



Department of Science and Technology
Ministry of Science and Technology
Government of India

NMSHE NATIONAL MISSION FOR
SUSTAINING THE HIMALAYAN
ECOSYSTEM



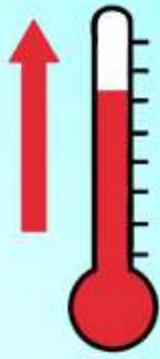
State Climate Change Cell, Manipur

Directorate of Environment
Government of Manipur

സ്റ്റേറ്റ് കാലാവസ്ഥാ മാറ്റം സംബന്ധിച്ച റിപ്പോർട്ട് State Climate Change Cell, Manipur NEWSLETTER

VOL. 3 | ISSUE 3 | JULY-SEPT 2017

CLIMATE IMPACTS ON HEALTH



cover story
Fusion of Climate Change and Health
"Climate sensitive and ecological shifts associated with climate change are resulting in increased distribution and incidences of mosquito-borne diseases."

Natural disaster : Bane to our existence
"The state of Manipur experiences countless forms of the natural calamities which not only brought havoc to the properties but also claimed life in few instances."
page 4

Lead Story

FUSION OF CLIMATE CHANGE AND HEALTH

“Climate sensitive and ecological shifts associated with climate change are resulting in increased distribution and incidences of mosquito-borne diseases.”

- Kt Khino Anal

Climate change has become one of the most visible environmental concerns of the present century. The climate and weather are integral part of the complex life-supporting processes and have a powerful impact on human health and well-being. Like other natural systems, when the climate is coming under pressure from human activities, an effort to protect human health is also very much needed. Climate change is a long-term alteration in the average weather conditions for a particular location. It becomes apparent as a change in annual, seasonal or monthly means of climate variables like the temperature, rainfall and extreme weather events resulting in heat waves and floods over a period of time. Climate change also refers to the significant increase in the Earth's surface temperature i.e. global warming. The impact of climate change on health can be direct, when climatic variations like heat stress or high wind speed affect the human while it may impact indirectly through the ecosystems and hydrological cycle that determines the basic components like water supply, food and also on disease agents and vectors.

India, being a developing country, the impact of climate change on health will be inevitably more severe where the situation of poverty and inadequate infrastructure exist everywhere making it difficult to cope with the fast changing climatic conditions. It is also likely to limit various opportunity for development. However, in developed countries, the impact of climate change will be less harsh because of the well-equipped infrastructure and sufficient economy that will help in better mitigation and adaptation activities. The range of tolerance varies across regions and different countries respectively. According to IPCC (2007) the impacts of climate change and their associated costs will fall disproportionately on developing countries threatening to undermine achievement of the Millennium Development Goals.

According to the Indian Network of Climate Change Assessment (INCCA), climate change will increase temperatures across Northeast India in the 2030s. INCCA has been assessing the impact of climate change based on four important sectors of the Indian economy viz-a-viz, health, water, forest and agriculture.

The changing climate can affect the basic elements required to maintain good health; will reduce access to drinking water, affects the health of the poor, air quality and will also pose a threat to food security. Recently, India reported an increase in

the incidence of vector-borne diseases, decrease in crop production, more frequent extreme weather events which could be attributed to the changing climate. Though India has contributed only 2 per cent of the total carbon emissions from fossil fuel burning over the last 100 years, still it is likely to experience greater effects from the extreme weather events. Controlling vector born diseases began over a decade ago in our country. Diseases like Malaria and Kala-azar are no longer fatal like they used to be and their incidence has also decreased significantly, but new vector-borne infections like Dengue and Acute Encephalitis syndrome are on the rise and claiming lives.

North Eastern Region is critical from climate change perspective as it is geologically unstable because the region is nestled in the foothills which comes under the fold of eastern Himalayan stretch. The north east states have been experiencing recurrent floods, soil erosion and landslide, which has shaken the foundation of socio-economic livelihood and the life style of the region into misery. Climatic factors are an important determinant of various vector-borne diseases. Changes in the water ecosystem are likely to favor the survival and breeding of organisms that can cause diseases. The current evidence of climate effects based on seasonal variation such as temperature, rainfall and humidity have well-defined roles in the transmission cycle of vector borne diseases. Vectors of human disease are typically species of mosquitoes and ticks that are able to transmit viruses, bacteria or parasites to humans and other warm-blooded hosts. A disease that is transmitted to humans, plants or animals by any agent is a vector-borne disease. Mosquito-borne diseases are a major public health concern in the north eastern states of India, as it continues to deter the equitable socio-economic development of the region. Malaria, Dengue and Japanese Encephalitis are the predominant infections and spread across the north eastern states with confirmed cases and a high fatality rate affecting all ages.

In recent years, Manipur as one of the north eastern states also continuously witnesses fallouts of extreme weather events such as floods, landslides and hail storms. Climate sensitive and ecological shifts associated with climate change are resulting in increased distribution and incidences of mosquito-borne diseases. The climate change impact on insect vectors will depend on the relationship between host, vector and parasite, including the temperature and other conditions required for breeding and survival. Among the mosquito-borne diseases malaria is the most common sickness. Manipur has a cyclical outbreak of malaria cases but no deaths from it were reported in the past years, while Tripura and some of the states in the northeast recorded malaria deaths. In Manipur, districts of Churachandpur, Tamenglong, Chandel and Jiribam sub-division of Imphal East district are Malaria-prone areas because of the high humidity and temperature. Malaria parasite needs a high average minimum night temperature to complete its life cycle. Based on the report of NVBDCP, there is a decrease in the plasmodium (cerebral malaria) cases in Manipur from 119 cases in 2015 to 58 cases 2016. Among the districts, Churachandpur contributed 59% of the total malaria cases followed by Tamenglong district with 12% in 2016. One of the

factors that contribute to the decrease of malaria in the state is due to an increase in detection of cases by improving surveillance activity in the hill districts. Use of mosquito net also minimizes mosquito bites which is the best way to prevent malarial infection.

The country has achieved tremendous progress in control of Malaria in the past decade and its frame work has been started since January 2016 with the aim of achieving complete elimination of Malaria from the country by 2030. Malaria and Dengue has been declared as a notifiable disease in the state of Manipur vide Government Notification No.25/11/2016-M(Pt) dated 19th January, 2017 as a step for implementation of Malaria elimination framework . Accordingly all the districts of Manipur have been informed to take up necessary action with immediate effect. The state is also planning to launch Malaria Elimination Campaign for 2017 and 2018 with the goal of achieving the target by 2020.



Awareness on health and related issues

Based on WHO reports, ten out of eleven countries in South East Asia region including India are endemic for Dengue disease. It has become a major public health problem in many parts of India with dramatic increase in cases almost every year. But it is hypo-endemic in the north eastern states of India despite the fact that it is surrounded by several Dengue endemic countries like Myanmar, Thailand and Indonesia that have been experiencing frequent major outbreaks with several deaths. An estimated 2.5 billion people in the world are at risk of Dengue fever (DF) and Dengue haemorrhagic fever (DHF), of which 1.3 billion live in South East Asian Countries.

Manipur State experienced the first outbreak of fever with febrile illness in late 2007 through the middle of 2008. In Moreh town of Chandel district, suspected cases of Dengue were reported in that year from the local hospital. The outbreak could be possibly due to the increased temperature, relative humidity and decrease in cumulative precipitation. These climatic factors would have contributed to the Aedes mosquito abundance and increased virus transmission. There are cases of Dengue and Japanese Encephalitis spreading across the state in that year that confirmed 128 Dengue

positive cases and 125 people were confirmed positive with Japanese Encephalitis cases during the pre and post-monsoon season. The sample tested positive cases in the state are expanding particularly in the district of Churachandpur. In 2011, there were 220 cases of Dengue outbreak cases in Churachandpur district. This year too Churachandpur has been worst affected with highest confirmed cases of Dengue and Japanese Encephalitis reported in the State so far. Japanese Encephalitis is a zoonotic disease which is transmitted by vector mosquito belonging to *Culex vishnui* group. The transmission cycle is through animal reservoirs like pigs and water birds. Areas where there is close interaction between pigs/birds and human beings are prone to such sickness. The vectors of Japanese Encephalitis breed in large water bodies rich with aquatic vegetations such as paddy fields. The state being an agrarian economy in nature with major section of population depending upon agriculture as the source of livelihood, the associated activities might favor the spread of these sickness.

“From a socio-ecological viewpoint, an outbreak of Japanese Encephalitis may be facilitated by two factors, i.e. global climate change and modulation of agriculture such as adoption of paddy agriculture, use of pesticides and creation of modern pig farms”.

Extreme weather events like excess rainfall and flooding are the major contributors to water-borne infectious diseases. Many health problems could result from deterioration in physical, social and economic circumstances caused by shortage or limitation of natural resources e.g. fresh water and clean air. Furthermore, air pollution combined with higher temperature would enhance the frequency of allergic and cardio respiratory irritation and breathing difficulties. Changes in the climate affect the air we breathe, both indoors and outdoors. Increasing carbon dioxide and carbon monoxide from the vehicles also promote the growth of plants that release airborne allergens. Higher pollen concentrations and longer pollen seasons can increase allergic sensitization to the people.

The effects of climate change also deepen on mental health and well-being which is the integral parts of the overall climate-related human health impact. It is clear that climate change endangers human health depending on location and other economic factors like poverty and poor sanitation. There is no doubt that climate change is currently affecting public health through environmental consequences. Changes in precipitation resulting in frequent flash floods are being experienced in Manipur. Rising temperature, changes in intensity of storms and landslide, degraded air quality are anticipated to continue into the future. The recent outbreak of Dengue and Japanese Encephalitis in our state reflects the outcome of extreme weather events which in turn affect human health.

Natural disaster : Bane to our existence

“The state of Manipur experiences countless forms of the natural calamities which not only brought havoc to the properties but also claimed life in few instances.”

- Yengkokpam Satyajit Singh

The world wakes up to confront a change that has been a result of our own existence. The present scenario of global climate change has brought the world together to provide a solution before it is too late. Throughout the year, one or the other type of natural calamities strike one part or the other of the earth bringing about untold miseries with loss of life and properties and also vast destruction to our ecosystem. Anthropogenic activities are a major cause of the environmental imbalance which have led to different forms of natural disasters. With the rise in human population, the increased needs and consumerist tendencies have affected the natural resources and the sustainable capacity of the land tremendously.

Natural disaster manifests itself in the form of natural hazards such as earthquakes, landslide, floods, tsunamis, cyclones and droughts. It is a natural process that can cause widespread damage and disruption. Being a part of our environment, its occurrence cannot be totally prevented but there is always a possibility to minimize the magnitude of impact of these natural disasters on the people and their properties through precautionary measures at different levels. However if left unchecked, this situation might deteriorate in the near future and the odds of our survival on earth will be hanging by a thin thread.

The type and scale of natural disaster varies from place to place. The state of Manipur experiences countless forms of the natural calamities which not only brought havoc to the properties but also claimed life in few instances. Flood and landslides are the two most frequently occurring natural calamities in our state. The frequency of its occurrence has increased many-fold in the recent years and global warming may be attributed as one of the main causes. Anthropogenic activities like destruction of forests, improper land-use practice, jhum cultivation, vehicular pollution, and rapid urbanization are on the forefront in bringing the changes in the atmospheric temperature and precipitation. Erratic and torrential rainfall has become an order and this has led to many flash floods and landslides in the state.



During the current year, the incidences of flood occurred many times especially in the valley region. Improper drainage system multiplied the problems. The collapsing of river banks in many places brings destruction of properties and agricultural land. Flooding of fish farms and verdant paddy fields has also destroyed the economy of the farmers. The intensity of rain has been increasing over the last few years and there are reports of flood in many place even during the pre-monsoon season . Continuity of rain since the beginning of the year till the retreating monsoon gives us a clear picture of the present condition of climate over the region. There is also the peculiar site-specificity in the occurrence of rain. There might be an inch or more of rain on one area while leaving another area dry just a few blocks away. The incessant rains in the hilly areas have caused a number of landslides blocking the highways and disrupting connectivity and communication. It has also brought harm to the economy of the state.



Other forms of havoc brought to us by Nature are drought, hail-storms, and earthquakes. Climate related incidents like drought and hail-storms are also becoming common in our state. The frequency and destructive capacity of hail-storms are increasing at a pace. Increasing atmospheric temperature coupled with the topography of the land is conducive for hail storm. Hails of different shape and size had caused havoc to livestock, properties and standing crops in many areas of the state.

Maximum efforts must be given to the preservation and protection of the environment to mitigate climate change. Any form of development should be sustainable in all respect and the environment must be given the top priority in any decision making or policy framing. Over-exploitation of natural resources should be viewed as a bane to our survival on this planet. Man's greed has brought many imbalances to the environment and is contributing to the increasing instances of natural disasters. Ignoring Mother Nature could be a road to our own destruction.

Weather Report

MONTHLY ANALYSIS OF MEAN MAXIMUM AND MINIMUM TEMPERATURE AND RAINFALL OF MANIPUR FOR THE 3rd QUARTER, 2017

DISTRICT	JULY 2017			AUGUST 2017			SEPTEMBER 2017		
	Max temp (°C)	Min temp (°C)	Total Rainfall	Max temp (°C)	Min temp (°C)	Total Rainfall	Max temp (°C)	Min temp (°C)	Total Rainfall
BISHNUPUR									
CHANDEL	36.75	23.56	E	37.99	23.59	N	35.27	24.76	S
CHURACHANDPUR	32.4	19.73	S						
IMPHAL EAST	35.57	22.02	E	37.49	21.28	E	33.57	21.98	S
IMPHAL WEST	35.07	21.44	E	35.23	20.11	N	33.92	21.55	S
SENAPATI	33.19	20.36	E	33.96	19.72	E	29.65	20.42	S
TAMENGLONG				34.31	23.68	S	29.74	24.06	S
THOUBAL	29.65	21.8	N						
UKHRUL	26.94	15.34	E	27.74	15.92	D	23.37	15.64	S
MEAN	32.80	20.61		34.45	20.72		30.92	21.40	
MANIPUR	AAN	N		MAN	BN		AN	AN	

Source: State Climate Change Cell, Manipur, Directorate of Environment, Government of Manipur

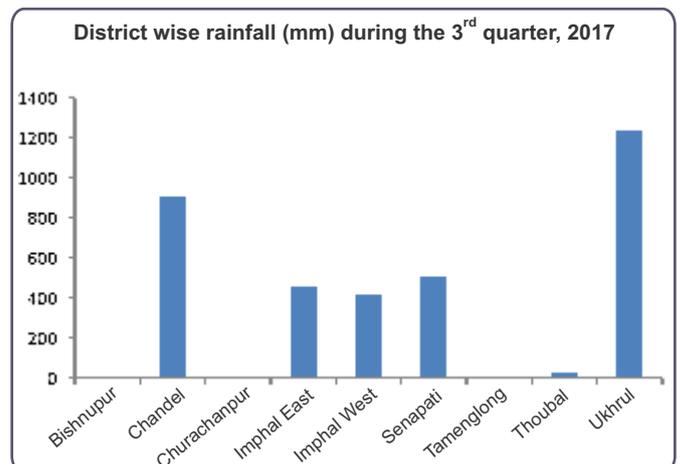
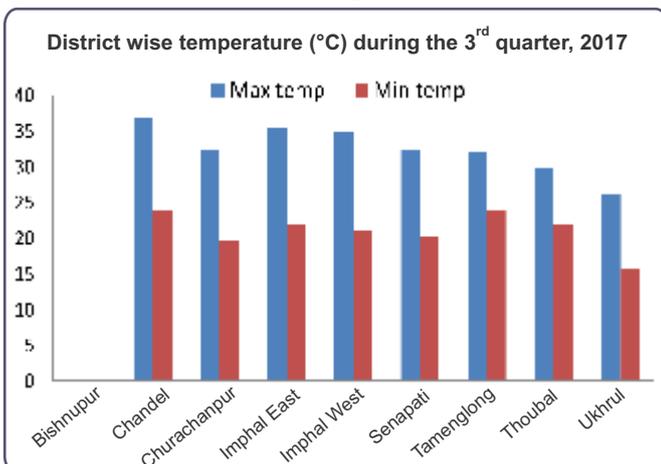
Note :

- N : Normal (N, N+1, N-1)°C
- * : Cold/Heat wave condition
- ** : Severe Cold/Heat wave condition
- BN : Below Normal (N-2)°C
- AN : Above Normal (N+2)°C
- ABN : Appreciably Below Normal (N-3, N-4)°C
- AAN : Appreciably Above Normal (N+3, N+4)°C

- MBN : Markedly Below Normal (N-5 and Below)°C
- MAN : Markedly Above Normal (N+5 and Above)°C
- E : Excess, (+20% or more of Mean rainfall)
- N : Normal, (+19% or -19% of Mean rainfall)
- D : Deficient, (-20% to -59% of Mean rainfall)
- S : Scanty, (-60% to -99% of Mean rainfall)
- NR : No Rain, (-100% of Mean Rainfall)

Non availability of data in some district during this quarter hindered the proper analysis of weather information. However it is observed that the recorded temperature over the quarter is above the calculated normal temperature. The month of August experiences the maximum temperature which is markedly above the normal. August also recorded the minimum temperature below the normal showing a wide gap in the diurnal temperature. Among the hill districts, Chandel always remain the region with the highest temperature and Ukhrul district maintain the coolness throughout the quarter. While in the valley area, Imphal East is warmer than the rest. In overall the temperature of the state is becoming warmer over the years indicating a change in the climatic condition of the region.

Being the month of monsoon, July experiences heavy rainfall in most of the districts. The number of rainy days has been increasing and added to it, the intensity of rain in the region is also increasing causing widespread flood. The state have faced a number of floods during this quarter. Though the rainfall diminishes as the monsoon progress, it continued to bring havoc to the people causing destruction of lives and properties. Senapati and Imphal East district received more rain than the other districts. Tamenglong district which usually received the highest rainfall is dry this quarter with the total rainfall recorded as scanty. Flash-flood and landslides were very frequent during this quarter effecting most of the districts.



Source: State Climate Change Cell, Manipur, Directorate of Environment, Government of Manipur

— Analysed by Yengkokpam Satyajit Singh

Safeguarding Amur falcon in Tamenglong district

- Ashem Rahul Singh

Situated on the north western part of Manipur bordering Nagaland, Tamenglong district is 150 kms away from the capital Imphal. The district is largely inhabited by Zeliangrong communities who still followed the traditional culture and their villages are administered by village republic and normally ruled by elders. The presence of diverse floral and faunal diversity including the migratory birds in Tamenglong district is known since time immemorial. In altitude, the district varies from 35m above mean sea level at Nongleiband in Khoupum valley to 2241m above mean sea level at north east of Atang Khullen village. The district is famous for Barak River, Makru River, Irang River, Iring River, Leimatak and Zeilad rivers. Recently, the Bhalok village is declared as Amur falcon village by the Government of Manipur. The village is located 8 kms away from the district headquarter. Amur falcon is well known to the Rongmei tribes of Tamenglong and is called as *Akhuaipunia* in local dialect. They believe that the arrival of Amur falcon indicates the start of winter season and departure of summer. The bird is the longest annual migratory bird ever known among any bird of prey. Amur falcon migrates from Mongolia to Bhalok village, Tamenglong tehsil of Manipur in search of feeding grounds or to escape the severe winter of their natural habitat.



Tamenglong district is known for its god's gifted biological diversity hot spot. The district is a distinctive component of the Indo Myanmar hotspot. With the changing scenario of climate in the present era, the survival status of Amur falcon is an issue of concern. Climate change is playing an important role in the distribution, structure and ecology of forests. As a result of climate change, the bird can change their routes, shorten or completely cancel their journey in the long term. The change in climate is also expected to cause major shift in vegetations, shift in land use by humans such as changes in agriculture and the environment. Such shifts cause problems for birds if the plants and animals they interact with do not shift at the same rate of time. Urbanization, industrialization, and disappearance of lakes are other factors affecting the migration pattern of Amur falcon. Due to growing human settlement in key corridors and severe fragmentation and degradation of forest, the human birds conflict is increasing and more risk to poaching. The impact is likely to be more severe in areas where other pressures are deemed to be high such as encroachment on forest areas, over-grazing, felling of trees for jhum cultivation. The loss of habitats due to pollution or exploitation caused by encroachment for settlement, agriculture, grazing is the main threat in birds' migration, as they are dependent on finding suitable breeding and wintering grounds as well as stopover sites along their flyways where they can rest and feed. The loss of any of these sites used by the birds during their annual cycle could have a dramatic impact on the birds' chances of survival. Migration is one big challenge in birds' life as they travel thousands of kilometers to find the best suitable place for feeding, breeding and raising their young ones. Amur falcon choose Tamenglong district as their temporary haven by undertaking such a long and tough journey.



Migratory Amur falcon roosting in Tamenglong district

In a move to save the migratory bird, the 3rd edition of Amur falcon festival was organized by the Rain Forest Club under the aegis of western forest division, Tamenglong district. Out of the 69 falcon species found worldwide, Amur falcon is the least known migratory birds protected under the Wildlife Protection Act, 1972 and included in the Schedule IV of the act. The bird is categorized as the Least Concern under International Union for Conservation of Nature (IUCN). It is also listed in Appendix II of CITES. Any persons who hunt Amur falcon or sell its meat are liable to be punished with imprisonment up to three years or fine up to Rs 25,000.00 (Rupees twenty five thousand) or both. Besides Bhalok, the countless number of birds also roosts at Phallong, Dailong, Barak, Lenglong and other villages of Tamenglong district. In the state, the range of the bird covers the districts of Churachandpur, Bishnupur, Senapati, and Ukhrul.

Every year, this migratory bird touches the shores of three continents – Asia, Africa, and Europe on its journey. Birds are considered as reliable indicator of environmental change and needs the support of local community for its conservation. It is the right time to take up measurable steps for the conservation of their habitat to benefit the communities, socially, economically and environmentally. The need of the hour is to address issues and offer solution towards species and habitat related concerns. These concerns include - local community involvement in conservation, promotion of sustainable livelihood opportunities, prevention of hunting and more research on lesser known species.

WORLD NATURE CONSERVATION DAY

- Dr. Bharati Brahmacharimayum

World Nature Conservation Day is celebrated on 28th July every year throughout the world. The day is celebrated to increase awareness about the need to protect and conserve the natural resources that the Earth is bestowed with. The significance of this day lies in the fact that it makes the people ponder about the conservation of Mother Nature and realize the importance of nature for our existence. The temperature across the globe is on the rise as global warming and climate change is occurring in reality. Issues like deforestation, lack of wildlife habitat, pollution and reduction of drinkable water - are just few of the predicaments of human beings which have resulted from man-made blunders. Thousands of species are also on the verge of extinction. The sooner we wake up to ensure a sustainable and safe environment for the future generations, the sustenance of the present generation will no longer be possible on earth.

Mother Nature has nourished us with air, water and soil amongst many which are the source of life's existence on this planet. But human beings, in the thirst of development have extracted much more from nature both for survival and luxury. We have also created several things of which few are harming the Nature and have resulted in an imbalance of the environment. The monsoon season has become erratic and we do not receive the monsoon rain in the pattern we used to get before. The seasonal temperatures have also varied to a large extent. Some places have experienced extreme weather in summer as well as winter while in other parts of the globe, winters are becoming warmer. Snowfall has also been limited in many places in winter. There have been cases of heavy rainfall in one corner while extreme drought conditions have occurred in areas which once received heavy rainfall. In short, changes in the climate have been experienced by one and all. These circumstances can be attributed to the extreme pressure of human exploitation on nature which has resulted to an imbalance world. Natural disasters such as tsunamis

28 July

WORLD NATURE CONSERVATION DAY

and earthquakes and also the depletion of ozone layer can be related as impacts of the man-made disturbances on nature. As such creating awareness among the present generations regarding the importance of the conservation of nature to avoid major disasters is the need of the hour.

World Nature Conservation Day highlights the significance of a healthy environment which will lead to a productive society for sustainable present and future generations. With the alarming consequences of the depleting natural resources, it is necessary to look after Mother Nature in the same manner which she has nurtured us. We can try to incorporate some of the conservation habits in our daily life like saving water, electricity and reducing our carbon footprint on a local, national and global scale. Even a small step like walking to the shops or to work will cut down the fuel emission for the day and if more and more of the populace opt for this option, it will make a huge difference. We also need to teach and encourage our kids the importance and beauty of the environment and the need to preserve it.

The environment is comprised of nature as well as mankind and unless mankind functions in a commendable manner, nature is bound to be completely destroyed. Mahatma Gandhi rightly said, "Earth provides enough to satisfy every man's needs, but not every man's greed." A lot of hue and cry about nature and its exploitation, the need to preserve it have been heard every day, but still there are many who pay a deaf ear. As the survival of each and every living entity depends on the natural resources such as water, air, soil and minerals, conservation of nature becomes very crucial. But the real challenge of the present times is how to protect and conserve nature for the future generations after satisfying the needs and demands of the ever increasing human population. All the efforts to save our Mother Nature would be a waste until each and every one of us starts to contribute our small individual share. In unison, the day wouldn't be far where we would be seeing a world where nature sings in harmony with mankind.



State Climate Change Cell, Manipur

The Climate Change Cell, Manipur of the Directorate of Environment, Government of Manipur is a unit for climate research extension and strategic knowledge network on climate information of the state. The Cell has been strengthened during October 2014 by the Department of Science and Technology, Ministry of Science and Technology, Government of India as one of the target activities of National Mission for Sustaining the Himalayan Ecosystem (NMSHE) under the National Action Plan on Climate Change (NAPCC).

The primary objective	<ul style="list-style-type: none">- To develop a resource base climate information network and sustainable capacity for continuous assessment of the ecosystem health so as to enable in policy formulation and implementation of climate sensitive activities in the state
The secondary objective	<ul style="list-style-type: none">- To develop a wider knowledge network for climate information;- To develop regional climate data base information management system and connectivity;- To enhance research activities on vulnerabilities of the impact of climate change;- To evaluate the climate sensitive policies and alternatives towards its sustainability;- To have more understanding and linking the traditional knowledge system to the climate sensitive activities in adaptation, mitigation and coping;- To build the capacity of local researchers, young scientists, planner, executers, communities, etc.;- To conduct awareness and trainings for better implementation of the climate sensitive actions;- To evaluate, monitor and update the existing State Action Plan of Climate Change.
The long term objective	<ul style="list-style-type: none">- To make position a viable and self-learning climate knowledge networking system to assist the policy and the state authorities in long run.
Goal	<ul style="list-style-type: none">- Strengthening capacities of the state government officials for effective planning and implementation of climate change adaptation actions;- Undertaking vulnerability assessment of the climate sensitive sectors;- Spreading awareness among the masses on climate change and its likely impacts.
Key deliverables	<ul style="list-style-type: none">- Networking and strengthening of regional climate knowledge institutions;- Development of observational network to monitor the health of the Eco-system;- Capacity building and trainings to the officials, planners, young scientists and community practitioners;- Development of State level Climate Information System;- Development of a log frame for effective implementation of climate sensitive action by integrating traditional knowledge and community based management system;- Develop the sectoral document of identified sectors under SAPCC (State Action Plan on climate Change).

