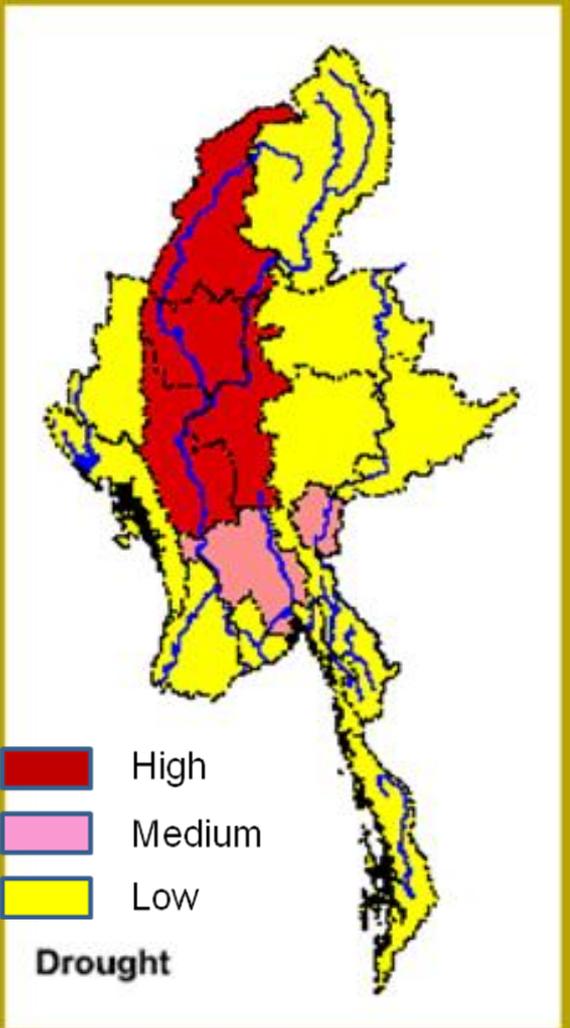




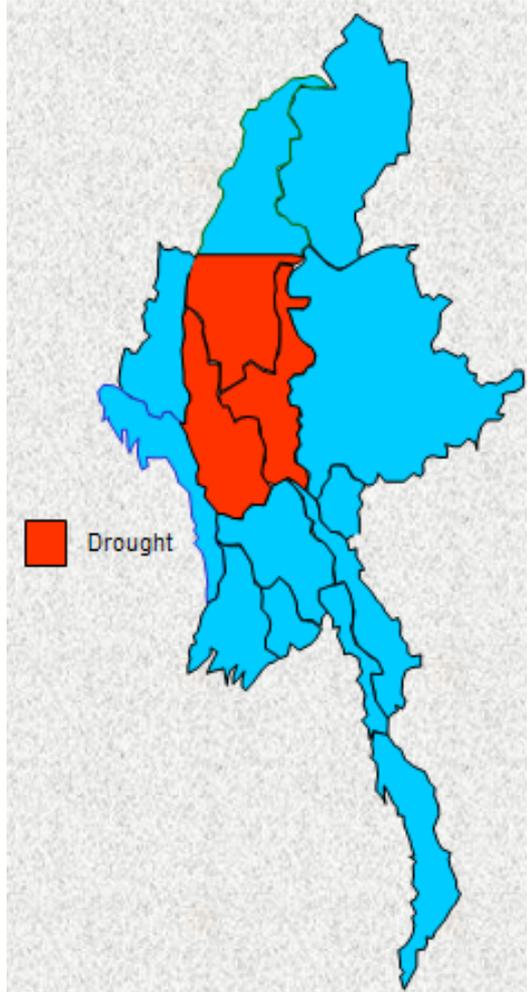
Drought Conditions and Management in Myanmar

**Tin Yi (Deputy Director)
DMH, MYANMAR**

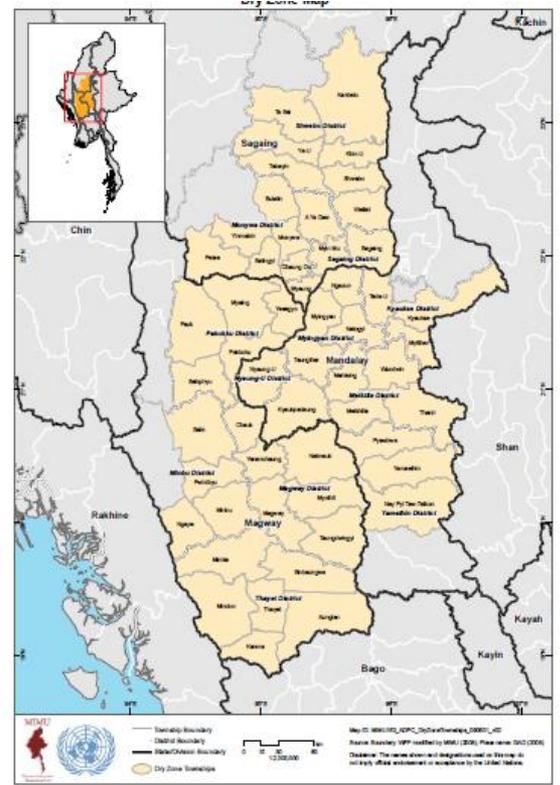
The potential drought hazard of Myanmar



Drought Vulnerable Area of Myanmar



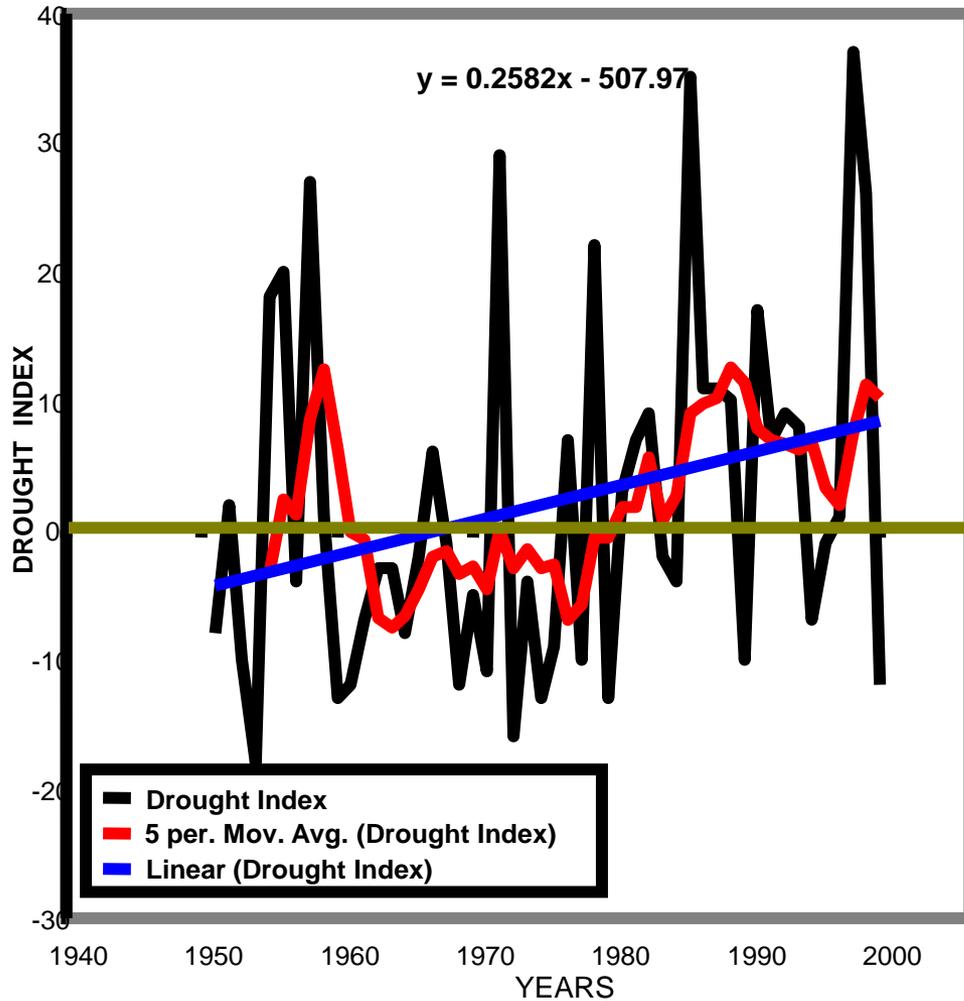
Dry Zone Area of Myanmar



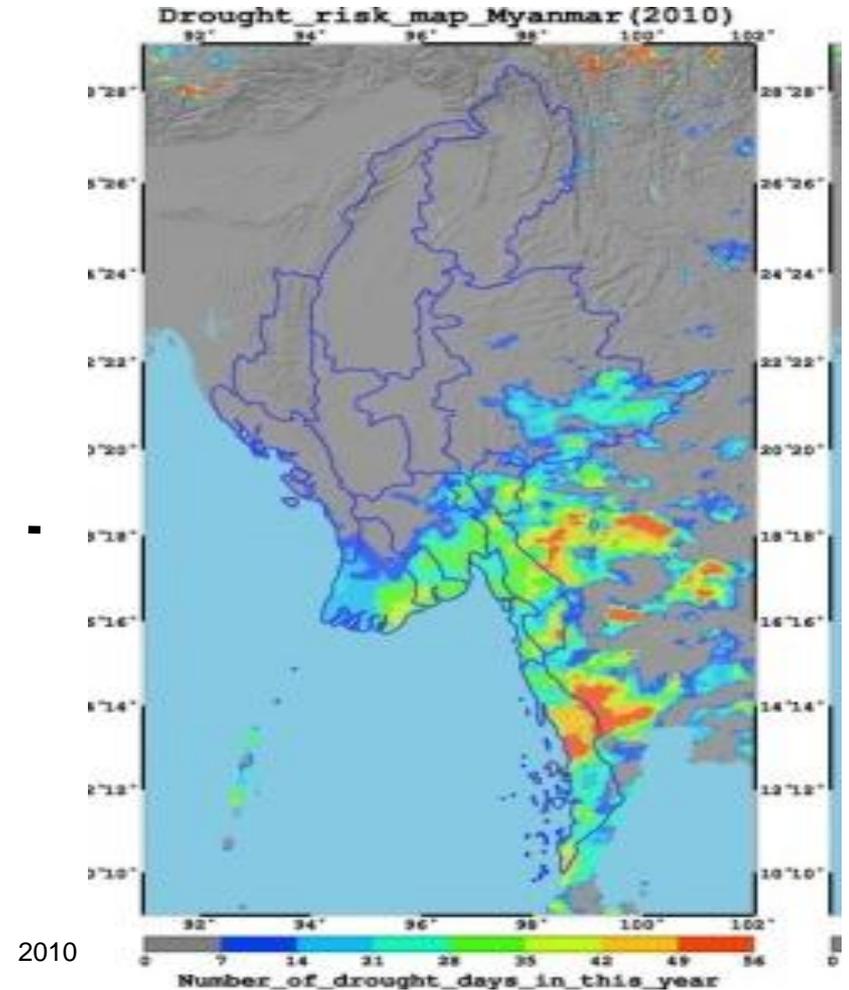
Drought in Myanmar

- **The dry zone, central area of Myanmar is the area vulnerable to drought as compared to other parts of the country.**
- **Dry Zone Area - 67,700 km² and 10 % of the total area**
- **low rainfall, intense heat and degraded soil conditions, affecting social and economic situations of the communities living in the region.**
- **About 35% of the cultivable land in dry zone**
- **3 Regions (including 54 townships under 13 districts)**
- **Very High temperature and hottest in April and May**
- **The precipitation in Dry Zone is controlled by the monsoon circulation system.**
- **Annual rainfall is less than 750mm(national average precipitation is 2353 mm)**
- **In Myanmar, drought years were observed as 1972, 1979, 1982, 1983, 1986 and 1987.**

ANNUAL DROUGHT INDICES OF MYANMAR DURING 1951-2000



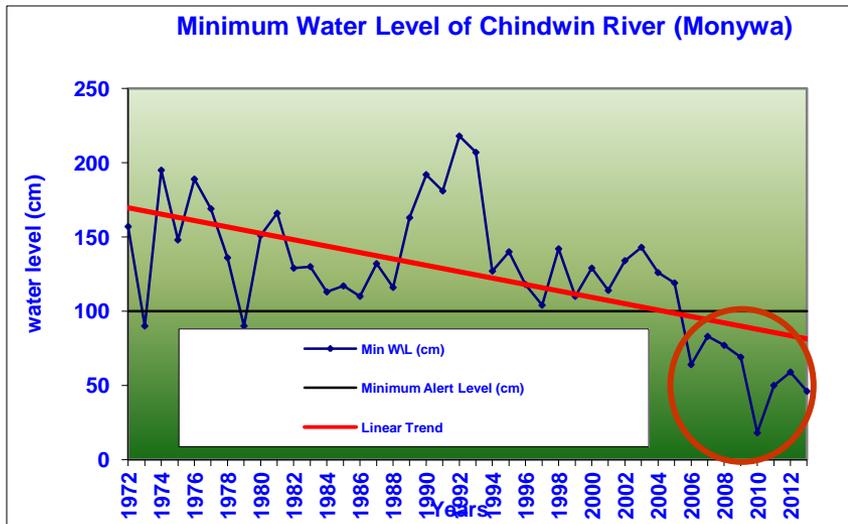
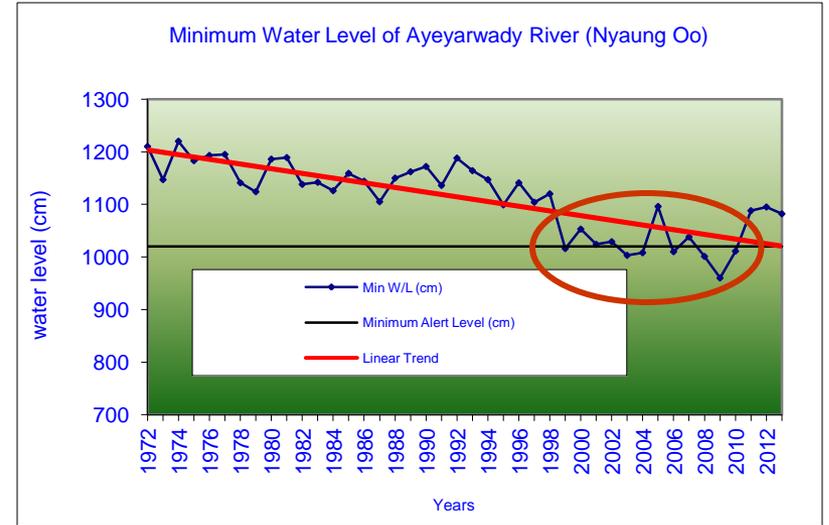
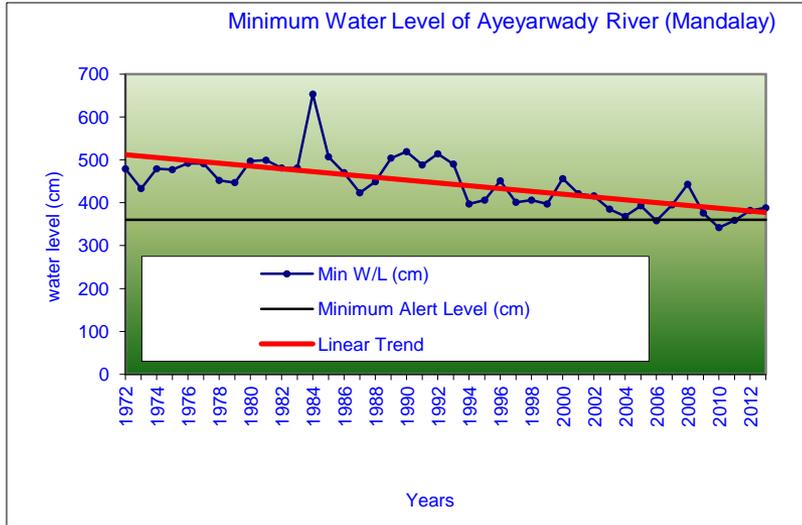
Drought Risk Map of Myanmar during 2010



Drought Conditions in 2010 and 2011- 2013

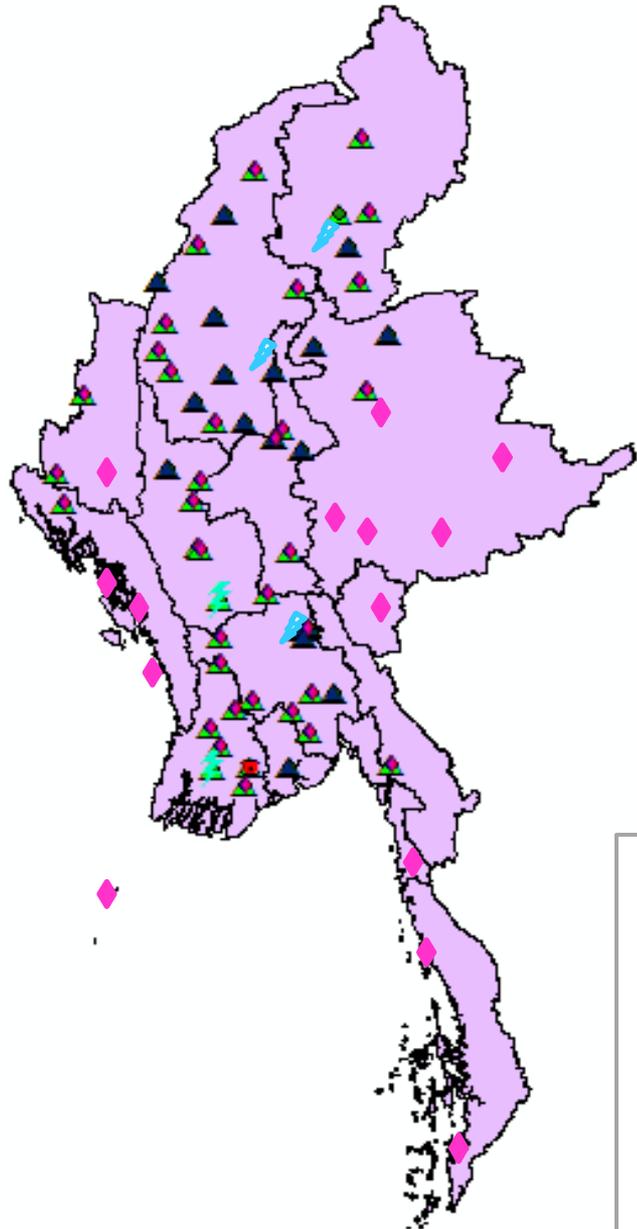
- Exetreme Temp recorded 47.2 °C on 14.5.2010 at Myinmu in Dry Zone Area
- Highest Temp. recorded at 20 stations during May
- Inle Lake, which is the major tourist destination in Shan State of Myanmar, has been dried up in many parts.
- Water shortage is most severe in Ayeyarwaddy, Sagaing, Yangon, Mandalay and Bago Regions and Mon, Rakhine and Shan States in 2010
- Most of the wells were dried up due to the depletion of underground water supply because of late of Monsoon onset and so the scarcity of drinking water problems occurred in Myanmar
- ✓ According to the Drought Annual Report of DMH, the drought mostly occurred in dry zone area during Pre and Peak Monsoon period of 2010, the drought slightly occurred in Myanmar during 2011 and during 2012 & 2013, the severe and moderate drought occurred in dry zone area, some regions and states and mild drought occurred in some regions and states

Analysis of the annual lowest water level of the stations along the Ayeyarwady and Chindwin rivers in central Myanmar area (dry zone area)



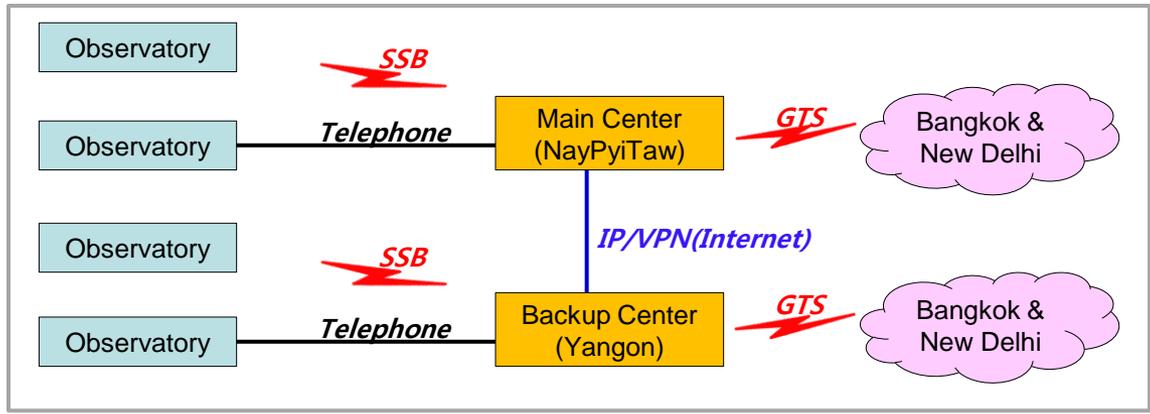
The droughts mainly impact to the agricultural fields, farmers, drinking water scarcity and also impact to social, economic, health, public, livestock and environment of Myanmar.

Meteorological and Hydrological Observation Network (DMH)



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

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



Responsibilities of DMH

Warning, Bulletin, Forecast and News

- Cyclone Warning
- Storm Surge Warning
- Flood Warning
- Untimely Rainfall Warning
- Fog Warning
- Heavy Rain Warning
- Aviation Weather Warning
- Low flow water level
- Tsunami Warning
- Port Warning
- ✓ Agro-meteorological Bulletin
- ✓ Bay Bulletin
- ✓ Flood Bulletin
- ✓ Special Weather Bulletin
- ❖ Daily Weather/Water Level
- ❖ 10 Days Weather/Flood
- ❖ Monthly Weather/Flood
- ❖ Seasonal Weather/River Flood Forecast
- ❖ Aviation Weather Forecast
- ❖ Marine Weather Forecast
- ❖ Special Forecast
- Earthquake News
- Rainfall / Temperature Records
- Cyclone News

Drought monitoring and early warning systems in Myanmar

- DMH also issues the dekad agro-meteorological bulletins to support the agriculture.
- DMH also established the drought monitoring center at the upper Myanmar office (Mandalay office) locating in dry zone area in 2010. This center is now preparing and issuing the seasonal and annual drought reports based on the rainfall conditions.
- DMH cannot issue the warnings for drought .
- DMH needs to upgrade the drought monitoring center such as capacity building and also forecasting techniques etc.
- DMH is also trying to upgrade the data observation networks, the forecast techniques, capacity building and the early warning system cooperating with international organizations.
- Forest department were carried out Dry zone rehabilitation activities during 1953-1963
- FD also implemented for the land rehabilitation and development of central dry zone during 1963-1982

- **During 1994-96, 9 and 13 District Greening Project in dry zone area was carried out by FD. About 21,320 hectare (52,680 acres) were planted during the project period.**
- **Watershed Mountain Greening Special Project of Myingyan district was also implemented in 1996-97.**
- **In July 1997, Dry Zone Greening Department (DZGD) was constituted under Ministry of Environmental Conservation and Forestry. Its working covers central dry zone of Myanmar including 3 regions (Sagaing, Mandalay and Magway Regions), 13 districts and 57 townships, covering 21.557 million acres of dry land forests.**

Vulnerability assessment in Myanmar

- **The vulnerable sectors of society and economy due to drought in Myanmar are agriculture and food production, drinking water supply, health, livestock and fisheries, industry and environment. The largest vulnerable area is the dry zone area of Myanmar and the affected societies are farmers, people and livestock in rural area**

Emergency relief and drought response in Myanmar

- The National Disaster Preparedness Central Committee under the Vice President (2) has been re-established in May 2013 (22 members include)**
- National Disaster Preparedness Management Working Committee under the Minister of Ministry of Social welfare, Relief and Resettlement has also been re-established in May 2013 (10 sub-committees)**
- established the Disaster Management Committees at State/Region, District, Township and sub-township levels**
- Committees, the concerned departments and organizations are cooperating and working for disaster management in Myanmar.**
- These disaster management committees and the Ministry of Social welfare, Relief and Resettlement are the main responsibility of emergency relief and response for disaster and also other concerned departments and organizations are cooperating.**
- These committees, concerned ministries and departments and organizations carry out the activities for relief and drought response.**
- Needs to upgrade the emergency relief and drought response in Myanmar**

Practices/Activities to alleviate drought impacts

- **DMH issues the daily, dekad, monthly weather and river water level forecasts, news, warnings and bulletins for storms, floods, untimely rainfall, temperature and minimum alert water level, agro-meteorological bulletins and seasonal and annual drought report.**
- **Agriculture department is also doing in cooperation with international seed research centres for seeking and identifying drought resistant crops in Myanmar, conducting research on cultivation methods to be employed at the time of drought. The Ministry has been importing seeds that can survive with less dependence on water, and trying to nurse the crops and produce them.**
- **The Ministry of Agriculture and Irrigation carry out the construction, repair and maintenance of dams, reservoirs and water supply facilities, has been implementing the river water pumping project, is also helping the people to build drinking water supply works. It does so by feeding water to water tanks from the dams and reservoirs, digging lakes and wells, installing water purifying systems and providing other technologies.**
- **Ministry of Forest and Environmental Conservation has been implementing the afforestation and land rehabilitation in dry zone area through the projects.**
- **The local governments, public and also NGOs are also implementing the digging lakes for getting the drinking water during drought period, distributing the drinking water during water shortage and also rainwater storage.**

Needs for Drought Management in Myanmar

- To set up the Warning system for drought in Myanmar**
- To develop the forecasting techniques and capacity building for drought**
- To set up a Task force including authorities and experts of Administration, Relief, Water resources, Agriculture, Forestry, DMH, other concerned depts. , NGOs, INGOs**
- To conduct Drought risk assessment**
- To promote education and public awareness for drought mitigation**
- To encourage community level plans for Drought Mitigation.**
- To cooperate, coordinate and collaborate the concerned departments and organizations in Myanmar and also INGOs for drought management in Myanmar**
- To develop the concerned departments's activities for drought mitigation**
- To develop the drought policy and strategies for drought management in Myanmar**
- To set up the Drought Management System in Myanmar**

Thank you for your kind attention!

Website - <http://www.moezala.gov.mm>