



# Water Management and Climate Change in Myanmar

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Overview on water management in Myanmar

Activities of Department of Meteorology and Hydrology in Myanmar

Climate Change Facts in Myanmar

Impacts of Climate Change in Myanmar

Activities of DMH on Climate Change and Adaptations

# Right for Water

The 2015 National Water Policy states that:

**“The Union, the Regions and States, and local bodies (governance institutions) must ensure access to minimum quality of potable water for essential health and hygiene to all its citizens, available within easy reach of each household.”**

- The Water Law draft has been in a public consultation process.
- To be finalized in 2020.

## Ayeyarwady Integrated River Basin Management Project (AIRBMP)

**Component 1** Water Resources Institutions, Information and Capacity Building

**Component 2** Hydromet Observation and Information Systems Modernization

**Component 3** Ayeyarwady River Navigation Enhancements

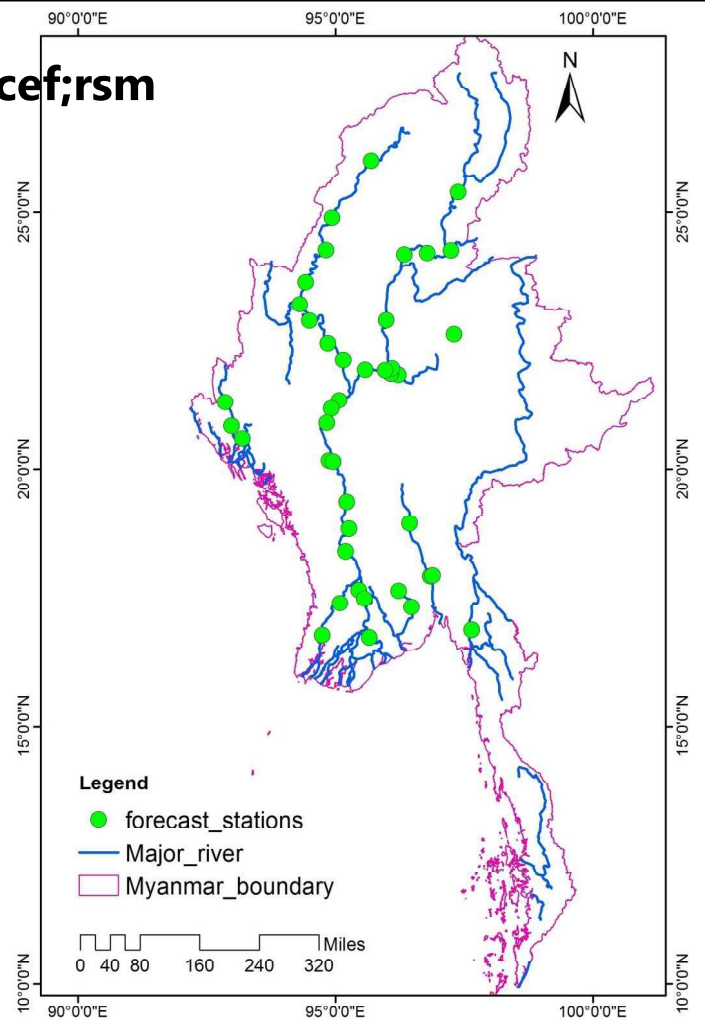
### **Project Development Objectives (PDOs):**

- To strengthen integrated, climate resilient management and development of the Ayeyarwady River Basin and national water resources.
- To contribute to the development of integrated river basin management on the Ayeyarwady River.

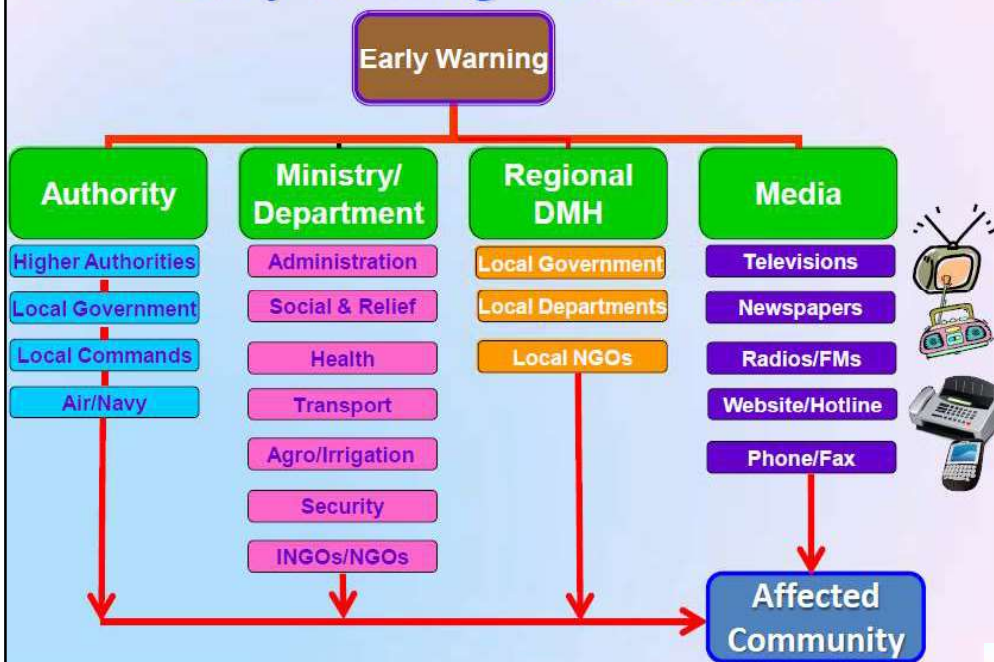


## Water Level Forecasting Stations

- ❖ Ayeyarwady - 18 Stations
- ❖ Chindwin - 8 Stations
- ❖ Sittaung - 2 Stations
- ❖ Thanlwin - 1 Station
- ❖ Dokhtawady - 3 Stations
- ❖ Bago - 2 Stations
- ❖ Shwegyin - 1 Station
- ❖ Ngawun - 2 Stations
- ❖ Toe - 1 Station
- ❖ Kalaten - 2 Stations
- ❖ Lay myo - 1 Station



## Early Warning Dissemination



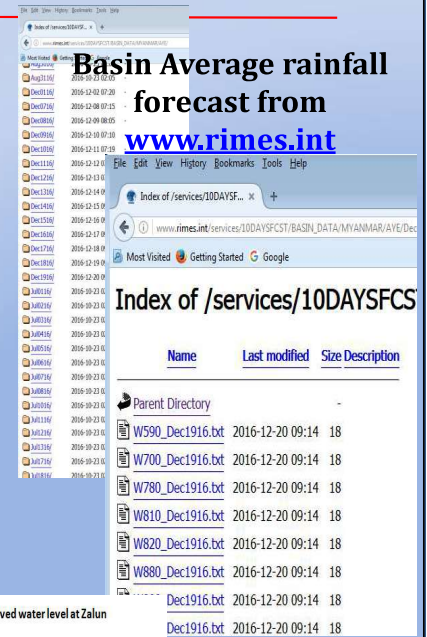
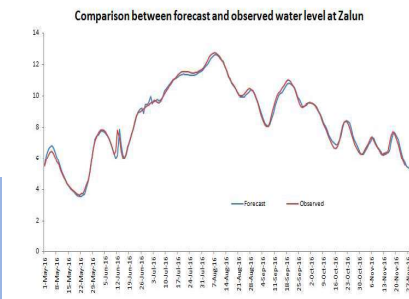
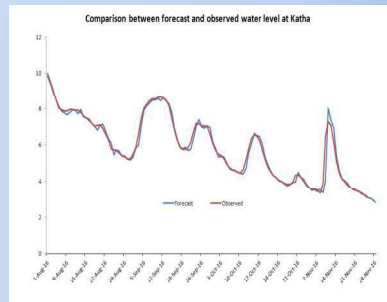
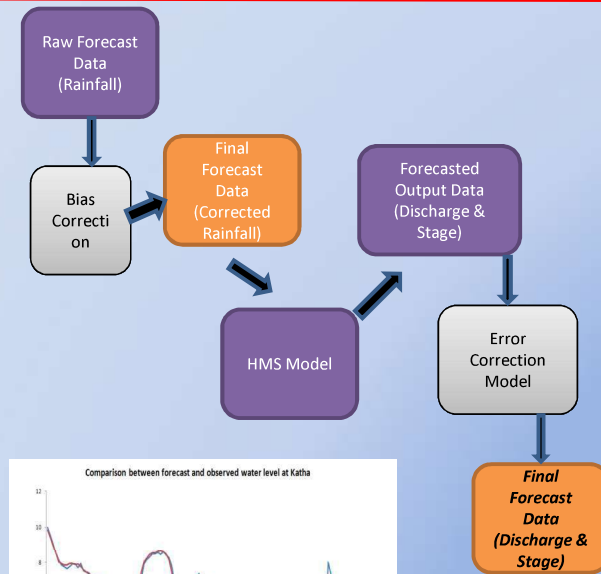
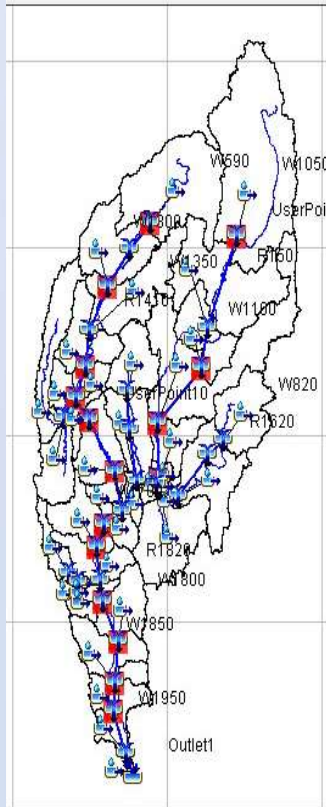
Common Alert Protocol(CAP)



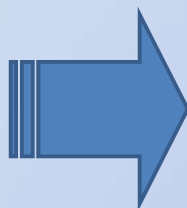
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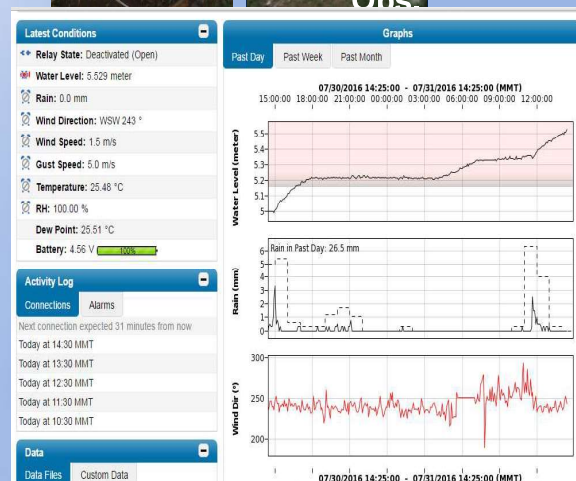
# HEC HMS Model(Ayeyarwady River Basin)



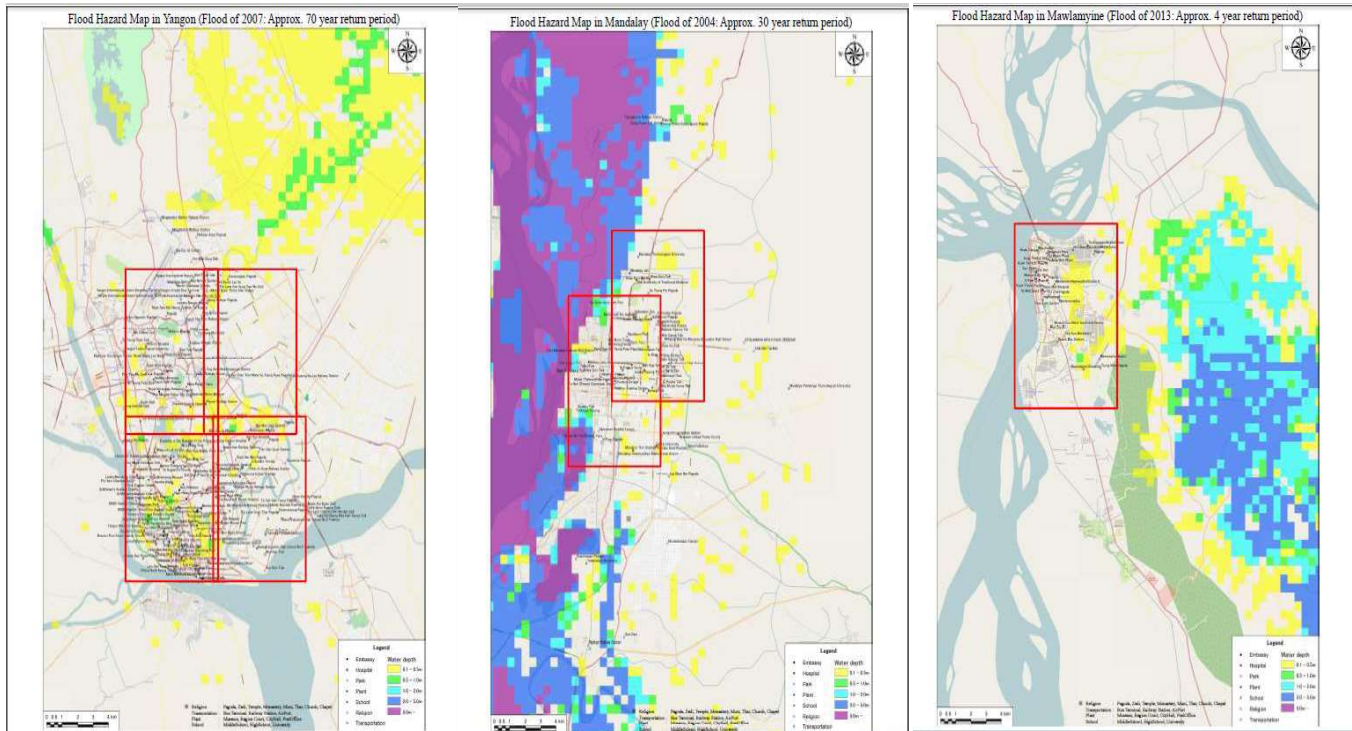
## Upgrade the manual Observation to Automatic Water Level Observations



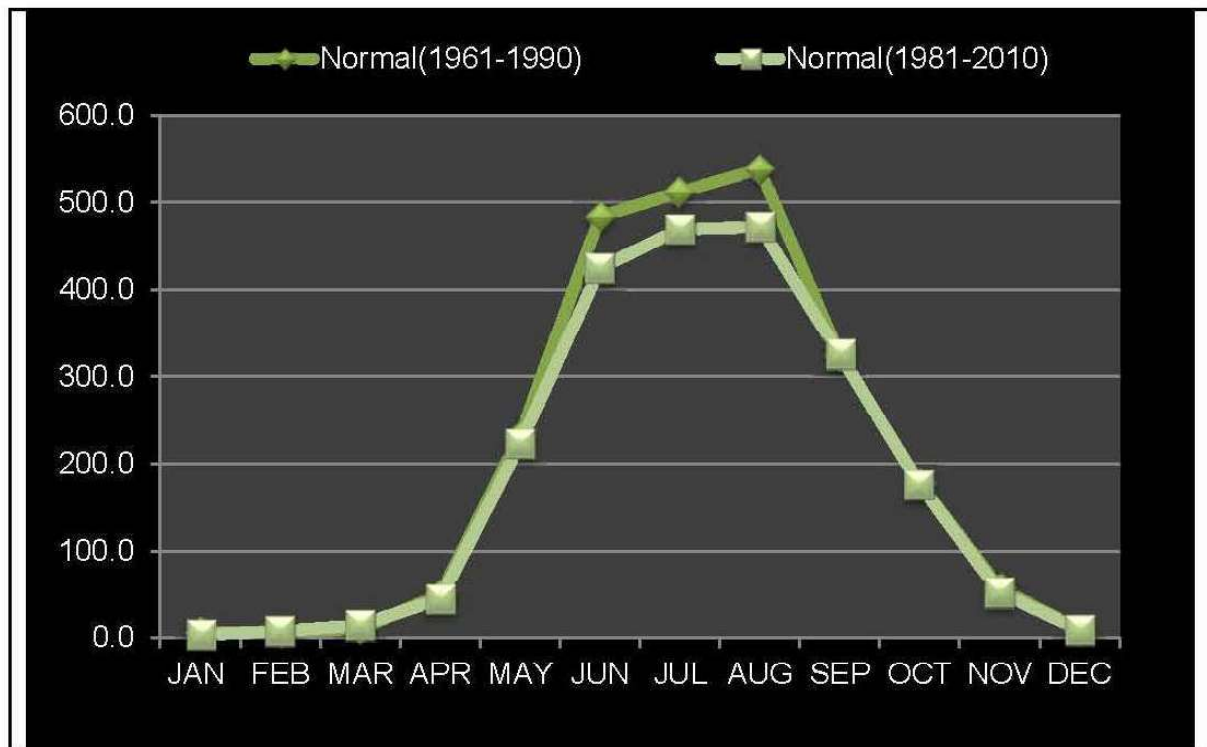
The observers at hydrological station have to measure the water level before standard time (6:30, 12:30 and 18:30).



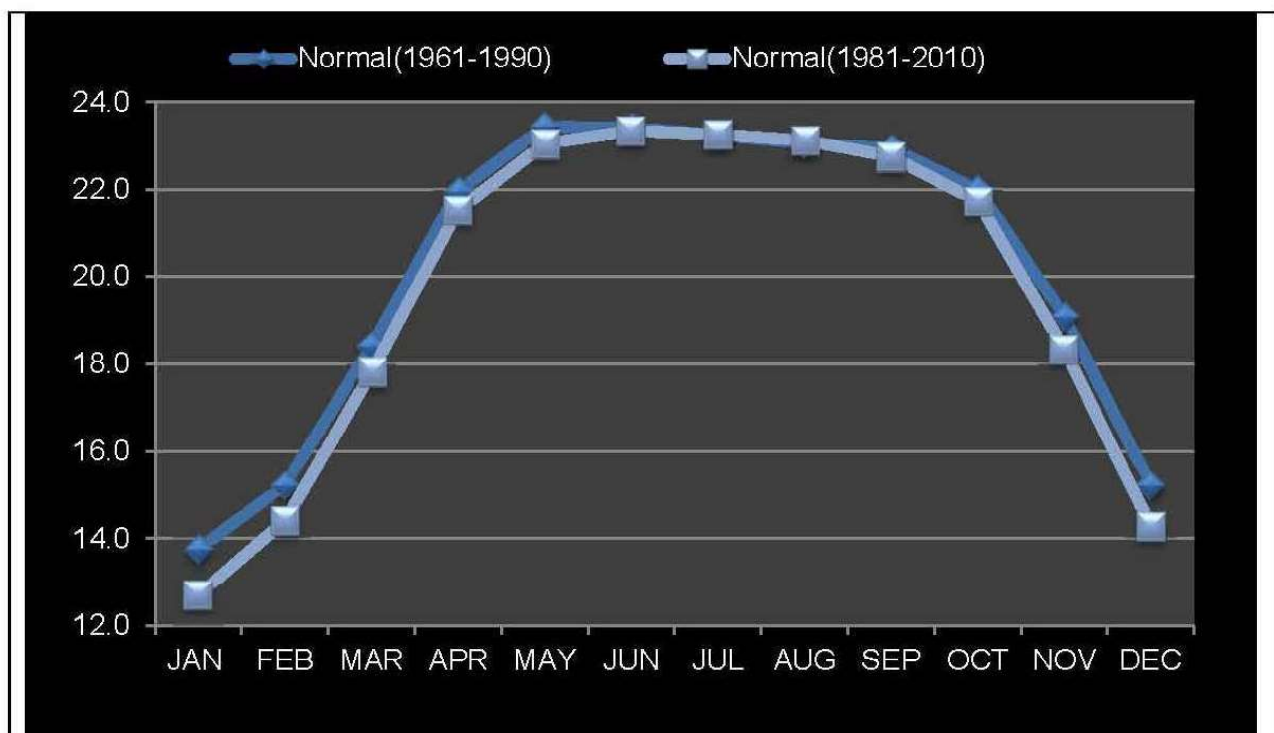
## Flood Hazard Maps of Yangon, Mandalay and Mawlamyine



## Country Normal Rainfall Comparison over Myanmar

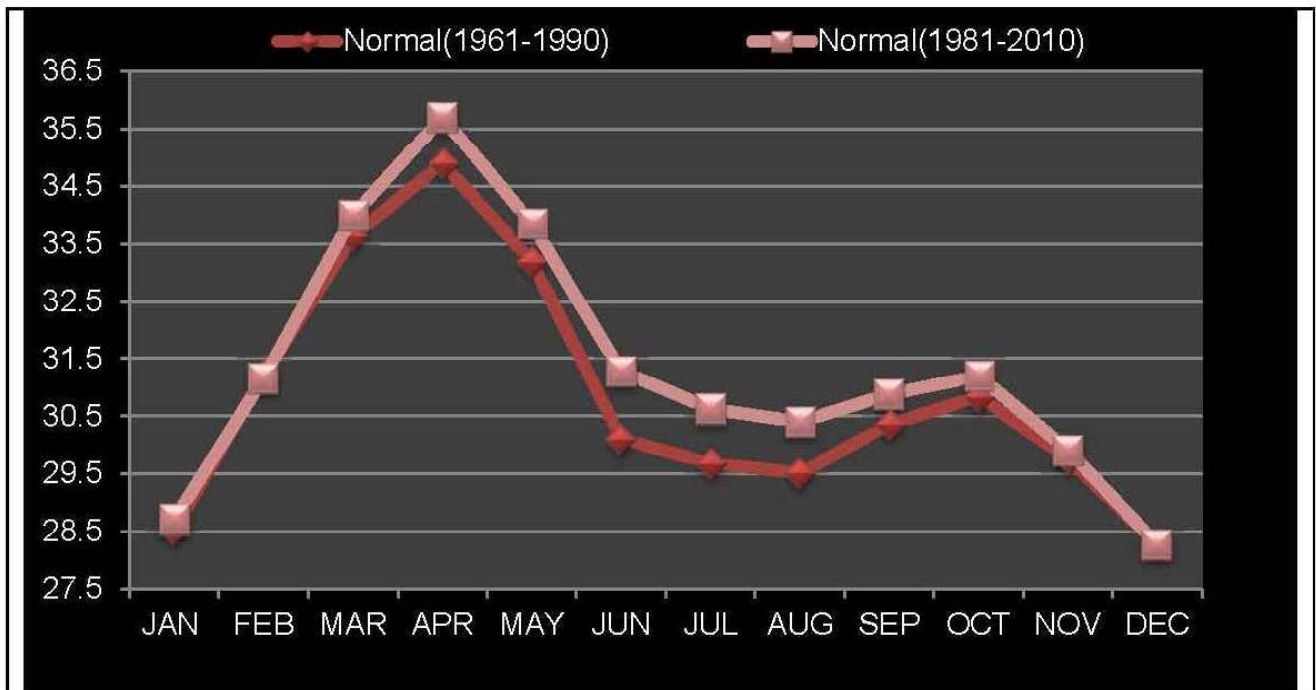


## Country Normal Minimum Temperature Comparison over Myanmar



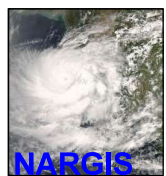
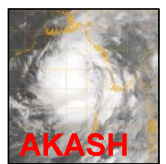


## Country Normal Maximum Temperature Comparison over Myanmar



## Impacts of Climate Change in Myanmar

- Late monsoon onset after 1977
- Early monsoon withdrawal after 1977
- Shorter monsoon duration after 1977
- Retardation of monsoon advancement increased in 1990s
- The monsoon strength were weak in 1951, 1953, 1957, 1977, 1979, 1996, 1998 and 2003 where the impacts of EL Nino were evident in some years.
- Heat and drought indices increased after 1977
- Annual rain decreased after 1977
- Normal monsoon breaks disappear in 1990s
- The Monsoon depressions become less significantly in 1980s and 1990s
- The abnormal synoptic situations occurred in 1980s and 1990s.
- Sea surface temperatures rise, which is causing storms, including cyclones and hurricanes, to intensify.
- Heaviest rainfalls were recorded during July and Aug 2011 and June and Oct in 2010 and Highest Temps were recorded in March, April and May 2010



## Activities of DMH for Climate Change and Adaptation

- *Observing Meteorological & Hydrological data*
- *Analyzing data*
- *Issue Warnings and Forecast s in time*
- *Monitoring the changes of climate condition*
- *Cooperating with related organizations and neighboring countries*
- *Researching climate phenomena*
- *Issuing Global and Local Climate Change*
- *Organizing the International & Local seminars, meetings, workshops*
- *Public education for Climate Change effects and adaptation*
- *Cooperating in projects for climate change adaptation*

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## Climate Change Adaptation in Myanmar

- Signed UNFCCC on 11 June 1992 and ratified the convention on 25 November 1994.
- Ratified Kyoto Protocol in 2003.
- NCEA is focal point for UNFCCC.

### Initial National Communication (INC)

- A project was implemented by Myanmar with financial assistance from GEF/UNEP (2008-2010)
- Established a Project Management Team (PMT) and National Study Teams (NSTs) which included working groups of
  1. GHG Inventory and Mitigation Options Analysis (GHG)
  2. Vulnerability and Adaptation Assessment (V&A, DMH)
  3. Development and Transfer of Environmentally Sound Technologies (ESTs)
  4. Research and Systematic Observation (RSO, DMH)
  5. Education, Training and Public Awareness (ECODEV)
  6. Compilation of National Communication (ECCDI)
- Myanmar had submitted INC to UNFCCC.



# Climate Change Adaptation in Myanmar

## National Adaptation Programmes of Action (NAPA)

- A project is being implemented by Myanmar with financial assistance from GEF/UNEP (2011 March - Dec)
- Established a Project Management Team (PMT) and Multidisciplinary Integrated Assessment Team (MIAT) which included working groups of
  1. Agriculture and Forestry
  2. Biodiversity
  3. Coastal Zone
  4. Energy , transport and Industry
  5. Public Health
  6. Water Resources
- Under Myanmar National Adaptation Plan of Action (NAPA), Vulnerability Assessment have been done and Measured for reduction of impact and strategy for adaptation were prioritized.

## Conclusion

Myanmar is more vulnerable to Multihazards in current years due to the Climate Change.

Department of Meteorology and Hydrology is Cooperating actively with International associations like UN organizations, Regional Associations to upgrade the forecasting technologies.

The relevant departments and organizations in Myanmar are cooperating in the climate change adaptation activities and also cooperating in the regional and worldwide climate change adaptation.

**Thanks a Lot**