State Climate Change Cell and the Administrative Training Institute, Government of Mizoram to this effect. The trainings are part of the National Mission for Sustaining the Himalayan Ecosystem and are being implemented with technical support under IHCAP. **Read More**