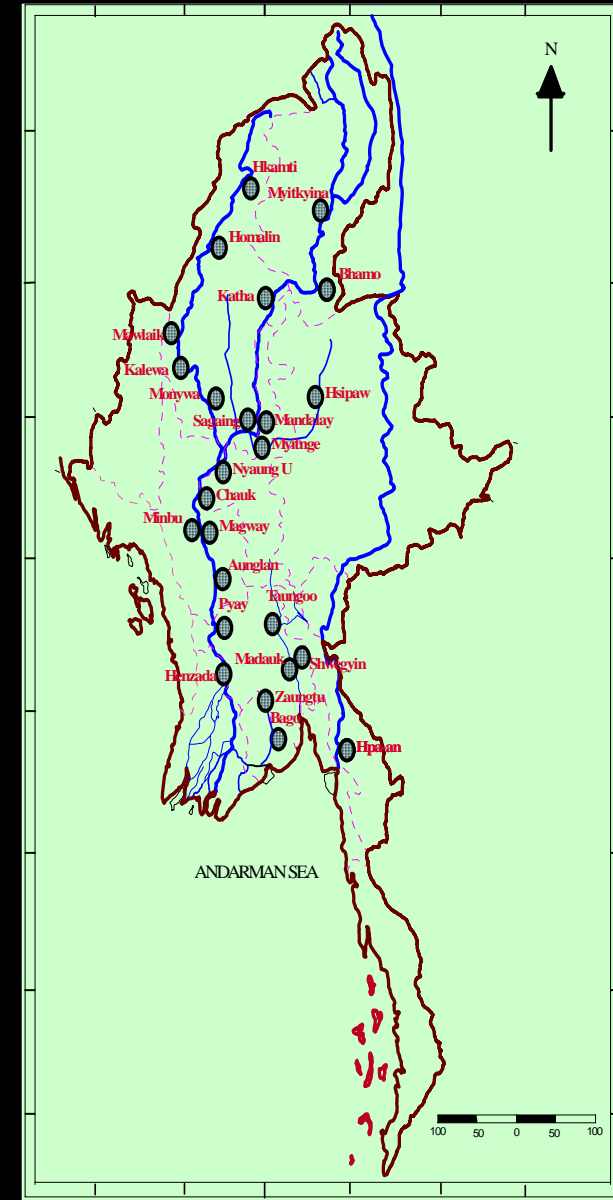
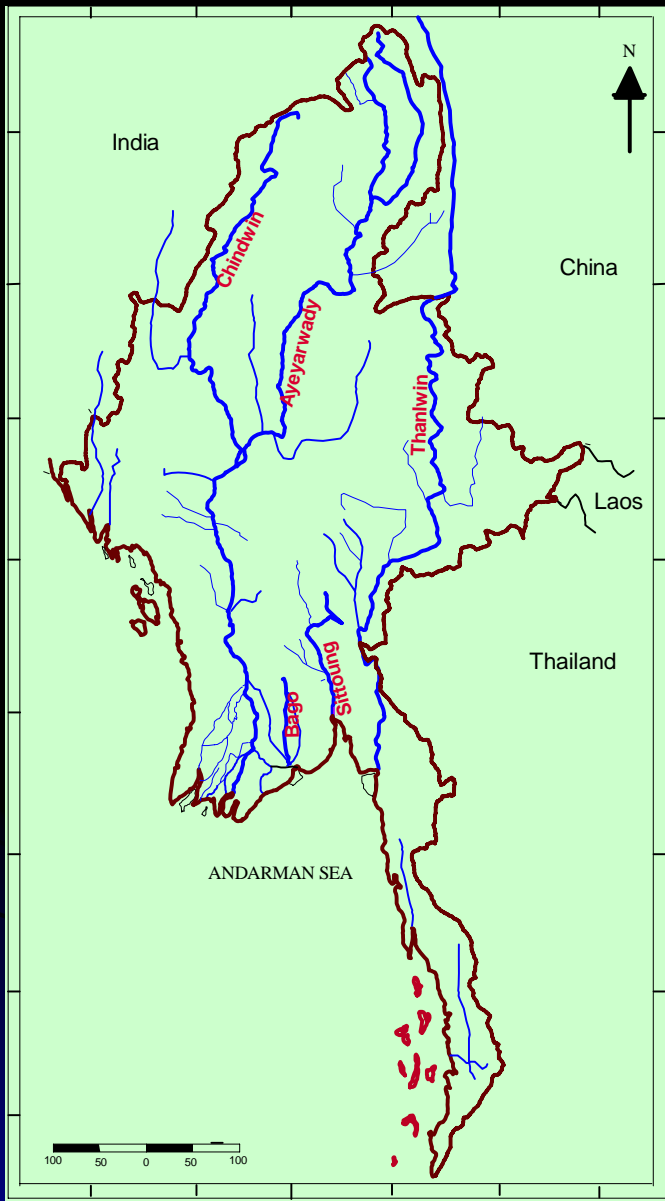


A tropical sunset scene with palm trees and a river. The sun is low on the horizon, casting a golden glow over the water and the silhouettes of the palm trees. The text is overlaid on this scene.

# **Flood Forecasting and Mitigating in Myanmar**

**Dept. of Meteorology & Hydrology, Myanmar**



**Rivers in Myanmar**

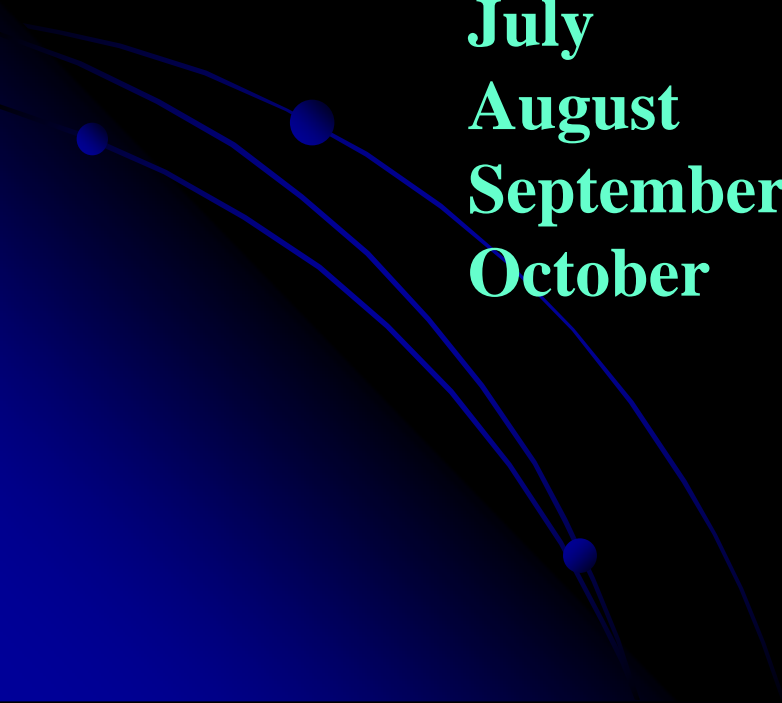
**River forecasting stations  
in  
Myanmar**

# Flood Period in Myanmar

June – October

## Occurrence of flood

June	6 %
July	23 %
August	49 %
September	14 %
October	8 %



# Flood in Myanmar

## Widespread flood

mostly occur in the large and medium rivers caused by the heaving rainfall striking at the head water for considerable

region

period ( 1- 3

days),

the flood wave forming at

the head water started to move

downward and causing flood

along the river up to the deltaic

area

## Flash Flood

in

usually occur in the small and streams

caused by heavy rainfall on source and the flood

the

wave move

downward

swiftly



## Widespread flood



# **Flood mitigation and preparedness in Myanmar**

**Dept. of Meteorology and Hydrology (DMH)**

**Dept. of Irrigation (DI)**

**Directorate of Water Resources and Improvement of River System (DWIR)**

**Dept. of Relief and Resettlement (DRR)**



# Flood mitigation and preparedness measures

## Forecasting and Warning

- Non-structural flood control measure
- DMH started since 1966
- Reliable forecasting and easily understandable warning information with sufficient lead-time are of vital importance for flood forecasting system

### Issues

Daily Water Level Forecast

Dekad and Monthly Water Level Forecast

Flood warning

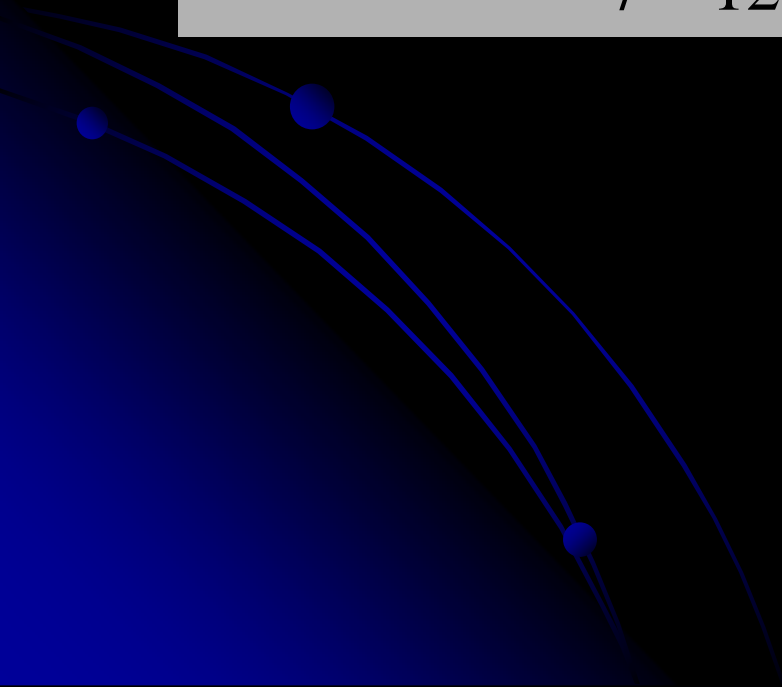
Flood bulletin

Significant bulletin

## Methods

Empirical model (based on single and multiple regression analysis)

Lead-time 1 – 2 days for short range forecast  
7 – 12 days for the long range forecast





- **Flood frequency analysis**

- **Conceptual models**

**Sacramento**

**SSARR**

**HBV**

**Tank**

**Flood forecasting and  
river**

**warning system**

**smaller**

**Dissemination**

**adequate for large**

**still exists problem of  
flash flood at the  
catchment**

- **Radio, television, telephone, SSB transceiver and  
other communication (means for concerned  
government Dept. and Agencies)**

# Flood preparedness Plan

- **DWIR**                      **River Training (Bed Regulation Method)**
- **DI**                              **Special repairs to be done on embankment system using machine and manpower to fill up where the embankment is low and of the strengthening weak portions them**  
**embankment by resectioning**

**Make arrangements with administrative officers and local people through flood**

**Collect Emergency materials**

**Stored in predetermined places**

- **Arrangements to evacuate man and cattle to save places, preparations to organize patrolling parties to work day and night for the assessment of flood and embankment condition and send the situation reports during flood**
- **Meteorological and Hydrological reports and warning regularly collect and send to important places daily**
- **DI collect the prediction of river level after danger level has been reached**
- **It is to collect the river level at the station (deltaic area) at the time of breach of embankments**

**DI try to close breach in temporary measure but in permanent nature later on, to send the refugees to predetermines places if danger is imminent for the people after the breach of embankment has been**



# Long-term Programs for Flood Prevention

Myanmar has planned to implement on the tributaries of the rivers the following reservoir schemes :

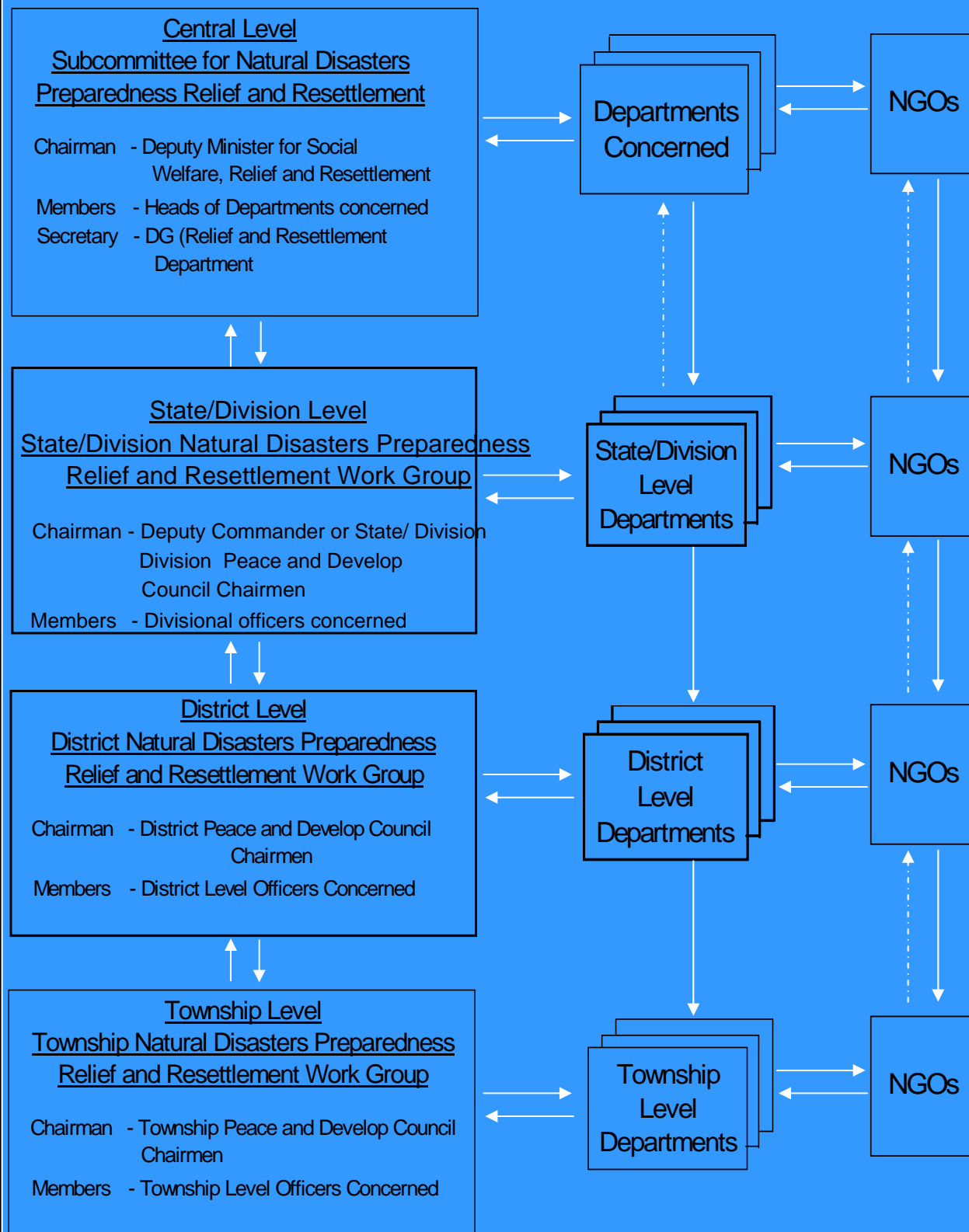
- Kinda Reservoir Project on Panlaung River  
(tributary of the Ayeyarwady River)
- Thapanseik Reservoir Project on Mu River  
(tributary of the Ayeyarwady River)
- Paunglaung Reservoir Project on the Sittoung River
- Yeywa Hydroelectric Power Project on Myitnge River  
(tributary of the Ayeyarwady River)

**After completion of these projects the effects of disastrous flood mitigate to a greater extent**

### **Control Basin Erosion**

- by reforestation in the basin , training the farmers in the hilly region to adopt terrace and contour ploughing**
- Using systematic methods of logging in Lumber Industry**

# Measures for Natural Disaster preparedness



## National Disaster education courses

- Management training courses on natural disaster preparedness were opened yearly by rotation in states and divisions in cooperation with other related departments.





# The Mekong River Basin

## Characteristics:

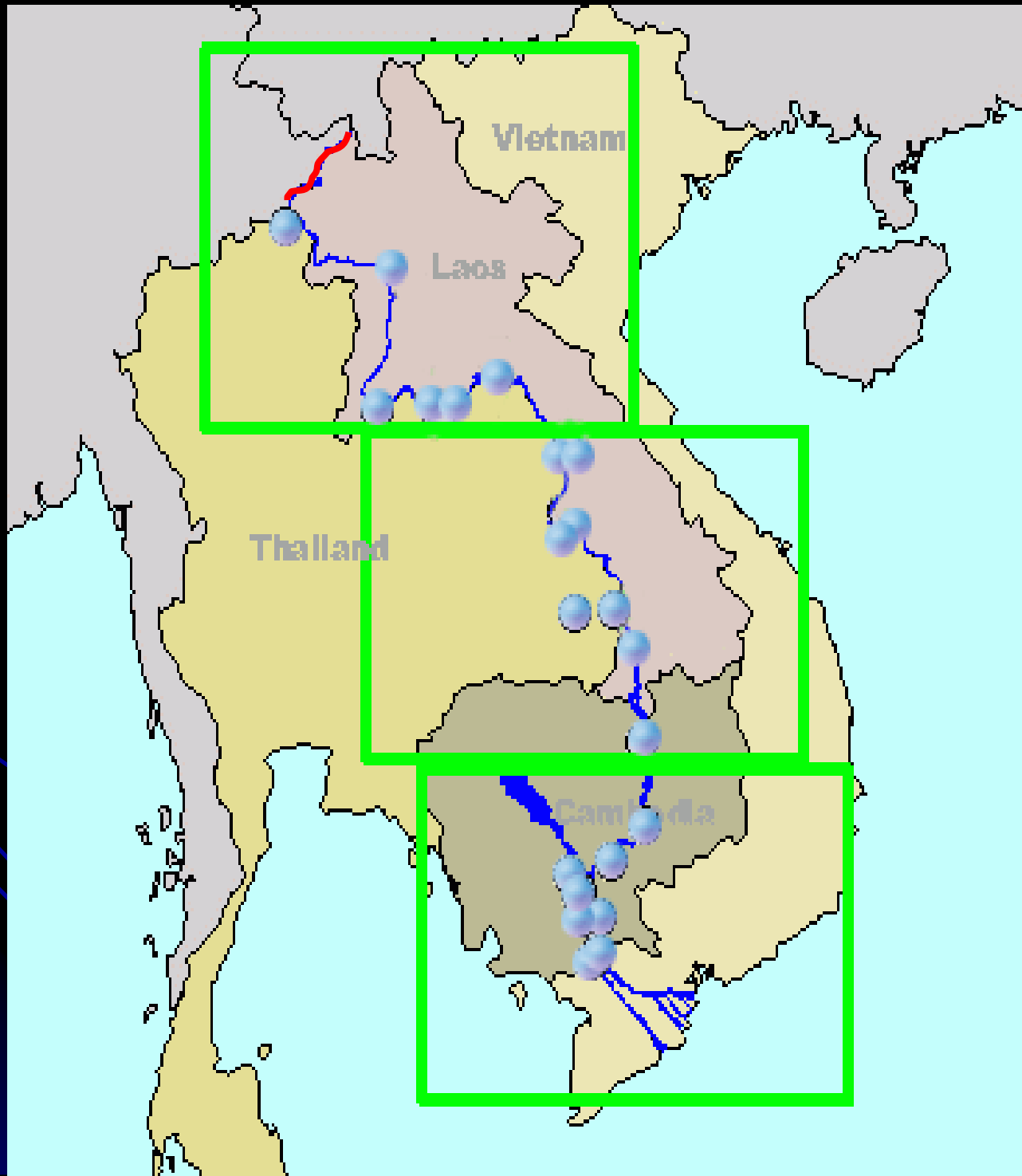
Area: 795,000 km<sup>2</sup> (21)

Length of mainstream: 4,400 km (12)

Average discharge: 15,000 m<sup>3</sup>/s (8)



# Mekong River Basin in Myanmar



# Mekong River Basin in Myanmar



River Length - 350 km

(8.3% of total Length 4,200 km)

Drainage Area- 28,600 sq km

(3.6 % of total area 795,000 sq

km)

Average Annual Flow - 17.634 km<sup>3</sup>

- DI has undertaken construction of some diversion weirs under the Border Area Development Programme for the objective of encouraging production of crop for self-sufficiency
- DI is investigating to construct two dams on the tributaries of Mekong River
- Electric Power Enterprise has constructed feasibility studies and constructed small-scale hydroelectric power stations in this region



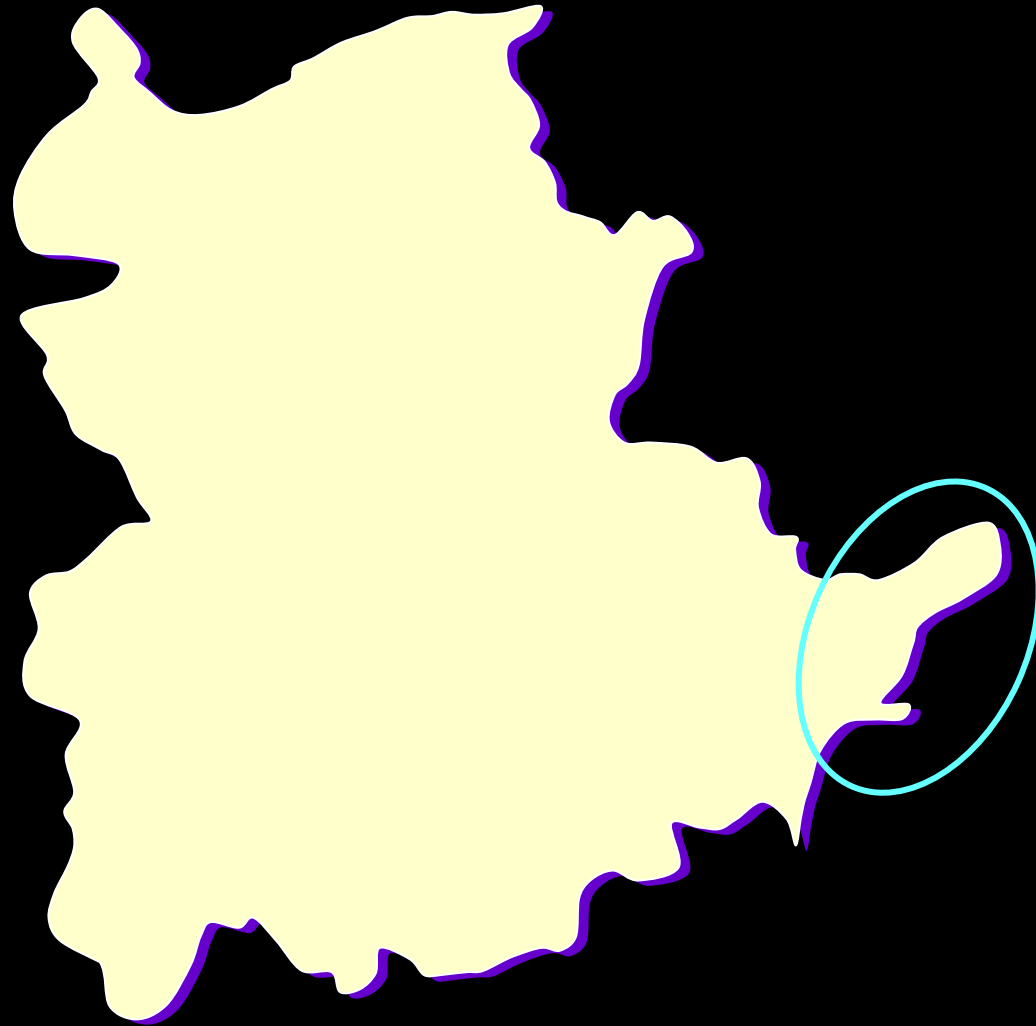
# Meteorological Stations

<u>Station</u>	<u>Start Date</u>
(a) Kengtung	11.3.1951
(b) Monghsat	20.9.1966
(c) Mongyaung	16.1.1994

- Difficulties to install new Met. & Hydrological Stations in the basins



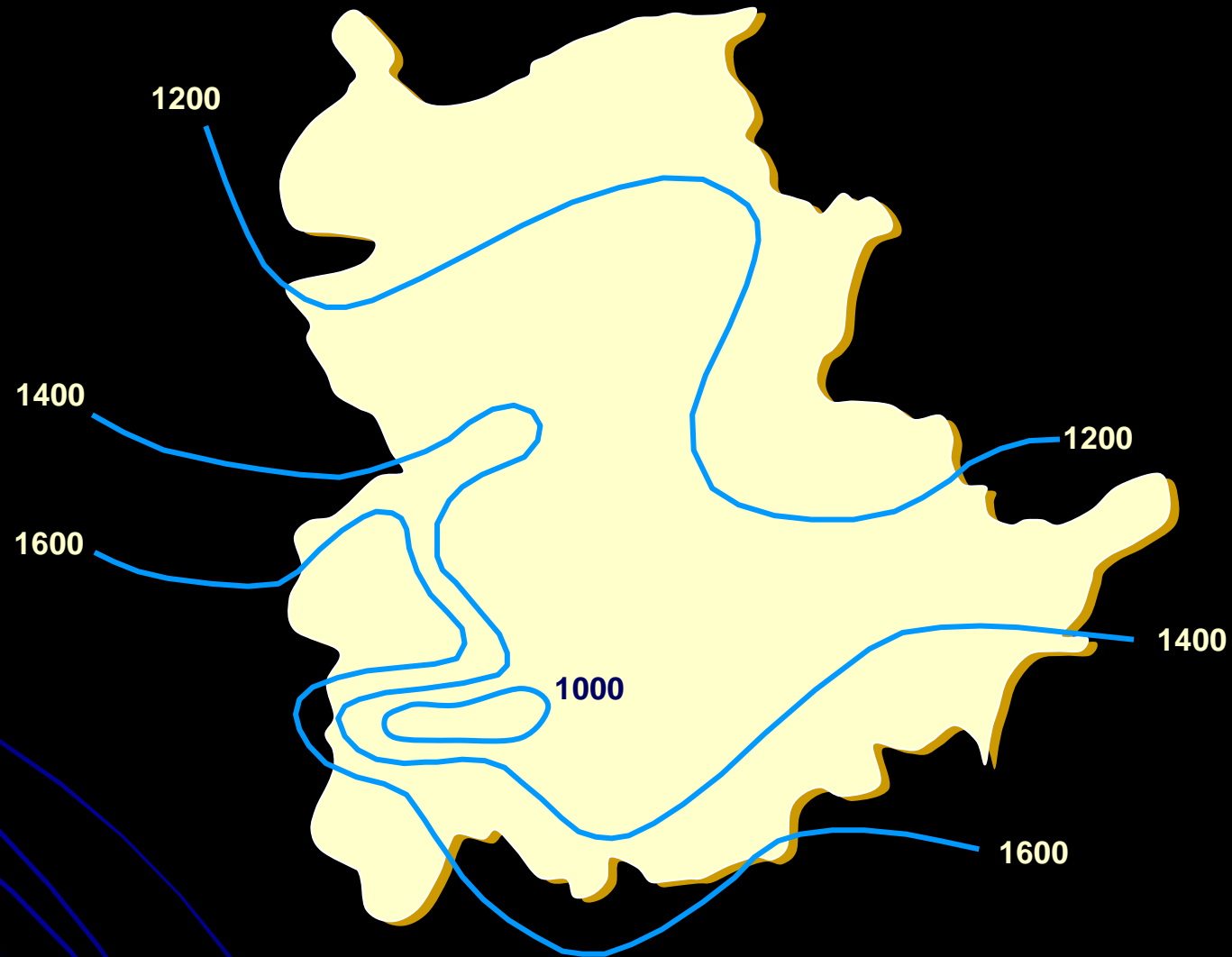
# Map of Shan State, MYANMAR



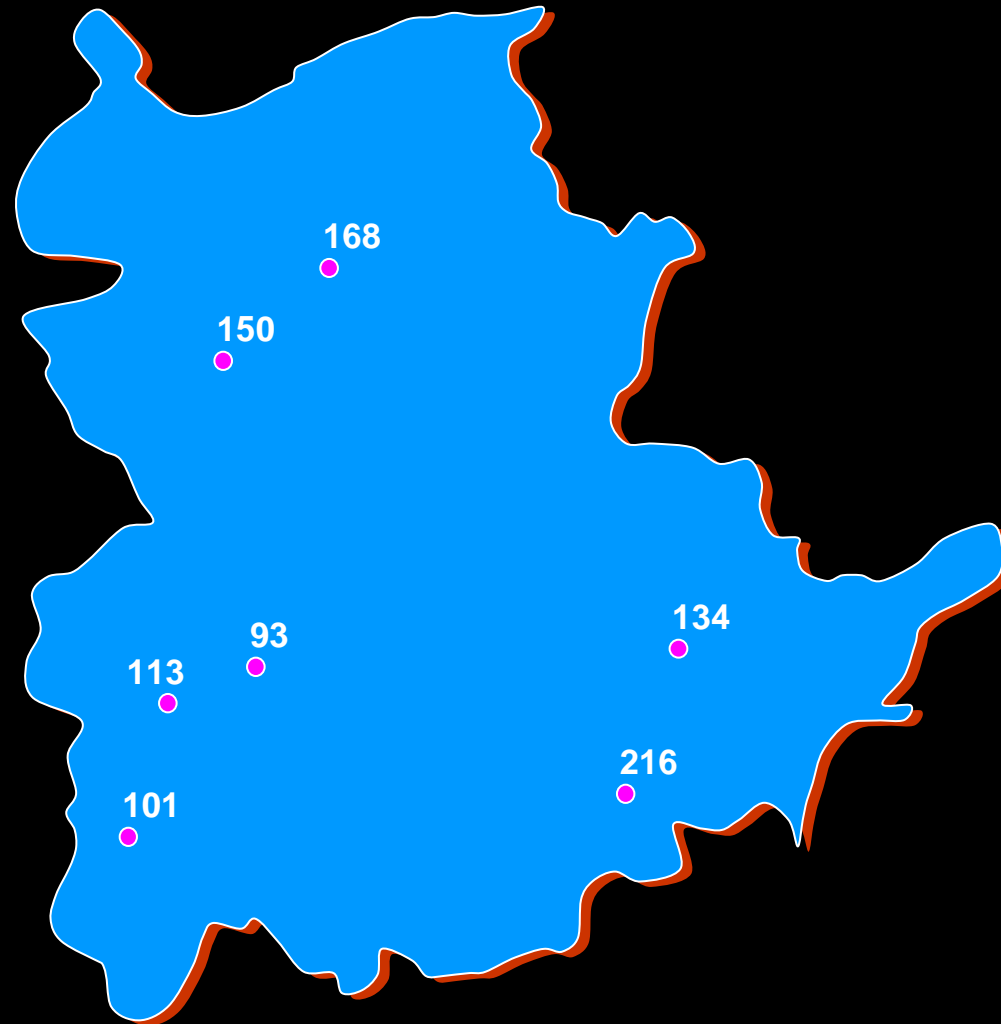
**Area**  
**Population**

**60155 sq miles**  
**4629000**

# Average Annual Rainfall(mm) in Shan State, MYANMAR



# Heaviest Rainfall(mm) in Shan State, MYANMAR

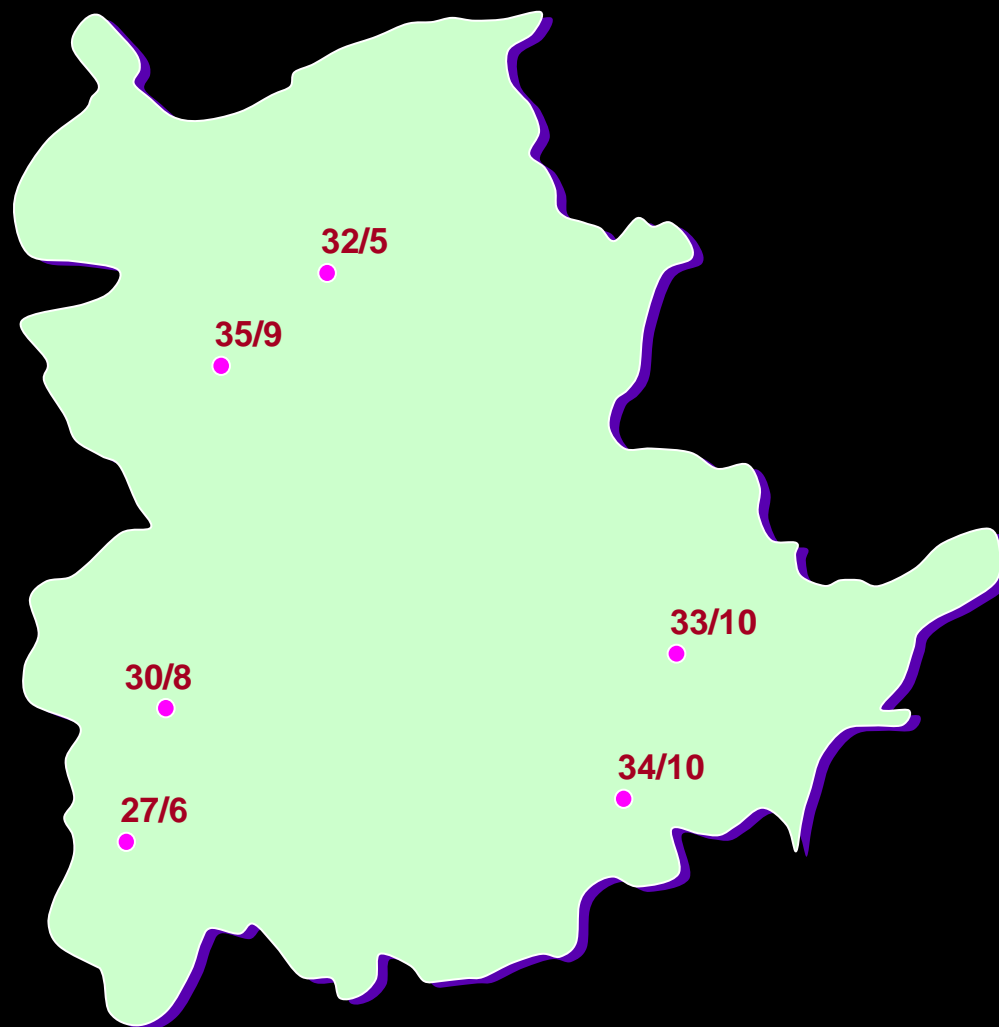




# Temperature

Shan State, MYANMAR

Max / Min °C



# Flood Mitigating

## Plan

- to held Workshops and Training
- to install GIS and Remote Sensing system related Flood Mapping

Phase I (2006-2007)

Phase II (2007-2008)

## Conclusion

### **flood prevention in Myanmar**

- **Flood warning system**
- **Public education on flood fighting for the awareness of the local populace**
- **In organizing various committee to tackle the flood, they form permanently but not as ad-hoc committees from state and division level to village level**

- **From the experiences gained in the past years, drills can be organized and practiced**
- **so that all the parties who will participate in this activity when the flood come**
- **Flood Management in Myanmar mostly cover for the rivers existing Forecasting Stations and there should be contribute in the remaining rivers**



**Thank you for your kind attention!**

