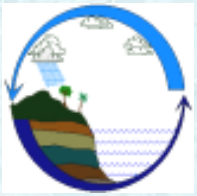
National Water Forum 2014

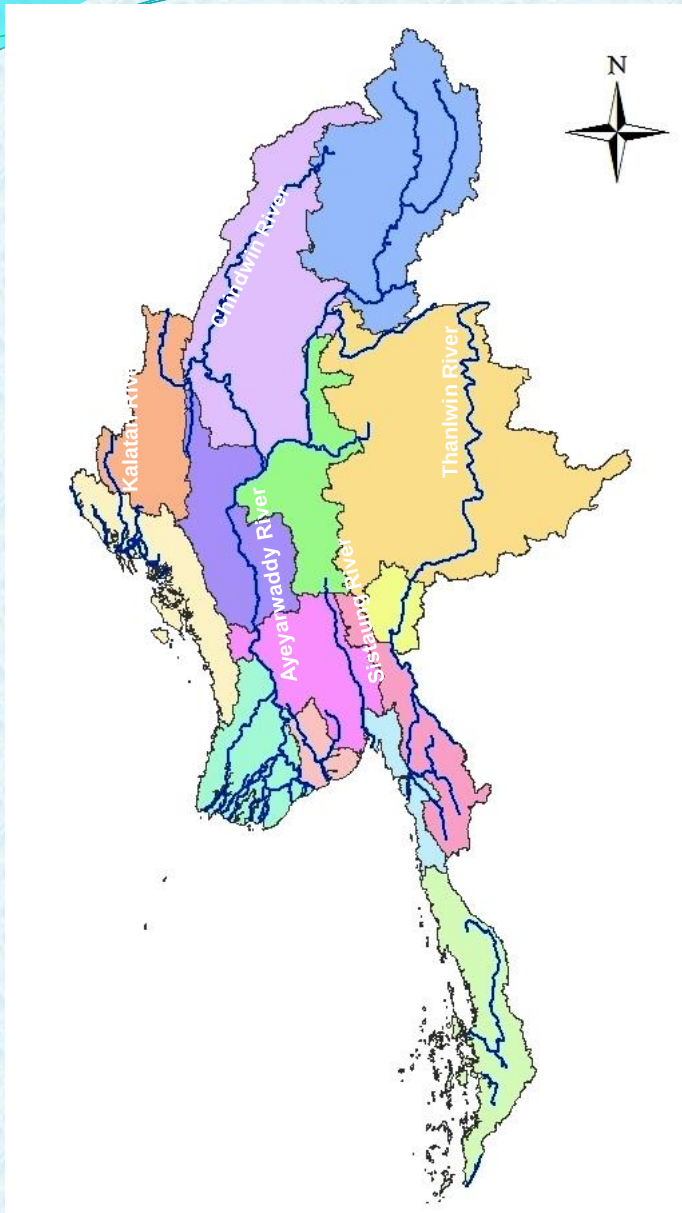
Water Resources Conservation and Disaster Protection



Aung Kyaw Hmuu
Deputy Director
Directorate of Water Resources and Improvement of River Systems
Ministry of Transport

21st October, 2014
MICC II, Naypyitaw

Major Rivers and their territories



Name of River	(Length) (km)	(Catchment) (sq-km)	(Discharge) (million cu-m)
Ayeyarwady	2100	288900	313720
Chindwin	1100	115300	141290
Sittaung	420	34395	41900
Thanlwin	2410	158000	257920
Kaladan	650	22611	53800

Navigable Length of Major Rivers

Name of River	Navigable Length (km)
Ayeyarwady	1534
Chindwin	730
Thanlwin and other rivers in Mon State	380
Delta Region	2404
Rivers in Rakhine State	1602
Total Length (km)	6650

Limitation of Draught for dry season

Ayeyarwady River	Restricted Draught
Henzada – Pyay (172 km)	1.7 meter
Pyay – Mandalay (522 km)	1.5 meter
Mandalay – Katha (290 km)	1.2 meter
Kaha – Bhamo (130 km)	1.1 meter
Sinbo – Myintkyina (134 km)	0.8 meter
Chindwin River	Restricted Draught
Mouth of Chindwin – Monywa (85 km)	0.9 meter
Monywa – Kalewa (234 km)	1.0 meter
Kalewa – Homalin (208 km)	0.9 meter
Homalin – Hkamti (203 km)	0.8 meter

Major threads for River Water Resources

- Huge sedimentation leads to decreases the available depth, changes the river morphology and degrades the stability of river banks.
  result --- navigation channel block, bank erosion
- Changes of rainfall pattern together with high intensity overcomes the available access discharge of the stretch.
  result --- flood, serious erosion
- Degrading of water quality and movement of sand bars tend to limit domestic use and pump irrigation site.
- Loss of precious mother land in border streams/rivers.
- Scouring at the bridge piers and instability of approach channel hazards the stability of bridges.
- Inadequate for scientific information, research and technologies is the key question for accuracy and reliability.
- Insufficient transparency and data sharing lead to mismanagement of water resources.

Water Resources Conservation Services

- Discharge Regulation (Reserviors)
- Water Level Regulation (Wiers, Dam)
- Bed Level Regulation (training structures and Dredging) (low cost and effective)

(a) Training the wild river
- permeable groyne
- semi permeable groyne
- non permeable groyne


Semi permeable groyne


permeable groyne


non permeable groyne

(b) Improving navigational ways

- dredging and discharging at the deep pools
- removing sand bars and disposing at eroded bank site to strengthen the stability
- suction dredging by custom way

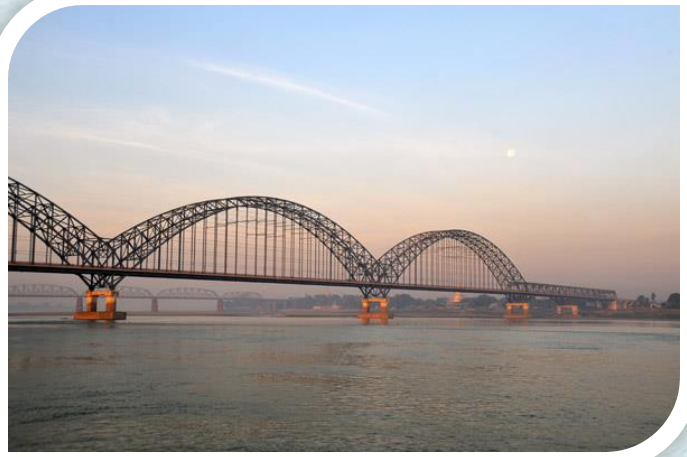

Channel improving

(c) Removing obstacles for navigation safety

- Removing snags, debris and rock

(d) Cooperation with government organization and private sectors

- Recommendation for Bridge alignment
- Water transfer for pump Irrigation
- Surveying and mapping for target area
- Pilotage for tourism boat
- Design, Estimate and supervision service

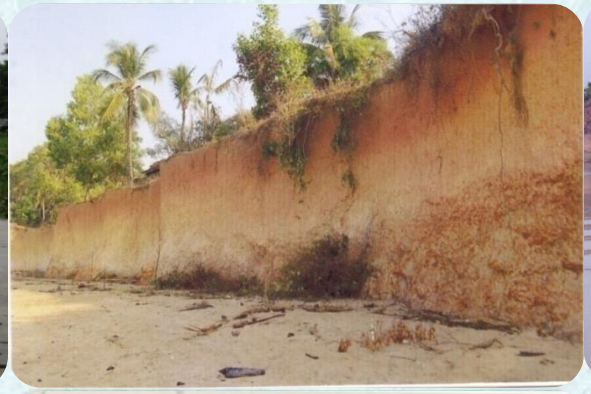


(e) Guidance to vessels for proposed waterways

- Installation of Navigation Marks
- Check and report for changing of bridge channel access

Disaster Protection

Nature of disasters in waterways



- Loss of households
- Waste of agricultural land
- Breaking of linkage (Bridges and Roads)

Disaster Protection Services

(a) Bank Erosion protection



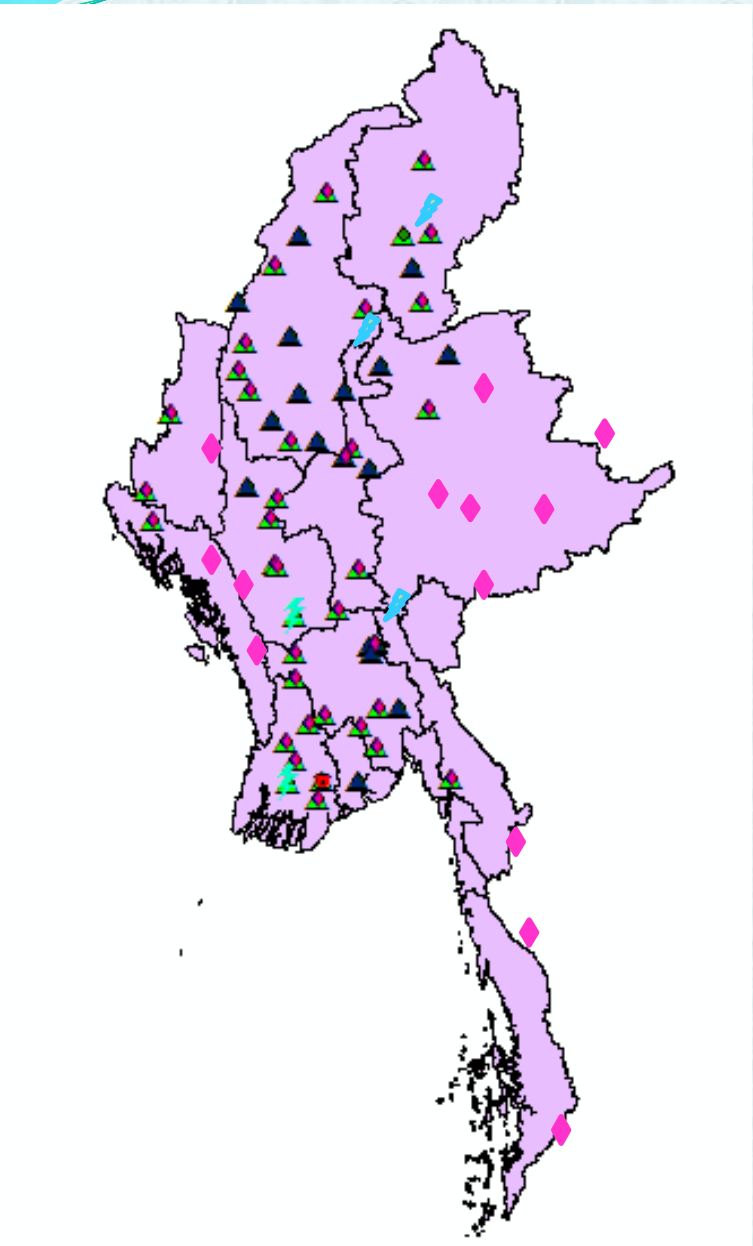



(b) Flood reduction activities
- Improving channel access

(i) dredging for required cross-sectional area

(ii) Bend cutting for straight flow

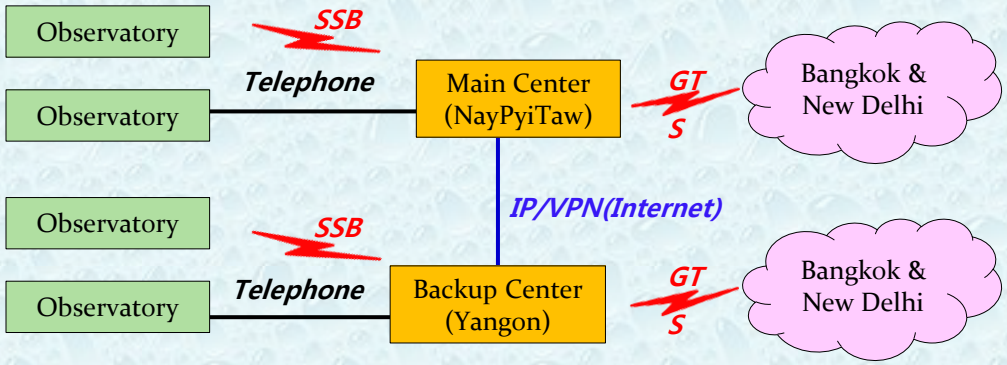
(c) Data Management and Information Sharing for Disaster reduction activities by DMH



Meteorological and Hydrological Observation Network (DMH)

- WMO Register (3)hourly Synoptic Observation Stations 37
- Upper Air Observation Global Meteorological Observation System 1

- **Meteorological/Hydrological Stations 39**
- **Meteorological Stations 63**
- **Hydrological stations 28**
- **Agro meteorological Stations 17**
- **Upper Air Station 1**
- **Aviation Weather Station 8**



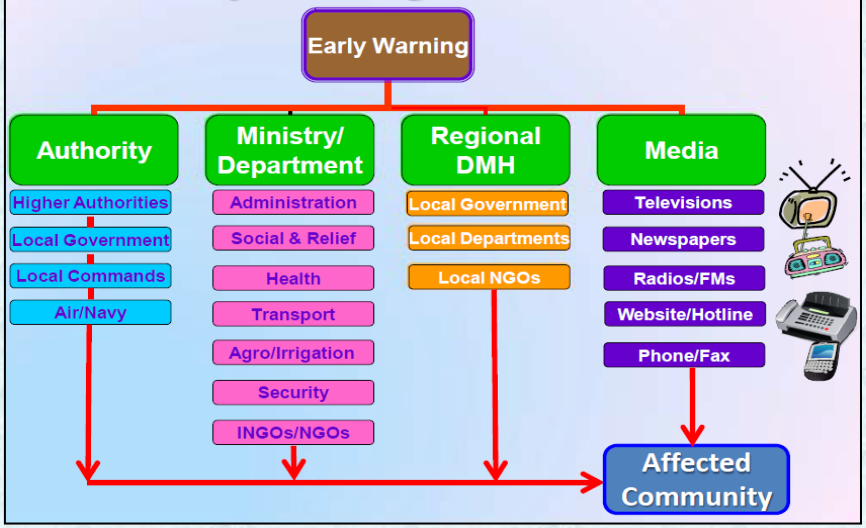
(d) Disaster reduction activities by DMH

Weather News, Bulletin, Warning

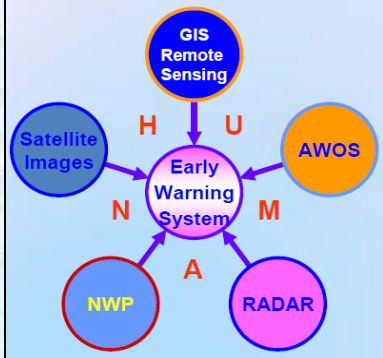
- Cyclone News and Warning
- Storm surge Warning
- Heavy rainfall Warning
- Untimely Rainfall Warning
- Fog Warning
- Port Warning
- Aerodrome Warning

- Daily Weather News
- Bay of Bengal Bulletin
- Agromet Bulletin
- (10) Day Weather FC
- Monthly Weather FC
- Seasonal Weather FC
- Special Weather FC
- Extreme Weather News
- TV Weather News/Web

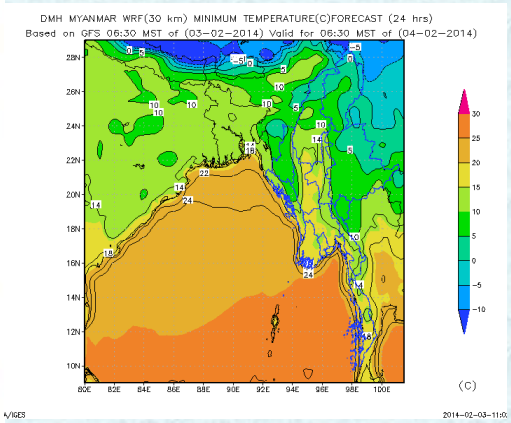
Early Warning Dissemination



Strategies to Enhance Early Warning



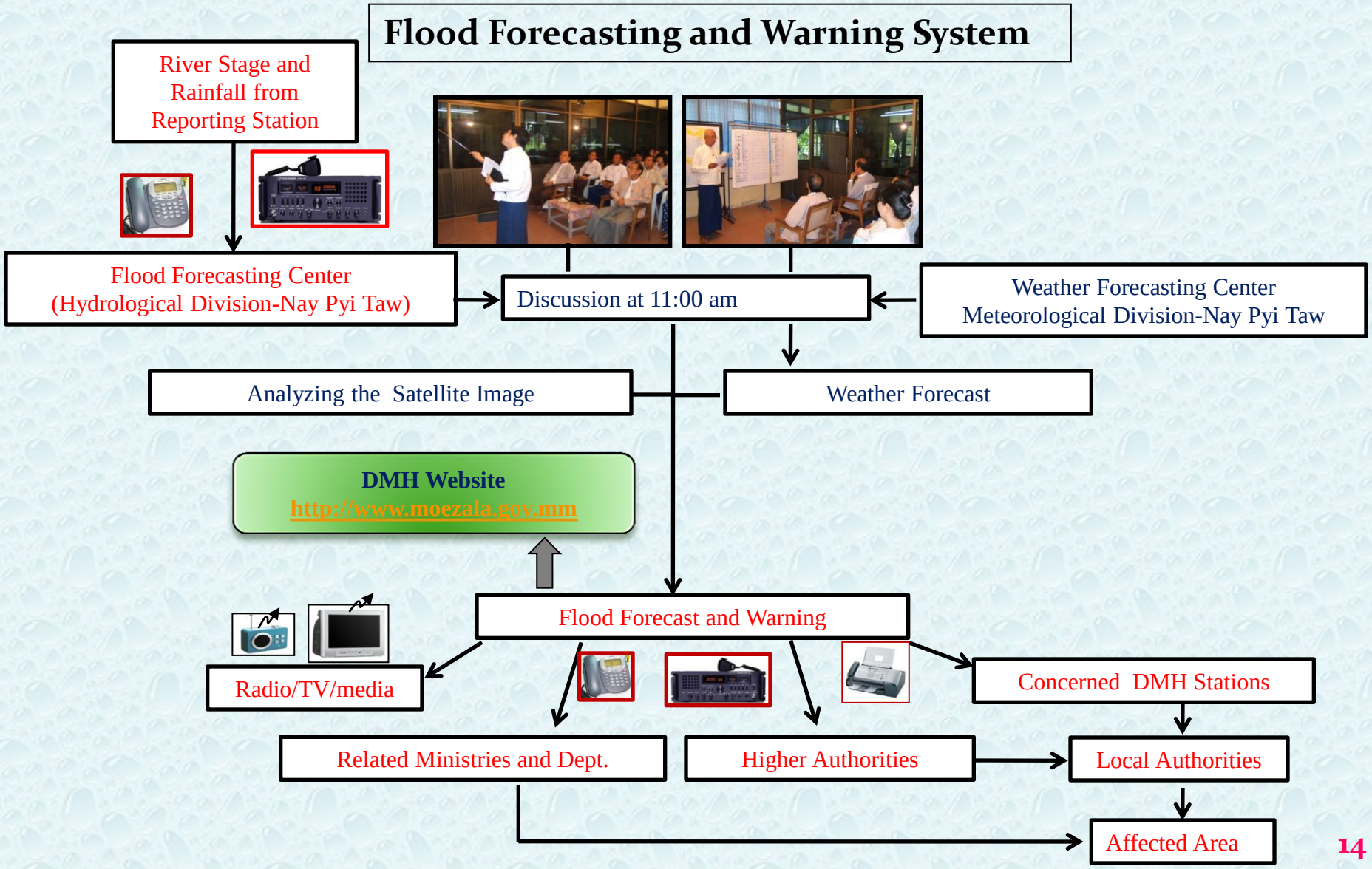
- Extend Regional Cooperation to receive real time and near real time Multi Hazard Early Warning: supportive to National EWS to reduce impacts of Natural Disasters.
- Upgrading Capacity development in National Multi Hazard Early Warning Centre with National Budget, ODAs, VCPs to reach effective EWS.
- Strive to succeed clear, under - standable and actionable warnings.



(3) Radars and (30)AWOS will be installed In Myanmar with Japan's Grant Aid Program.

DMH set up WRF Model Since 2012 Nov

(e) Flood Forecasting and Warning System (DMH)



(d) Dissemination of the warning and bulletin (DMH)

- President Office
- Union Government Office
- Union Minister for Union Ministry of Transport
- Deputy Union Minister for Union Ministry of Transport
- Concerned Chief Minister of Regions/States
- Concerned Local authorities
- Chairman of National Central Disaster Management Committee
- Commander-in-Chief (Army)
- Commander-in-Chief (Navy)
- Myanmar Radio and Television, Myawady Television, MRTV-4, Myanmar International, FM Radios, News and Periodicals Enterprise
- Myanmar Red Cross Society
- Department of Health
- Department of Relief and Resettlements
- Inland Water Transport
- Department of Marine Administration
- Related ministries, departments and organizations , concerned DMH stations
- DMH website

sending by Telephone, Fax

Gaps and Challenges for Modernized Mechanism

- Limited Data (Discharge, Rainfall, Water Budget, Sediment,
- Modernized Instruments (Water Quality, Flow , Boats,…)
- Limited facilities (night navigation, sophisticated boys,…)
- Human Resources and Capacity (high technology, researches,…)

(DWIR)

- Real-time Data (Actual, hourly, daily values)
- Historical Data (Long-time series, Extreme and mean values
- Statistical Data (100-year flood, yearly volume of sediment transport)
- Predicted Data (Meteorological and hydrological forecast)
- Vizualized Data (Hydrograph, mapped aerial information)
- Calculated Data (Probability map of precipitation depth)
- Meteorological and hydrological bulletins
- Early Warnings and Reports
- Meta Data and expertise related to stations, monitoring methods, transmission, processing
- Special products (Thunderstorm tracking)

(DMH)

Challenges for future scenarios on WRM

Future Climate Changes in Myanmar for 21st Century By ECHAM5 Model (DMH)

- Annual average temperature (especially in April and May) will increase
- At the same time, Model projected Rainfall for SW Monsoon period also is expected to be increased
- Late Onset will be at Deltaic area, Central Myanmar and Northern Myanmar and Early withdrawal from Whole country
- Predicted Length of Rainy Season (L.R.S) showed that the L.R.S will be shorter than Normal(144 Days)
- Monsoon Intensity will be generally moderate along Myanmar coast in 21st Century.

Conclusion

- How to manage more runoff in a short period ? (flood,...)
- How to control low flow in dry season ? (Drought,...)
- How to integrate water related agencies ?
- How to establish the forecasting data ?

To overcome these questions, the role of NWRC is standing at the top and speeding up the momentum of the committee is extremely important.

Thank you for your attention