



DST's NMSHE - Mizoram State Climate Change Cell

Brochure

About SCCC

The **State Climate Change Cell (SCCC) of Mizoram** was created on 25th November 2014 with the financial support from the **Climate Change Programme (CCP) Division** (the then Strategic Programme Large Initiatives Coordinated Actions Enabler (SPLICE) and CCP Division) of **Department of Science & Technology**, Govt. of India through the **National Mission for Sustaining the Himalayan Ecosystem (NMSHE)**. The project Phase-I was completed by the end of FY2019-2020. The project Phase II (*Strengthening the State Climate Change Cell under NMSHE (Phase 2) for the state of Mizoram*) was then continued through the continuous support from CCP division of DST, Govt. of India from FY2021 to 2022.

There are three project staff along with two project investigators currently working under the cell. The Mizoram SCCC has been functioning under the aegis of Mizoram Science, Technology & Innovation Council (MISTIC), Directorate of Science Technology, Govt. of Mizoram. The Cell concentrates in implementation of its own project objectives whilst meeting the requirements of the mission objectives of the NMSHE. Simultaneously, the Mizoram SCCC has been given the responsibility of a leading role by Government of Mizoram to implement the mission objectives of the **Strategic Knowledge Mission (SKM) and technical knowledge partner of the Mizoram State Action Plan on Climate Change (SAPCC)**. Since the inception of the Mizoram State Action Plan on Climate Change (SAPCC), the Mizoram SCCC has been an active member of the Mizoram State Climate Change Coordination Group (CCCG) coordinated by Environment, Forest & Climate Change Department, Government of Mizoram.

About NMSHE

The National Mission for Sustaining the Himalayan Ecosystem (NMSHE) is one of the eight missions under the India's National Action Plan on Climate Change (NAPCC). NMSHE intends to evolve suitable management and policy measures for sustaining and safeguarding the Himalayan ecosystem along with developing capacities to continuously assess its health status. Recognizing the importance of scientific and technological inputs required for sustaining the fragile Himalayan Ecosystem, the Department of Science and Technology (DST) has been given the responsibility of coordinating the mission. As a part of the NMSHE activities, State Climate Change Cells (SCCCs) have been set up and strengthened under in the Indian Himalayan Region (IHR) states.

Key objectives of SCCCs under NMSHE:

- Vulnerability and risk assessment due to climate change
- Institutional Capacity building and R&D
- Training Programmes for Stakeholders
- Awareness

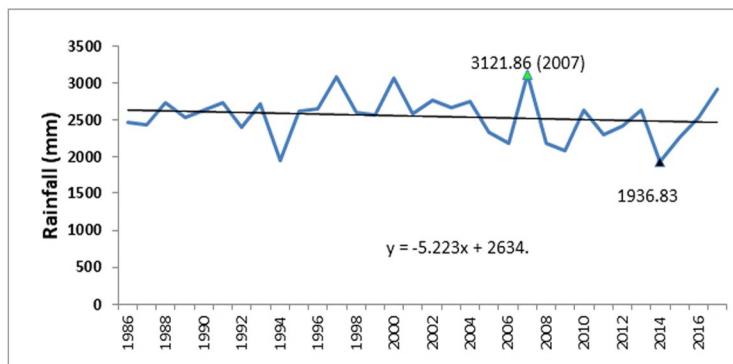
In general, the Mizoram SCCC conduct scientific study of Climate Change issues including analysis of meteorological data, vulnerability, impacts & risk assessment, climate modelling and simulation of future scenario change in different sectors. It conducts research mainly for database/information generation for the state. The cell also conducts capacity building, training and awareness programmes for different stakeholders especially for adaptation strategies in response to climate change for integration into developmental activities by including policy makers, concerned departments, other Government officials, academicians, media, NGOs, students and the local mass.

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"If we want the world to be a better place to live, we have to treat it as one unit. If we want economic growth to be pervasive, we have to make people its partners. If we want the process of development to be sustainable, we have to work with the environment."

- *Narendra Modi*

Climate profile of Mizoram



Rainfall

During the period of 32 years (1986 to 2017), the total amount of rainfall in Mizoram decrease at the rate of 5.22 mm every year. The average of the total rainfall received every year is 2551.88 mm

District wise temperature of Mizoram

District	T _{max}	T _{min}	Average Temperature
Aizawl	24.67	16.67	20.64
Kolasib	26.35	17.34	21.83
Mamit	26.67	17.46	21.74
Champhai	22.91	14.43	18.63
Lunglei	25.08	16.98	20.99
Serchhip	23.69	15.40	19.51
Siaha	24.61	16.46	20.51
Lawngtlai	26.08	17.76	21.89

Temperature

During the period of 32 years (1986 to 2017), a mixed trend of temperature is seen across different districts of Mizoram. On average, the maximum, minimum and mean trend of temperatures shows yearly increasing trends of 0.01°C, 0.08°C and 0.04°C respectively.

Climate Projection of the State

- Mean annual maximum temperature for RCP4.5 scenario is projected to increase by about 1.5 degree Celsius by mid-century. For RCP 8.5 scenario, it is projected to increase by about 3.6 degree Celsius by mid-century.
- Mean annual minimum temperature for RCP4.5 scenario is projected to increase by about 1.4 degree Celsius by mid-century. For RCP 8.5 scenario, it is projected to increase by about 3.5 degree Celsius by mid-century.
- Mean annual rainfall for RCP4.5 scenario is projected to decrease significantly by about 6.8% towards mid-century.
- For RCP 8.5 scenario rainfall is projected to decrease by about 17.25% towards both mid-century.

(Excerpt from Mizoram State Action Plan on Climate Change Ver. 2 (upto 2030))

Observed Climate Data¹¹ (1951-2013): IMD Gridded Data

Temperature	Precipitation	Climate Extremes
Increasing trends observed for both maximum and minimum temperatures (Low to medium confidence (for the entire region it is 0.2°C - 0.3°C per year).	Annual average precipitation showed a decreasing trend.	Frequency of one-day maximum precipitation, warm nights and hot days increased (Medium confidence).

Projected Climate Data¹² (2040-69): RCP 4.5 and RCP 8.5

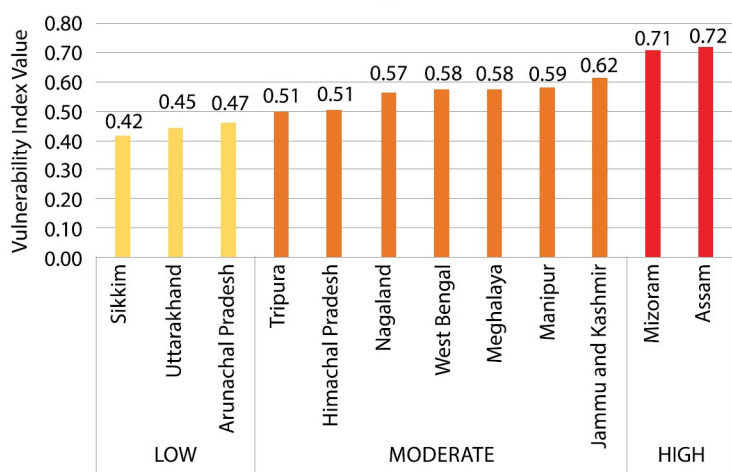
Projected change in Temperature	Projected annual precipitation changes	Projected extreme events:
Under RCP 4.5 T _{max} : 1.5°C T _{min} : 1.4°C	Under RCP 4.5 Decrease by 6.8%	Projected extreme events: Heavy rainfall, floods and droughts are likely to increase in future and will become increasingly important and play a more significant role in disaster management.
Under RCP 8.5 T _{max} : 3.6 °C T _{min} : 3.5 °C	Under RCP 8.5 Decrease by 17.25%	

Climate Vulnerability profile

- The State of Mizoram located in the adjoining areas of the southern foothills of the Indian eastern Himalayas with a population of about 1.2 million people is characterized by large rural population, scattered in low density, large proportion of indigenous tribal communities living in large area under forests that rely hugely on natural resources.
- The area has been experiencing changes in climate including rising temperature and changes in the temporal and spatial distribution of rainfall. The effects of such changes have been evident in the increased events and intensity of climate-related hazards and disasters in the state of Mizoram.
- The region is characterised by a series of hill ranges, rough terrain with steep slopes and deep valleys.
- The region also has diverse climate regimes which are highly dependent on the Indian southwest monsoon.
- The majority of the crops in the state are under rain fed agriculture.
- The natural resources in the region are subjected to degradation and loss due to deforestation, unsustainable shifting cultivation practices, fragmentation and degradation.
- Due to the hilly terrain and the cultivation of crops along the slopes, the soil resources are also subjected to erosion and loss.
- Many areas face severe water scarcity during the summer months.

The state of Mizoram is highly vulnerable to climate change and climate variability exacerbated by poor infrastructure

Mizoram rank 2nd highest in climate vulnerability among the Indian Himalayan Region (IHR) states



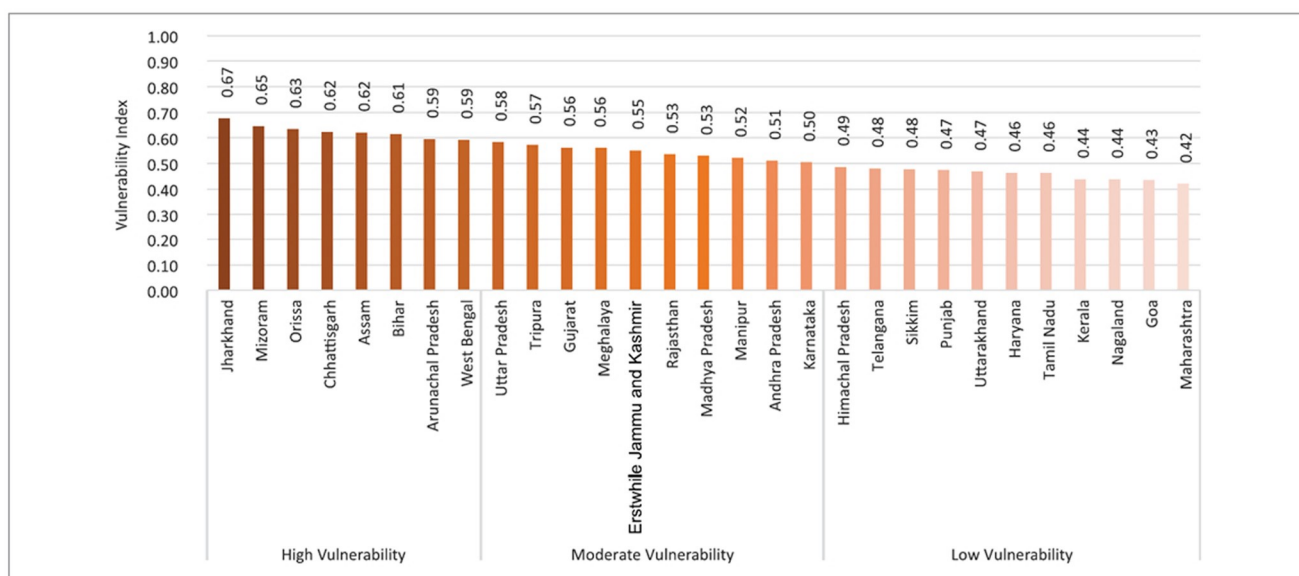
Mizoram has very high sensitivity of agriculture sector along with poor connectivity, access to information and infrastructure.

The state has seven major drivers of vulnerability –

- **highest yield variability**
- **no area under crop insurance**
- **largest area under open forests, and**
- **largest area under slope >30% .**

It also has the second lowest percentage area under irrigation and the third lowest road density among the 12 states.

Mizoram also rank 2nd highest in climate vulnerability among the 29 Indian states

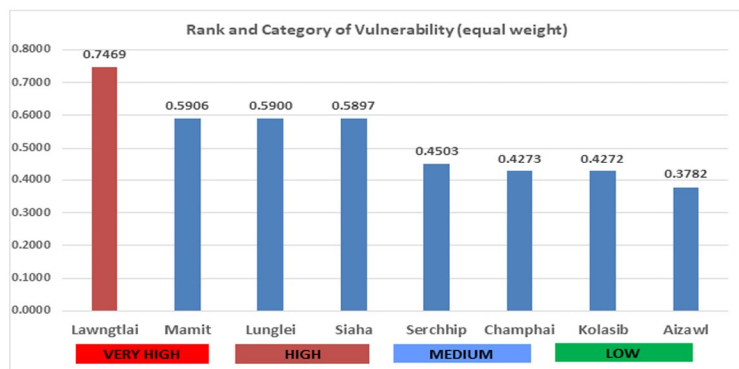


Major drivers: High yield-variability of food grains, very low coverage of crop insurance, prevalence of rainfed agriculture, high incidence of vector-borne diseases. **Other drivers:** High share of income from natural resources (agriculture and allied services), low road density, and lack of railway network. Despite highest density of health care workers per thousand population, less than 8% are doctors among them.

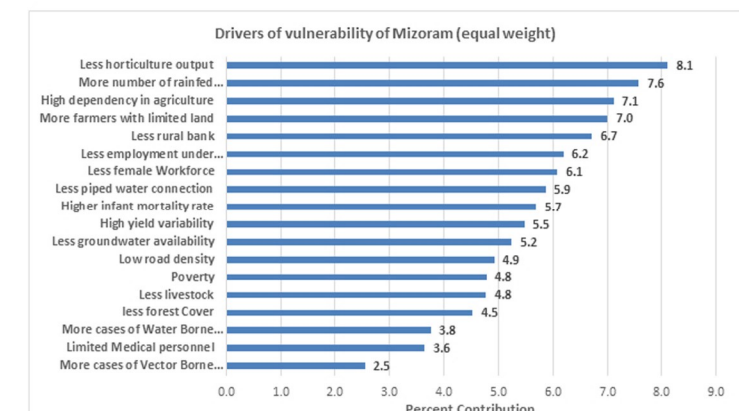
Climate Vulnerability Assessment Carried out in the State

District Level Climate Change Vulnerability Assessment of Mizoram: Biophysical and Socio-Economic Sectors

Top down assessment using secondary data collected from various sources and geospatial techniques were used for the assessment. The study was done by taking current vulnerability as a function of sensitivity and adaptive capacity. 18 sub-indicators belonging to a category four indicators were selected for the assessment. Study was done with both equal and unequal weights to maximize the aspects of the result in different scenario. Unequal weights were assigned based on stakeholder and expert consultations. Districts were rank and categorized based on their calculated vulnerability indices. The selected 18 sub indicators used for the assessment are categorised into socio-economic and livelihood indicators, biophysical indicators, institutional and infrastructure indicators and health indicators.



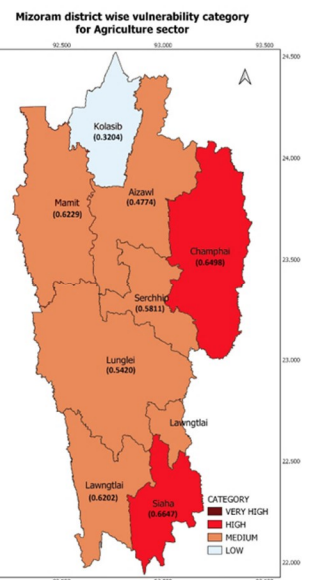
The major drivers of vulnerability in general for biophysical features and socio-economic features identified in the study are *horticulture output ratio to agriculture output* and *large area under rainfed agriculture* in the states, and *large number of farmers depending on agriculture as main employment*.



District Level Climate Change Vulnerability Assessment of Mizoram: Agriculture Sector

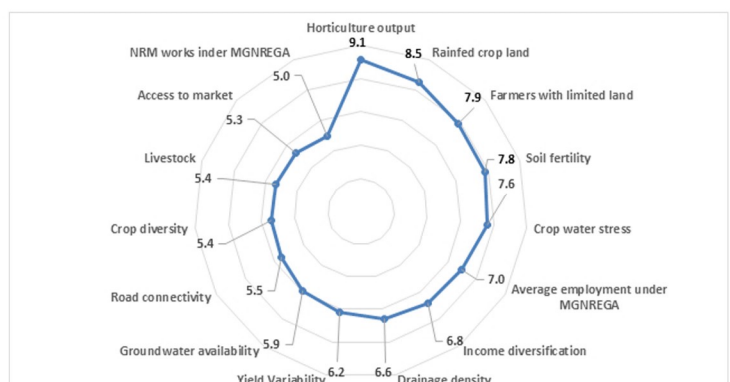
Top down assessment using secondary data collected from various sources and geospatial techniques were used for the assessment. The study was done by taking current vulnerability as a function of sensitivity and adaptive capacity. 15 indicators belonging to a category agriculture, socio-economic and demographic characters were selected for the assessment. Study was done with assigning equal weights to minimize biasness and remove the difficulty in assigning weights to a set 15 different indicators. Districts were rank and categorized based on their calculated vulnerability indices.

Siaha district have the highest vulnerability index value (0.6647) comparatively to the other seven districts in the state of Mizoram which place it in vulnerability rank 1 indicating it to be the most vulnerable district. Similarly, Champhai district scored the vulnerability index value of 0.6498 and was placed in rank 2 followed by Mamit in rank 3 (0.6229) and so on. Kolasib district scored the least number of vulnerability index value (0.3204) making it the least vulnerable district.



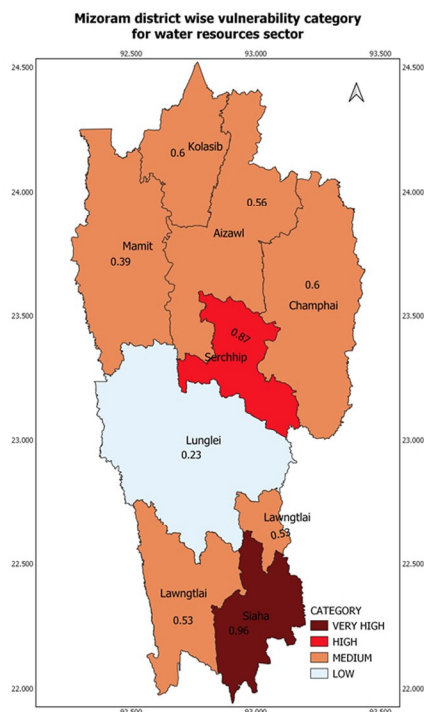
Based on the percent contribution of each indicators across all districts, the top/ major drivers of overall vulnerability for agriculture sector are :

- *higher horticulture output to agriculture output ratio contribute highest (9.1 %) to overall vulnerability*
- *large area under rainfed crop land (8.5%),*
- *more farmers with limited land holdings (7.9%) and*
- *lesser area under fertile soil (7.8 %).*



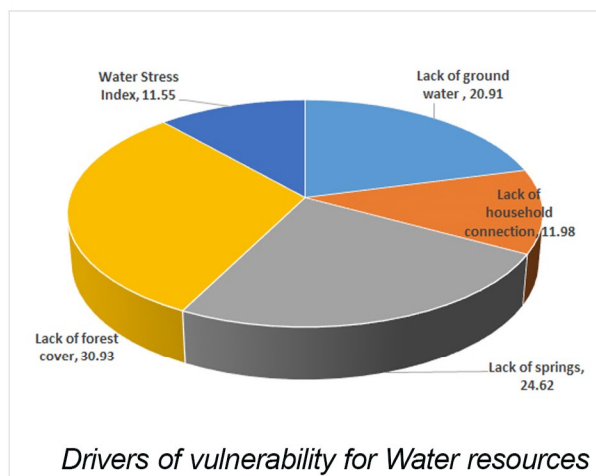
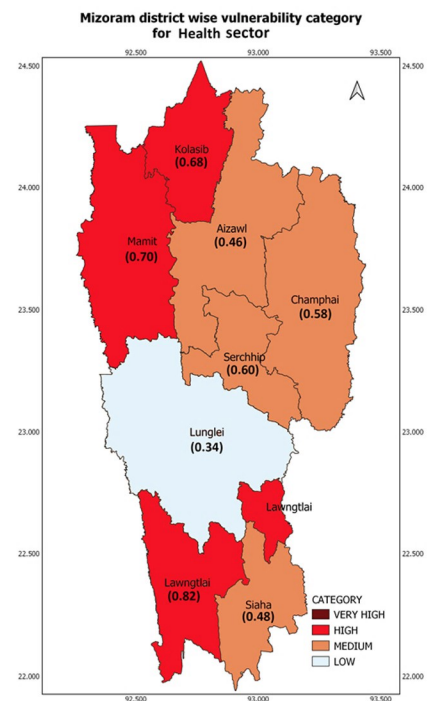
District Level Climate Change Vulnerability Assessment of Mizoram: Water resources approach

Top down assessment using secondary data collected from various sources and geospatial techniques were used for the assessment. Secondary data were collected from Public Health Engineering Department, Government of Mizoram. The study was done by taking current vulnerability as a function of sensitivity and adaptive capacity. Five indicators belonging to a category water resources and demographic characteristics were selected for the assessment. Study was done unequal weights assigned to indicators. Unequal weights were assigned based on stakeholder and expert consultations. Districts were rank and categorized based on their calculated vulnerability indices. The selected five indicators used for the assessment are available ground water resources, percent household with piped water connection, No of springs per household, forest cover and water stress index

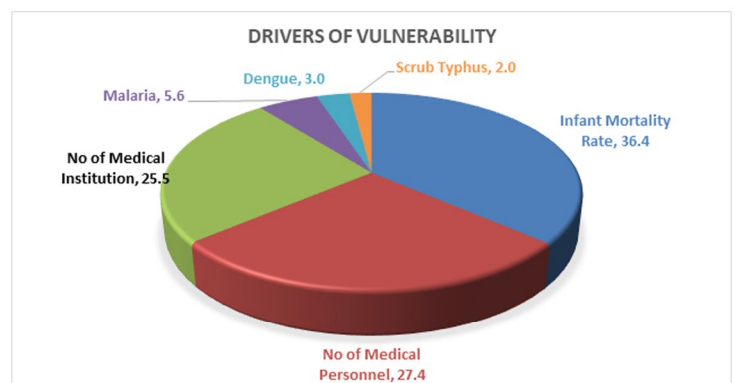


District Level Climate Change Vulnerability Assessment of Mizoram: Water resources approach

Top down assessment using secondary data collected from various sources were used for the assessment. Data were collected from Health and Family Welfare Department, Government of Mizoram. The study was done by taking current vulnerability as a function of sensitivity and adaptive capacity. Six indicators belonging to a category of health and demographic characters were selected for the assessment. Study was done with assigning unequal weights to indicators. Unequal weights were assigned based on stakeholder and expert consultations. Districts were rank and categorized based on their calculated vulnerability indices. The selected indicators used for the assessment are Malaria (API rate) per 1000 persons, Dengue (No of Cases per population), Scrub Typhus (No of cases per population), No of Hospitals/PHC/CHC etc per population, No of Doctors/Nurse/Health Workers etc per population and Infant Mortality Rate.



Drivers of vulnerability for Water resources sector in Mizoram and their percentage contribution to vulnerability



Drivers of vulnerability for Health sector in Mizoram and their percentage contribution to vulnerability

Capacity building and networking

Memorandum of Understanding (MoU) signed for Institutionalising Capacity Building Programmes on Climate Change Adaptation

On 26th April, 2018 at the Chamber of Chief Secretary, Government of Mizoram a Memorandum of Understanding was signed between the Administrative Training Institute (ATI), Government of Mizoram and Mizoram State Climate Change Cell under Mizoram Science, Technology and Innovation Council (MISTIC) for institutionalising Capacity Building Programmes on Climate Change Adaptation at Administrative Training Institute, Government of Mizoram for a period of five years. The MoU was drafted by Indian Himalayas Climate Adaptation Programme (IHCAP) and finalized by both the sign-

The objectives of the MoU are:

- To promote trainings on climate change adaptation for strengthening capacities of government officials in the state.
- To provide sustainability to the training programmes being conducted under NMSHE by developing a curriculum and a training calendar.
- To create a pool of master trainers within the state on climate change adaptation related to specific sectors.



Level 2 Training Programme for State Level Officials on Capacity Building Programme on Climate Change Adaptation Planning

Date: 31st October, 2017

One day Level 2 training programme for state level officials on capacity building programme for climate change adaptation planning was organized in collaboration with NABARD Consultancy Services (NABCONS) through the support of IHCAP at Secretariat Conference Hall, New Capital Complex, Khatla, Aizawl, Mizoram on 31st October, 2017. A total of 30 participants from different line departments, invited speakers, delegates and NABARD (Aizawl) representatives attended the programme.



(L to R) Dr. Divya Mohan, Science Policy Officer, IHCAP, Dr R.K. Lallianthanga, CSO & Member Secy., MISTIC, Chief Guest: Pu Lalmalsawma, Chief Secretary, Govt. of Mizoram and Chairman: Dr. C. Vanlalramsanga, Secretary, Planing (S&T), Govt. of Mizoram

Delegates and participants of the training programme

Level 3 Training Programme for District Level Officials on Capacity Building Programme on Climate Change Adaptation Planning

Four days level 3 training programme for district level officials on Capacity Building programme on Climate Change Adaptation Planning was organized in collaboration with NABCONS through the support of IHCAP during 4th to 7th September 2018 at ATI, New Capital Complex. A total of 44 participants from district officials of different line departments, invited speakers, delegates and NABARD (Aizawl) representatives attended the programme.

Level 1 Orientation Programme for Legislatures and Bureaucrats on Capacity Building Programme for Climate Change Adaptation Planning

Date: 20.11.2017

Attendance: 40 Nos

The programme was organized in collaboration with IHCAP and NABCONS through the support of CCP, DST



Hon'ble Chief Minister, Pu Lalthanhawla



Dr. N.H. Ravindranath, IISC, Bangalore



Dr. Suraj Pandey, NABCONS



Hon'ble Minister (S&T), Pu Lalsawta



Dr. S. Satapathy, Technical Adviser, UNDP



Field visit by participants of the training programme to NAFCC project site



Group exercises on Monitoring & Evaluation Framework for Adaptation Project Planning

Mizoram State Action Plan on Climate Change Ver. 2 (Upto 2030)

The Mizoram State Government through the State Executive Council on Climate Change has constituted Climate Change Coordination Group (CCCG) in December 2017 to revise the Mizoram State Action Plan on Climate Change (SAPCC) 2012-2017 for which the operational period has ended.

The CCCG led by the Nodal Department (Department of Environment, Forest & Climate Change) has initiated the revision with full participation of its members constituting mission lead departments and other partner departments with technical assistance provided by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) through the services of Bhubaneswar based consulting firm called CTRAN.

After series of meetings, long process of tireless works and inputs given by different stakeholders, the draft State Action Plan on Climate Change (Upto 2030) was completed and approved by the State Executive Council on Climate Change headed by the Chief Secretary on 19th November 2020. With formal approval by the State Government, the draft copy of new SAPCC is being forwarded to the National Steering Committee under the Ministry of Environment, Forest & Climate Change, Govt. of India for review and due approval.



The Mizoram State Climate Change Cell has been proactive in the process of formulation of SAPCC by being a technical knowledge partner of the process, specifically in the revision of the Strategic Knowledge Mission of the SAPCC and the technical chapters of Vulnerability & Risk Assessment

Mainstreaming Climate Action with Stakeholders

Climate Change Thematic 3D Model Exhibition

The Mizoram State Climate Change Cell (SCCC) in collaboration with Science Teacher Association of Mizoram (STAM) organized a Climate Change Thematic 3D Model exhibition on 5th July 2022. A total of 21 high schools from 10 districts in Mizoram turned up and participated at the exhibition.



Climate Change Awareness through Solid Waste Removal from Important Rivers/Streams

During March 2022, six local NGOs were engaged in cleaning of important streams and rivers in and around Aizawl city area. Solid wastes collected from the rivers/streams were transported to Municipal Waste Management facilities. Climate Change Awareness messages were read out at each site.

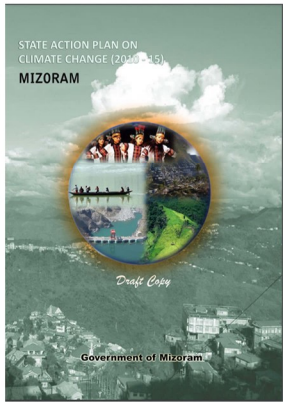


Cycle Rally for Reducing Carbon Footprint and Climate Change Awareness Drive

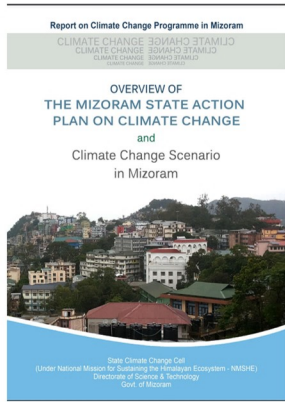
Cycle rally for reducing carbon footprint and climate change awareness drive was organised in collaboration with Mizoram Cycling Association on 19th March 2022. A total of 79 cyclist participated in this rally.



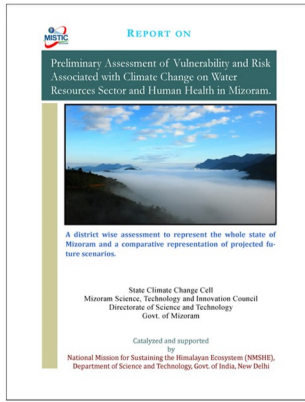
Knowledge Products under NMSHE



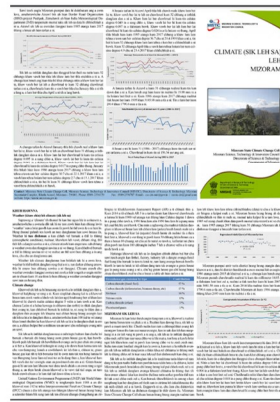
State Action Plan on Climate Change (2012-2015)



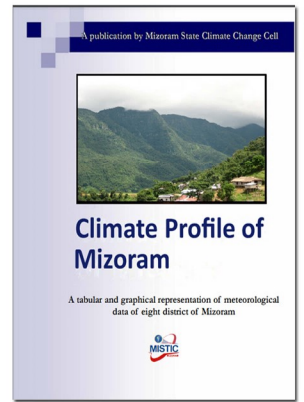
Booklet: Overview of State Action Plan on Climate Change



Report: Preliminary assessment of Vulnerability and Risk Associated with Climate Change on Water Resources Sector and Human Health in Mizoram



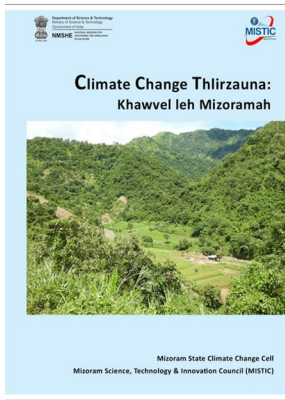
Leaflet for awareness in Mizo



Report: Climate Profile of Mizoram



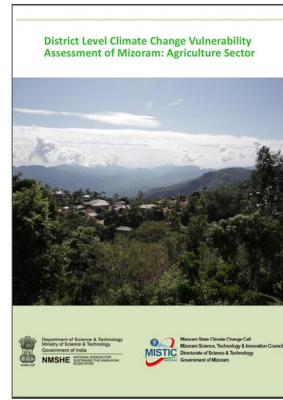
Leaflet for awareness in Mizo & English



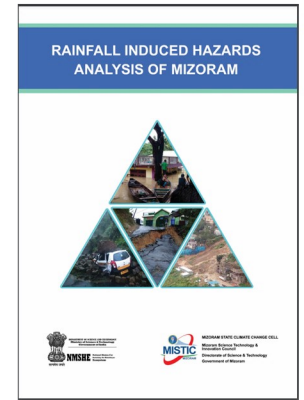
Booklet in Mizo: Awareness on Climate Change



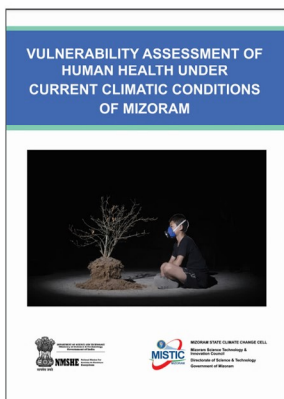
Report: District Level Climate Change Vulnerability Assessment of Mizoram: Biophysical and Socio-economic Sectors



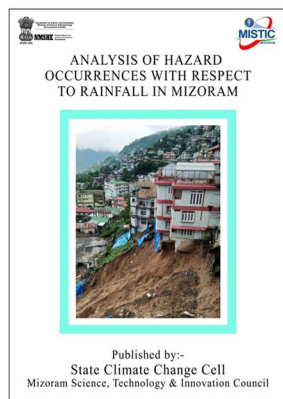
Report: District Level Climate Change Vulnerability Assessment of Mizoram: Agriculture Sector



Report: Rainfall Induced Hazards Analysis of Mizoram



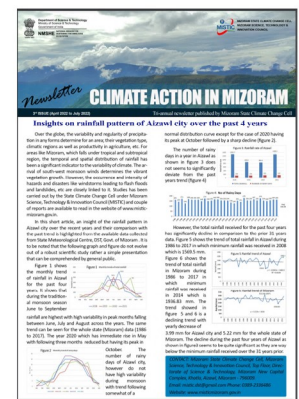
Report: Vulnerability Assessment of Human Health under current climatic conditions of Mizoram



Report: Analysis of Hazard occurrences with respect to rainfall in Mizoram



Lathanpuia et al. (2022). Assessment of District Level Climate Vulnerability of Mizoram, India: Water resources Approach. J. Clim. Chng, 8(3), pp. 21-29.



Newsletter: Climate Action in Mizoram

Sucess stories

Climate vulnerability profile at current scenario has been produced at district level for four sectors

- **Integrated Bio-physical & Socio-economic Sector**
- **Agriculture Sector**
- **Water resources Sector**
- **Health Sector**

Capacity building and training programmes

- **State level workshops & Seminars on climate change issues (4 Nos)**

A total of 349 persons from line departments, NGOs, Media and academicians



- **Four different levels of government officials were trained on climate adaptation planning**

- Legislatures & Bureaucrats - 40 persons
- State Level Officials - 30 persons
- District Level Officials - 44 persons
- Training of Trainers - 4 persons.



- **Capacity building for academicians & scholars**

- Climate change & plant biodiversity - 82 persons
- Climate change & wildlife - 36 persons

- **Media workshop on climate reporting**

26 persons from audio-visual & print media



Mainstreaming climate information/awareness

- **Sensitization programme on climate change**

- 7 District Government colleges - 1087 persons
- Aizawl district level stakeholders - 29 persons



- **Awareness programme on climate change for all NGOs, Village Councils and Govt. officials at five out of eight districts - 622 persons**



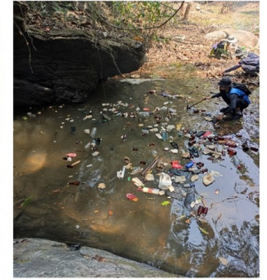
- **Awareness programme on climate change through various competitions and events**

- Photography competition - 76 entries
- Cleaning of non-biodegradable solid waste from six river - six NGOs were engaged and 12 pickup truck full of garbage were collected and dumped at municipal dumping ground.
- Jhumland Photography competition - 75 entries of photographs were received.
- Short Video Competition on Human triggered climate change - 12 entries were received.
- Cycle rally for reducing carbon footprint and climate change awareness drive - 80 cyclist participated.
- Climate change thematic 3D Model exhibition - 21 high schools participated

Photographs of awareness programmes



1st Prize winner of Climate Change Photography competition in 2017



Cleaning of non-biodegradable solid waste from rivers



1st Prize winner of Jhumland Photography competition in 2022



Cycle rally for reducing carbon footprint and climate change awareness drive



2nd Prize winner of Jhumland Photography competition in 2022



3rd Prize winner of Jhumland Photography competition in 2022



Climate Change Thematic 3D Model Exhibition