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National Monitoring Activities and Plans

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National Monitoring Activities and Plans

- Monitoring site**
- DMH's laboratory & Equipments**
- Wet Deposition monitoring**
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- QA/QC Activities**
- Data and Methodology**

Future Plan

Introduction

Location

Latitudes = $9^{\circ} 58'$ to $28^{\circ} 29' \text{ N}$

Longitudes = $92^{\circ} 10'$ to $101^{\circ} 10' \text{ E}$

- Situated in the Southeast Asia
- Total Area 678,000 Sq.Km (about)
- Sub-tropical region
- **Annual Rainfall:** Range 600 to 5300mm
- **Maxi Temp:** 38° C (in Central Myanmar)

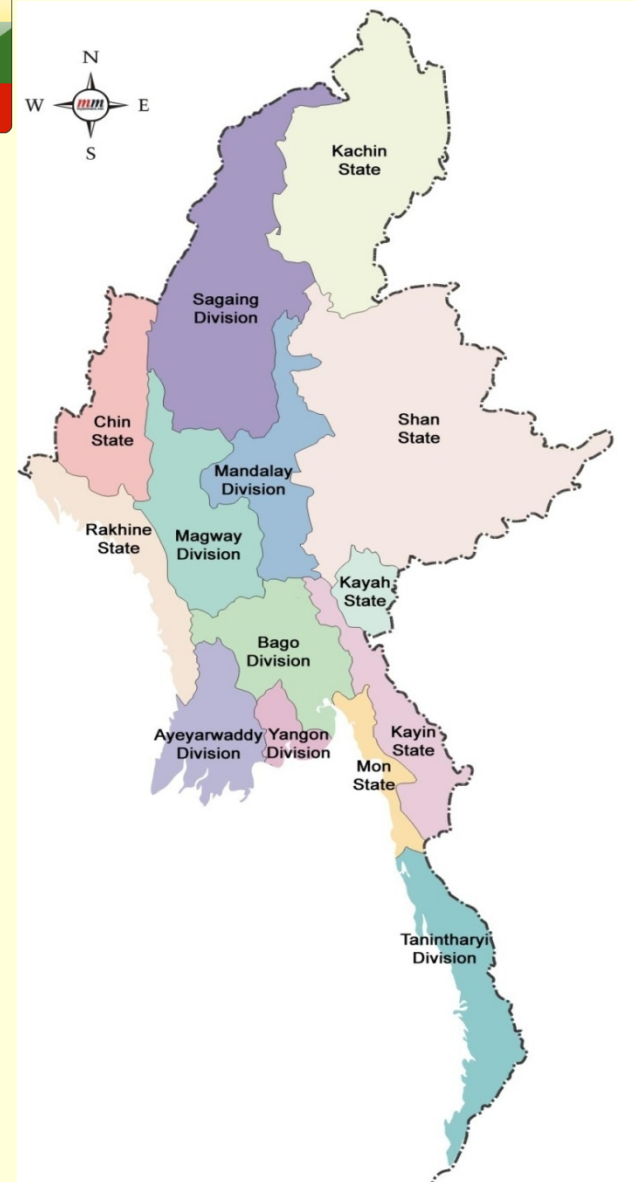
During March and April

- **Mini Temp:** 7° C (in Northern part of Myanmar)

During Jun and Feb

Major four rivers in Myanmar

Ayeyarwady, Chindwin, Thanlwin and Sittaung



Background

- The Laboratory of Department of Meteorology and Hydrology (DMH) has been established since 1998.
- In 2003, DMH started rain water collection by buck sampler at Yangon.
- Myanmar has joined Acid Deposition Monitoring Network in East Asia (EANET) in 2005 and Myanmar became the participating country of EANET.
- After Myanmar became member country of EANET, DMH is designated as National Center for EANET.
- Yangon (Kaba-Aye) was chosen as an Urban site for wet deposition monitoring in 2006.
- Network Center of EANET, Acid Deposition and Oxidant Research Center(ADORC), now Asia Center for Air Pollution Research Center (ACAP) has provided a Horiba pH/COND meter to measure the rain water samples.
- ADORC provided the two equipments in April 2007. There are Wet Sampler and Digital Balance. After, the systematic rain water collection by Wet Sampler was started in June 2007.

- In July 2009, JICA provided two instruments, Ion chromatography and Ultrapure water production system.
- Rain water samples are analyzed by IC (Ion chromatography) once a month.
Cation- (NH_4^+ , Na^+ , K^+ , Ca^{2+} , Mg^{2+}), Anion- (SO_4^{2-} , NO_3^- , Cl^-)
- In 2011, DMH extended to monitor for air pollution because air pollution problem is being faced in urban community, urban human health, properties and the environment. So, it is necessary to prevent the impact of air pollution. DMH received Filter Pack Method Sampler which Asia Center for Air Pollution Research Center (ACAP) provided to conduct the air pollutant concentration .
- Air quality monitoring have been started at Yangon (Kaba- Aye)Urban site since 15th November 2011.
- Sampling is taken for air concentration by filter pack method sampler biweekly.

National Monitoring Activities

•Monitoring Site

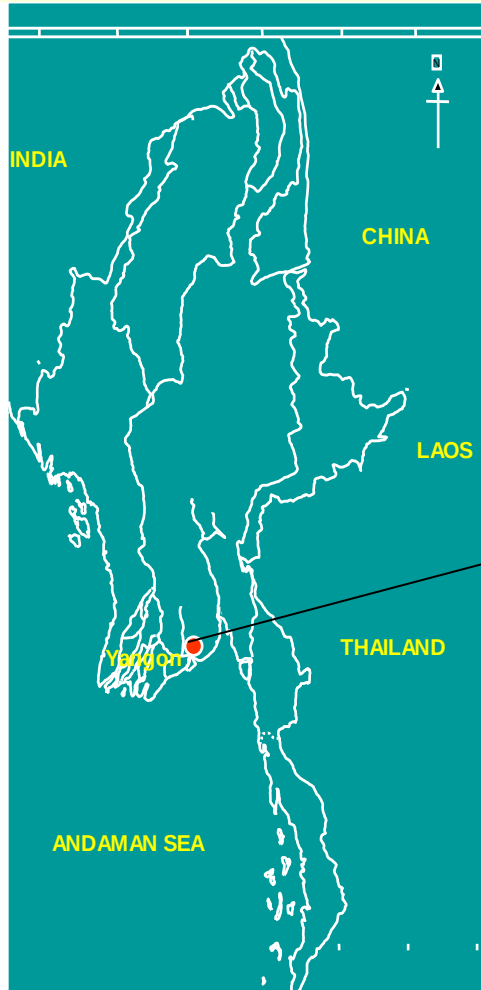
Site Name Yangon
(Kaba-Aye, DMH) Site

Classification Urban Site

Latitude 16.5°N
Longitude 96.11°E

Altitude 21.7 m above M.S.L

Height of funnel 7.62m Sampling
From the round level



Yangon (Kaba-Aye, DMH) Site

National Monitoring Activities

DMH's Laboratory



National Monitoring Activities

Equipments



Wet Sampler(19.6.2007)



Electric Balance (27.11.2009)



pH / Cond Horiba Meter



Filter Pack Sampler (2011)



Water Purification (2014)



**Ion Chromatography
(27.11.2009)**

National Monitoring Activities

Wet Deposition Monitoring

Yangon (Kaba Aye - DMH) was chosen as an Urban site for wet and dry deposition monitoring.

Set up - started in 2007
Sampling Interval - Daily Collection
Weekly Composite

Measurement

Parameters - pH, EC
- NH_4^+ , Na^+ , K^+ , Ca^+ , Mg^{2+}
- SO_4^{2-} , NO_3^- , CL^-



Collection



Weighing



Measuring

National Monitoring Activity

Dry Deposition Monitoring

Set up : started in Nov 2011

Sampling Interval : Biweekly

Parameters Cations : NH_4^+ , Na^+ , K^+ , Ca^{2+} , Mg^{2+}
 Anions : SO_4^{2-} , NO_3^- , CL^-

Ion Analysis : Once a month



Preparing



Fitting



Filtering

National Monitoring Activities

Dry Deposition Monitoring

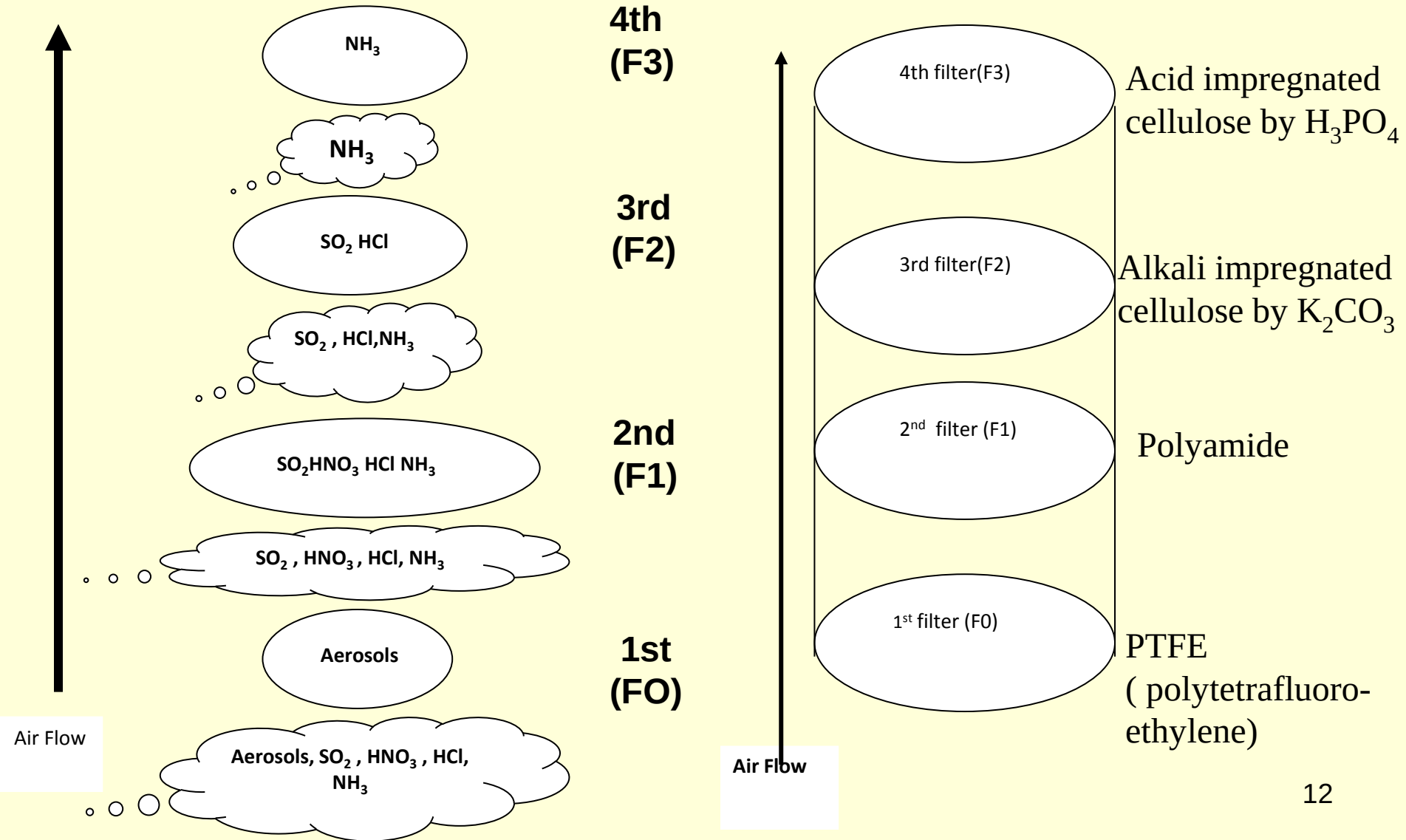


Four-stage filterpack sampler



Methodology

Four-stage filter pack

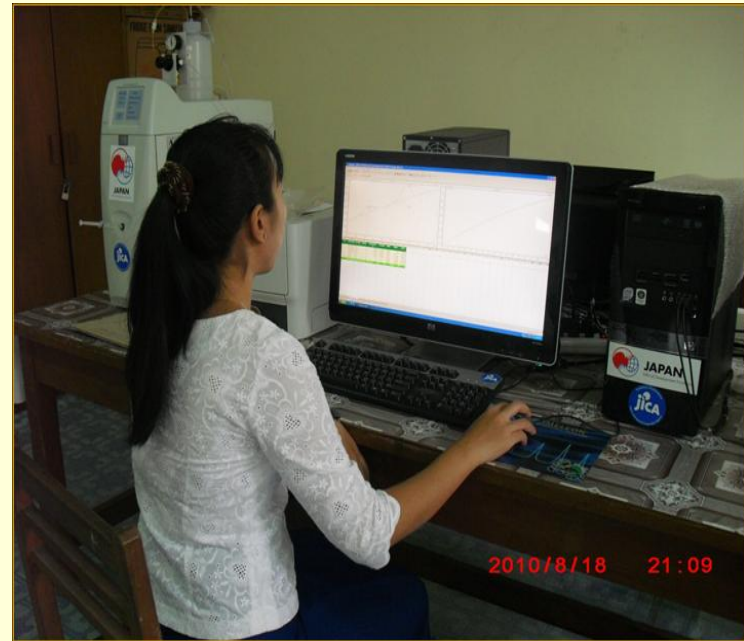


Wet & Dry Deposition Monitoring

Ion Analysis for wet and dry deposition



Ion Analysis



Data recording and reporting

QA/QC Activities

- Made Standard Operation Procedures (SOPs)
- Operation and maintenance of laboratory equipments
- Calibration of pH meter
- Maintenance of Sampling devices
- Collection of Wet Sampler
- Sample handling preservation and transport to laboratory
- Field blank test
- Test methods used in the analysis of required parameter for samples and quality control samples
- R1 and R2 Check
- Reporting of results

State of acid Deposition in Myanmar

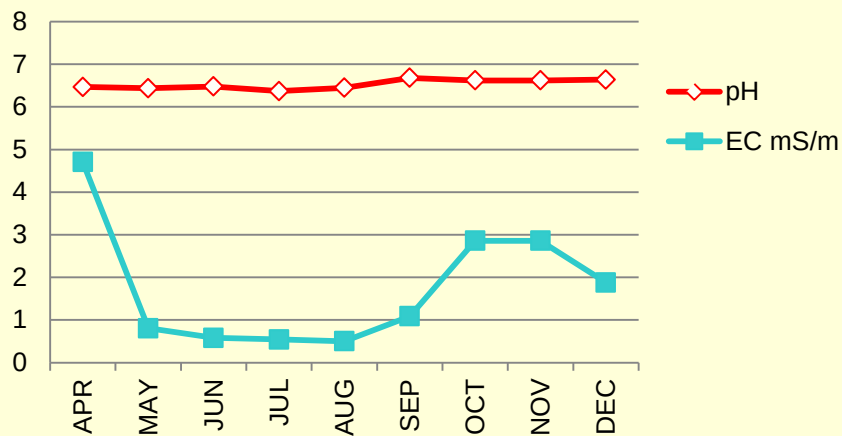
Annual means of pH and EC on wet deposition at Yangon
(Kaba-Aye)

Station	Year	pH			EC mS/m			Precipitation amount (mm)		
		Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Yangon (Kaba- Aye)	2010	5.75	6.85	6.49	0.36	8.75	1.13	8	192	88
	2011	6.20	7.09	6.52	0.30	5.28	0.94	4	246	102
	2012	5.83	7.10	6.60	0.31	4.50	1.54	3	246	78
	2013	6.06	6.99	6.61	0.42	8.30	1.62	1	270	93
	2014	6.00	6.98	6.69	0.42	5.73	1.28	4	295	103

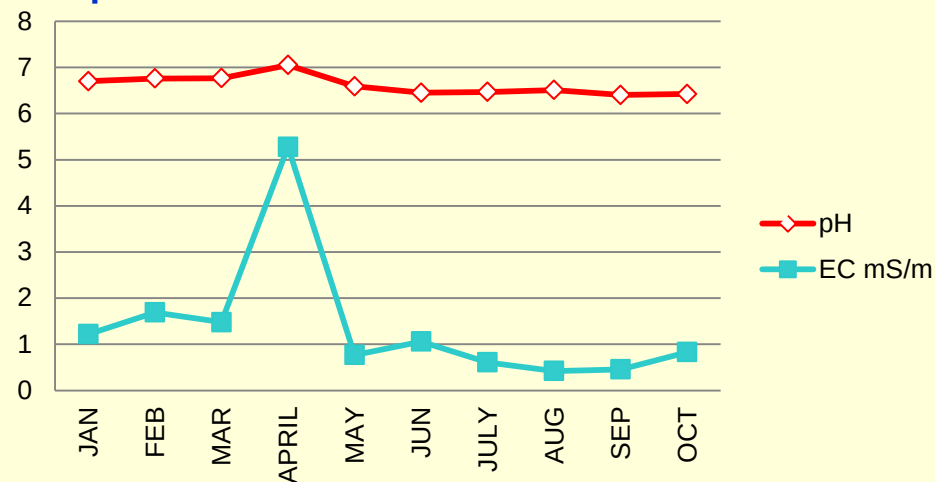
Data and Methodology

Rain Water Quality

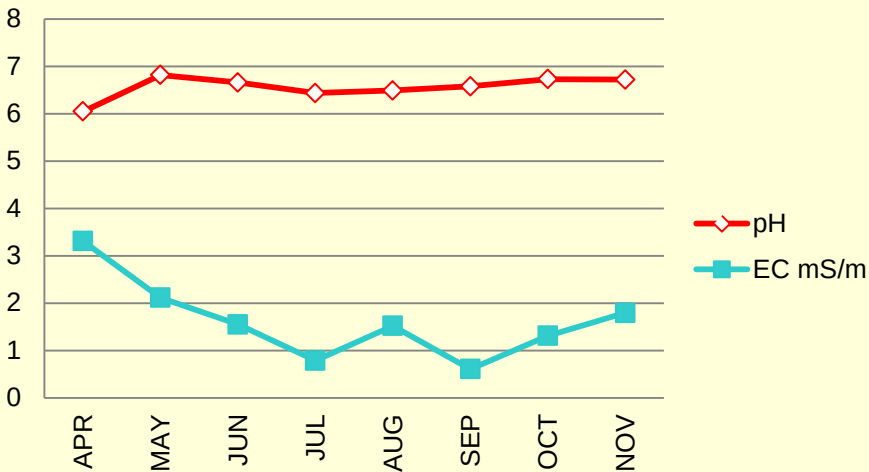
pH & EC mS/m in 2010



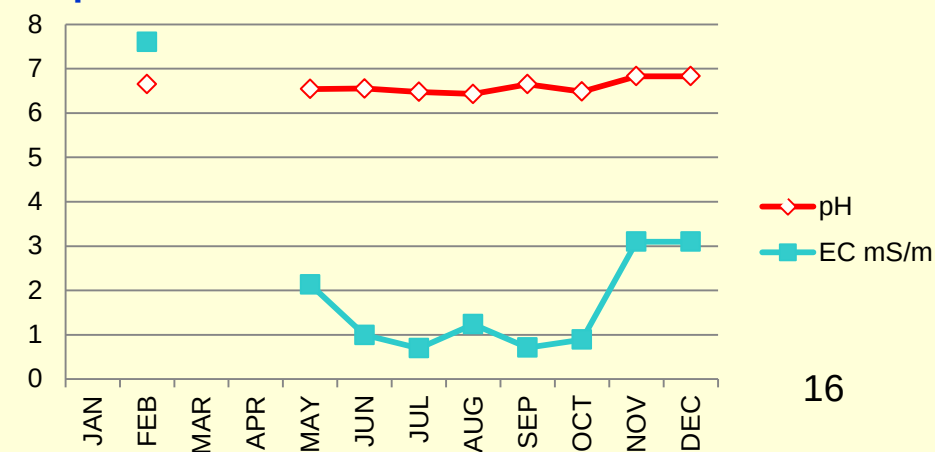
pH & EC mS/m in 2011



pH & EC mS/m in 2012



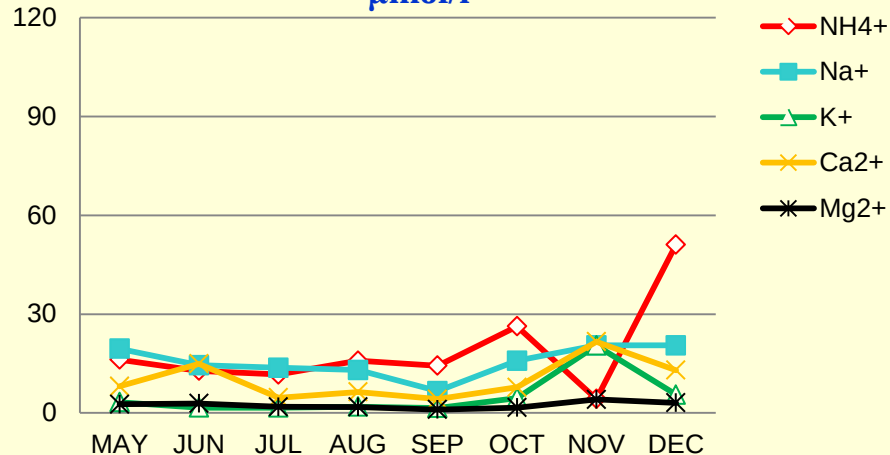
pH & EC mS/m in 2013



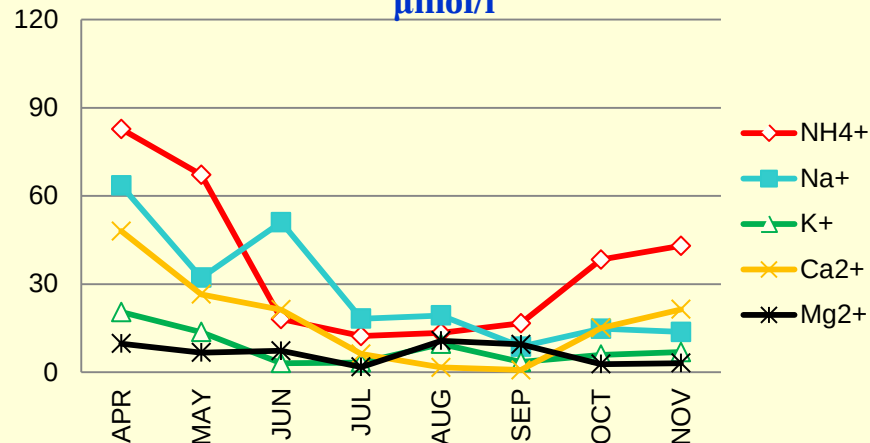
Data and Methodology

Rain Water Quality

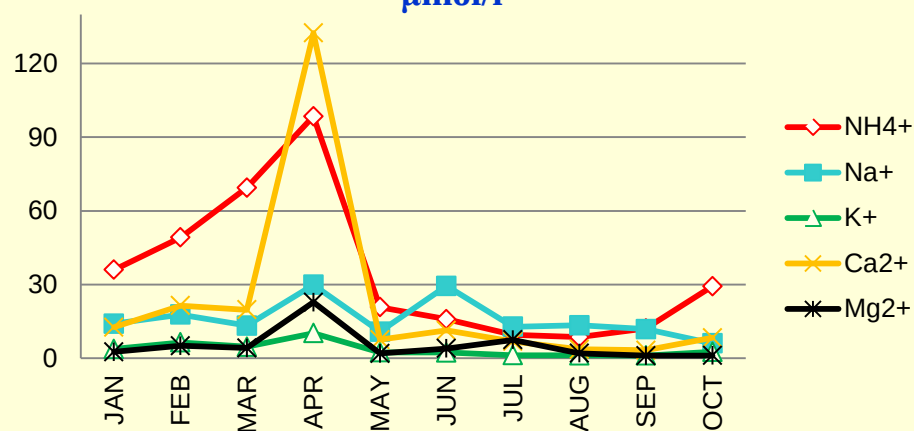
Concentration of Cation for Wet in 2010
 $\mu\text{mol/l}$



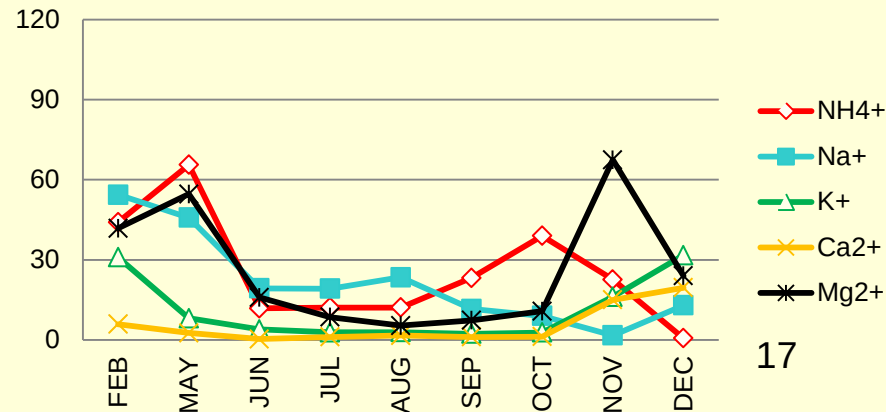
Concentration of Cation for Wet in 2012
 $\mu\text{mol/l}$



Concentration of Cation for Wet in 2011
 $\mu\text{mol/l}$



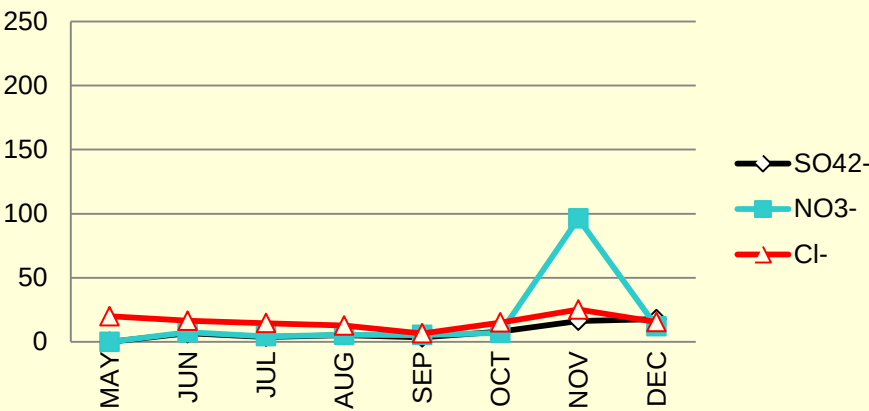
Concentration of Cation for Wet in 2013
 $\mu\text{mol/l}$



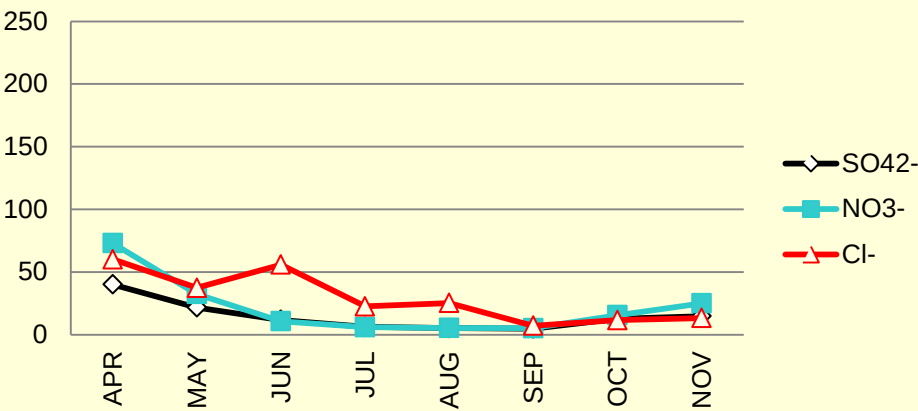
Data and Methodology

Rain Water Quality

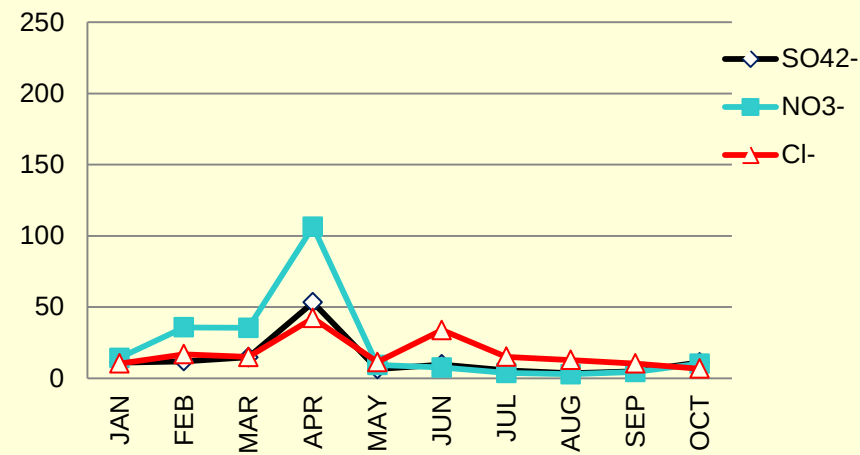
Concentration of Anion for Wet in 2010
 $\mu\text{mol/l}$



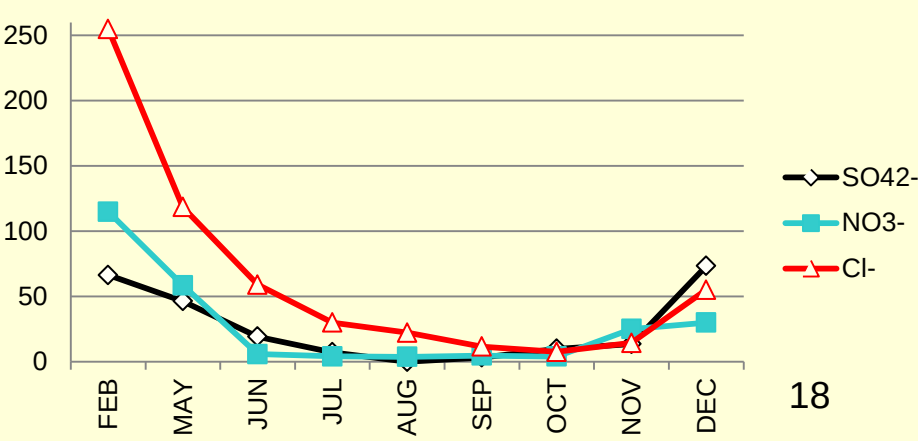
Concentration of Anion for Wet in 2012
 $\mu\text{mol/l}$



Concentration of Anion for Wet in 2011
 $\mu\text{mol/l}$



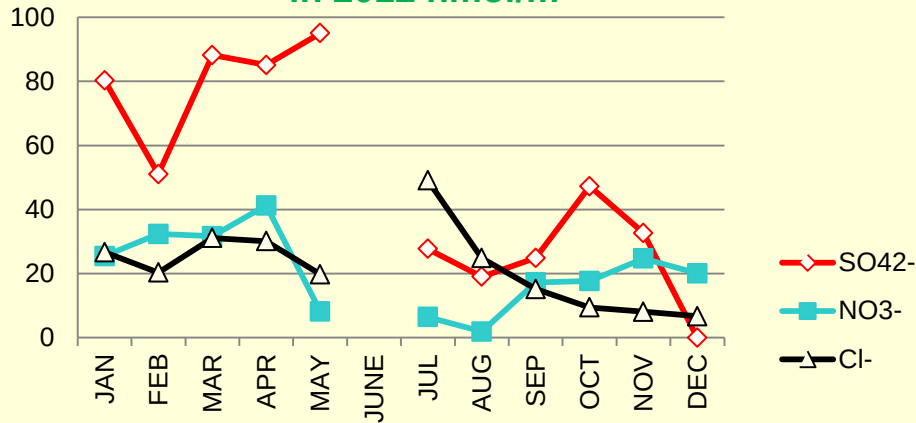
Concentration of Anion for Wet in 2013
 $\mu\text{mol/l}$



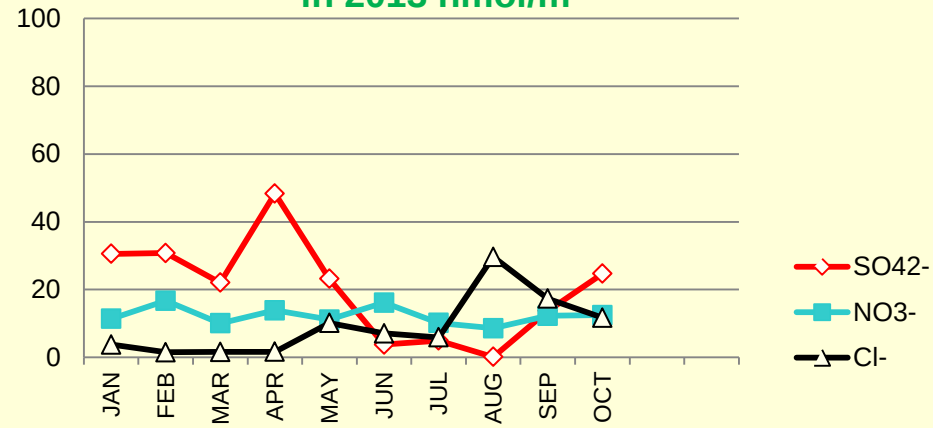
Data and Methodology

Air Quality

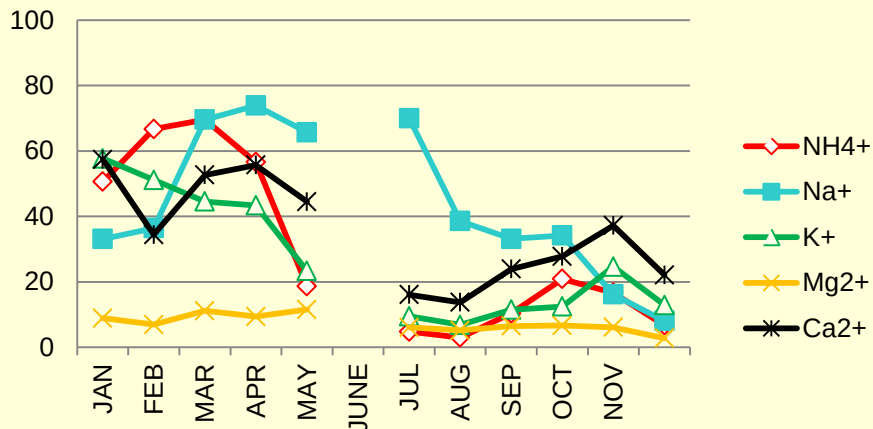
Concentration of Anion (Partical) for Dry in 2012 nmol/m³



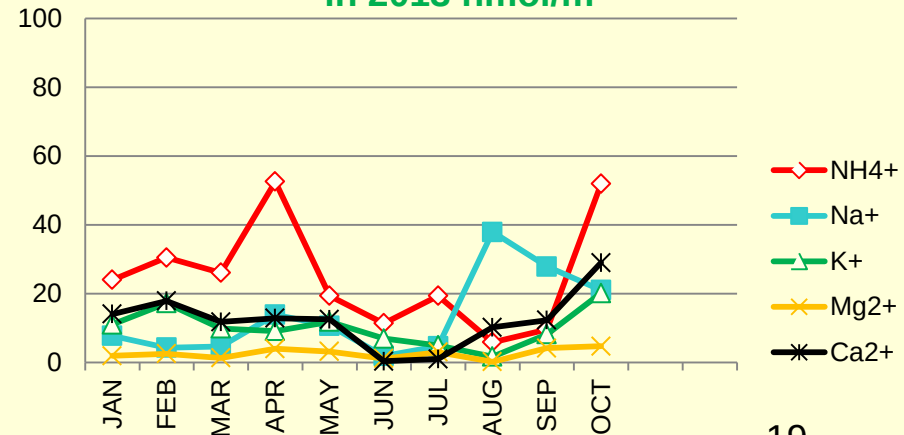
Concentration of Anion (Partical) for Dry in 2013 nmol/m³



Concentration of Cation(Partical)for Dry in 2012 nmol/m³



Concentration of Cation (Partical) for Dry in 2013 nmol/m³



Nowadays,

Air pollution problem is being faced in urban community.

- Imposing threat to urban human health, properties and the environment.
- To prevent the impact of air pollution, it is necessary to have reliable information on the ambient air quality in different activity zone.

Relevant governmental agencies are :

Yangon/Mandalay City Development Committee,
Environmental Conservation Department,
Department of Health,
Department of Atomic Energy,
Irrigation Department,
Water Resources Utilization Department etc.

Future Plan

- To upgrade wet and dry monitoring activities, installation of advance instruments, technology transfer, public awareness activities, so on.
- To install PM_{2.5} and O₃ monitoring instrument at DMH site by own government budget.
- Myanmar will initiate the monitoring of inland and aquatic environment and soil and vegetation in the near future.
- To cooperate and collaboration with other relevant departments and international organization.

THANK YOU