

Use of Space Applications for Disaster Risk Reduction and Resilience in Myanmar








































Department of Meteorology and Hydrology,
Myanmar



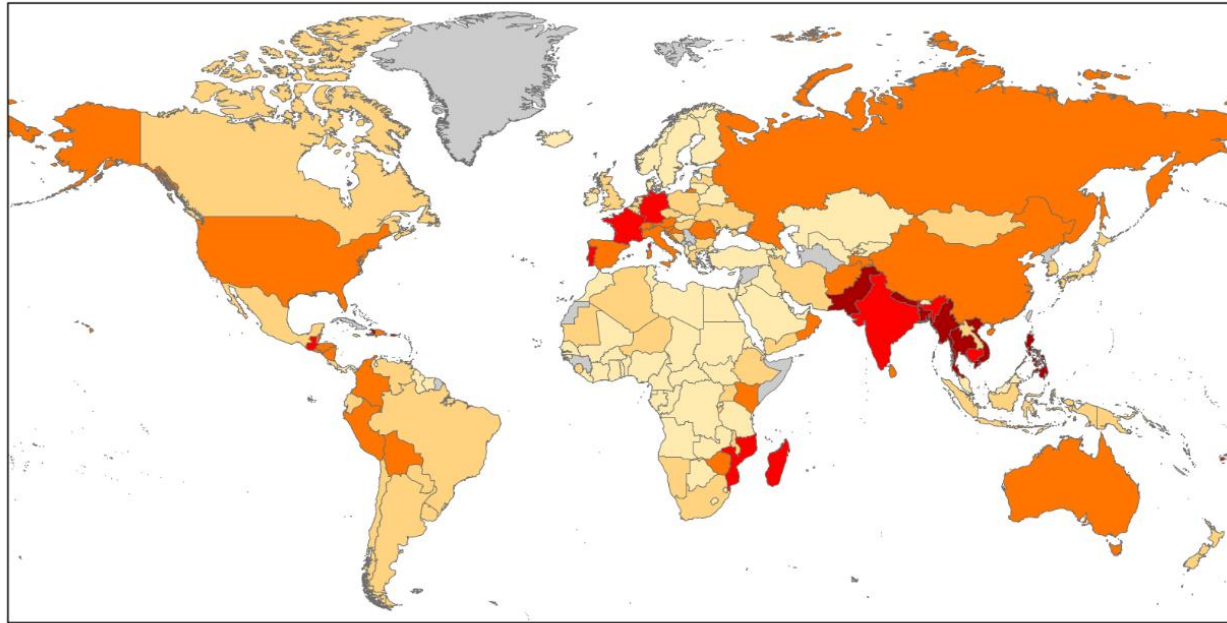
Contents

- ✚ Natural Disaster in Myanmar
- ✚ Space Applications for Disaster Risk Reduction
 - ✚ Mitigation and Preparedness
 - ✚ Relief and Recovery
- ✚ Contribution to Global Agenda
- ✚ Lesson learn and Recommendation

Natural Disaster in Myanmar

Hazards Calendar in Myanmar												
Hazards	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cyclone												
High Temperature												
Low Temperature												
Drought												
Squalls & Thunderstorm												
Flood												
Heavy Rain												
Monsoon Depression					၆	၆	၆	၆	၆			
Hail												





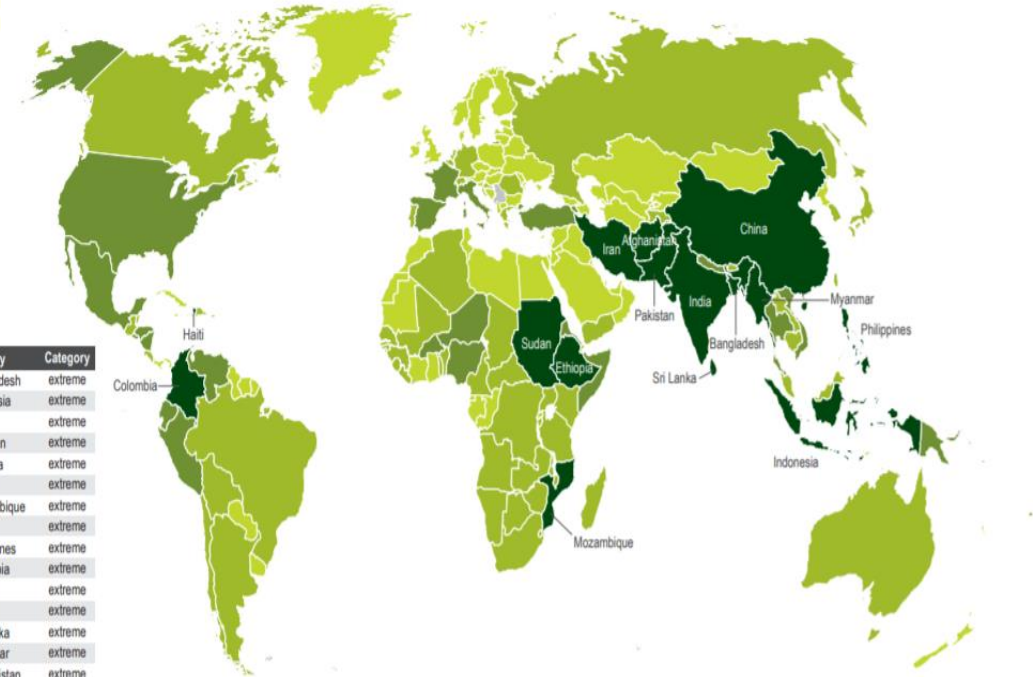
Climate Risk Index: Ranking 1999 - 2018

1 - 10 11 - 20 21 - 50 51 - 100 >100 No data

www.germanwatch.org/en/cri

Extreme risk
High risk
Medium risk
Low risk
No Data

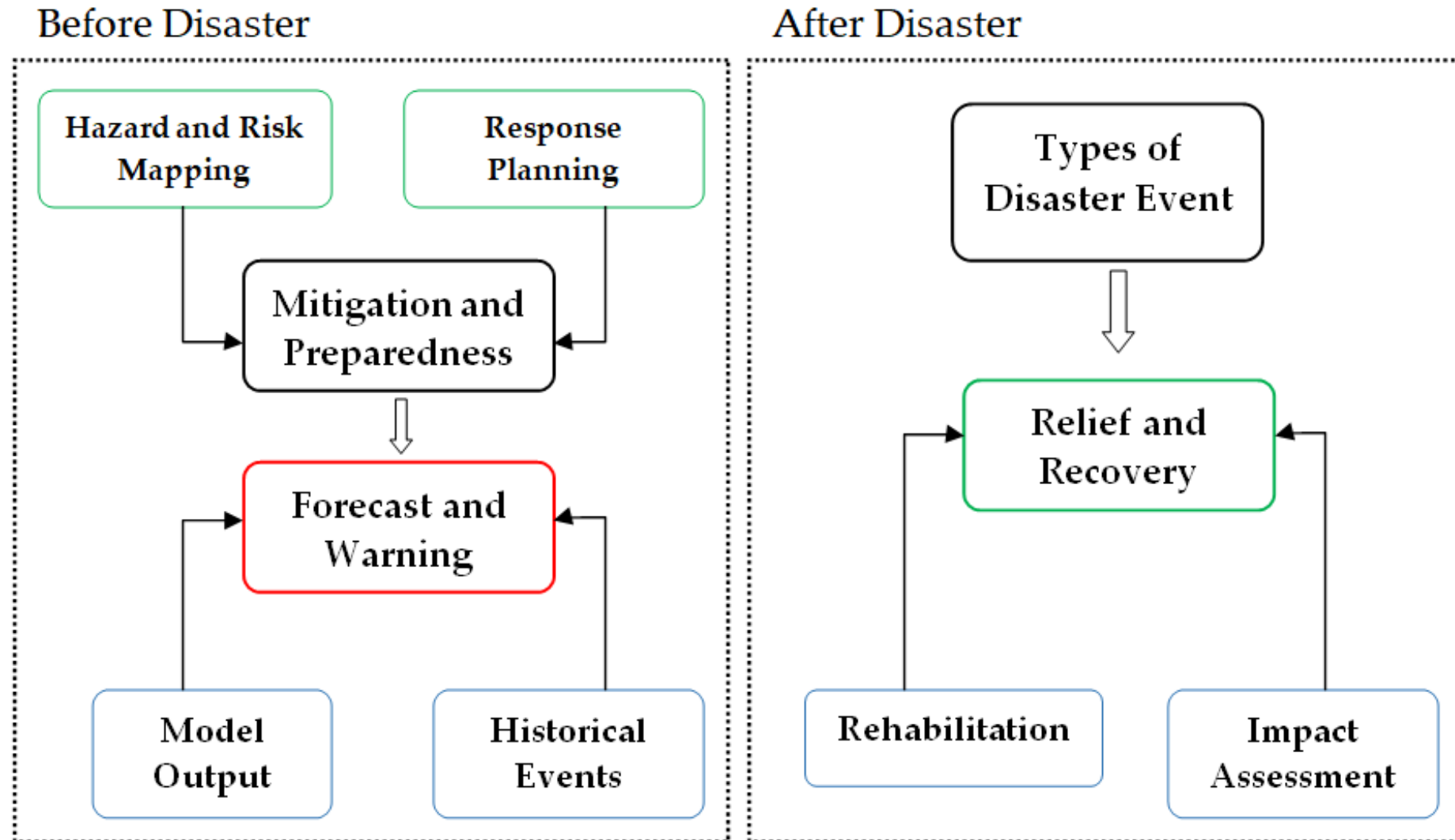
Rank	Country	Category
1	Bangladesh	extreme
2	Indonesia	extreme
3	Iran	extreme
4	Pakistan	extreme
5	Ethiopia	extreme
6	Sudan	extreme
7	Mozambique	extreme
8	Haiti	extreme
9	Philippines	extreme
10	Colombia	extreme
11	India	extreme
12	China	extreme
13	Sri Lanka	extreme
14	Myanmar	extreme
15	Afghanistan	extreme



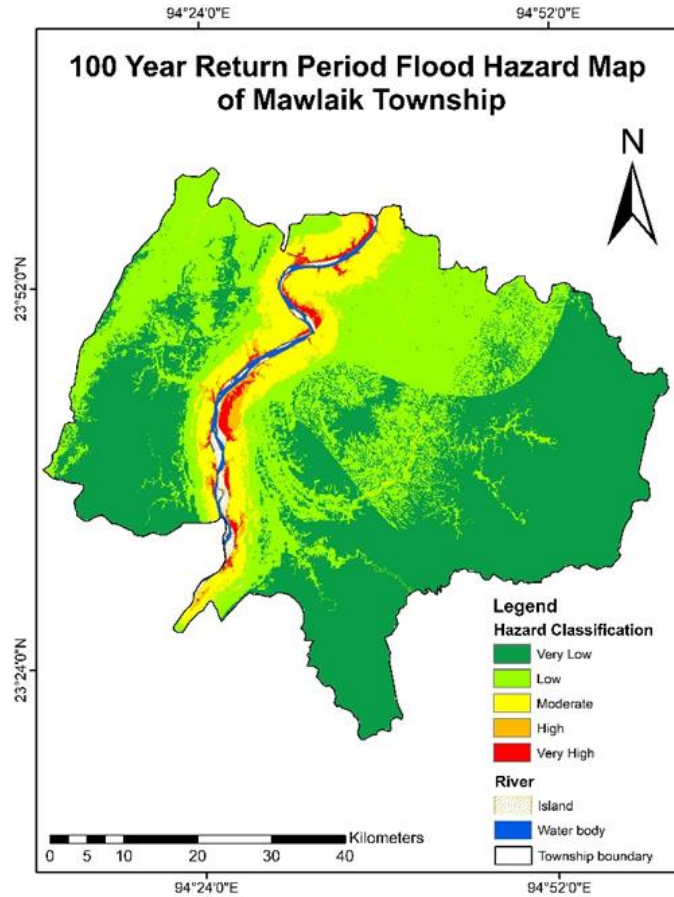
Myanmar has been identified as the **most affected** by impacts of weather-related loss events (e.g; storms, floods, heat waves, etc.,) during 1999 to 2018.

Myanmar has been identified as one of the **“Extreme Risk”** countries in terms of death tolls and frequency of events over the last 30 years.

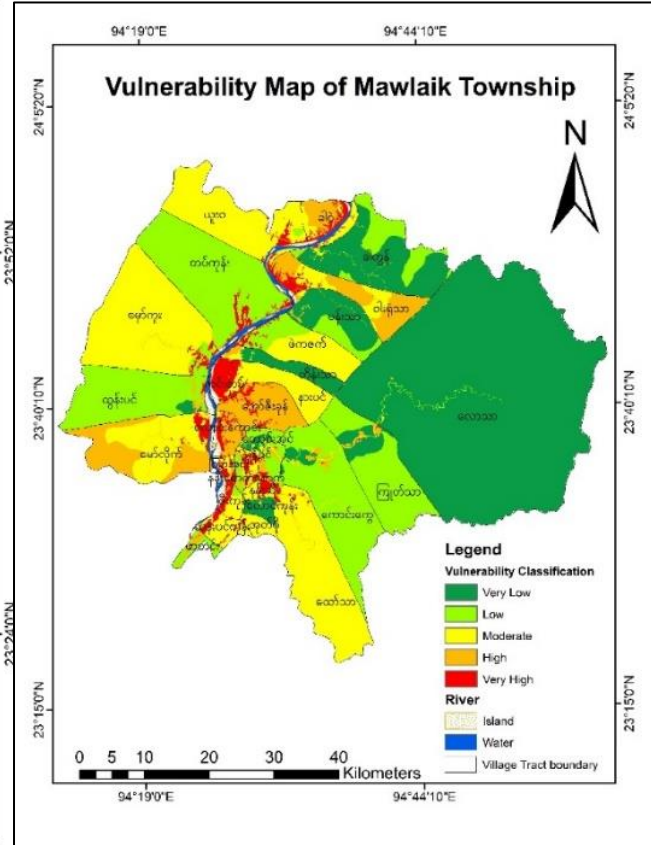
Space Applications for Disaster Risk Reduction



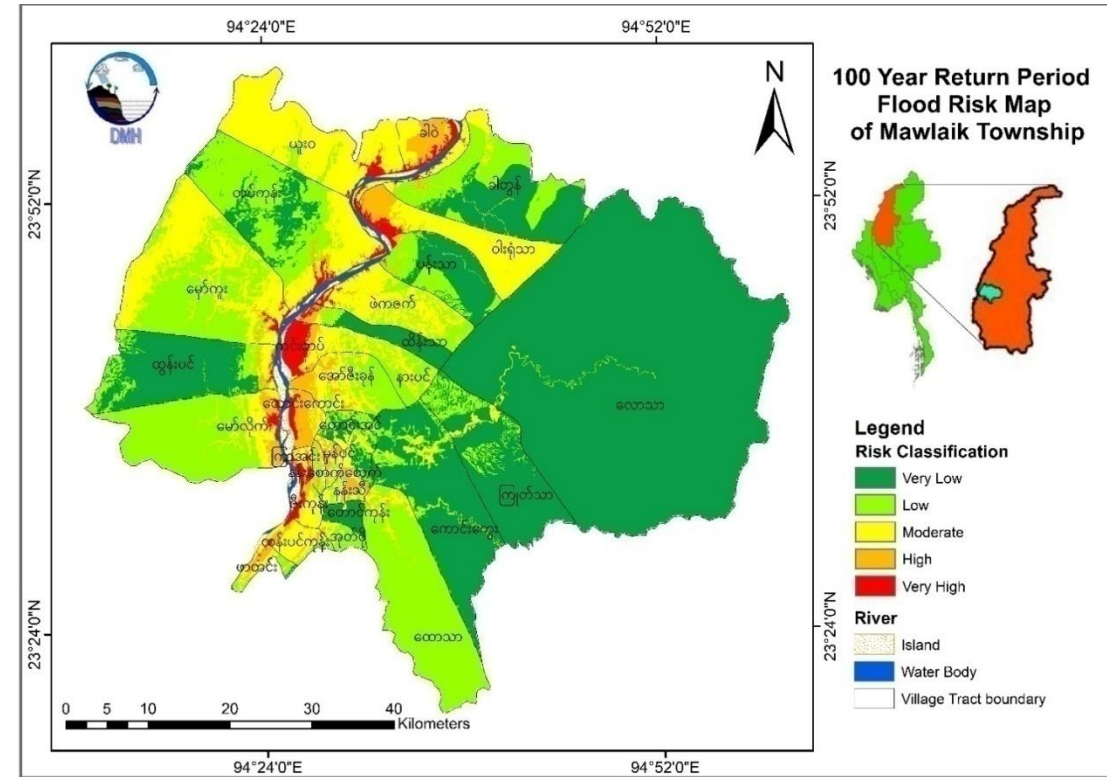
Mitigation and Preparedness



Hazard Map

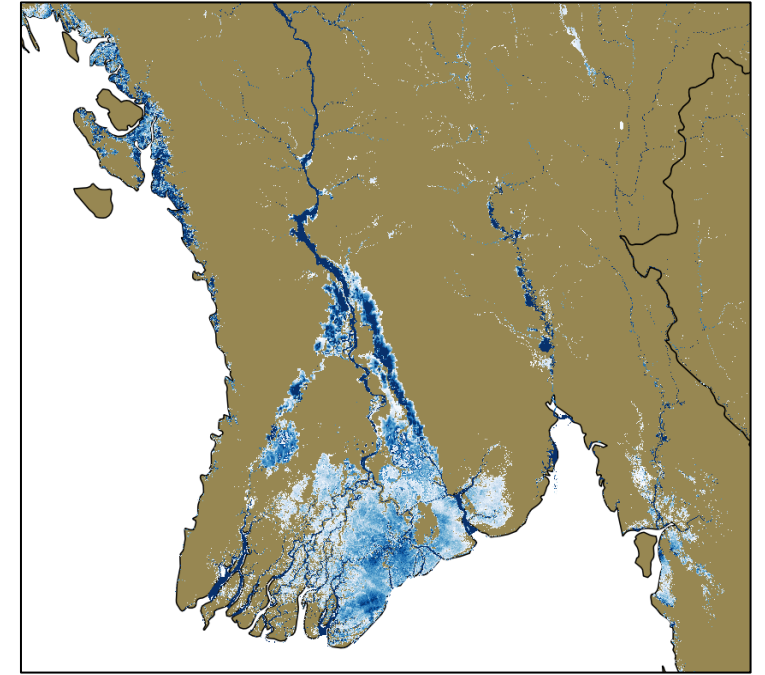
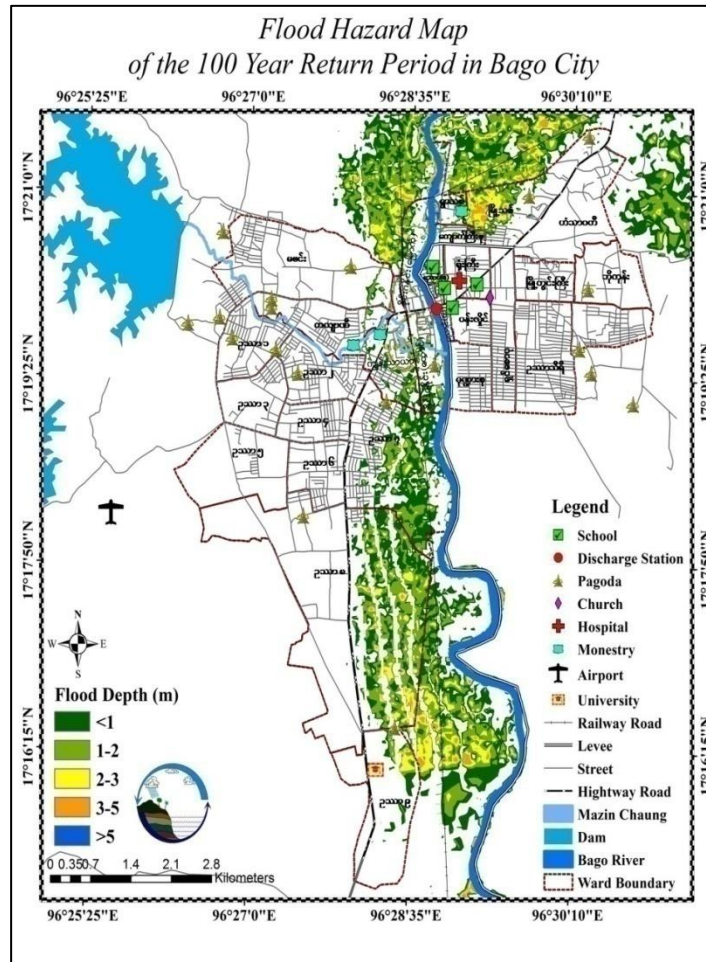
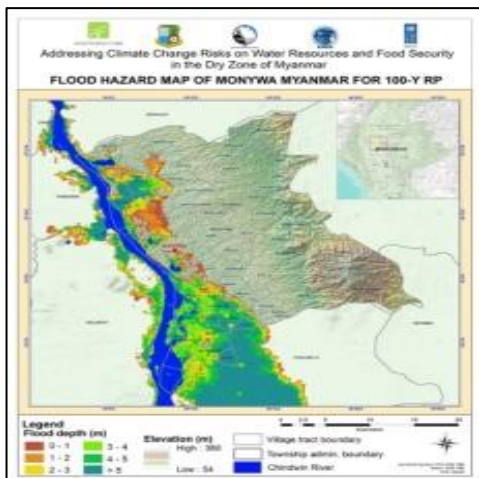
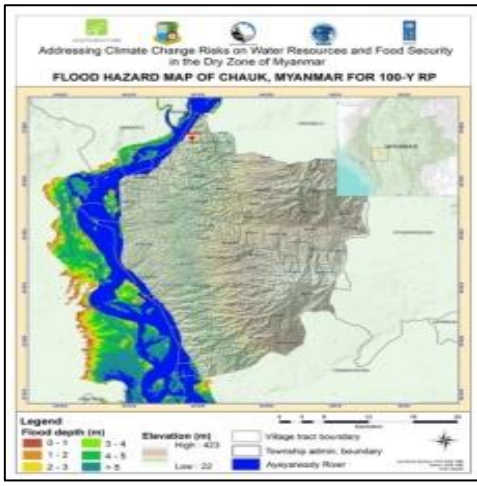


Vulnerability Map



Risk Map

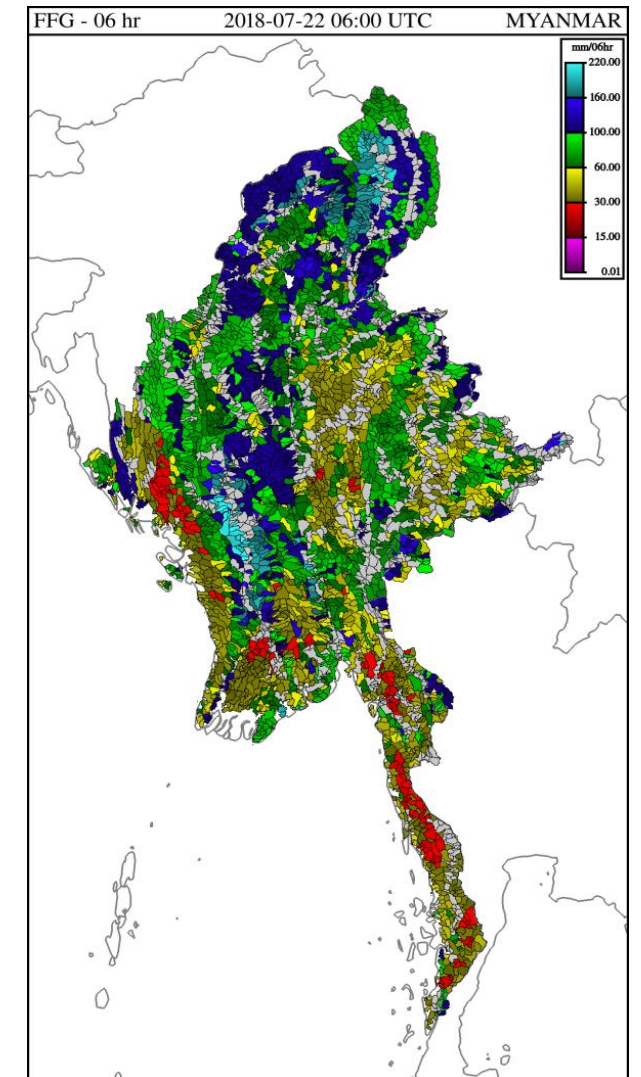
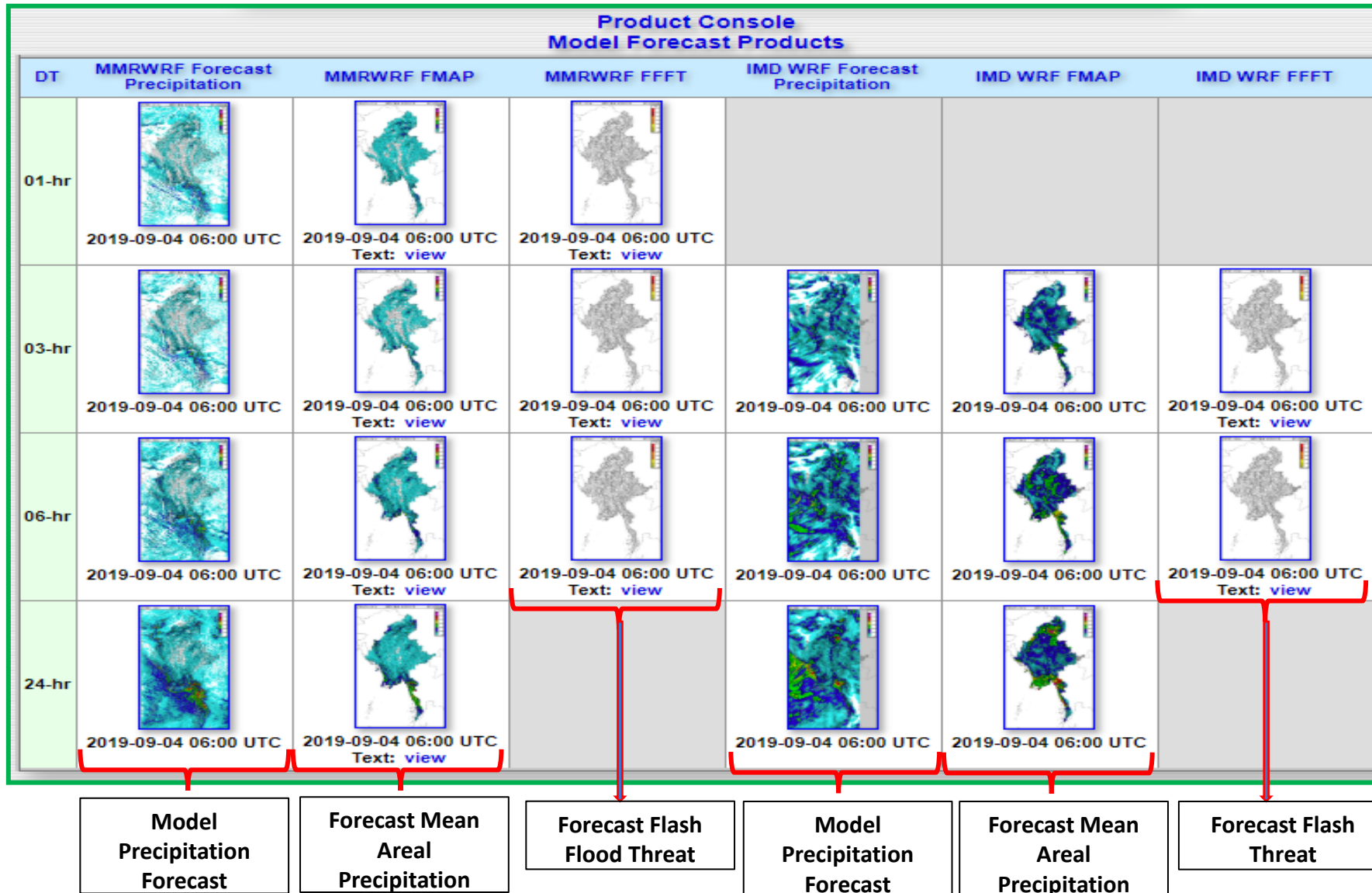
Hazard Map



Flood Hazard Map for Ayeyarwady Delta

- DMH has already developed the flood hazard maps with different return period for the different cities along the Myanmar rivers.
- Verify with ground data and feed back from local community and authorities.

Myanmar FFGS -Myanmar Flash Flood Guidance System





WRF Output

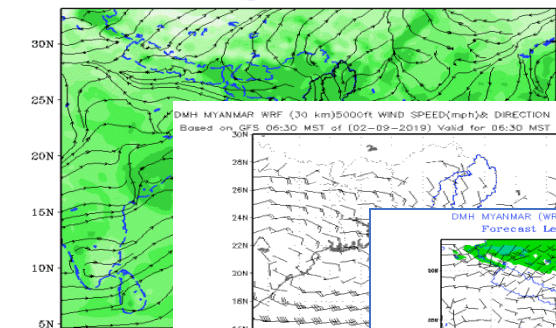


30 km (once a day)
9km (twice a day)

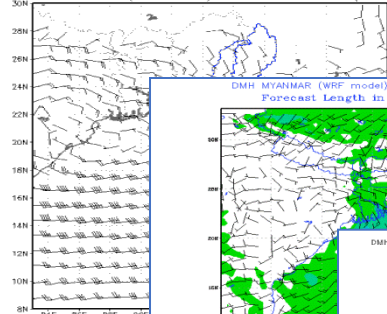
Simulation using WRF DIANA

11 km (once a day)

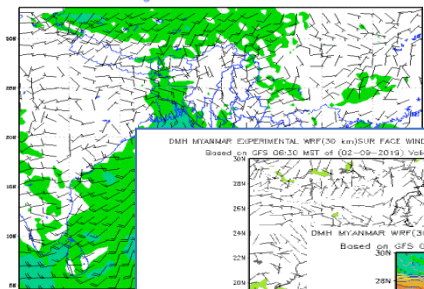
DMH MYANMAR (WRF model)Forecast Surface Stream Line & Relative Humidity
Forecast Length in Hours : 2015092000+3 Hours.



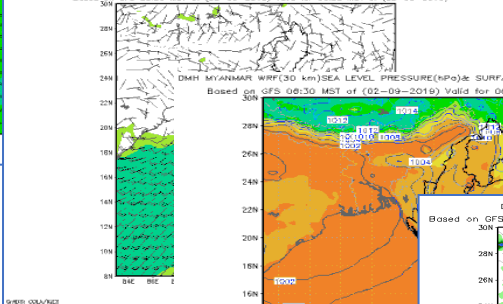
DMH MYANMAR WRF (30 km)5000ft WIND SPEED(mph)& DIRECTION FORECAST (24 hrs)
Based on GFS 06:30 MST of (02-09-2019) Valid for 06:30 MST of (03-09-2019)



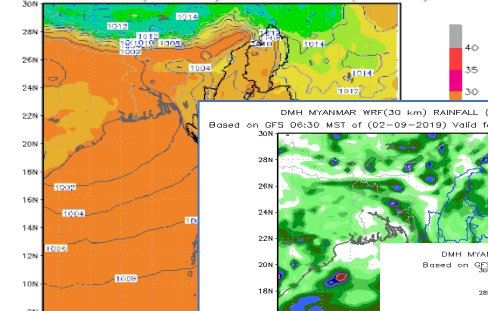
DMH MYANMAR (WRF model)Forecast 3 Hourly Surface Wind(in mph)
Forecast Length in Hours : 2015092000+3 Hours.



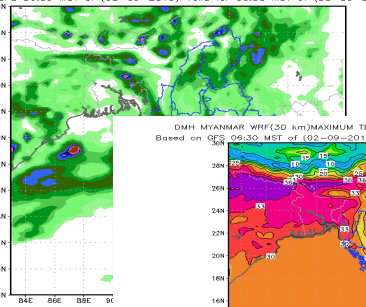
DMH MYANMAR EXPERIMENTAL WRF(30 km)SURFACE WIND SPEED(mph)& DIRECTION FORECAST (24 hrs)
Based on GFS 06:30 MST of (02-09-2019) Valid for 06:30 MST of (03-09-2019)



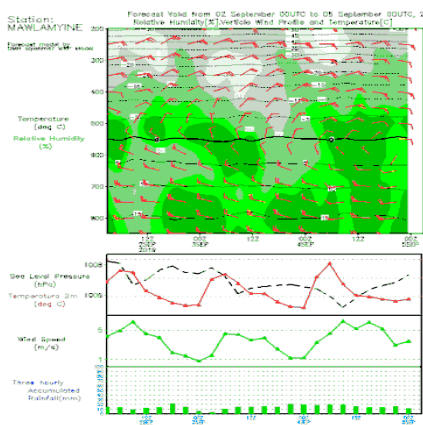
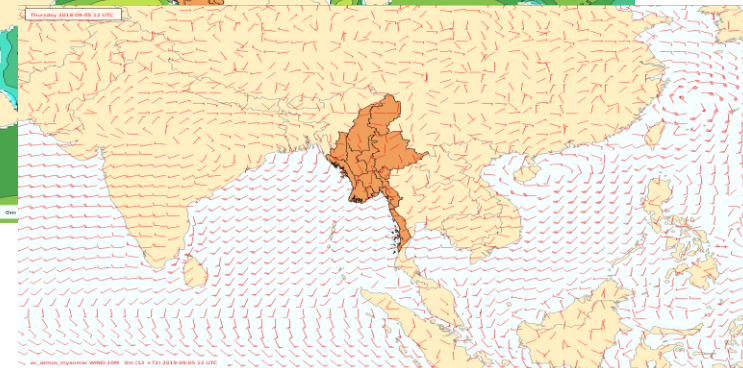
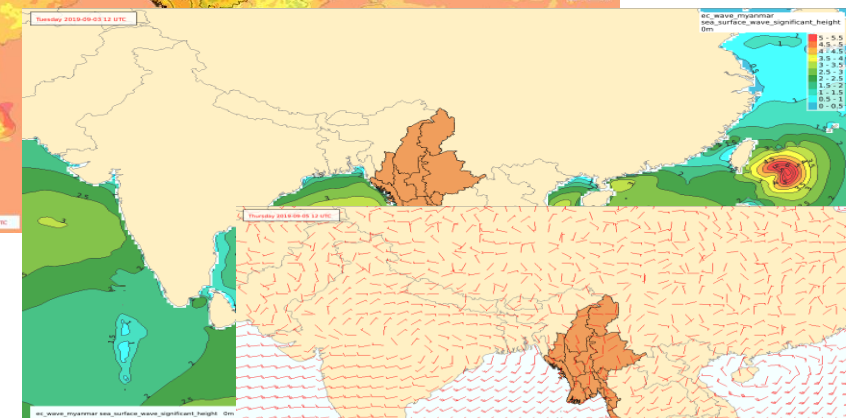
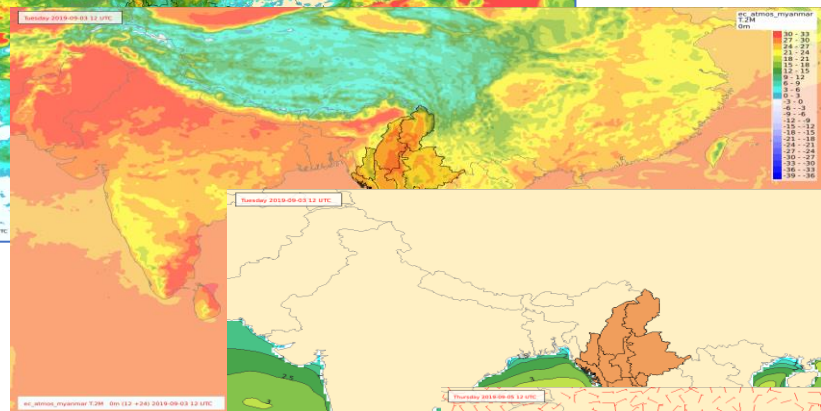
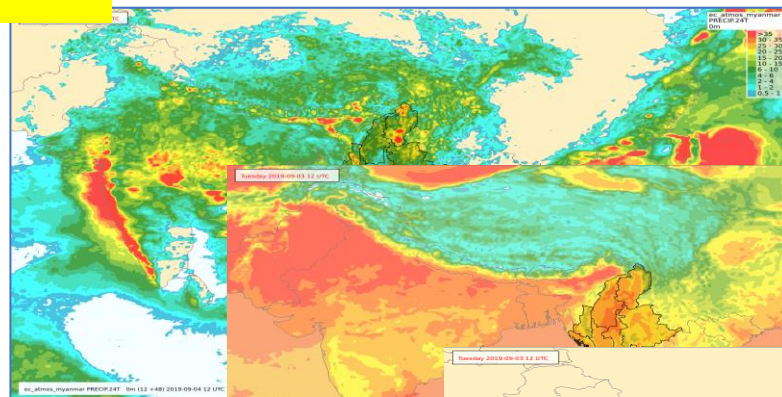
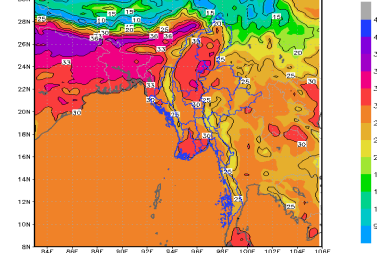
DMH MYANMAR WRF(30 km)SEA LEVEL PRESSURE(hPa)& SURFACE TEMPERATURE(C)FORECAST (24 hrs)
Based on GFS 06:30 MST of (02-09-2019) Valid for 06:30 MST of (03-09-2019)



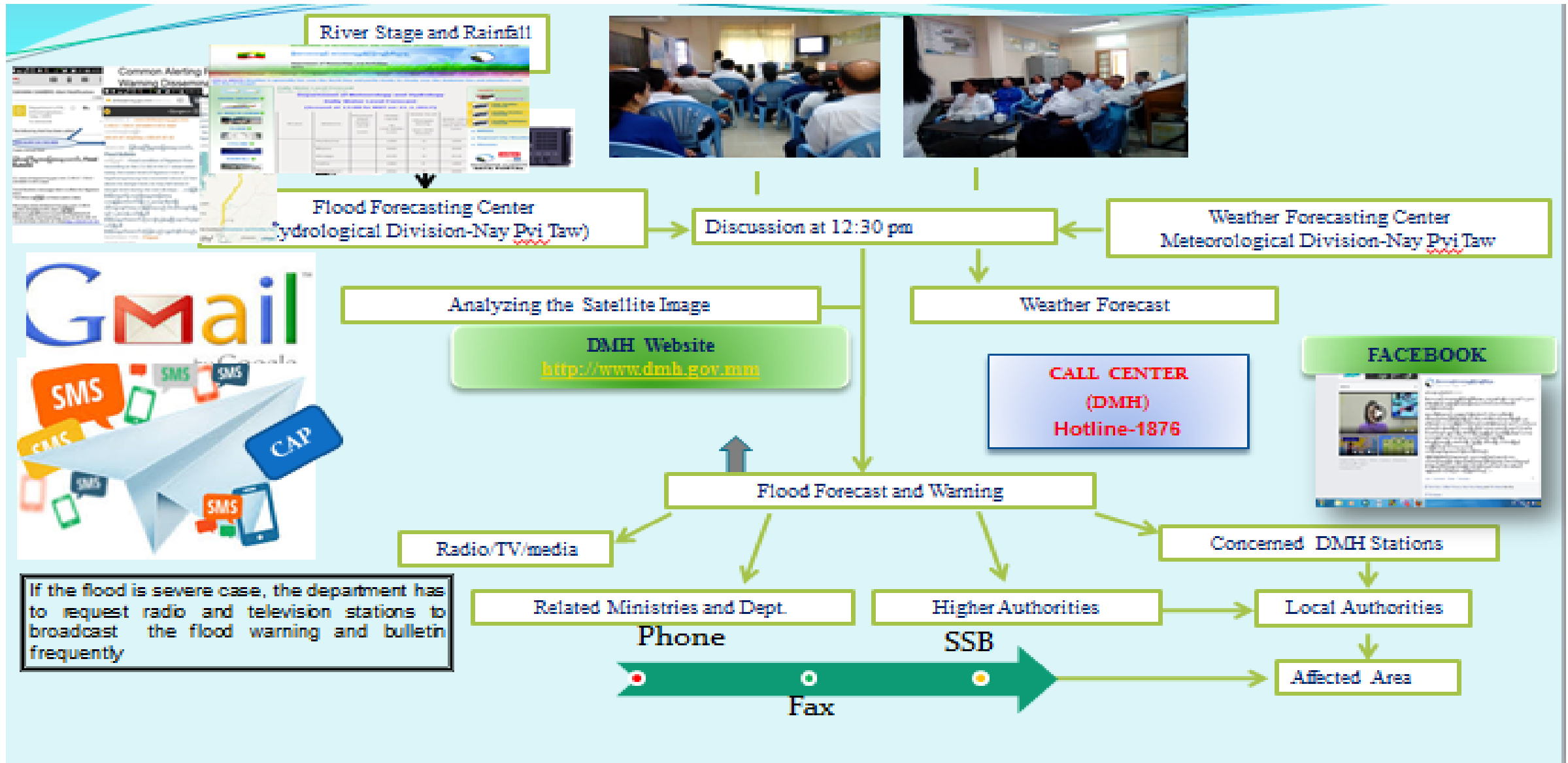
DMH MYANMAR WRF(30 km) RAINFALL (inches) FORECAST(24 hrs)
Based on GFS 06:30 MST of (02-09-2019) Valid for 06:30 MST of (03-09-2019)



DMH MYANMAR WRF(30 km)MAXIMUM TEMPERATURE(C) FORECAST (24 hrs)
Based on GFS 06:30 MST of (02-09-2019) Valid for 06:30 MST of (03-09-2019)



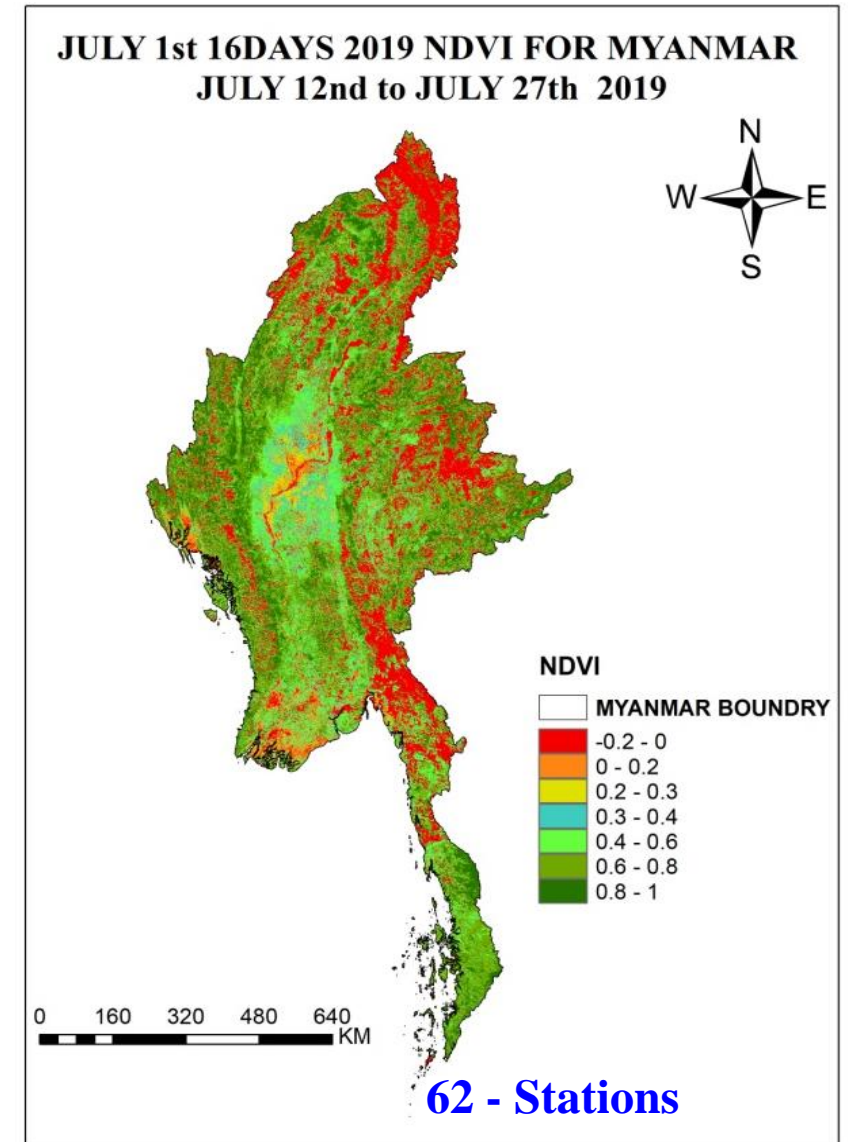
Forecast and Warning Dissemination



Drought Assessment using Satellite Image

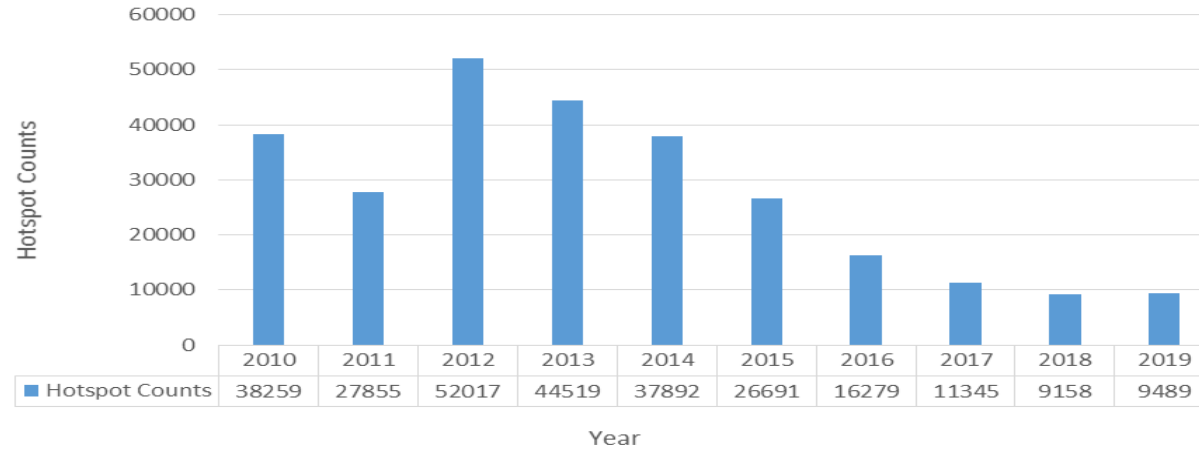


- ❖ Drought Monitoring Software(DMS) provided by ESCAP
- ❖ Need Capacity Building to upgrade and issue Drought Early Warning

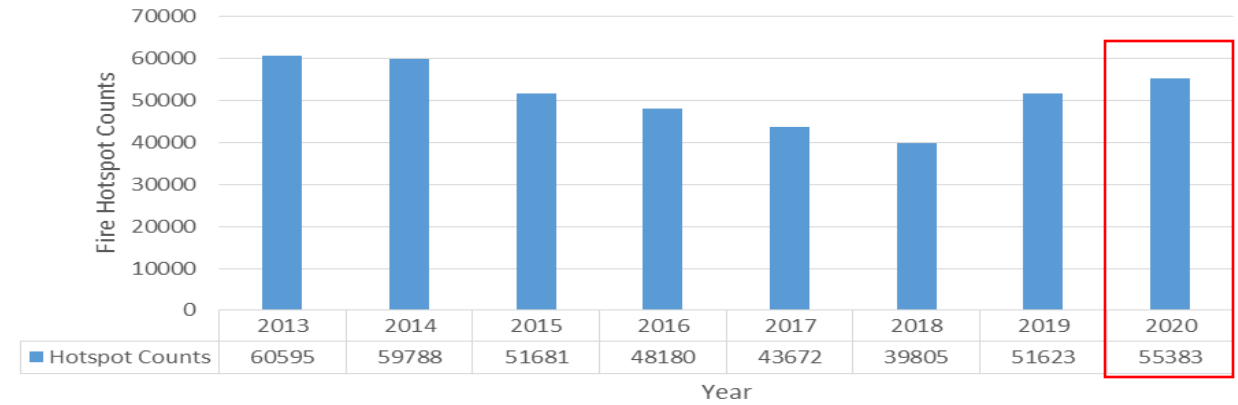


Fire Hotspots Information from ASMC and FIRMS

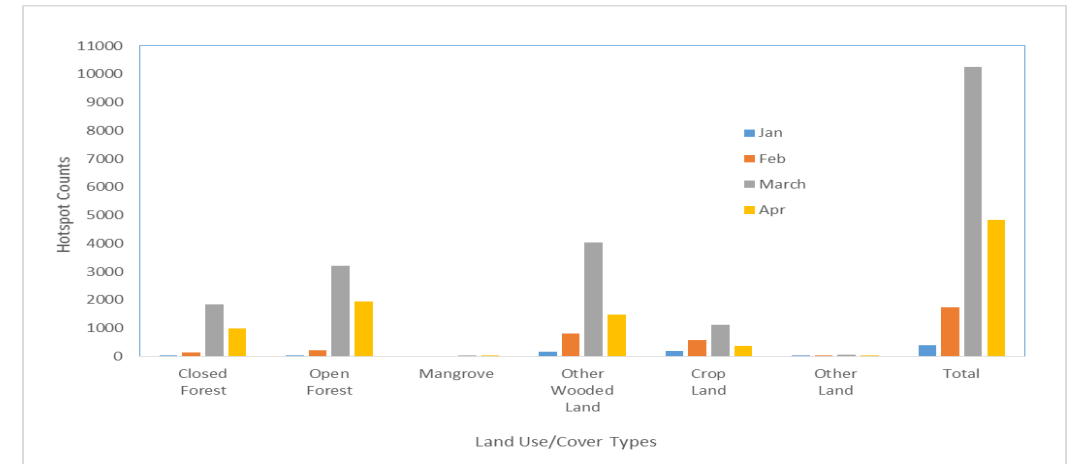
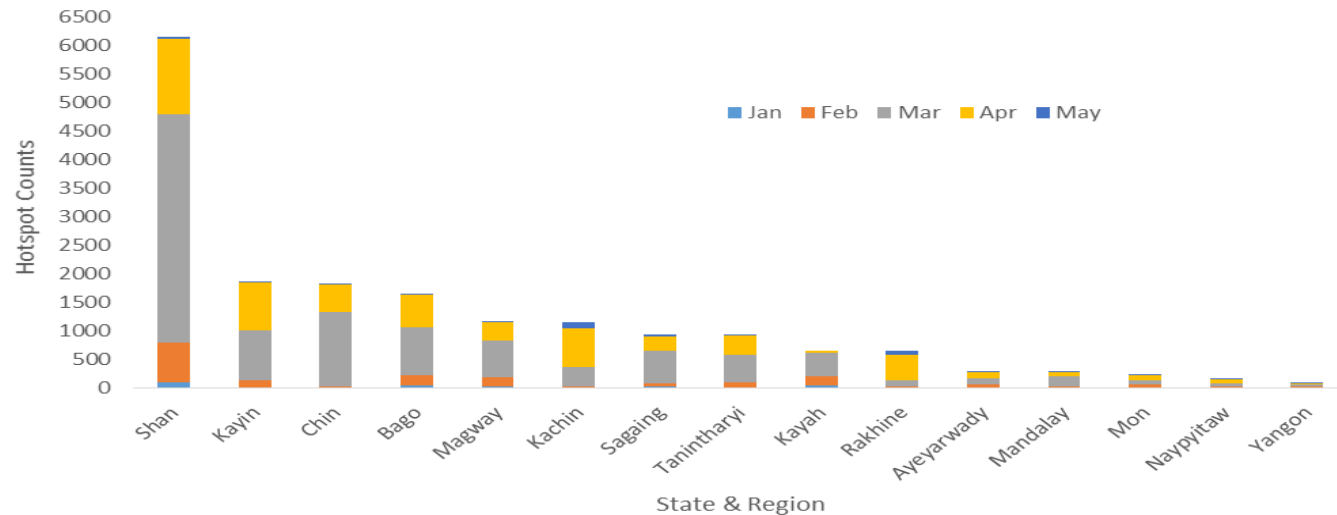
Hotspot Counts in Myanmar from 2013 to 2019 by NOAA 18 Satellite



Hotspot Counts in Myanmar from 2013 to 2020 (2013-2018 by Suomi-NPP Satellite and 2019 onwards by NOAA-20 Satellite)



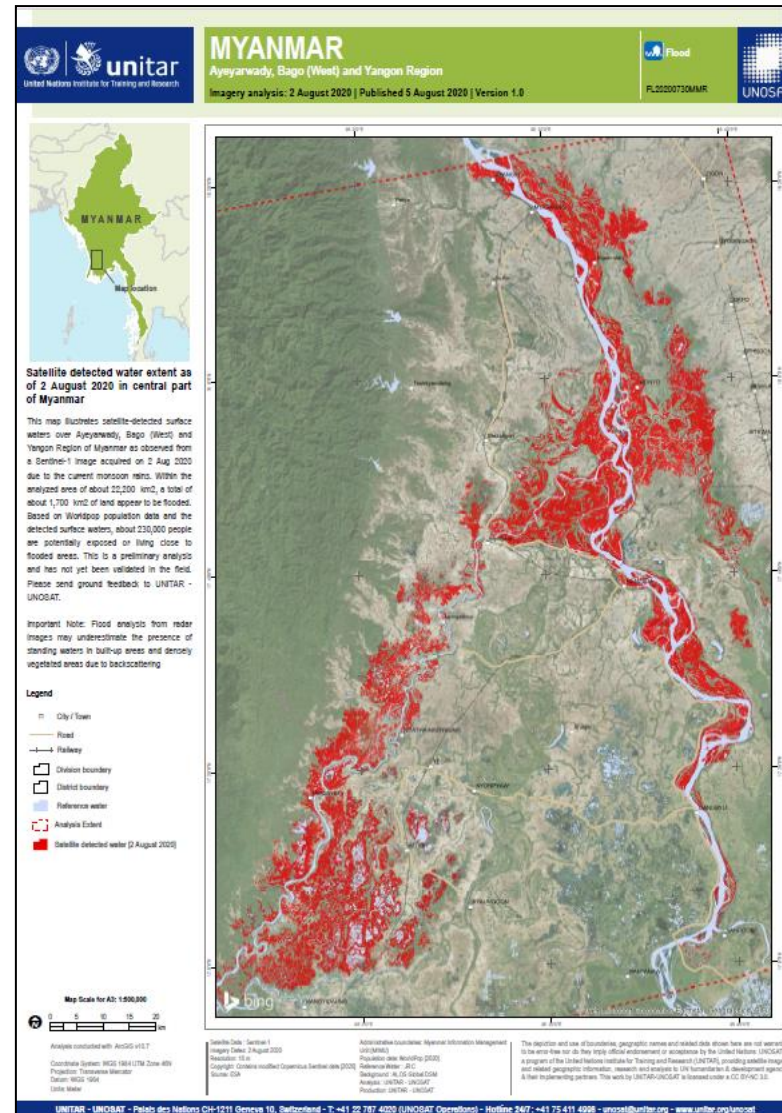
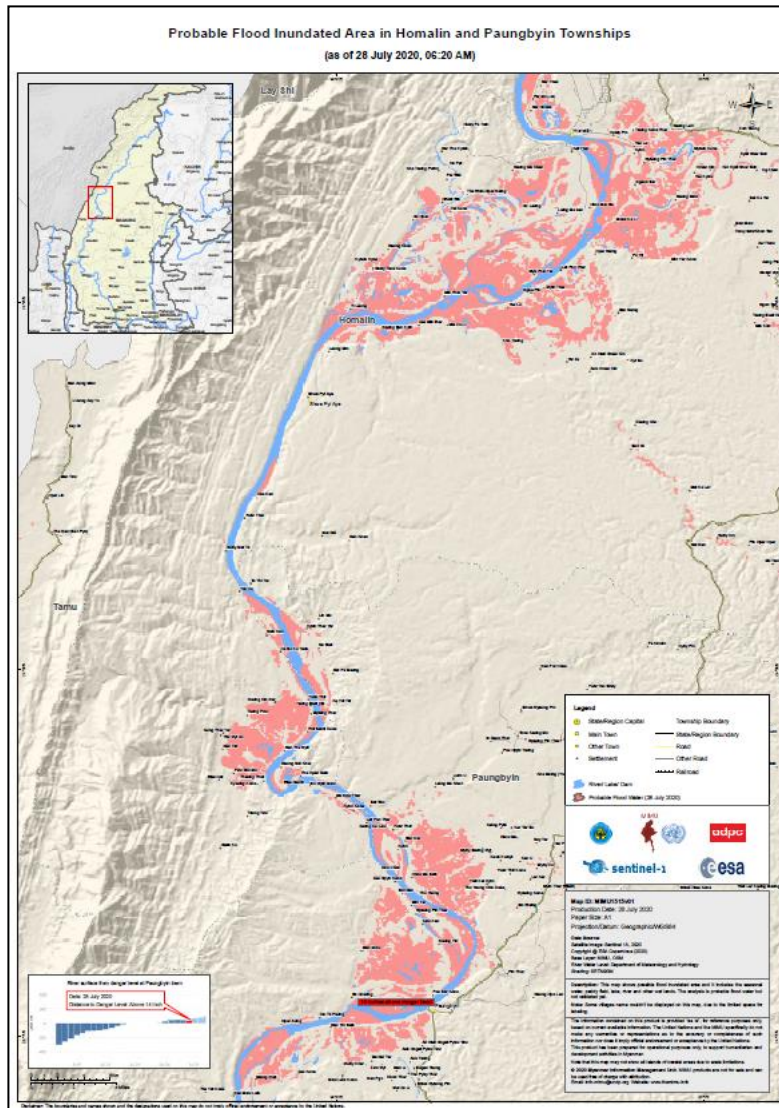
Fire Hotspot Counts in each State and Region of Myanmar



❖ Lack of Air Pollution Monitoring using space technology and need to fill the gap

[illegible][illegible]

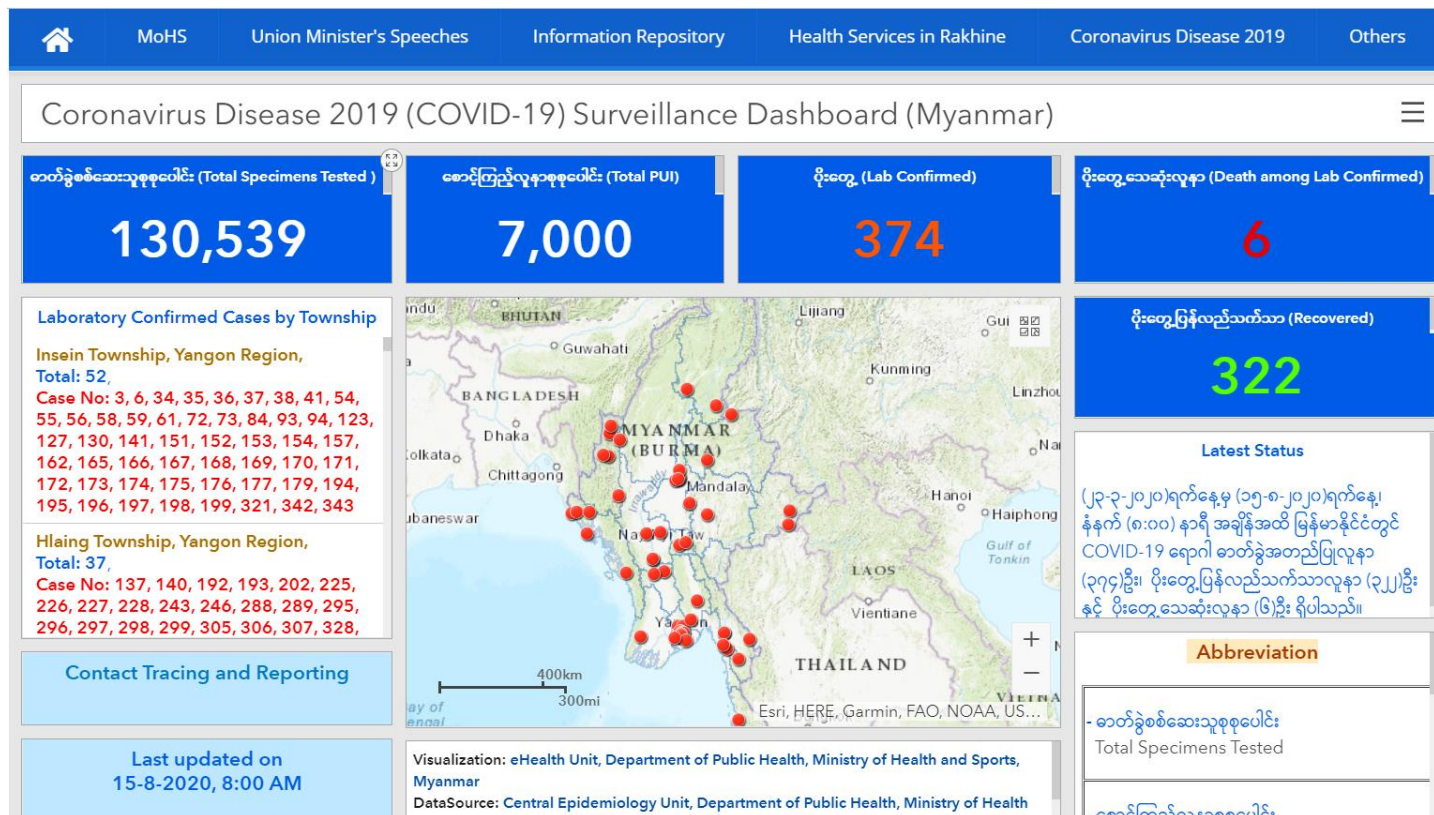
Landslide at Mon State in August, 2019



- ❖ UNOSAT provide rapid flood mapping including Geodata.
- ❖ Working together with national and international organizations, NGO, INGO, and local Communities for Disaster Response Mapping using social network (eg. Facebook).



Myanmar Geospatials For Disasters
 47 members in this group



- Providing immediate relief to disasters affected people.
- Cooperating and Coordinating with stakeholders for rehabilitation and reconstruction.
- Conducting training and awareness programmes on disaster risk management.

Contribution to Global Agenda

- The United Nations Sustainable Development Goals SDG No.11 and SDG No.13.



Make cities and human settlements inclusive, safe, resilient and sustainable



Take urgent action to combat climate change and its Impact

- Sendai Framework for Disaster Risk Reduction.
 - The Sendai Framework aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors. The Sendai Framework set several targets to be achieved by 2030, including a substantial reduction of global disaster mortality, the number of affected people and direct disaster economic loss through, inter alia, the *increase in the availability of and access to multi-hazard early warning systems and disaster risk information and assessments.*

Succeed Stories

- Flood Hazard Mapping
- Flood Vulnerability and Risk Mapping
- Rapid Flood Mapping
- Drought Monitoring
- Early Warning Disseminating using Web based. (DMRS, CAP)
- Risk assessment and appropriate response
- Communities – Private collaboration
- National and International Cooperation

Limitation and Recommendation

- Landslide/Storm Surge/Sea Level Rise, etc., Zoning Mapping
- Drought Early Warning
- **Air Pollution Monitoring**
- Budget Limitation
- Knowledge, capacity building, specific tools and well-trained human resources
- High resolution space-derived data
- More cooperation with multi-stakeholders, national and regional level
- Strengthening the use of space-based application in the field of disaster.

THANK YOU

Contact person: dg.dmh1@gmail.com