The Republic of the Union of Myanmar

Ministry of Transport and Communications

Directorate of Water Resources and Improvement of River Systems

“Water Resources in Myanmar after earthquake"

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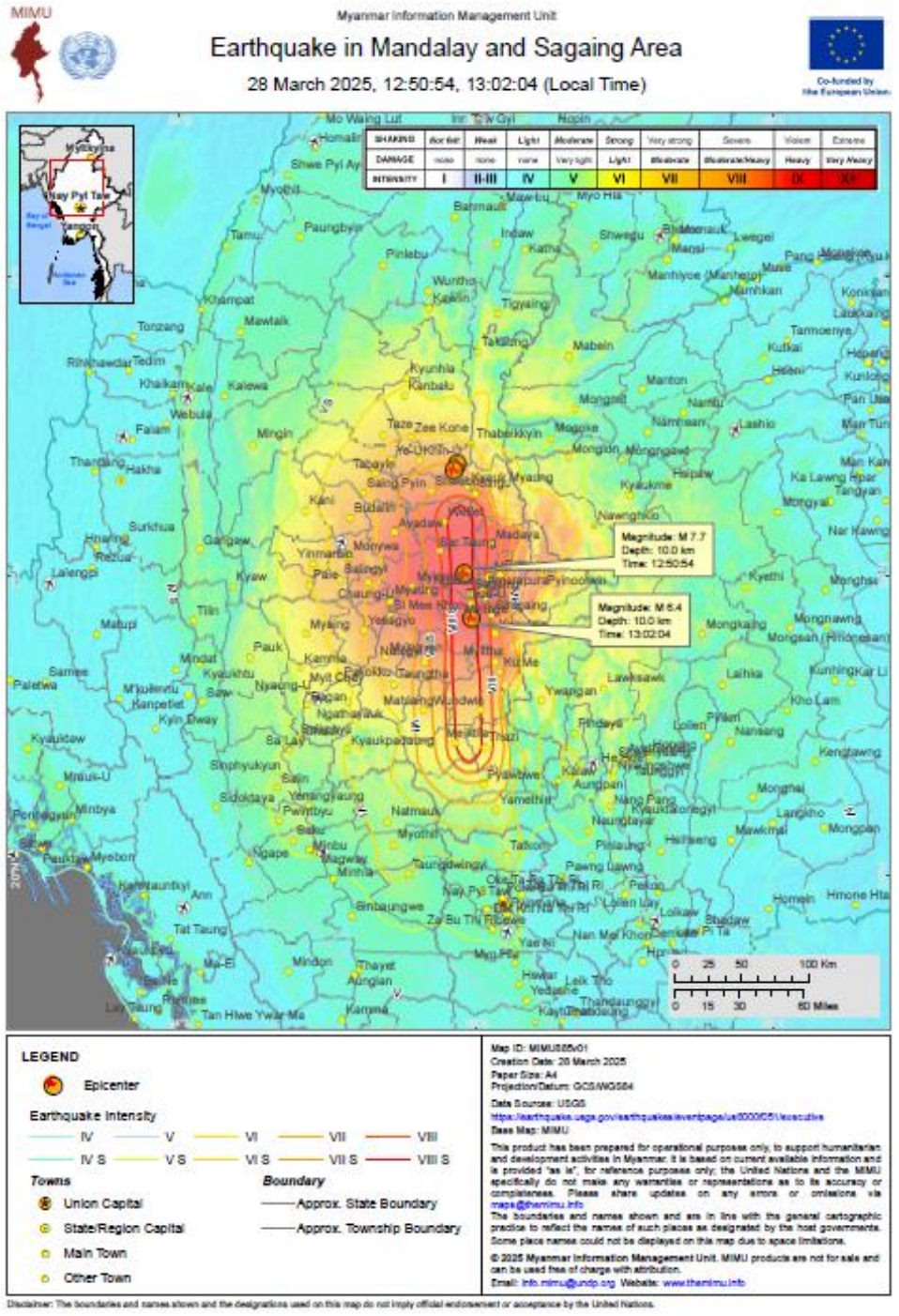
ရန်ကုန်မြို့ ၄-၄-၂၀၂၆

Contents

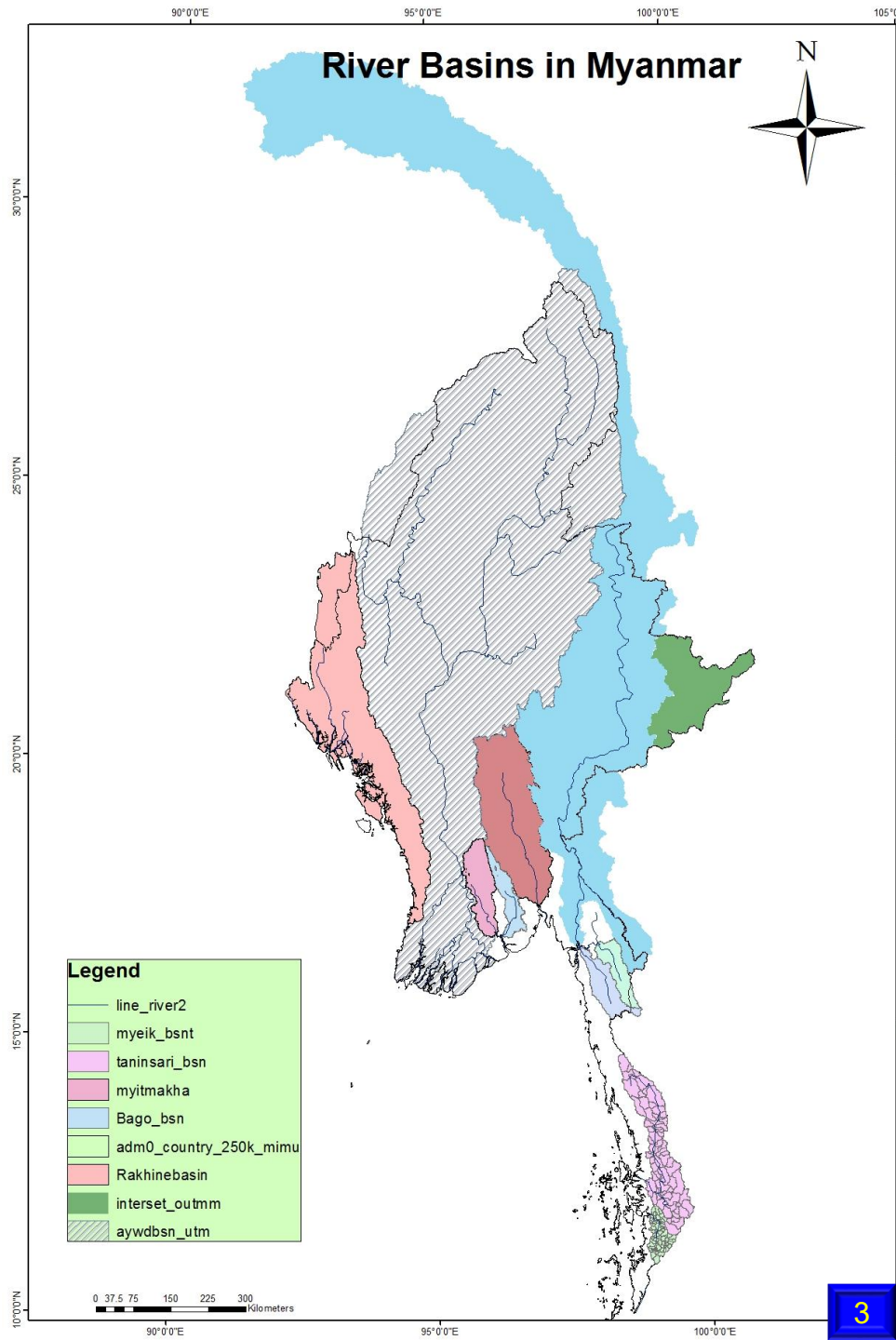
၁။ မြန်မာနိုင်ငံရှိ ရေအရင်းအမြစ်များအကြောင်း တင်ပြရန်၊
၂။ ငလျင်လှုပ်ခြင်းကြောင့် ရေအရင်းအမြစ်ထိခိုက်မှုများ လေ့လာတင်ပြရန်၊



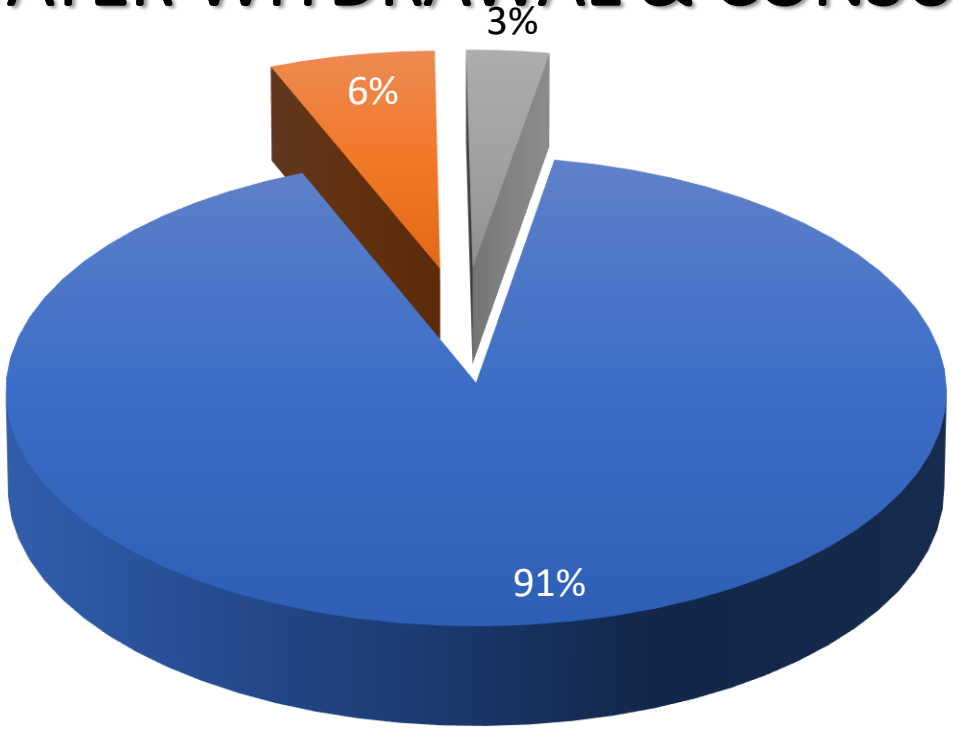
Water Resources Potential in Myanmar

No.	River Basins	Drainage Area (10^3 km^2)	Avg Annual Surface Water (km^3)	Groundwater (km^3)
1	Chindwin	115.30	141.293	57.578
2	Upper Ayeyarwady	193.30	227.920	92.599
3	Lower Ayeyarwady	95.60	85.800	153.249
4	Sittaung	48.10	81.148	28.402
5	Rakhine State	58.30	139.245	41.774
6	Taninthari Region	40.60	130.927	39.278
7	Thanlwin basin	158.00	257.918	74.779
8	Mekong basin	28.60	17.634	7.054
	TOTAL	737.80	1,081.885	494.713

1 km^3 = 810,714 ဇာပေ = 264,172 သန်း ဂါလံ



WATER WITDRAWAL & CONSUMPTION



- Myanmar : Agro- based Country and agriculture sector is the back bone of its economy
- Total utilization of nation's water at present is about 150 km³ and that is only 10% of total water potential
- Mainly for agriculture sector and some smaller quantities for domestic use, industrial use and other purposes

Population = 54,000,000

Groundwater available = 494.71 km^3

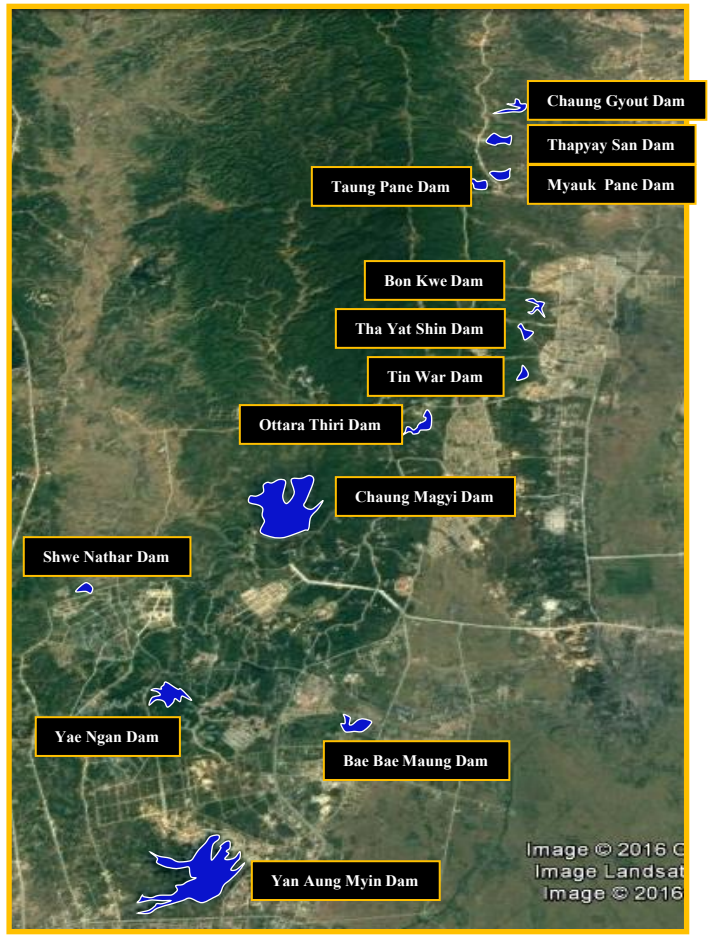
Surface water available = 1081.88 km^3

Water budget for one person = 9513.72 m^3 /year

Required water for one person = 73 m^3/year

Nap Pyi Taw City Water Supply System

Water Resources

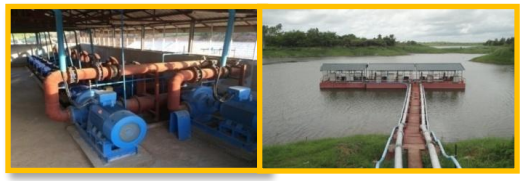


Source: NPTDC

Water Supply System

Water Resources

Pontoon



Treatment Plants

Storage Tanks

Users

Basic Data of NPT waterworks

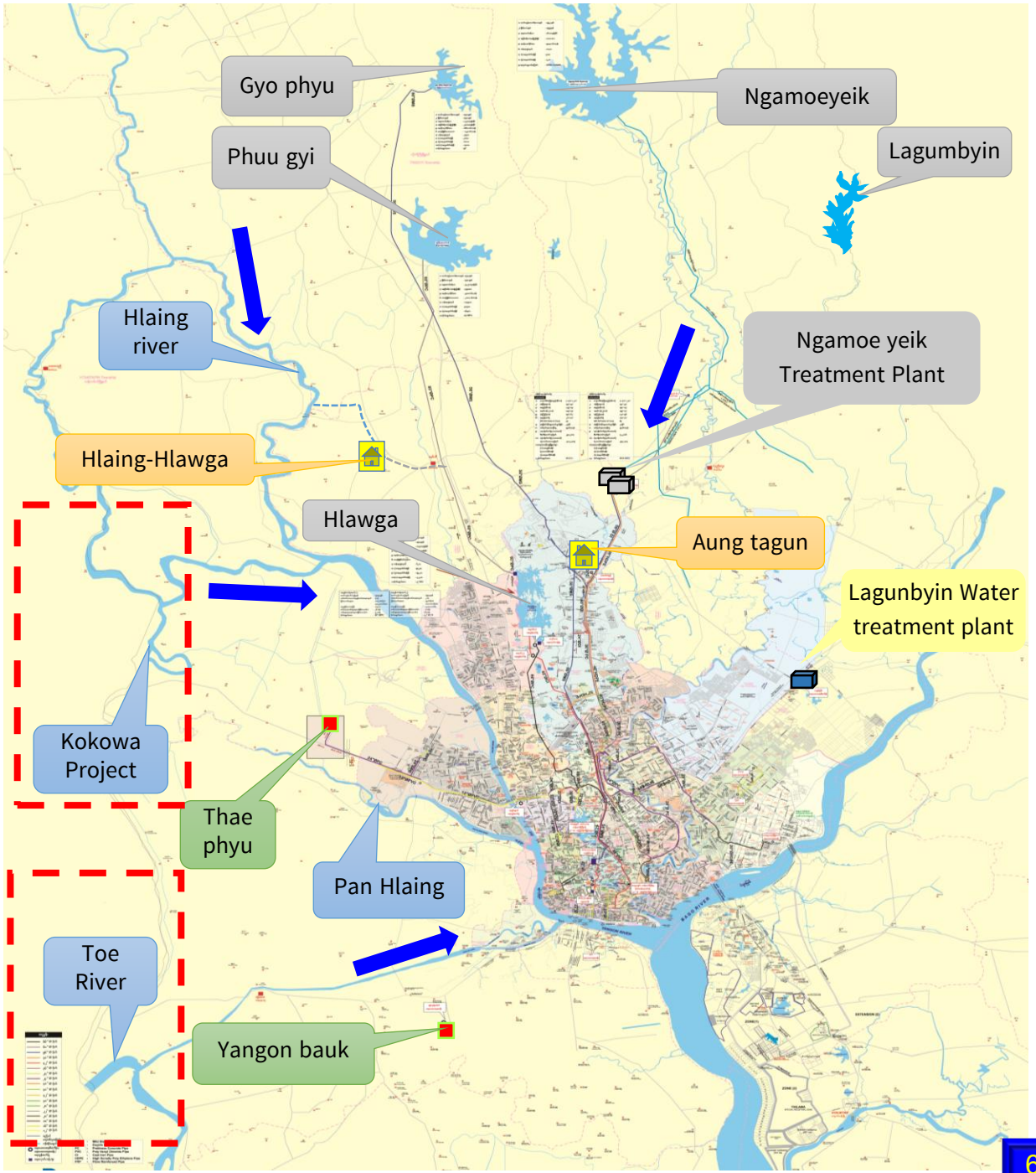
Population Served	50% of Urban Population
Number of service connections	17123
Total capacity of treatment facilities	27.55 MGPD
Disinfection facility	6 Nos

Water Supply in Yangon City

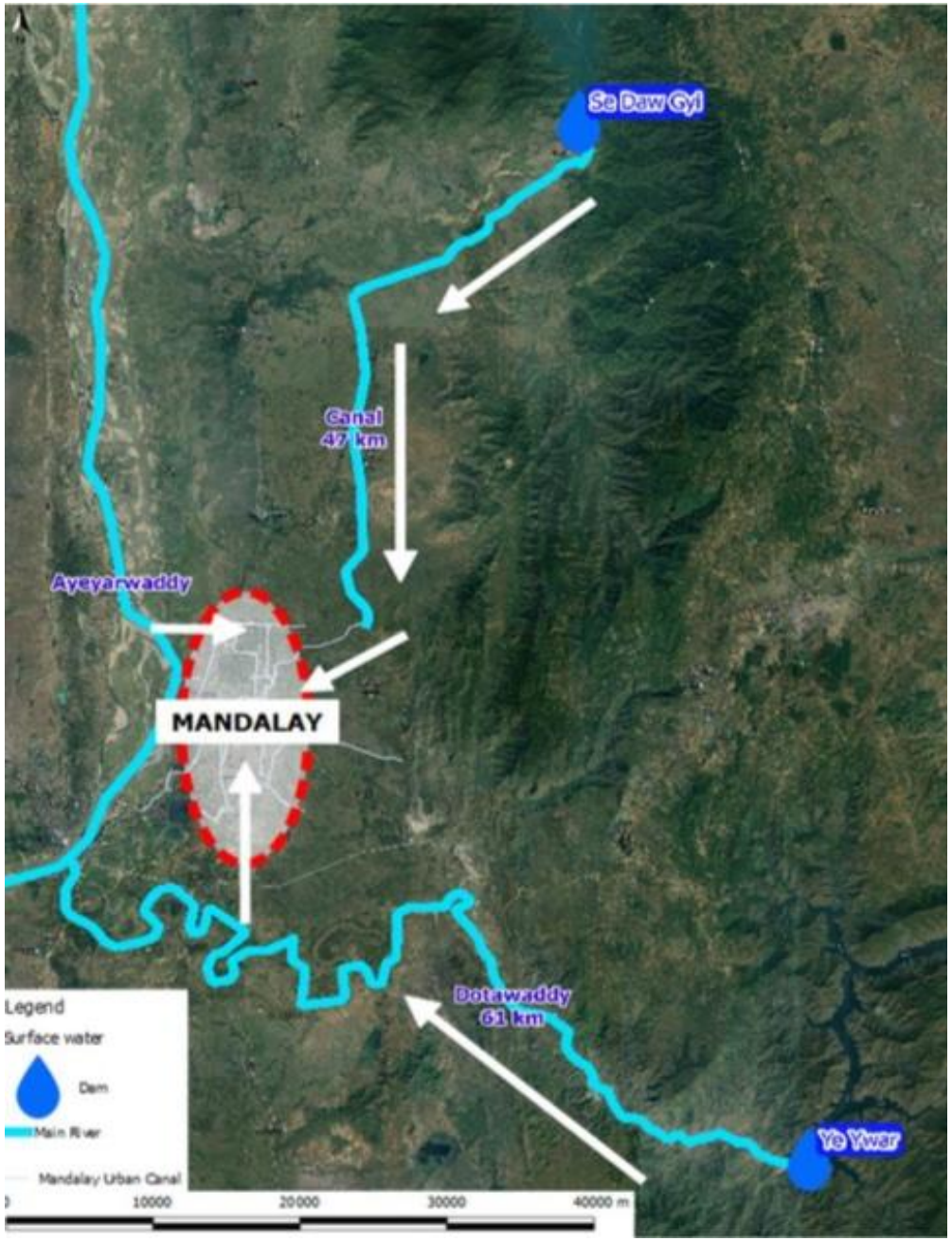
Daily Water Supply in Yangon City	
Water Source	**Million Gallons**
Hlawga	15
Gyo phyu	27
Phuu Gyi	54
Ngamoe yeik reservoir	130
Lagunbyin	40
Hlaing – Hlawga Water supply	60
Thae Phyu-Kan bauk	3
Total of	**329**

- Yangon City Population = 7.7 millions
- Water Supply Coverage(%) = 60 %
- New water resources are Kokkowa, Toe river and Twante canal
- New water supply projects with JICA are under implementing
- Water quality of piped water is with WHO standard

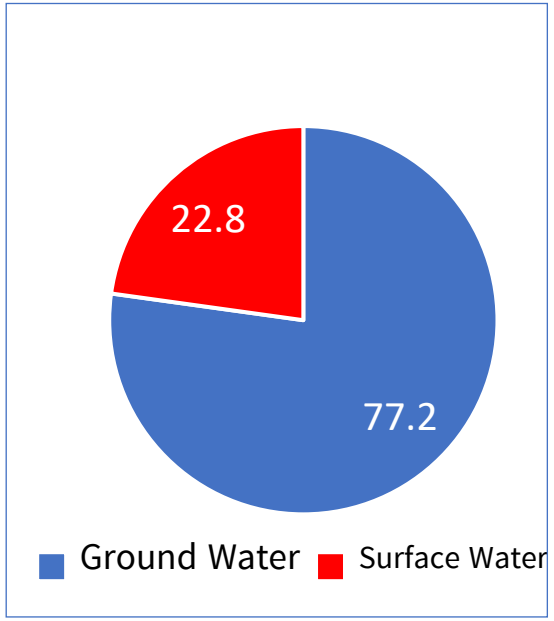
Source: YCDC



Mandalay city water supply information



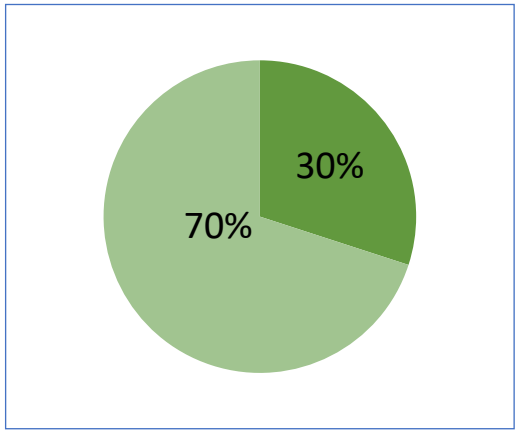
1. (Ground Water) - 77.2%
2. (Surface Water) - 22.8 %
   (a) Main Water Sources
      (1) Groundwater
      (2) Ayeyarwady river
      (3) Sedawgyi reservoir
   (b) Future plan
      (1) Myitnge river



Current condition

Daily water supply 42 million gallons

(a) Ground Water	32.424 mill (77.2%)
(b)Surface Water	9.576 mill (22.8 %)



Future Plan
Surface 70% and GW 30%

Access to drinking water according to 2019 inter census

unimproved water/ surface water (23)%

In Myanmar, households in villages accessing to basic water supply service were 62% in 2014 but improved to 77% in 2019

Maximum water availability

Mandalay Region- (90.9)%

Sagaing Region - (89.8)%

Kachin State - (89.8)%

Minimum water availability

Rakhine State - (44.3)%

Ayayarwaddy - (65.3)%

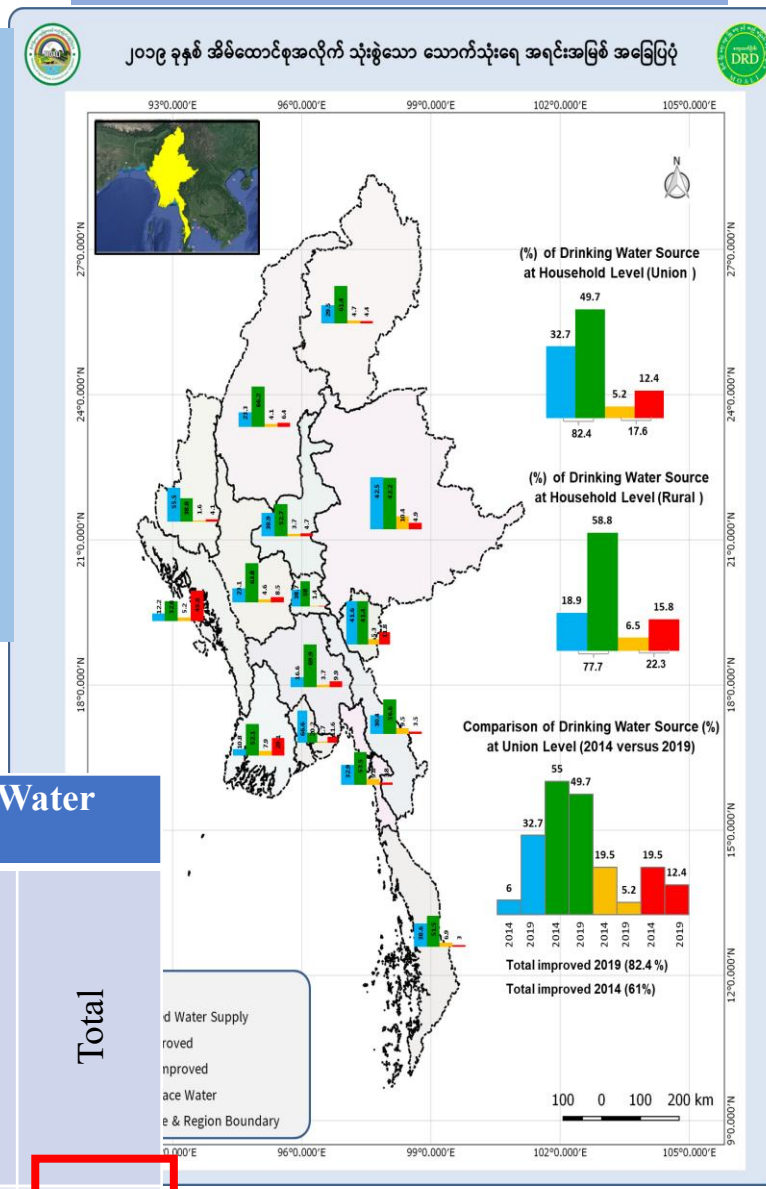
Chin State - (72.3)%

According to Inter Census 2019 , Percentage of Households in Rural Area that used (at Least)Basic water supply service

(from Improved water sources) - 77%

- Pipeline and Public Tap - 18%
- Tube wells and Protected wells - 47%
- Protected Spring - 2%
- Rainwater Harvesting Ponds - 2%
- From Water Treatment system - 8%

Status of Access of Basic Water Supply Services (Inter Census 2019)



Percentage of Households with Access to improved Source of Drinking water by Urban /Rural Area (2024 Data)

	Total	Improved Drinking Water Sources (%)							Unimproved Drinking Water Sources (%)			
Total	Total Number of Household	Piped water into dwelling/compound/plot/neighbour	Public tap/ standpipe	Borehole or tube well	Protected well/spring	Rainwater	Bottled water/ Home water purifier	Total	Unprotected well/spring	Tanker-tanker/ Cart with tank/drum & Others	Surface water	Total
Union	7,764,565	21.0	2.6	27.4	7.3	6.9	23.1	**88.3**	1.4	2.0	8.2	11.7
Urban	2,892,945	26.8	1.6	14.2	35	2.6	45.9	**94.7**	0.4	3.1	1.8	5.3
Rural	4,871,620	17.5	3.2	35.3	9.5	9.4	9.5	**84.5**	2.0	1.4	12.0	15.5

Source: DRD

HISTORICAL WATER-RELATED DISASTERS IN MYANMAR

2011

O 2 B

Pakokku

46

29,435

2015

Komen (Flood)

14 St & Region

181

1.7 M

2018

Flash Flood

Swa, Taungoo

7

77,148

2019

Landslide

Mon State

73

2023

Mocha

Cyclone

(Rakhine)

151

29,958

2024

YAGI

9 St & Regions

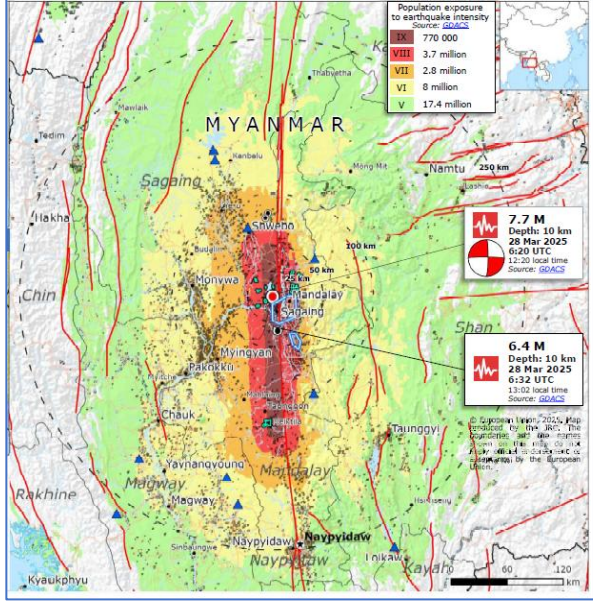
423

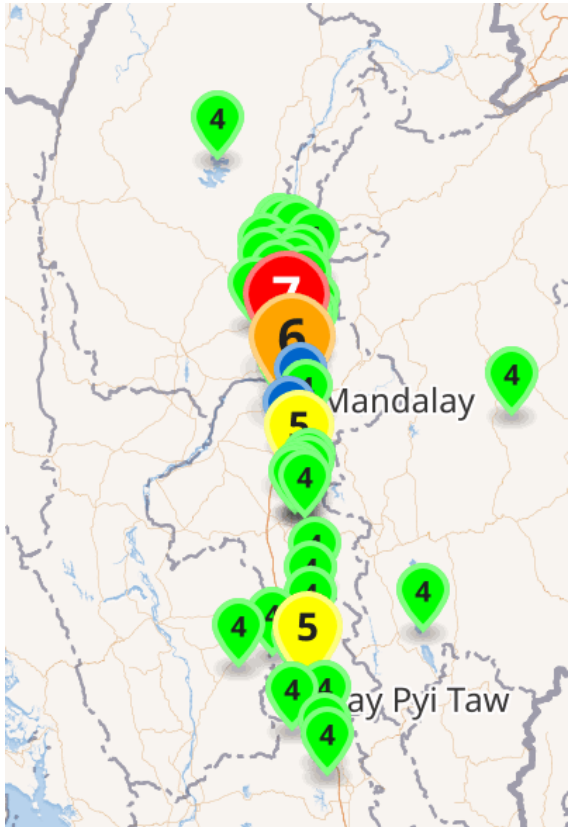
314,252

Source: DDM

Earthquake in Myanmar

- Earthquake - 7.7 ~ 7.9 Magnitude
- Date & time -28-3-2025, 12:51 pm (06:20:52 UTC)
- Epicenter - Near Sagaing and Mandalay
- Depth - 10 Km
- Fatalities - 3759 persons
- Injuries - 5107 persons
- Missing - 114 persons
- Affected people - 629,206 persons
- Saved alive -653 person
- Effected cities – Sagaing, Mandalay, Naypyitaw
- Damage - USD- 11 Billions
- Area affected - Myanmar, Thailand, Southwestern China and Vietnam





(Data are as of 24-4-2025)

(Ministry of Social Welfare Relief and Resettlement website)

Source: www.mswrr.gov.mm

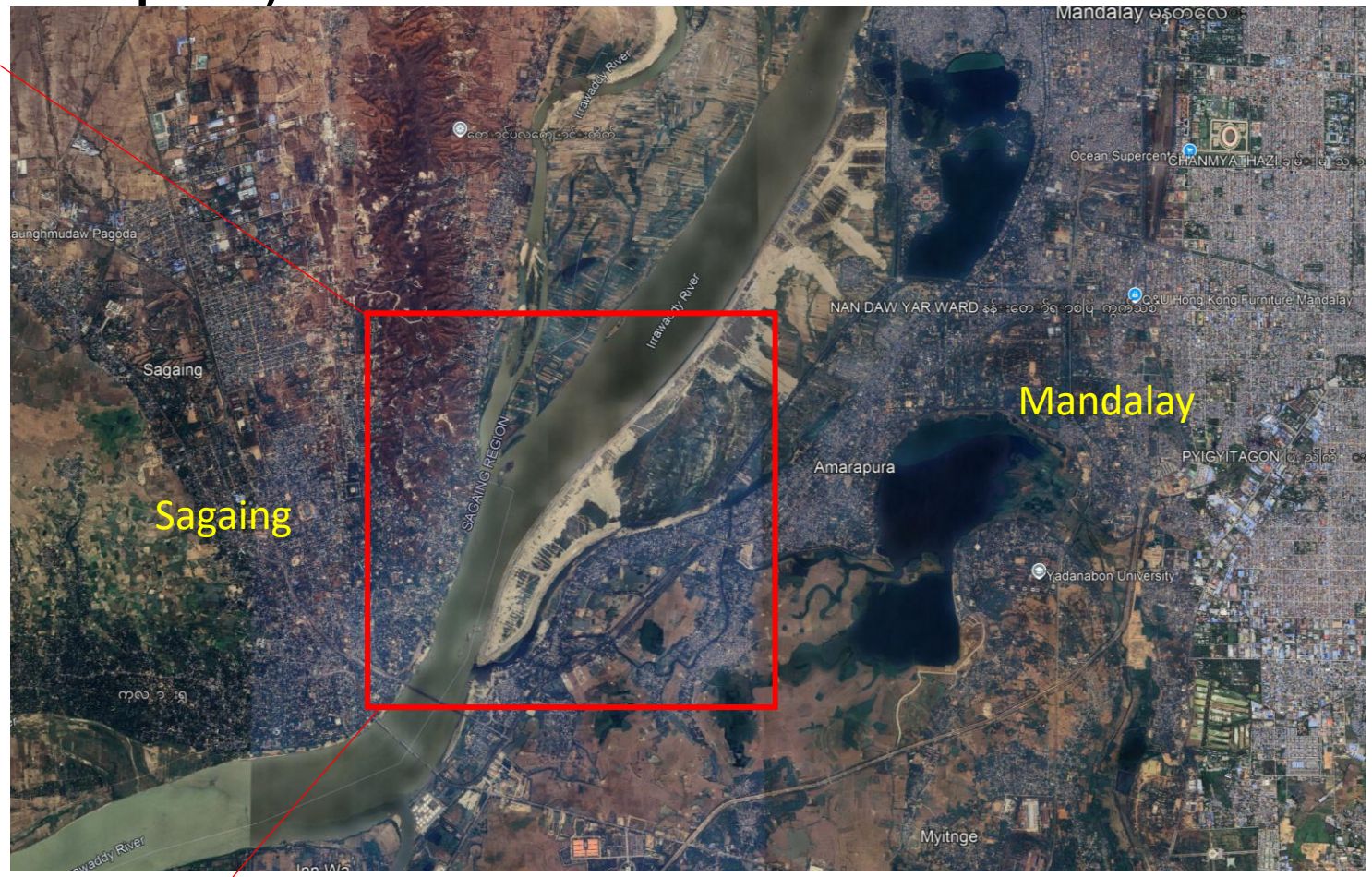
Impacts of earthquake on water resources

Item	Particular / impacts of earthquake on water resources	Findings in Myanmar after earthquake	Remark
1	Groundwater contamination	Suffered mainly near Sagaing and Mandalay	
2	Water infrastructure damage (reservoirs, dike, revetment, canal, supply system, etc.)	Earth dams, canals, Dikes, revetment, water supply networks are destroyed in Myanmar	
3	Creek changes its direction	No changes (no finding)	
4	Hydrological changes	Groundwater changes significantly	Sagaing, Mandalay and Naypyiaw
5	Impact on surface water bodies (quality, flooding, erosion, etc.,)	Reduced water surface immediately and then it became normal	
6	Water quality changes	No information currently	
7	Soil liquefaction	Found after earthquake but later disappeared	
8	Erosion and sedimentation	Not seriously impacted	
9	Geophysical water changes	Groundwater Level Changes: Fault-Induced Groundwater Flow	

Impacts of earthquake on water resources

Item	Monitoring Methods on water resources	Activities in Myanmar after earthquake	Remark
1	Remote sensing (surface water changes, channel shifting, extend of floods, etc.,)	We did some analysis, comparison of before and after earthquake.	
2	Groundwater quality testing	These activities are doing separately	NSPU did researches
3	Flow and Stage Gauges	Yes. We have flow gauges along the rivers	
4	Surveying and Geophysical methods	Yes	
5	Hydrological modeling	Not yet	
6	Public reporting systems	Prepared the reports	
7	Post-Earthquake Assessments	Reports are submitted	
8	Long-term Monitoring programs	We have to continue	
9	Collaboration with research institutions	Yes	

Water reduced (immediate impacts)



Some of Sink holes in the Ayeyarwady river (near Mandalay) after the earthquake.
But those sink holes disappeared later

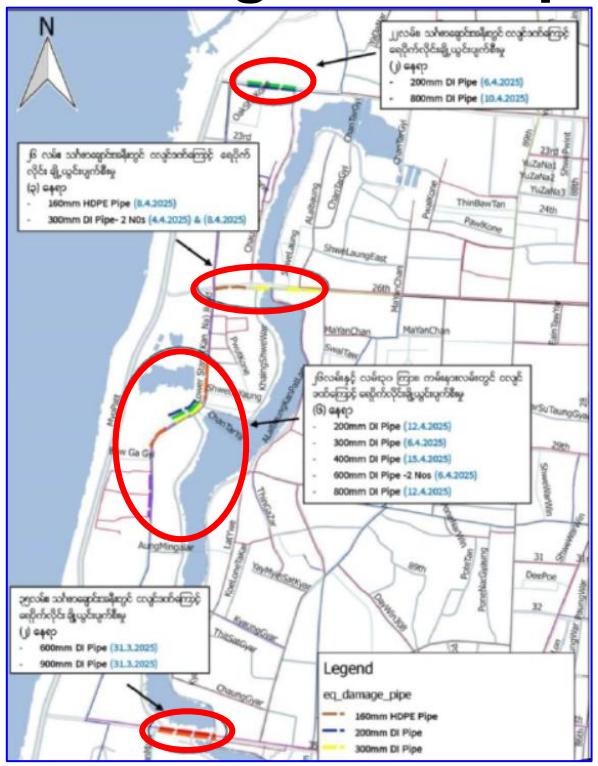
Damage and Repair photos of Water Supply Facilities in Naypyitaw

Source: Naypyitaw Council

Damage and Repair photos of Water Supply Facilities in Naypyitaw

Source: Naypyitaw Council

Damage and Repair photos of Water Supply Facilities in Mandalay City



Source : MCDC

Immediate activities of Ministry of Health for earthquake affected cities

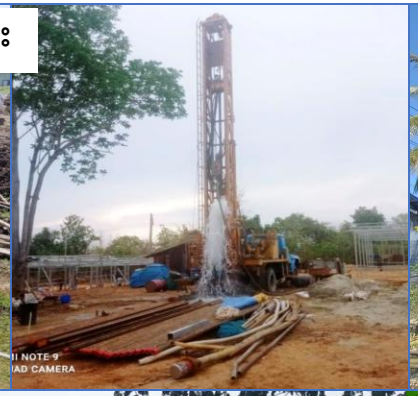
- Emergency health care centers opening
- Inviting international health communities
- Drinking water supply to the effected people
- Pure water taps available for public
- Consultation with public for basic health

ကျေးလက်ဒေသဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာန၏ ဆောင်ရွက်ချက်များ

စဉ်	ပြည်နယ်/တိုင်းဒေသကြီး	မြို့နယ်ပေါင်း	ကျေးရွာပေါင်း	ပျက်စီးမှုအခြေအနေ											ပျက်စီးဆုံးရှုံးမှုတန်ဖိုး	ပြန်လည်ပြုပြင်တန်ဖိုး(ကျပ်သန်း)				လုပ်ငန်းပြီးစီးမှု (%)	ငွေထုတ်ယူပြီးစီးမှု	
				စက်ရေတွင်း			ဂါလံ ၂၄၀၀ဆံ့ စင်မြင့်ရေစင်(လုံးဝပျက်စီး)			ဂါလံ ၂၄၀၀ဆံ့ စင်မြင့်ရေစင်(တစိတ်တပိုင်းပျက်စီး)			စုစုပေါင်း									
				လျာ	ပြီး	ဆဲ	လျာ	ပြီး	ဆဲ	လျာ	ပြီး	ဆဲ	လျာ	ပြီး	ဆဲ		ဌာန(၂၅-၂၆)	အလှူရှင်	ဌာန(၂၆-၂၇)	စုစုပေါင်း		ကျပ်သန်း	%
၁	နေပြည်တော်	၈	၇၀	၄	၄		၂၀	၁၃		၅၂	၅၂		၇၆	၆၉		၆၉၈.၈၄၃	၇၄၃.၆၃၄	၃၇၅.၀၀၀	၁၂၄.၆၈၄	၁၂၂၆.၆၈၄	၉၅%	၇၁၃.၇၇၁	၉၆%
၂	ပဲခူး	၄	၈	၁	၁		၅	၄		၃	၃		၉	၈		၁၇၃.၈၀၀	၂၁၂.၁၈၀		၄၂.၅၂၀	၂၅၄.၁၈၀	၈၈%	၂၁၂.၁၈၀	၁၀၀%
၃	မန္တလေး	၄	၃၇	၁၀	၆		၁၄	၁၄		၁၇	၁၇		၄၁	၃၇		၁၁၇၀.၆၀၈	၁၄၈.၆၃၀	၈၅၇.၃၈၉		၁၀၀၆.၀၁၉	၉၀%	၁၂၉.၂၄၁	၈၇%
၄	ရှမ်းတောင်	၁	၁				၁	၁					၁	၁		၁၁.၀၀၀		၁၁.၀၀၀		၁၁.၀၀၀	၁၀၀%		
	၄	၁၇	၁၁၆	၁၅	၁၁		၄၀	၃၂		၇၂	၇၂		၁၂၇	၁၁၅		၂၀၅၄.၂၅၁	၁၁၀၄.၄၄၄	၁၁၇၃.၈၃၉	၂၂၀.၁၂၀	၂၄၉၈.၄၀၃	၉၃%	၁၀၅၅.၁၉၂	၉၆%
	မှတ်ချက်	လုပ်ငန်းစတင်ရန် ကျန်ရှိသော (၁၂) ခုမှာ နေပြည်တော်ကောင်စီအတွင်းရှိ UNICEF မှ လှူဒါန်းမည့် ဂါလံ ၂၄၀၀ ဆံ့ရေစင်(၃) ခုနှင့် ၂၀၂၆-၂၀၂၇ တွင် ဆောင်ရွက်ရန် လျာထားသော ဂါလံ ၂၄၀၀ ဆံ့ရေစင် (၄) ခု၊																			
		ပဲခူးတိုင်းဒေသကြီးမှ ၂၀၂၆-၂၀၂၇ တွင် ဆောင်ရွက်ရန် လျာထားသော ဂါလံ ၂၄၀၀ ဆံ့ရေစင် (၁)ခုနှင့် မန္တလေးတိုင်းဒေသကြီးမှ UNICEF မှ လှူဒါန်းမည့် တွင်းနက်တူးဖော်ခြင်းလုပ်ငန်း (၄)ခု ဖြစ်ပါသည်။																			

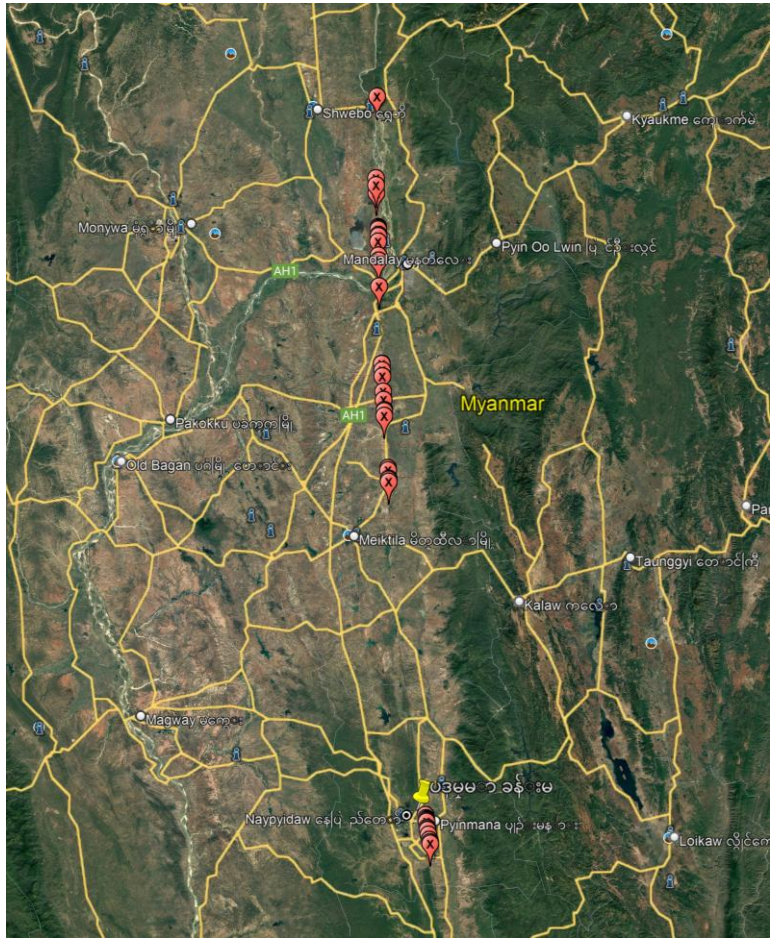
နေပြည်တော်ကောင်စီနယ်မြေအတွင်း ဆောင်ရွက်ချက်များ

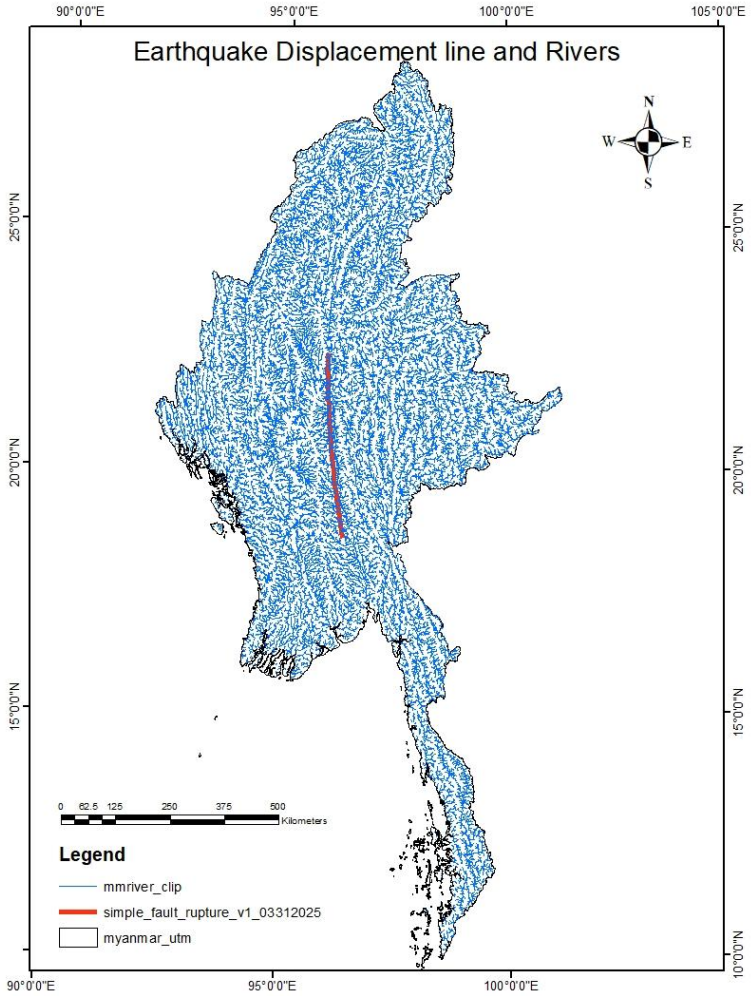


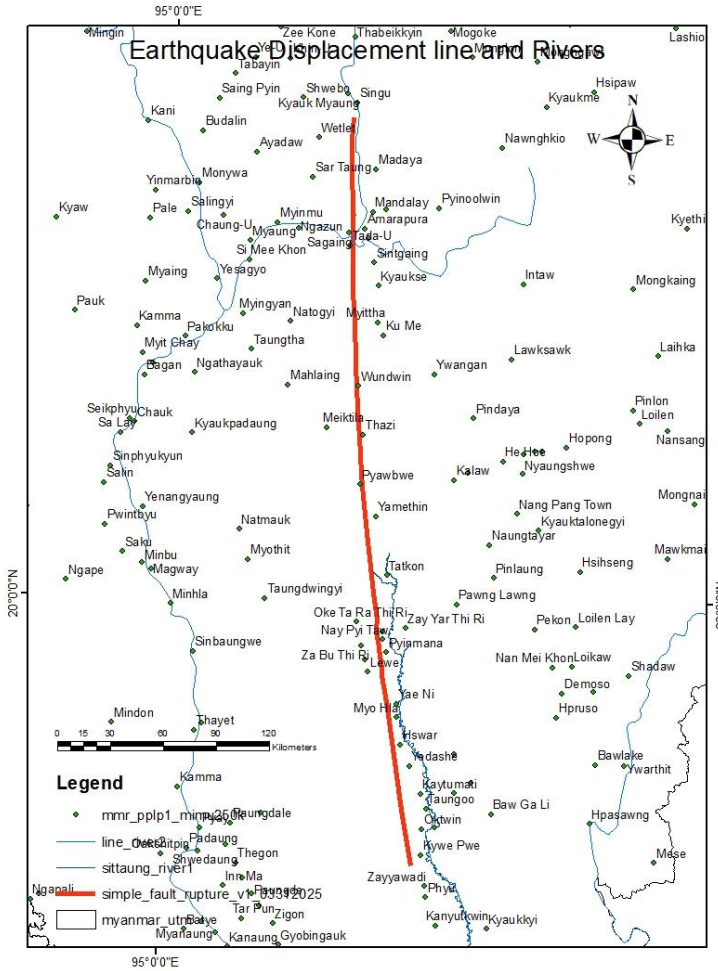




မန္တလေးတိုင်းဒေသကြီးအတွင်း ဆောင်ရွက်ချက်များ


Water Resources condition after Earthquake



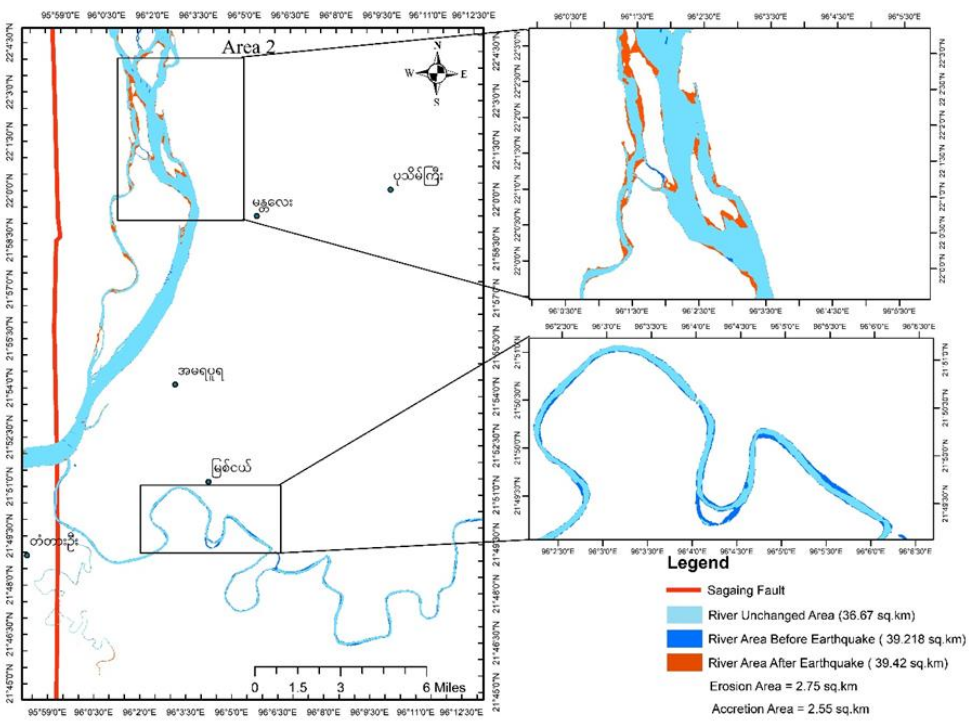


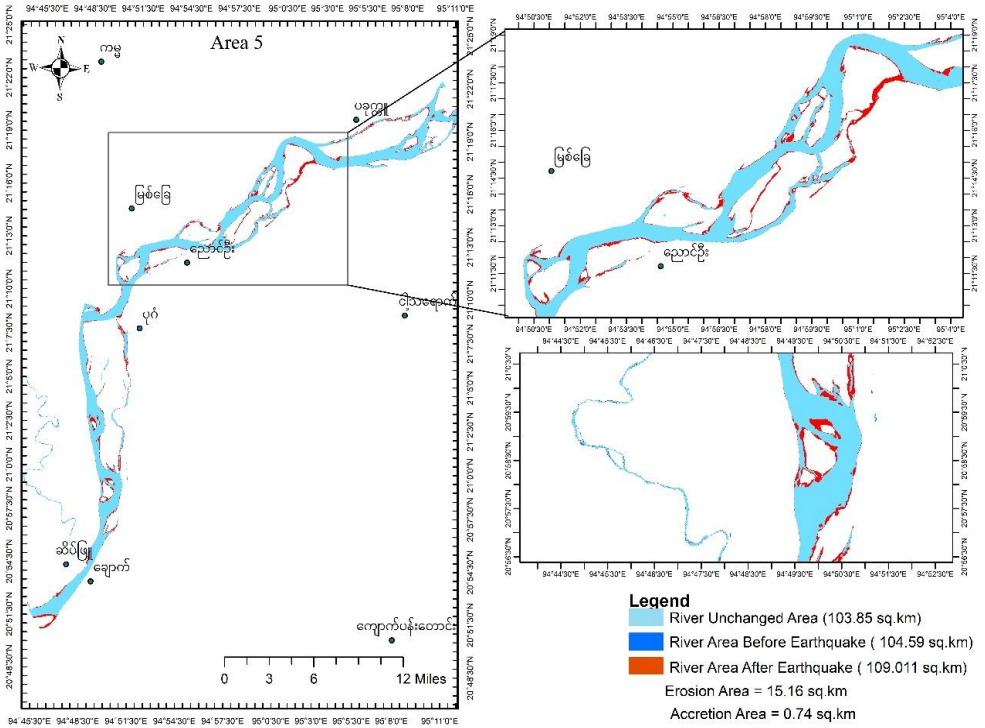


1. Channel shifted or not
2. Water surface area changes or not
3. Water level changes or not

Water Resources condition after Earthquake

1. Channel shifted or not

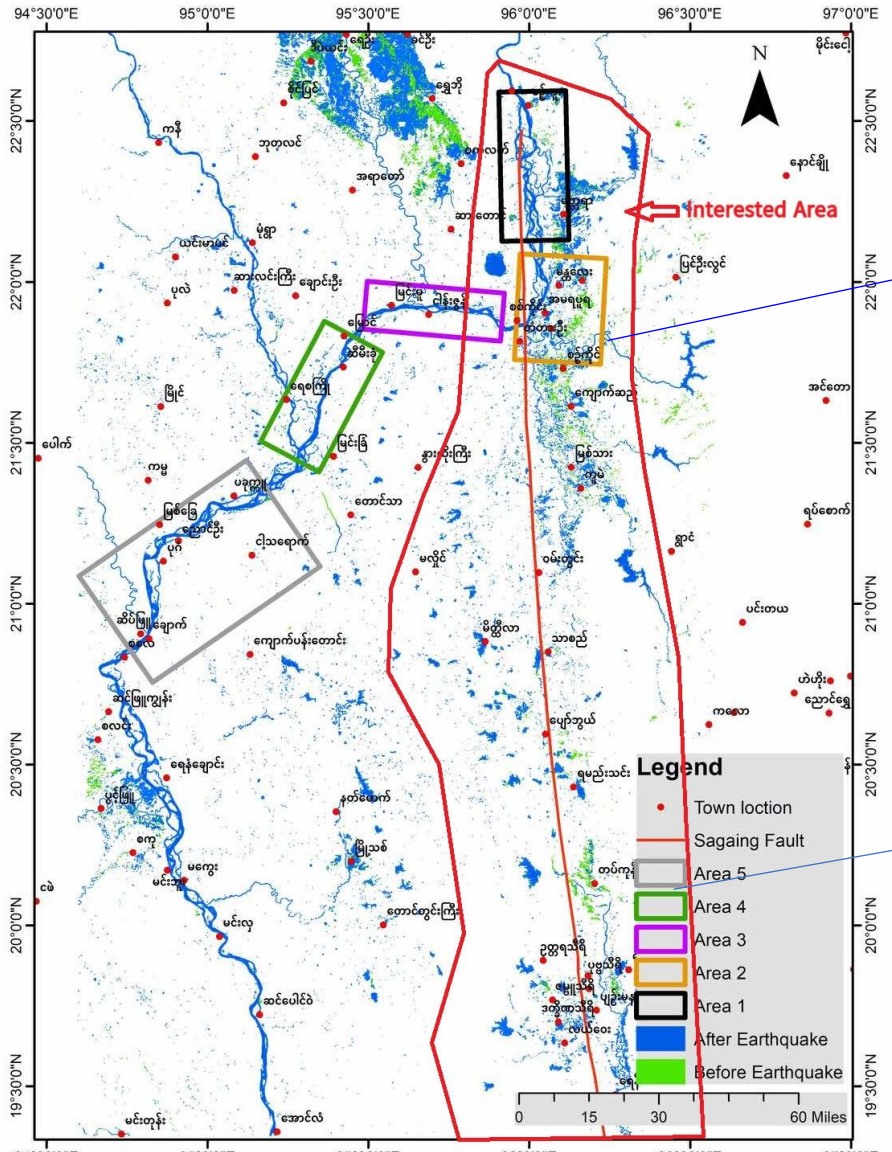


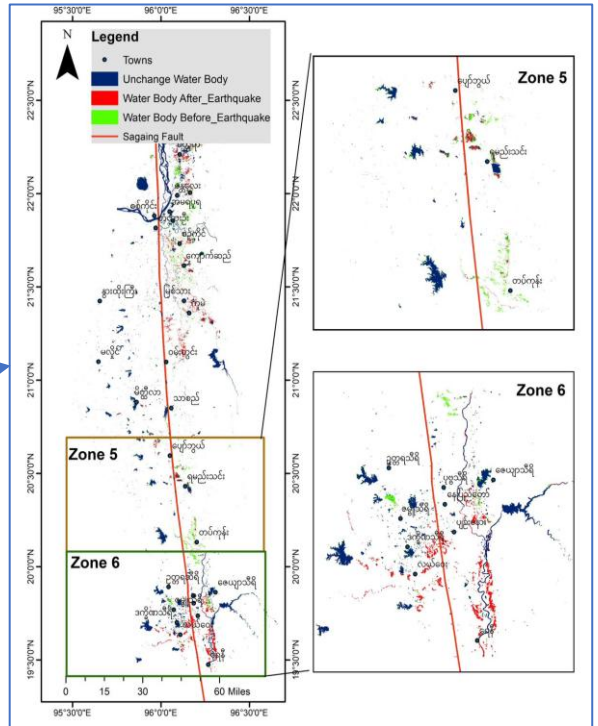


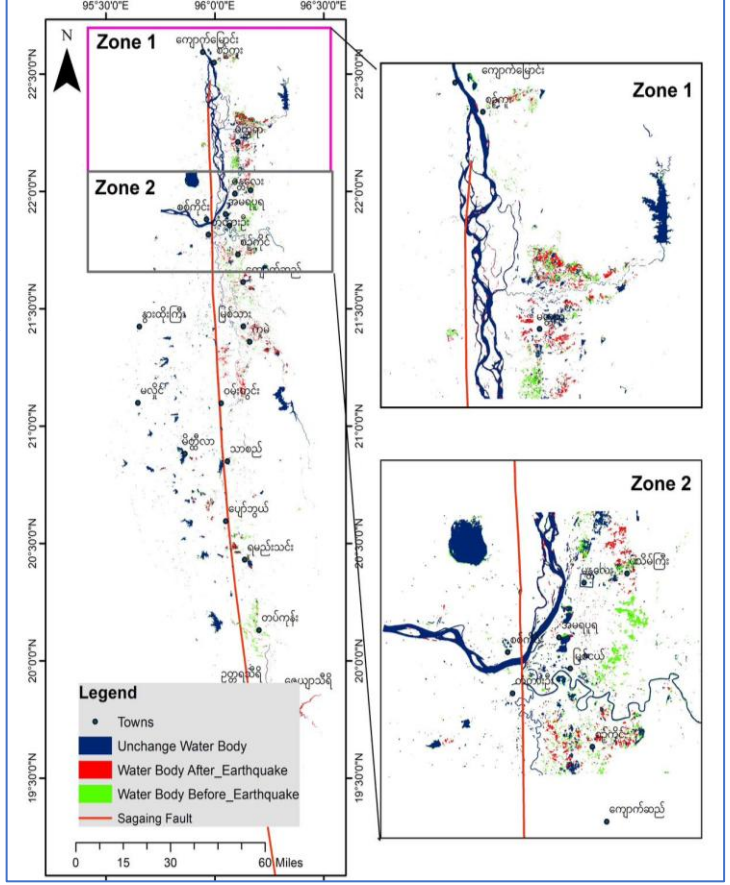
- Along the Ayeyarwady river and other streams, there is no channel shifted
- Water bodies near upstream fault line (Madaya, Mandalay, Sagaing cities), water surface area reduced
- Downstream area of that, there was increased about 10% water surface area
- Continue monitoring is required

Water Resources condition after Earthquake (immediate study)

2. Water surface area





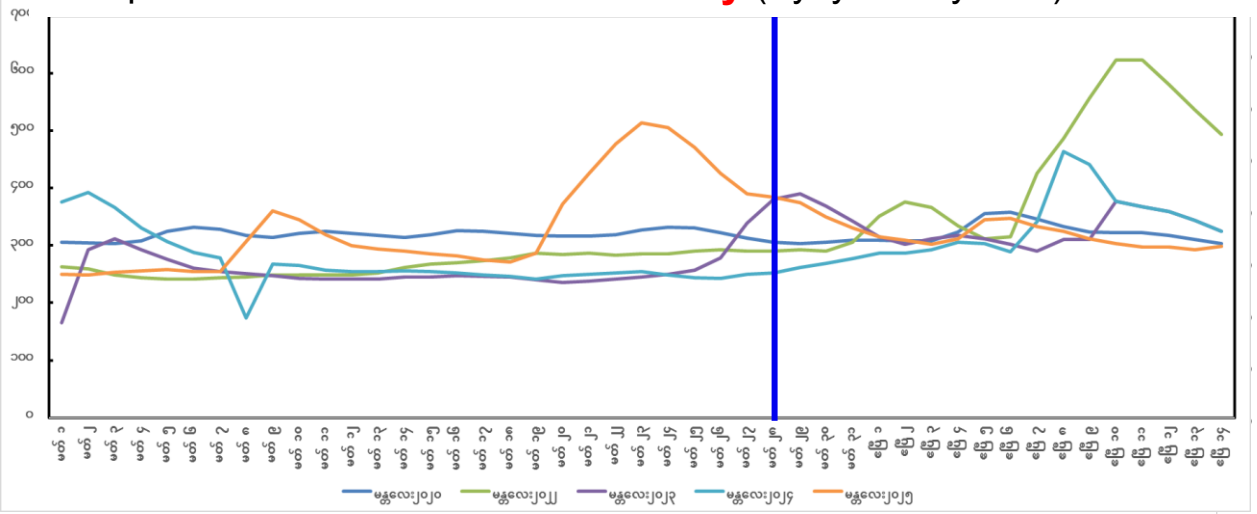


1. Water surface area near the Sagaing and Mandalay area reduced about 12%
2. Middle part of fault zone increased 10%
3. Naypyitaw area increased about 10%
4. Continue monitoring is required

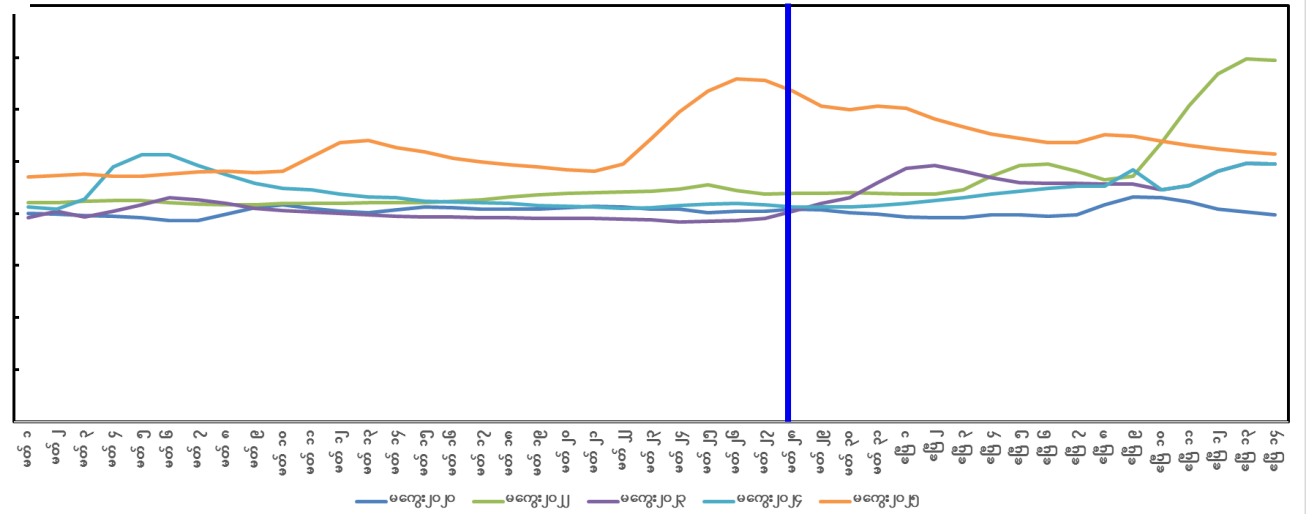
Water Resources condition after Earthquake

3. Water Level Analysis

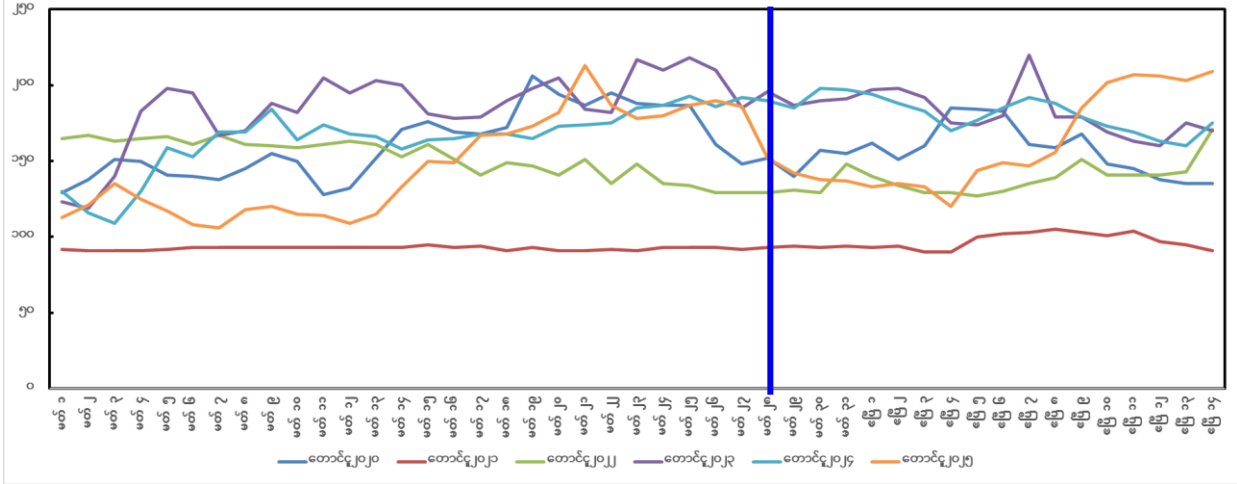
Comparison of Water Level of **Mandalay** (Ayeyarwady river) 2020-2025



Comparison of Water Level of **Magway** (Ayeyarwady river) 2020-2025

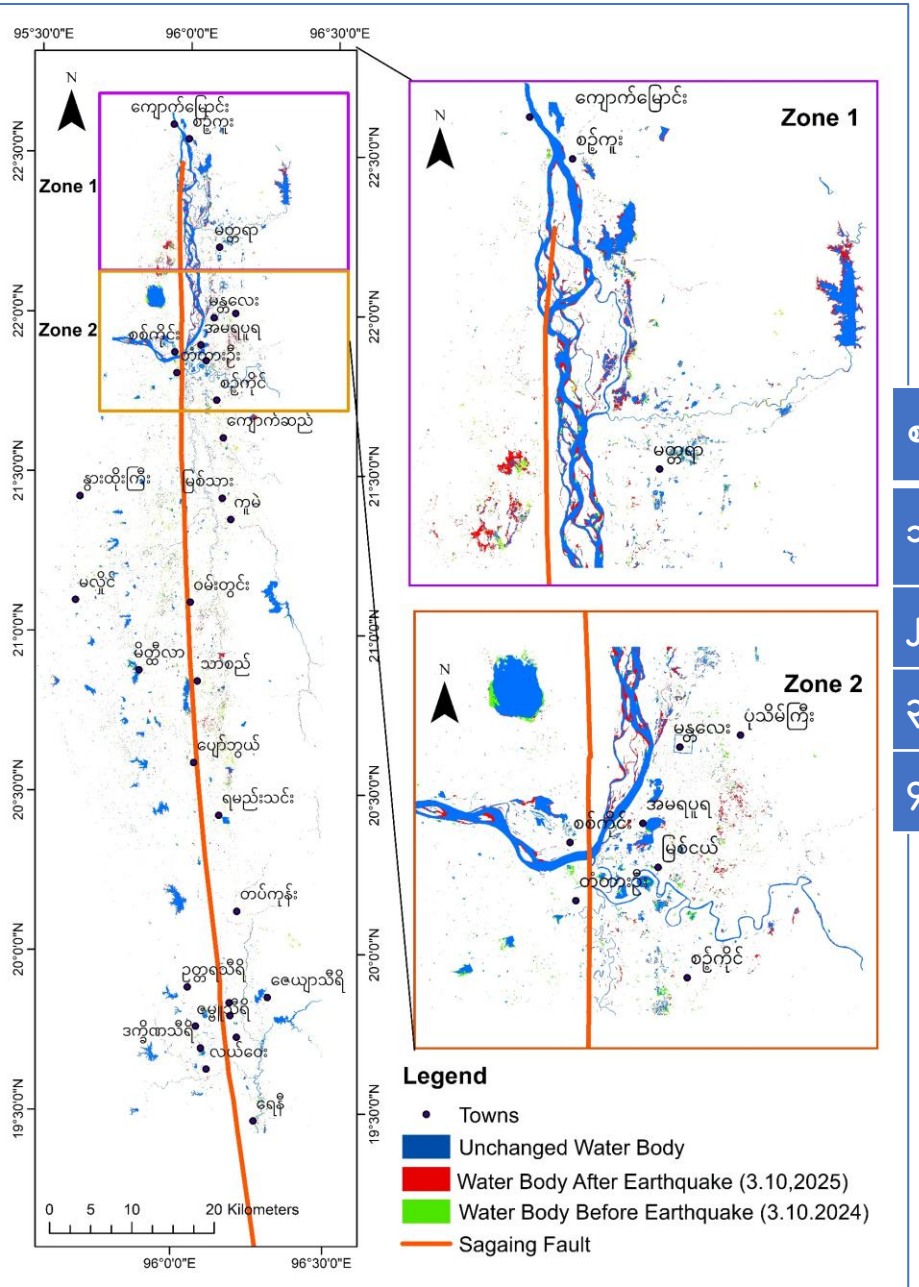


Comparison of Water Level of Taungoo (Sittaung river) 2020-2025



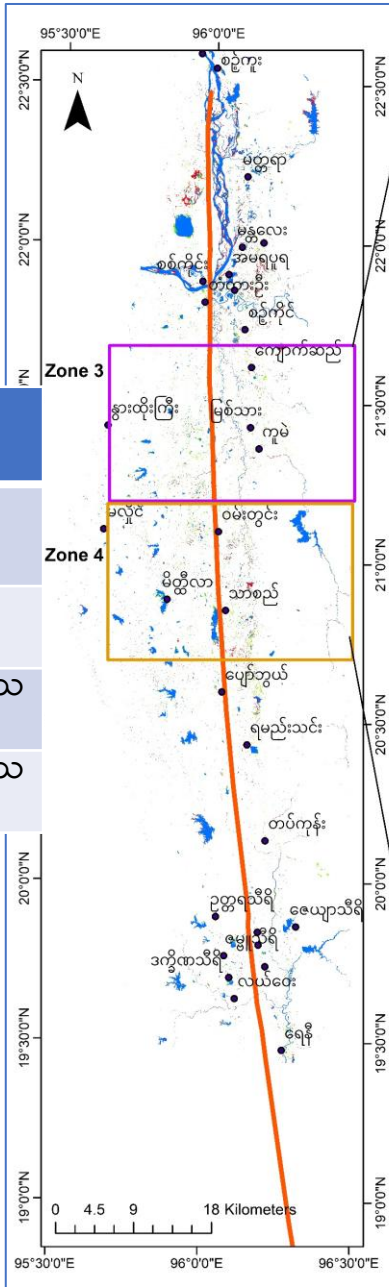
1. Water level of Ayeyarwady river at Mandalay station didn't low down after earthquake
2. Water level of Ayeyarwady river increased in NyaungOo & Magway was increased immediate after earthquake
3. Sittaung river water level didn't show significant low down
4. Continuous monitoring is required

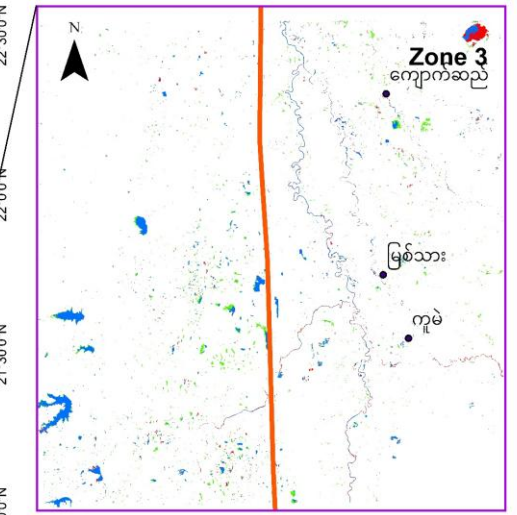
လျင်မတိုင်မီ (၂၀၂၄ ခုနှစ်၊ အောက်တိုဘာလ)နှင့် လျင်လှုပ်ပြီး (၂၀၂၅ ခုနှစ်၊ အောက်တိုဘာလ) နှိုင်းယှဉ်ချက်

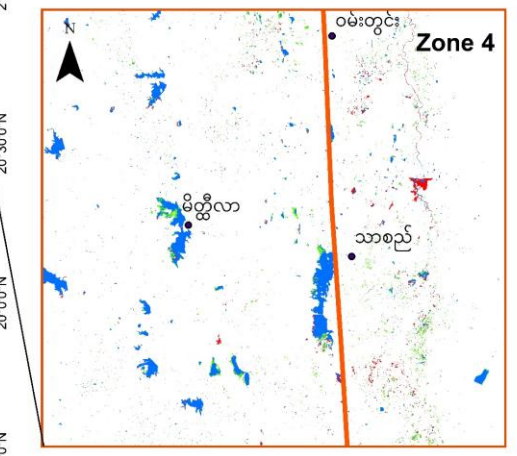


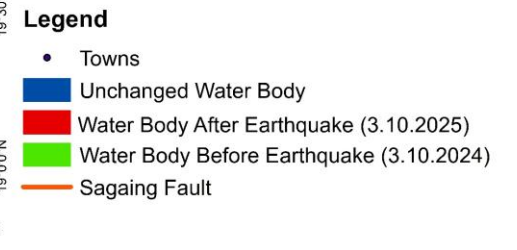
စဉ်	ဧန်သတ်မှတ်ခြင်း	ပြောင်းလဲမှု (sq.km)	Remark
၁။	စဉ့်ကူးမှ မတ္တရာအကြား ရေပြင်ဧရိယာ	30.46	တိုးများလာပါသည်။
၂။	မန္တလေးမှကျောက်ဆည်အကြား ရေပြင်	10.3	တိုးများလာပါသည်။
၃။	ကျောက်ဆည်မှဝမ်းတွင်းအကြား ရေပြင်	-7.9	လျော့နည်းပါသည်။
၄။	ဝမ်းတွင်းမှ ပျော်ဘွယ်အကြား ရေပြင်	-5.68	လျော့နည်းပါသည်။

မိုးရေချိန်နှင့်တိုက်ဆိုင်စစ်ဆေးသင့်ပါသည်။

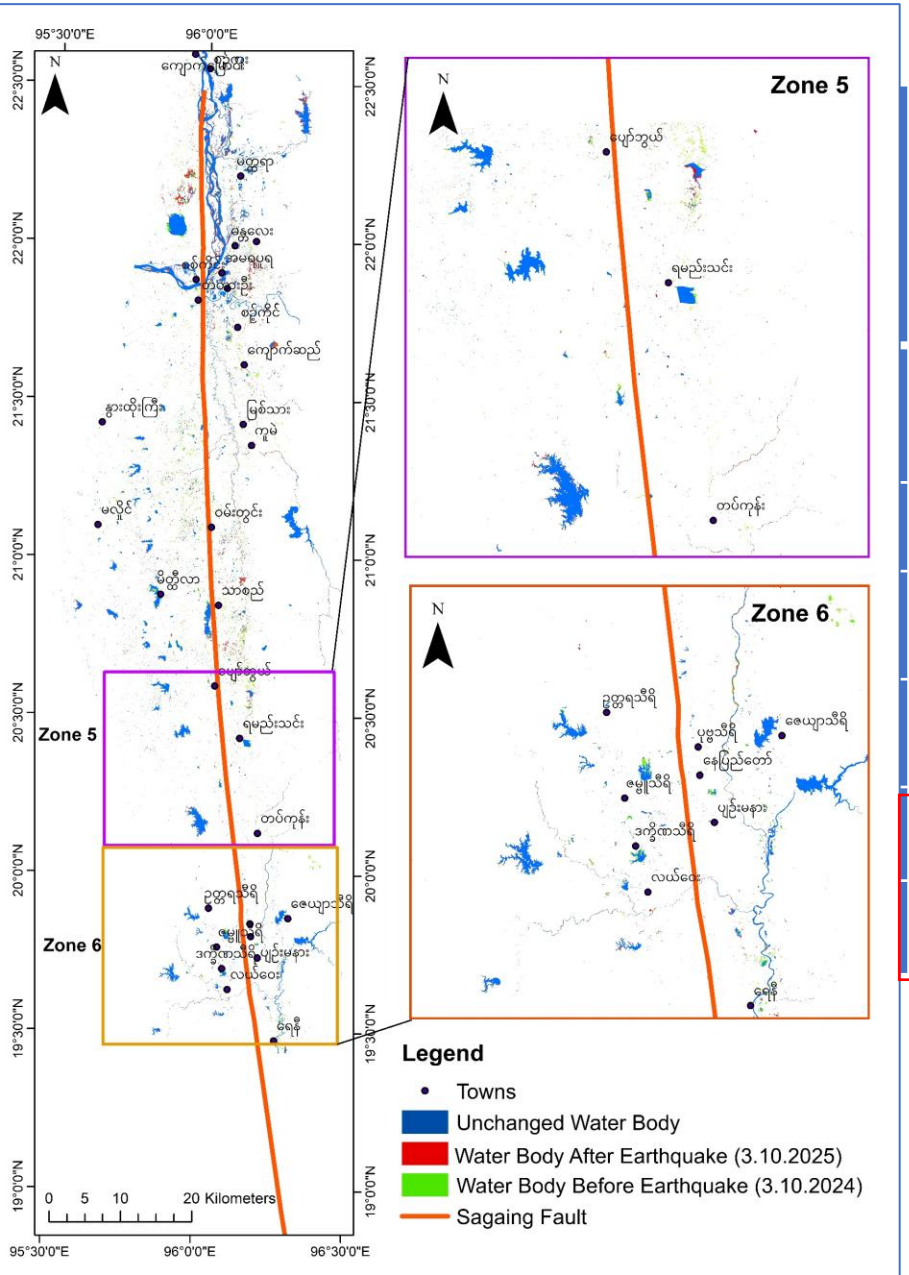








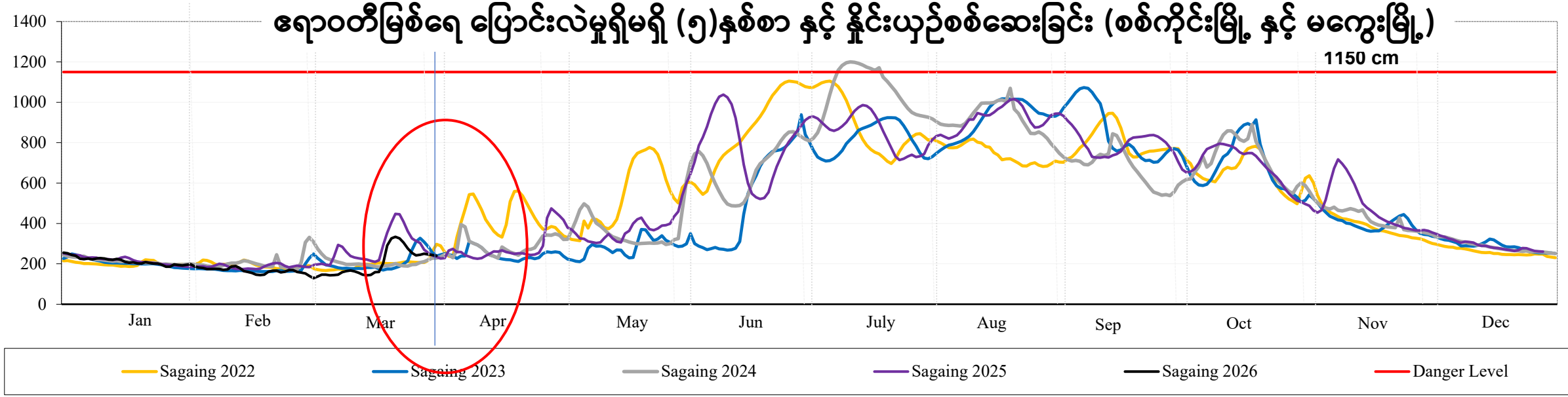
လျင်မတိုင်မီ (၂၀၂၄ ခုနှစ်၊ အောက်တိုဘာလ)နှင့် လျင်လှုပ်ပြီး (၂၀၂၅ ခုနှစ်၊ အောက်တိုဘာလ) နှိုင်းယှဉ်ချက်



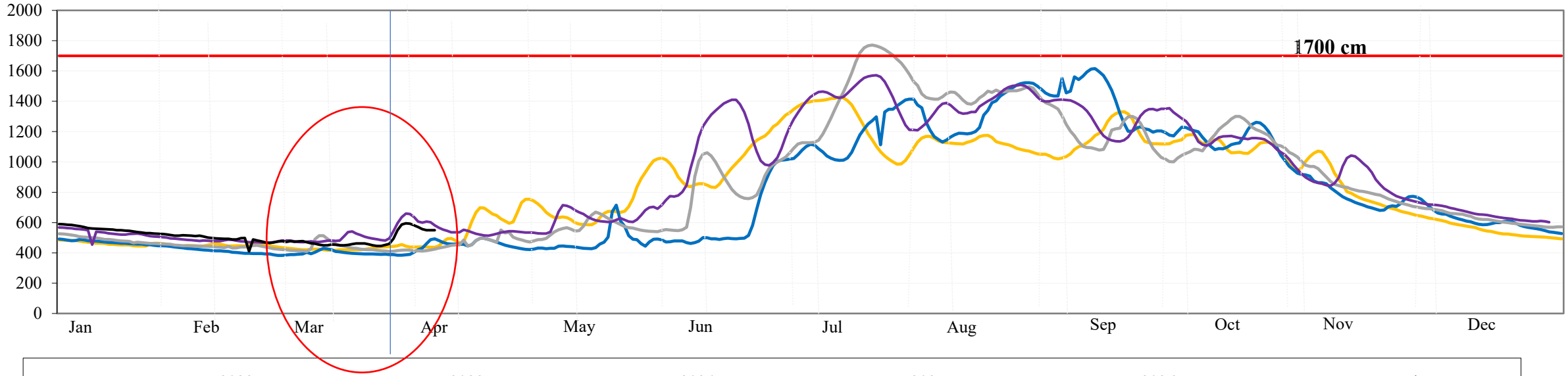
ဧရိယာအမှတ်အသား	လျင်မတိုင်မီ (၂၀၂၄ ခုနှစ်၊ အောက်တိုဘာ) (sq.km)	လျင်ပြီး (၂၀၂၅ ခုနှစ်၊ အောက်တိုဘာ) (sq.km)	ပြောင်းလဲမှု (sq.km)	Remark
စဉ့်ကူးမှ မတ္တရာအကြား ရေပြင်ဧရိယာ	169.51	201.96	30.46	တိုးများလာပါသည်။
မန္တလေးမှကျောက်ဆည်အကြား ရေပြင်	171.00	181.29	10.3	တိုးများလာပါသည်။
ကျောက်ဆည်မှ ဝမ်းတွင်းအကြား ရေပြင်	47.63	39.74	-7.9	လျော့နည်းပါသည်။
ဝမ်းတွင်းမှ ပျော်ဘွယ်အကြား ရေပြင်	128.30	122.61	-5.68	လျော့နည်းပါသည်။
ပျော်ဘွယ်မှတပ်ကုန်းအကြား	62.94	60.42	-2.52	လျော့နည်းပါသည်။
နေပြည်တော်နှင့် ရေနီအကြား	78.64	74.12	-4.52	လျော့နည်းပါသည်။

မိုးရွာသွန်းမှုနှင့် တိုက်ဆိုင်စစ်ဆေးရန်လိုအပ်ပါသည်။

Comparison Hydrograph WL 2022, WL 2023, WL 2024, WL 2025, WL2026 and Danger Level at Sagaing (Ayeyarwaddy River)



Comparison Hydrograph WL 2022, WL 2023, WL 2024, WL 2025, WL2026 and Danger Level at Magwe (Ayeyarwaddy River)



Conclusions

- ❑ Groundwater tube wells are impacted seriously (Sagaing, Mandalay and Naypyitaw)
- ❑ Water quality monitoring also need to continue
- ❑ Studied impacts of earthquake on the water resources with our own resources
- ❑ Generally, earthquake didn't impact surface water flow
- ❑ We should collaborate with Research Institutions and other Development Partners for WRM and DRR
- ❑ **Build back Better after any Disaster**

Thank you for your kind attention !!