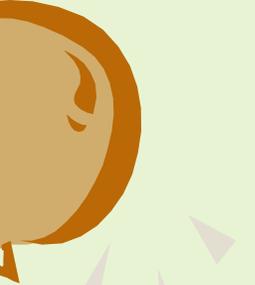




5th International Forum on Sustainable Future in Asia
5th NIES International Forum



Air Quality Assessment Initiatives in Myanmar



Dr. Than Htut (Honorary Professor)

Department of Occupational and Environmental Health

University of Public Health, Myanmar

JAN 21-22, 2020

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Introduction

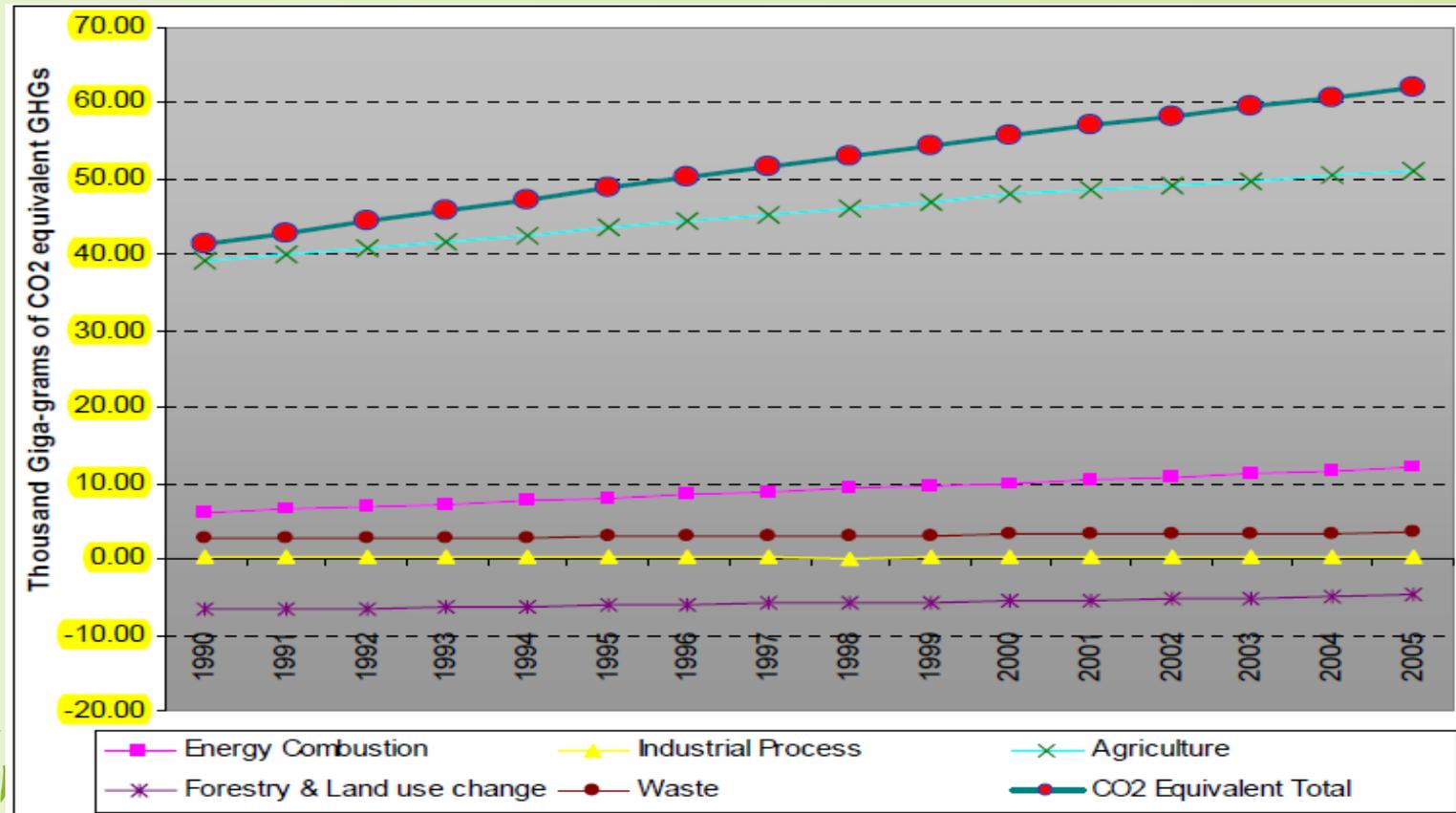
Sustainable Development phenomena had shown off as a formal global process in **1992**

1990

National Commission for Environmental Affairs (NCEA) a signatory commission of Myanmar was formed in order to manage and coordinate environmental matters in the country

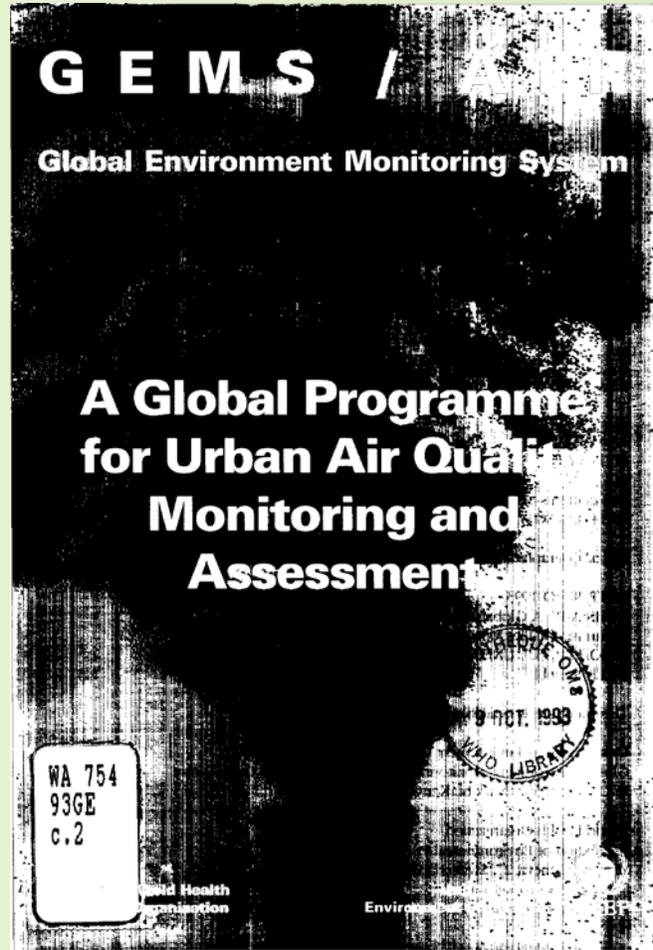
- 
- › **1994** National Environmental Policy
 - › **1997** Myanmar Agenda 21
 - › Myanmar conducted its **first GHG inventory** with the assistance of **ADB in 1997** under the **Asia Least Cost Greenhouse Gas Abatement Strategy (ALGAS)** project
 - › The inventory is for **base year 1990** and includes **annual projections of GHG emissions through to year 2020**

GHG Emissions in CO₂ Equivalent – 1990 to 2005



Source: ALGAS Study (ADB & et al, 1998), CSO 1989, 1993, 1997 & 2003

1995



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ENGINEERING RESEARCH INSTITUTE A CONSTITUENT LABORATORY OF CSIR



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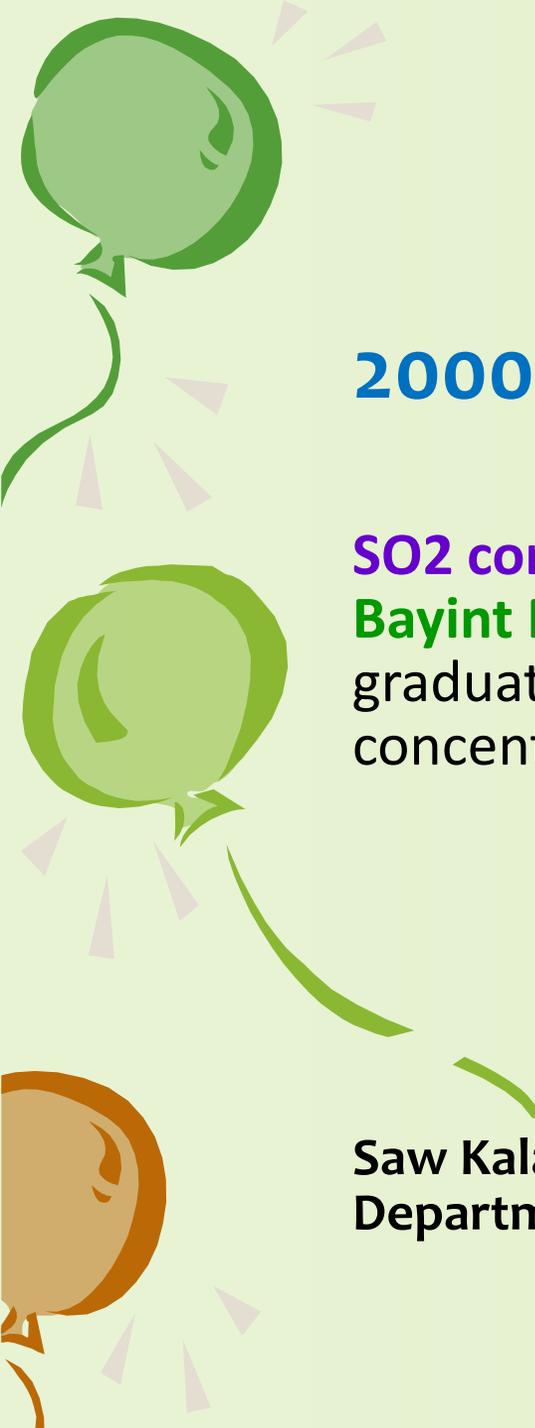
1996 “Review of GEMS/AIR Monitoring Stations South East Asia Region”

Sponsored by UNEP and WHO, Nehru Marg, Nagpur



1996 UNEP/WHO study undertaken with the Occupational Health Unit of the Department of Health

spoke of worsening air pollution in Yangon linked to the use of low octane number petrol containing lead and other additives (National Environmental Engineering Research Institute, 1996)



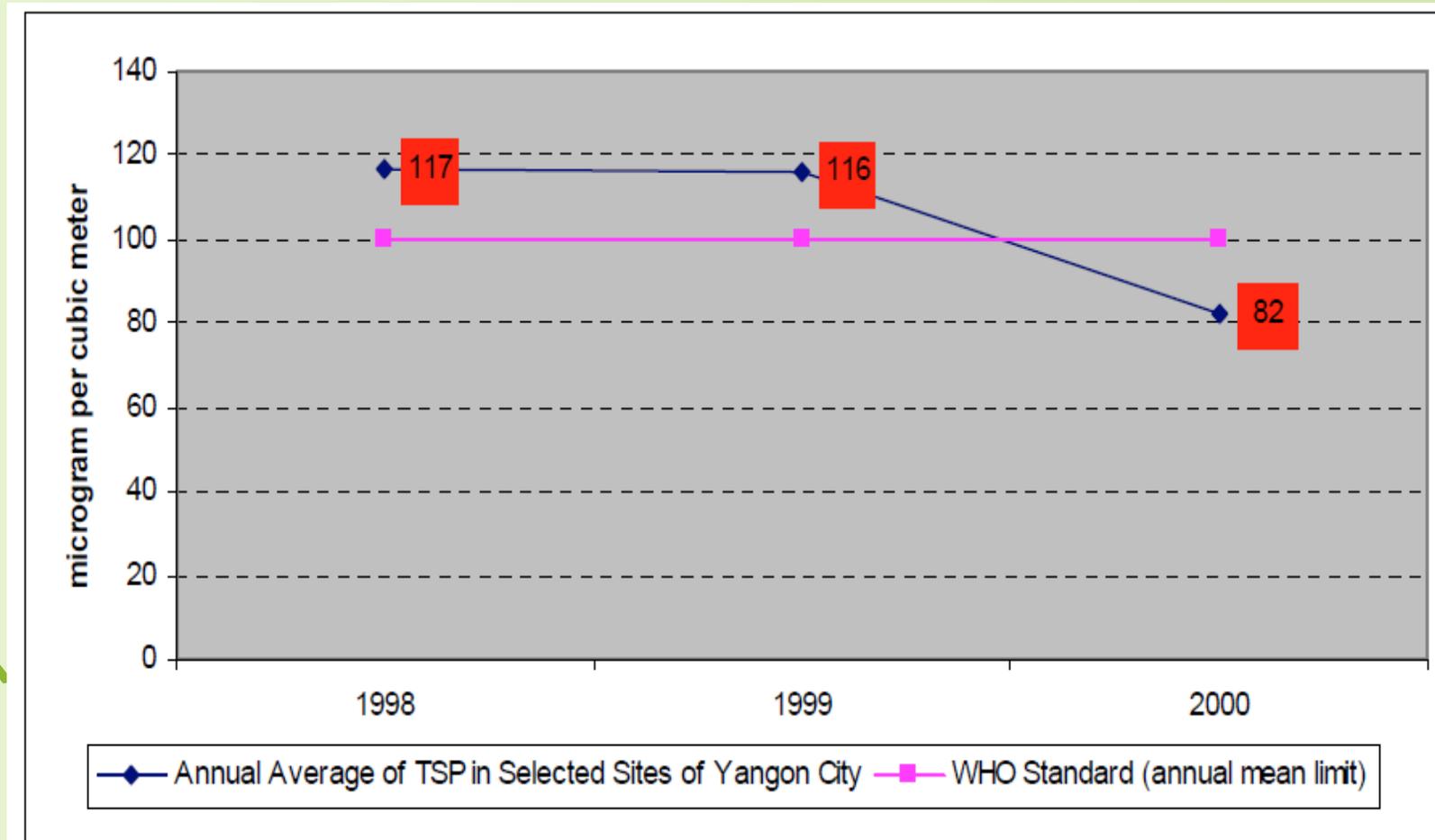
2000

SO₂ concentrations for the period of 1999-2000 in residential areas around Bayint Naung Road, Hlaing Township were expressed in one of the post graduate thesis of Yangon University. As in the case of TSP, dry season concentrations of SO₂ were well above those of the wet season

Saw Kalayar. 2000. Sulphur Dioxide in Yangon City Area Near Chaung Wa. M.Sc. thesis, Department of Chemistry, Yangon University

Annual Average of Total Suspended Particulate (TSP) Matter in Yangon

Wai Zin Oo (2001) "Air Pollution Monitoring Using Nuclear Related Analytical Techniques", departmental technical paper, Department of Atomic Energy, Ministry of Science and Technology, Yangon, Myanmar

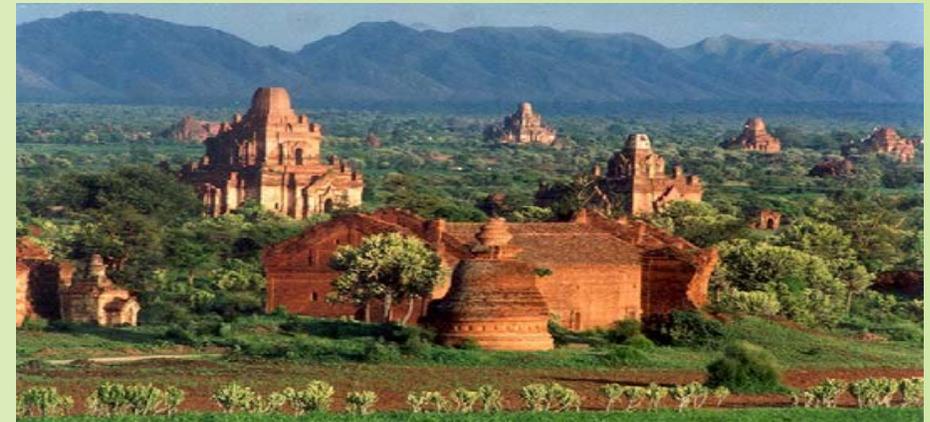


ADB, GEF, UNEP
in collaboration with IGES and NIES

National Performance Assessment and Subregional Strategic Environment Framework in
the Greater Mekong Subregion

MYANMAR NATIONAL ENVIRONMENTAL PERFORMANCE

ASSESSMENT (EPA) REPORT



Prepared by National Commission for Environmental Affairs, Myanmar

And Project Secretariat UNEP Regional Resource Center For Asia and the Pacific

March 2006

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ADB, GEF, UNEP
in collaboration with IGES and NIES

National Performance Assessment and Subregional Strategic
Environment Framework in the Greater Mekong Subregion

ADB T.A. No. 6069-REG

**MYANMAR
NATIONAL ENVIRONMENTAL PERFORMANCE
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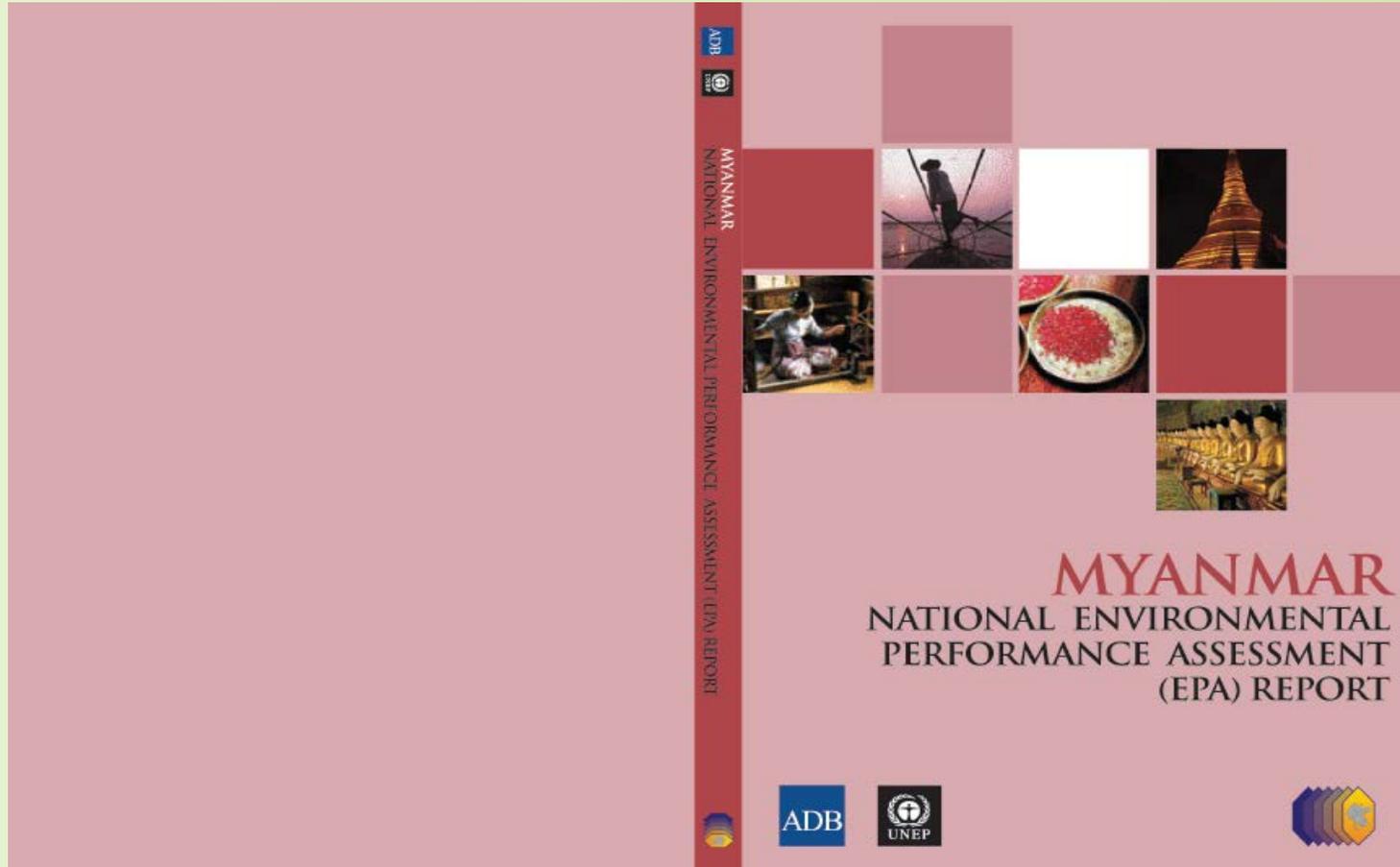
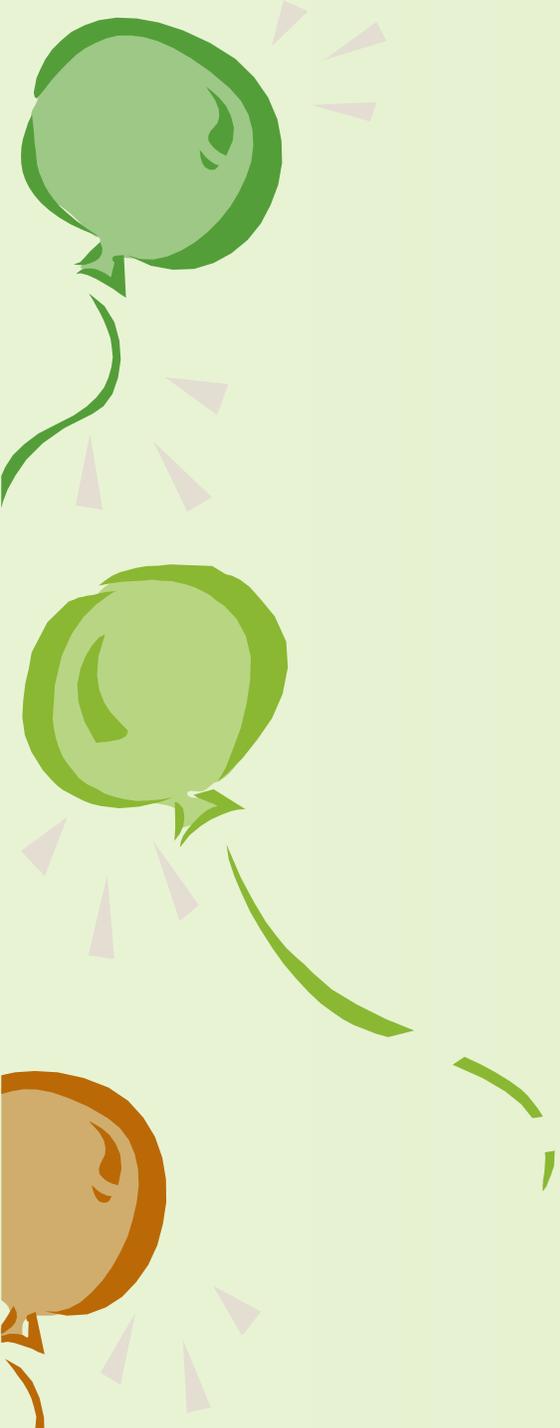
Prepared by
National Commission for Environmental Affairs, Myanmar
and
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For Asia and the Pacific



March 2006

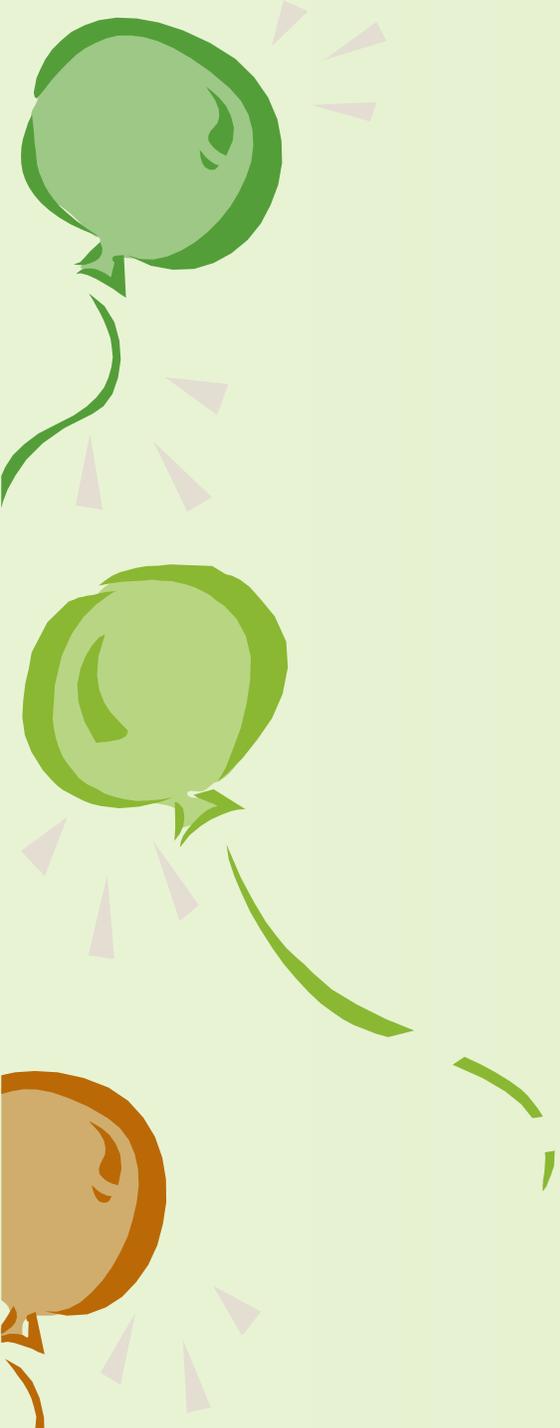
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Technical review completed by UNEP RRC.AP

Collaborative Partners

IGES Institute for Global Environmental
Strategies (IGES)



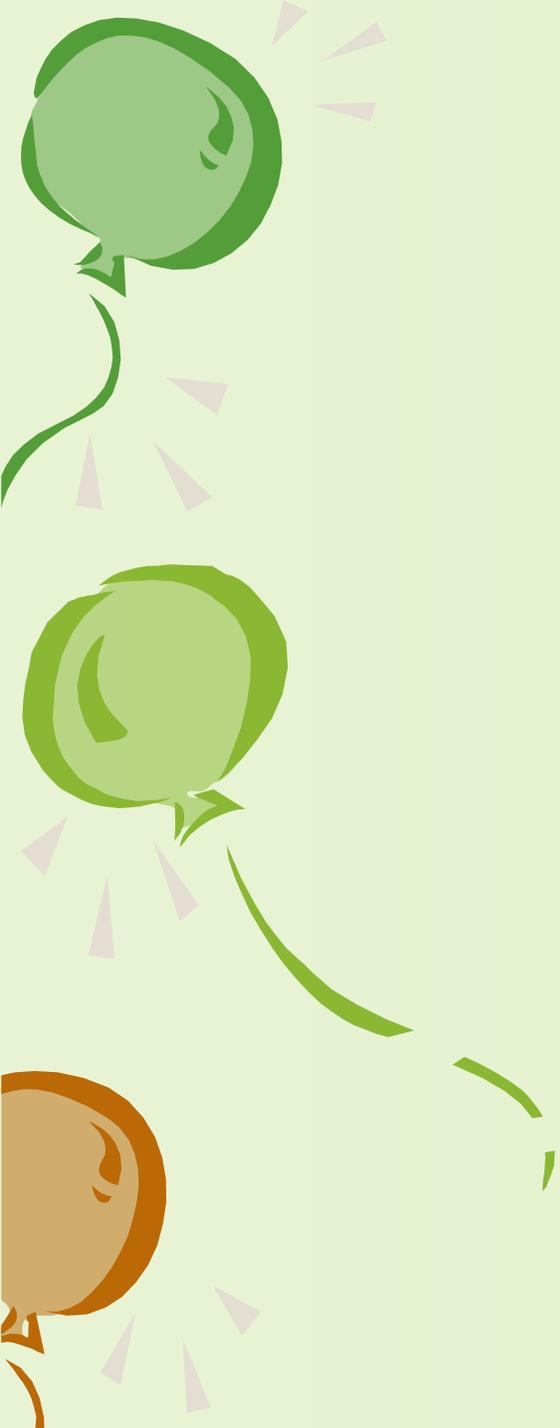
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**National Institute for
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Instruments

Lamotte combination air quality testing kit



Lamotte air sampler model AR02 and consumables



Lamotte smart2 colorimeter



Portable air sampling pump



A Pilot Study (Yangon and Mandalay)

April 2007 and January 2008

Air Quality Monitoring in Selected Sites

In collaboration with

NCEA

Occupational Health Division, Department of Health, MOH

Department of Medical Research (Lower Myanmar)

MOH



Selected sites (Yangon)

- Site 1 - Commercial site (Traders Hotel)
- Site 2 - Residential site (IBC)
- Site 3 - Surrounding site near to industrial zone (Forest Department Head Quarter)

Monitoring results (Yangon)

Air Quality survey results in Yangon

Site		TSP (ug/m3)	PM10 (ug/m3)	SO2 (ug/m3)	NO2 (ug/m3)
1	April, 2007	342.58	177.69	-	-
	Jan, 2008	143.21	71.75	-	-
2	April, 2007	168.61	68.59	1.14	23.22
	Jan, 2008	118.70	65.30	1.24	22.28
3	April, 2007	127.32	66.95	0.37	28.36
	Jan, 2008	188.66	136.92	0.25	25.42

TSP = Total Suspended Particulate

PM10 = Particulate Matter smaller than 10 micros

Site 1 = Commercial Area

Site 2 = Residential Area

Site 3 = Industrial Area



Selected sites Mandalay

- › Site(1) Commercial area **Zay Cho market**
- › Site(2) Residential area **Office of MCDC**
- › Site(3) Industrial area **(Mandalay Industrial Zone)**

Monitoring results (Manadaly)

Air quality survey results in Mandalay

Site	TSP (ug/m3)	PM10 (ug/m3)	SO2 (ug/m3)	NO2 (ug/m3)
1	495.87	112.49	0.86	32.13
2	213.08	61.67	0.98	17.80
3	350.57	131.54	1.50	19.14

Site 1 = Commercial Area (Zay Cho Market)

Site 2 = Residential Area (office of MCDC)

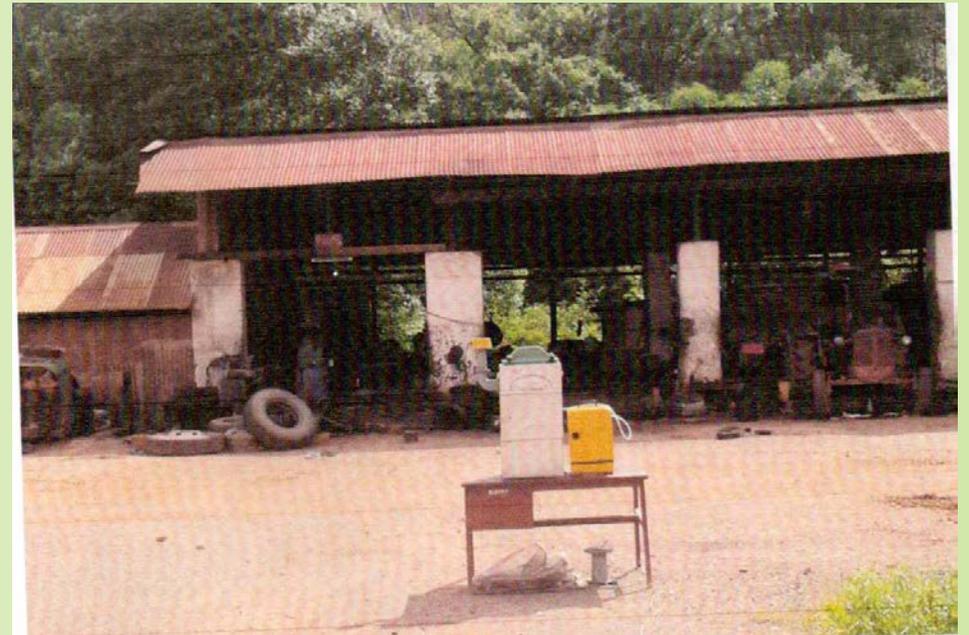
Site 3 = Industrial Area (Mandalay industrial zone)

High Volume Samplers



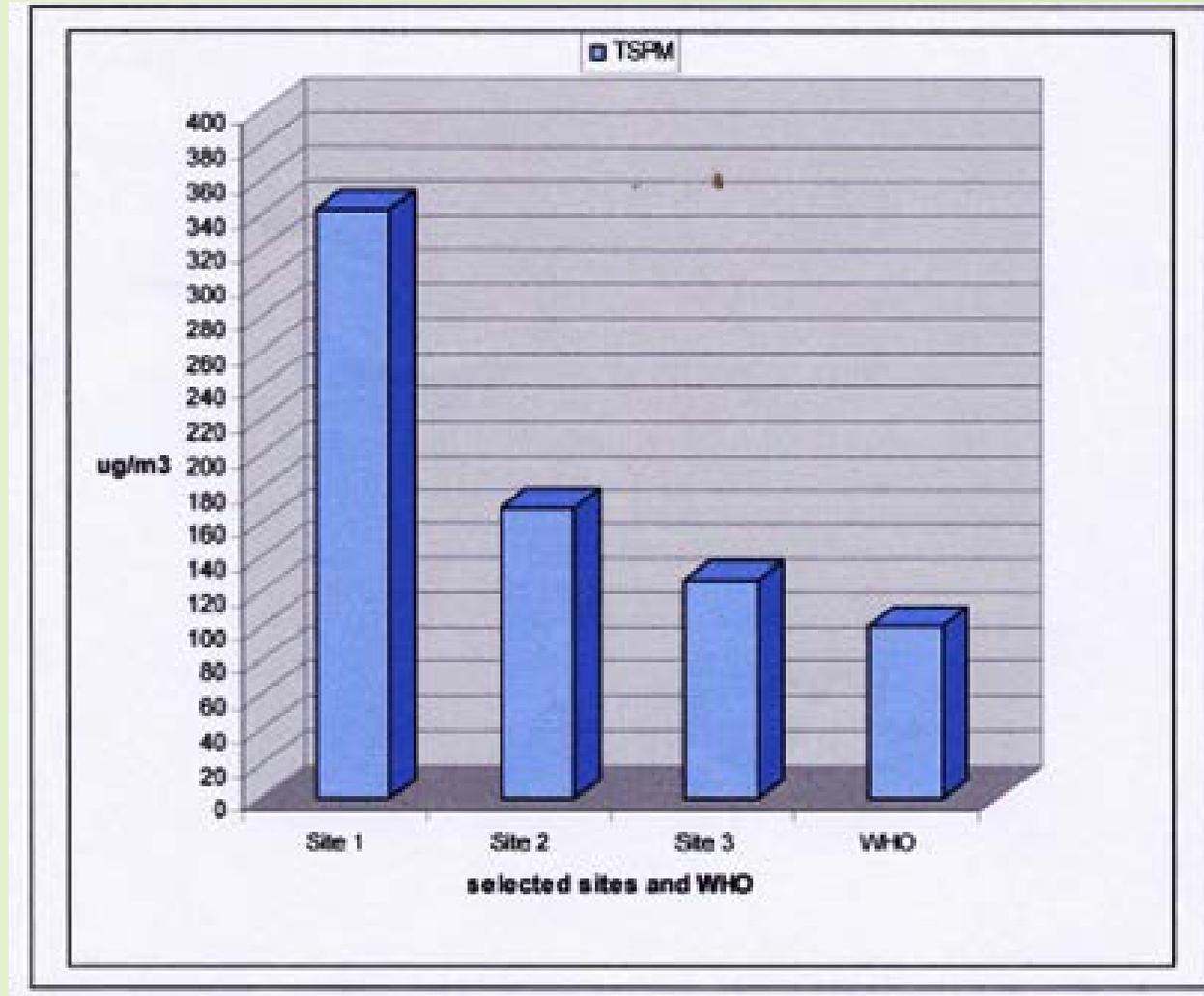
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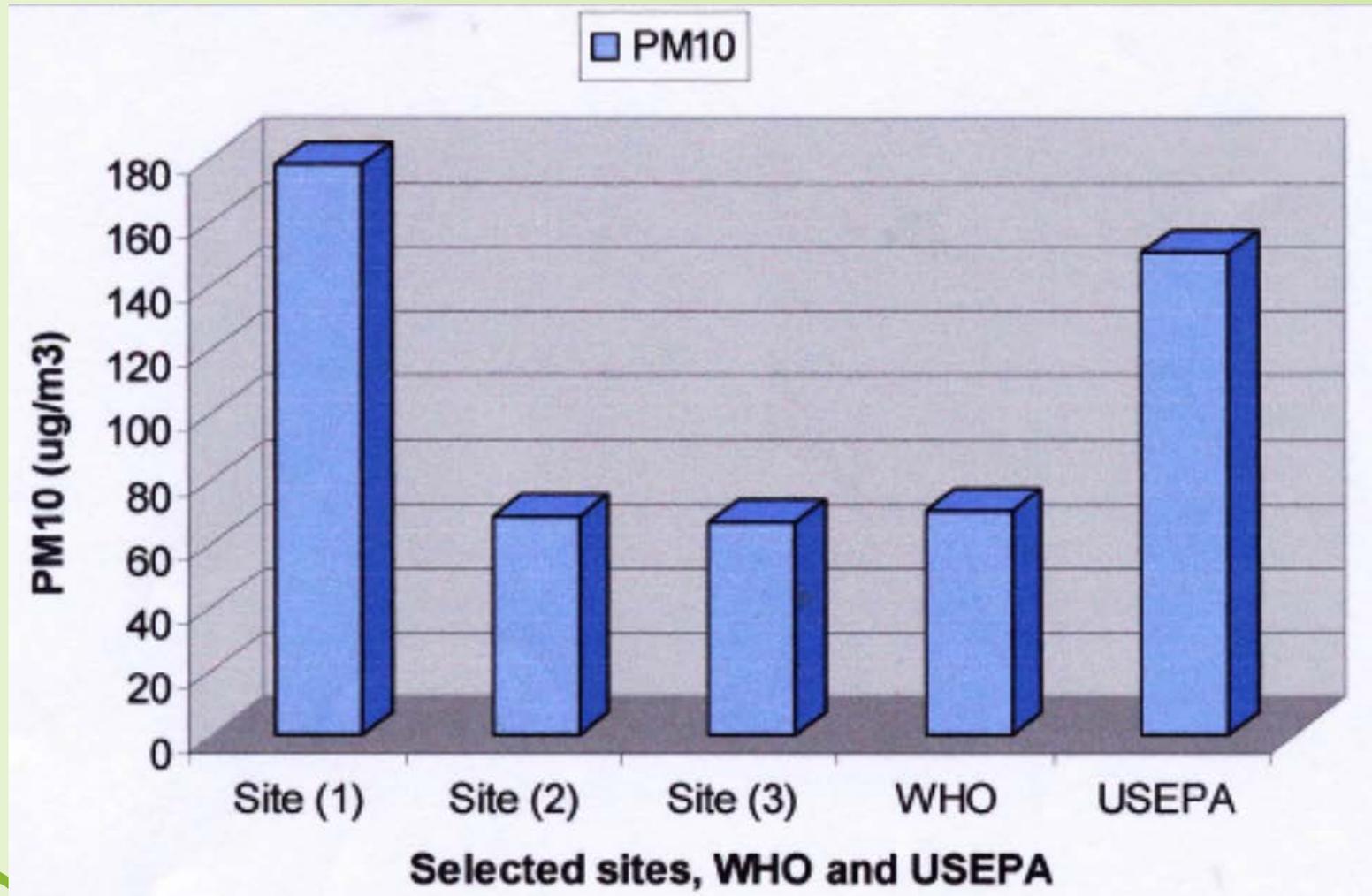
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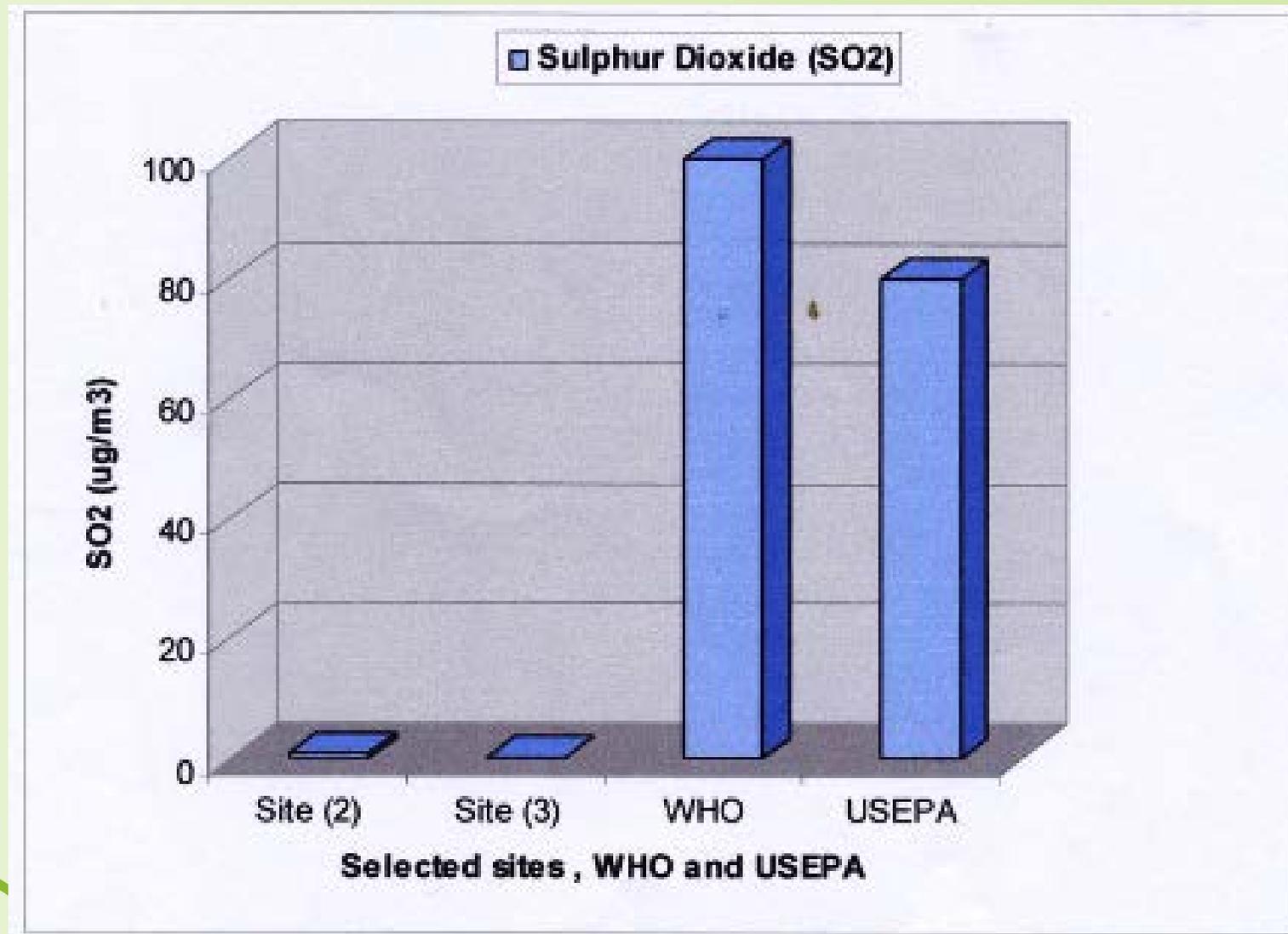
Among comparison of Suspended Particulate Matter (SPM) in selected sites and WHO guidelines (24 hrs average)

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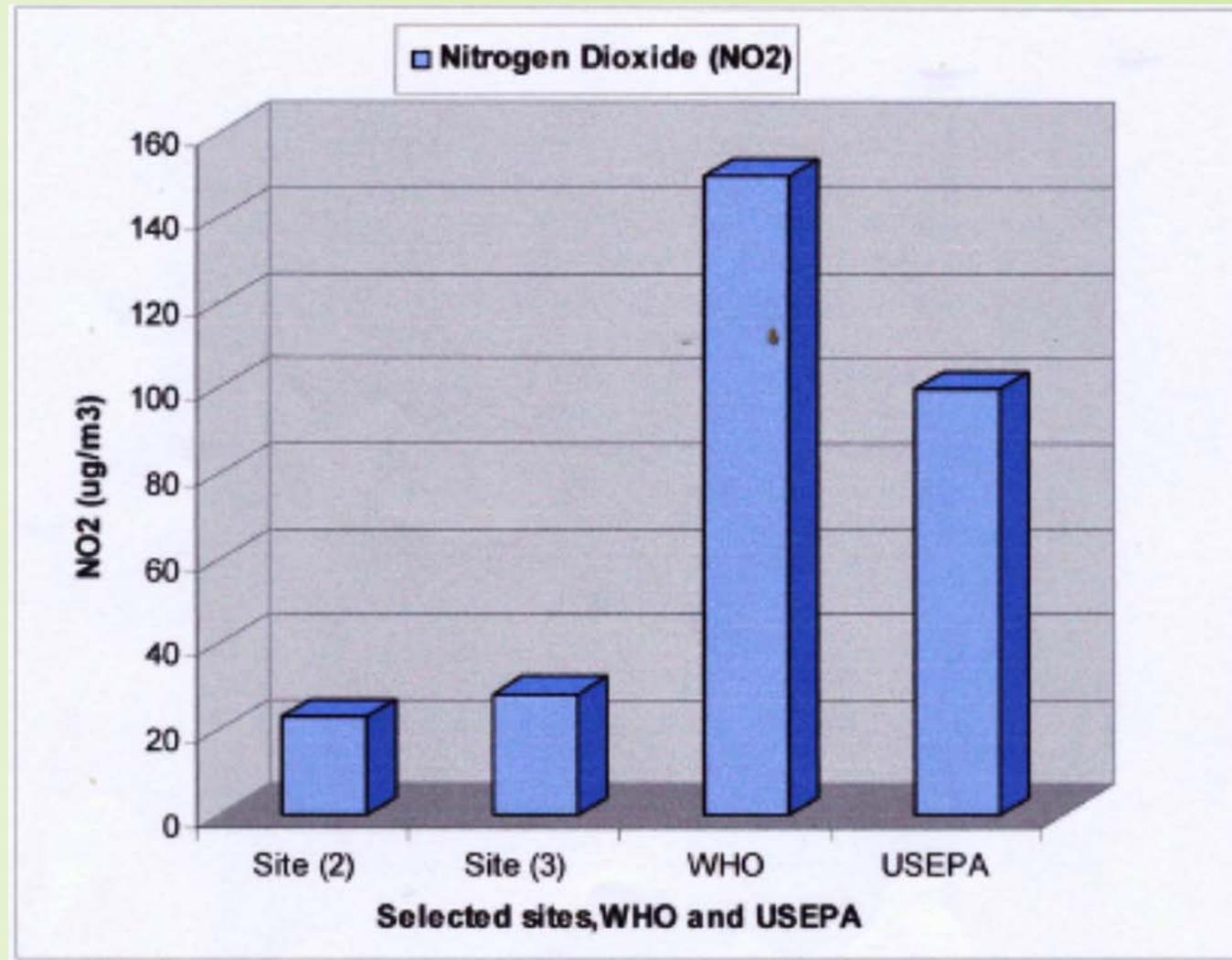
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Comparison of Particulate Matter (PM10) in selected sites and WHO Guidelines (24 hrs average) **PM10 level was higher in commercial site (site 1) than the others**



- › Comparison of SO₂ level in two Sites, WHO guidelines and USEPA (24hr average) Between the two sites, **site 2 is higher SO₂ level than site 3**



- › Comparison of (NO₂) in selected sites and WHO Guidelines and USEPA (24hr average) **The levels of NO₂ of site 2 and 3 are also lower than that of WHO guidelines (24 hrs average). But NO₂ levels of site 3 is higher than site 2.**



Monitoring of Air Quality and Health Effects

- › Occupational and Environmental Health Division (OEHD), Under Department of Public Health is the **focal division** in **MoHS** for **monitoring air quality and associated health effects**
- › **Air Quality Monitoring**
 - Indoor
 - Ambient
- › **Health Effect Monitoring**
 - Health Management Information System
 - Surveys

Location of OEHD

- **Head office–Office No - 47,**
- **Nay Pyi Taw**
- **Yangon sub-office-No(250/A),**
Lower Kyi Myin Dine Road,
Ahlong Township, Yangon

Two laboratories

(a) **Occupational Hygiene Laboratory**

(b) **Toxicological and Environmental Health Laboratory** are situated in Yangon sub-office



Ambient Air Quality Monitoring

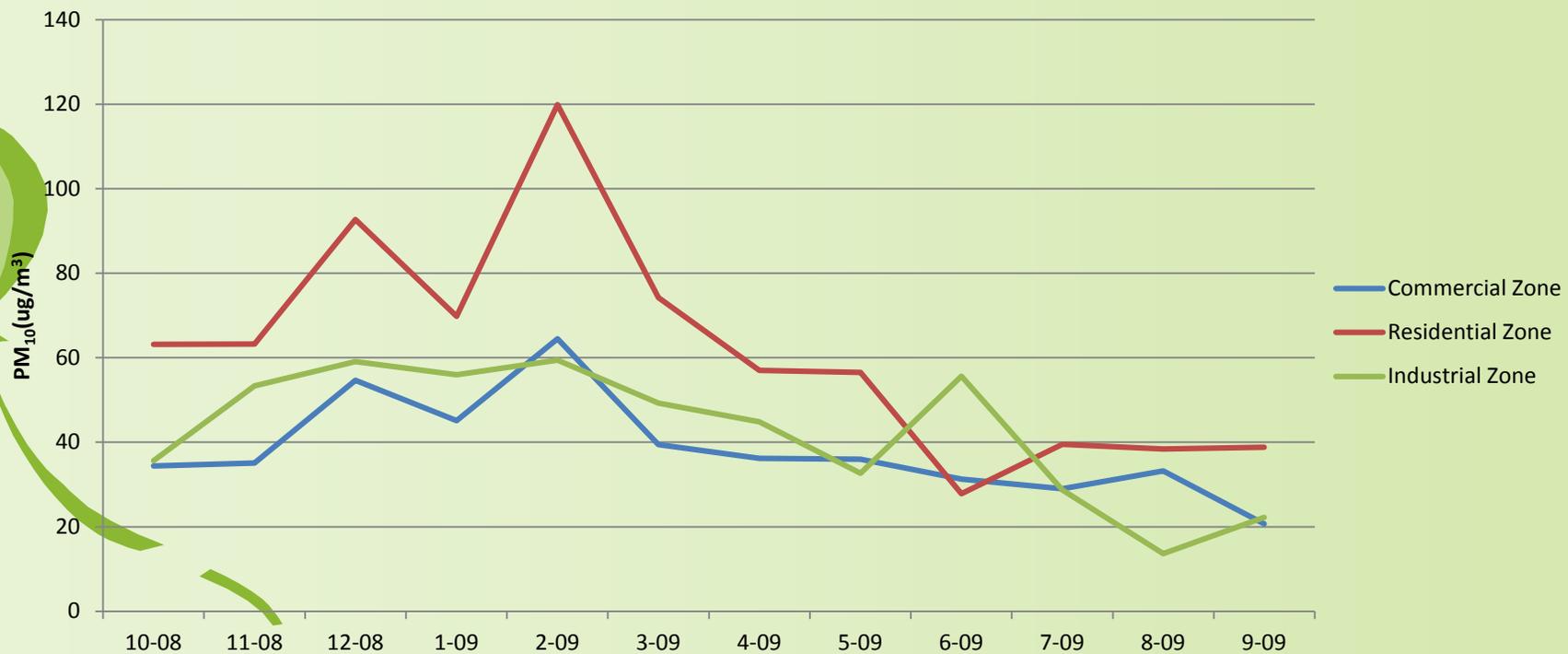
An air quality monitoring of Yangon City for (2008-2009) was done by Occupational Health Division, Department of Health



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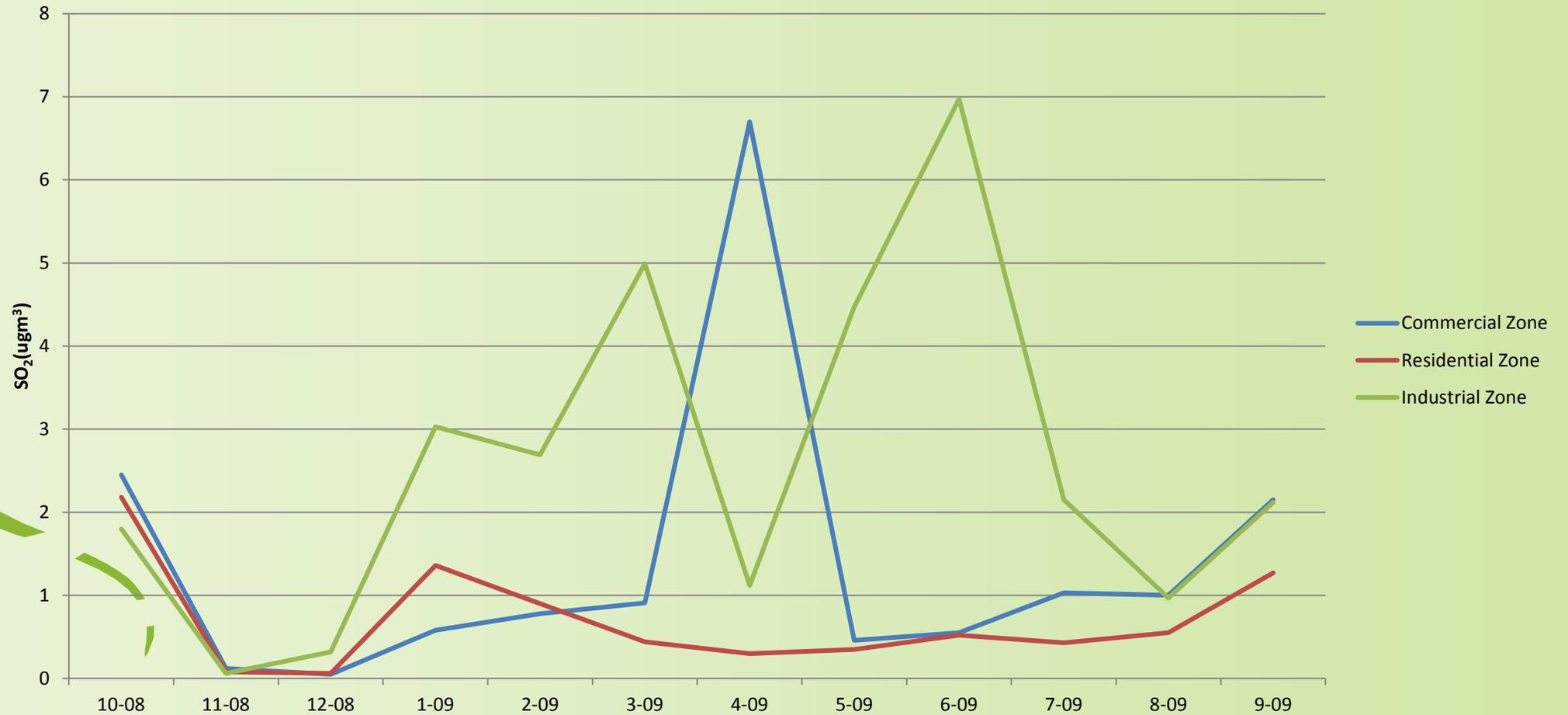
PM₁₀ Conc: in Ambient Air of 3 Different Zones of Yangon in 2008-09



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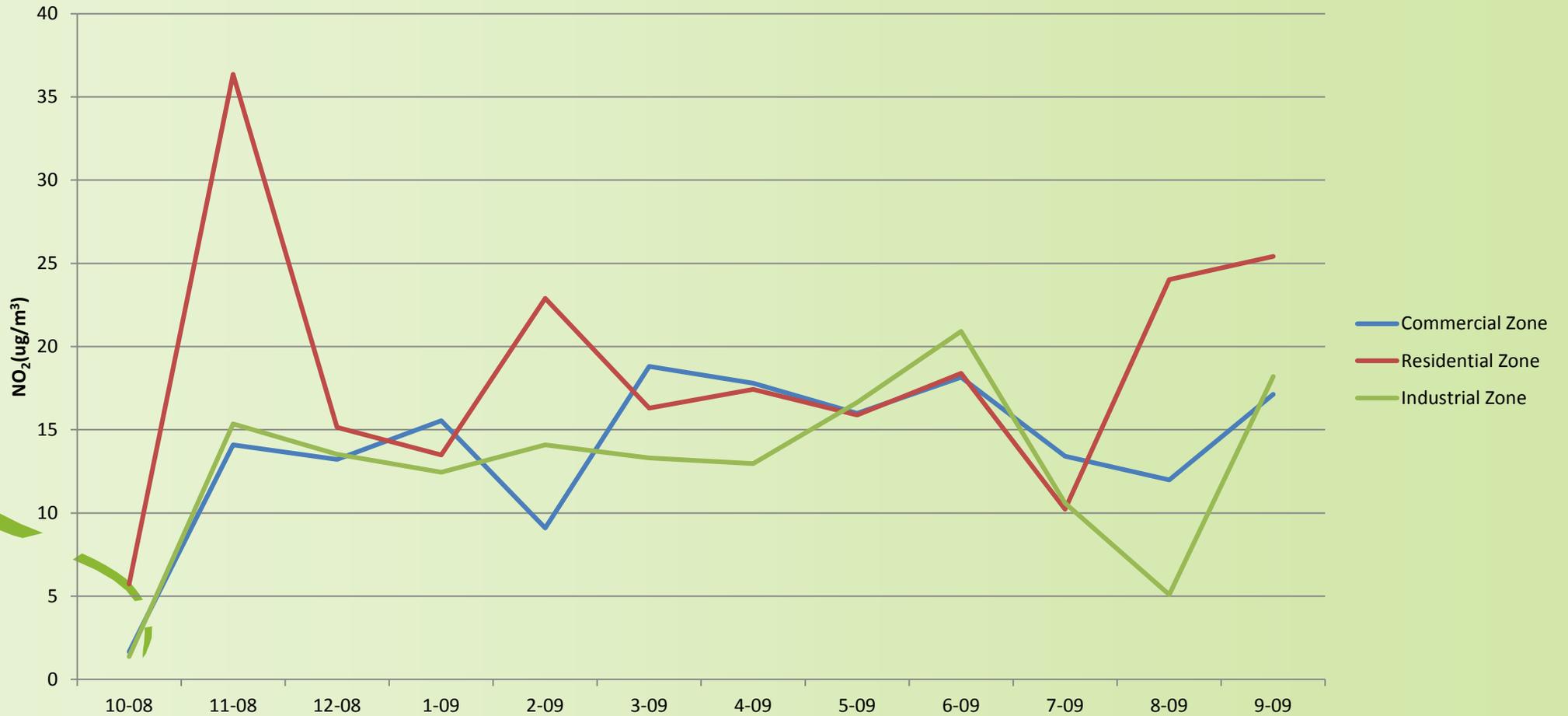
SO₂ Conc: in Ambient Air of 3 Different Zones of Yangon in 2008-2009



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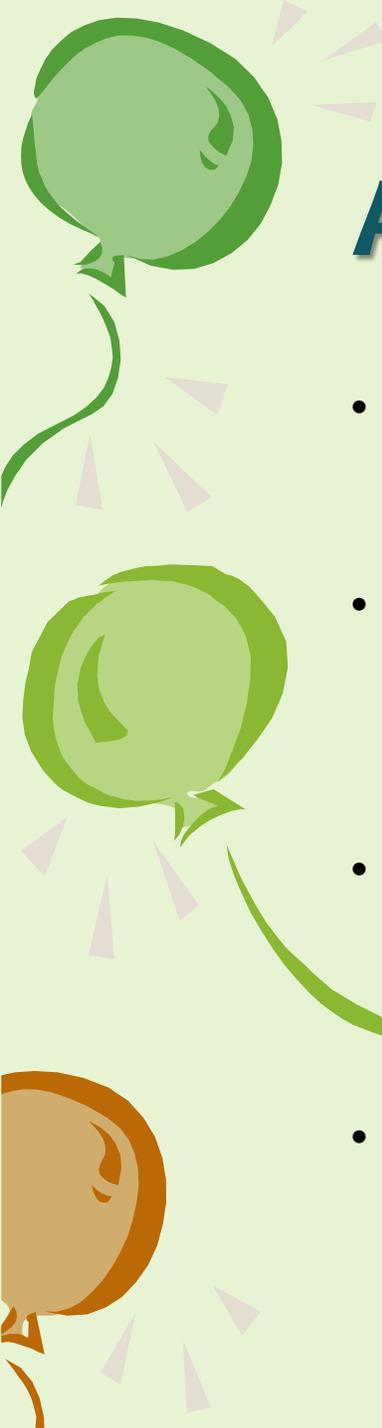
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NO₂ Conc: in Ambient Air of 3 Different Zones of Yangon in 2008-09



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Ambient Air Quality Monitoring

- OEHD has currently **two air quality monitoring stations** (one in Nay Pyi Taw office and one in Yangon office)
- In each station, ambient air quality monitoring (**for a period of 24 hrs**) is being carried out **2-weekly basis**.
- Previously high volume sampler but From January 2019 and onwards, **haz-scanner** (measuring PM_{2.5}, PM₁₀, CO, SO₂ and NO₂) is being used.
- These air quality data are sent to **WHO every year** to estimate on the health risks associated with ambient air pollution.

E Pas Haz Scanner



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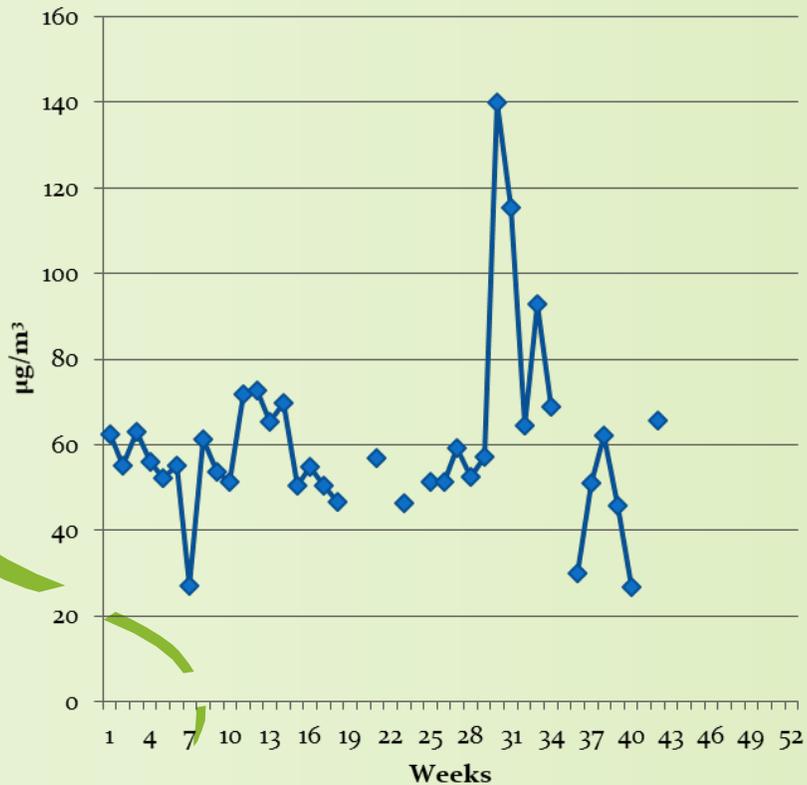


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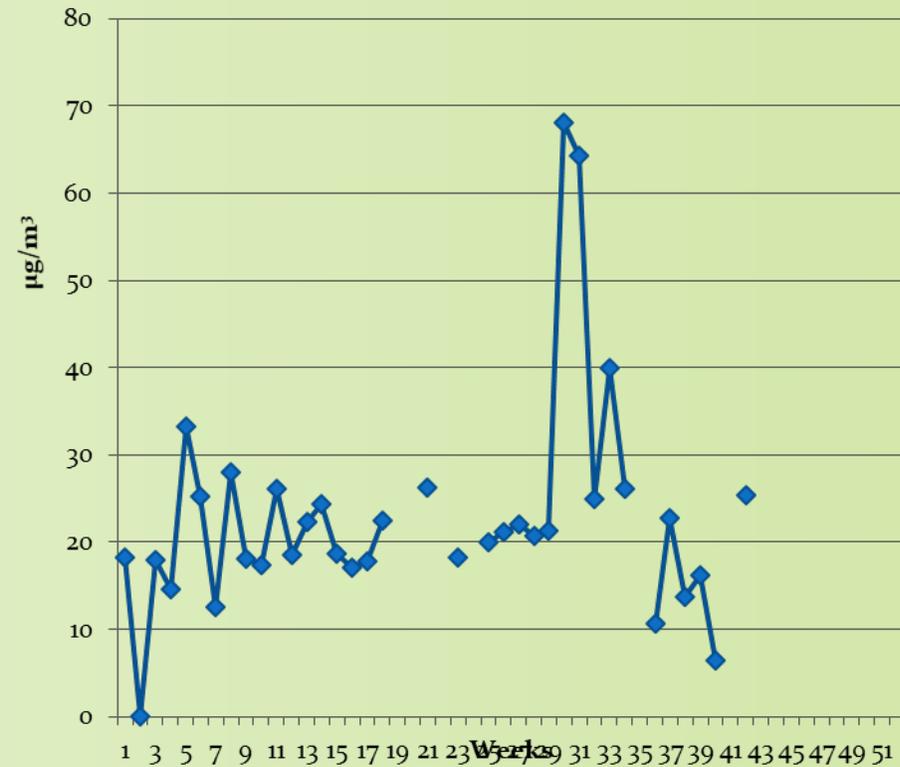
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Ambient Air Quality Monitoring in Naypyitaw in 2018

TSPM in Nay Pyi Taw (2018)



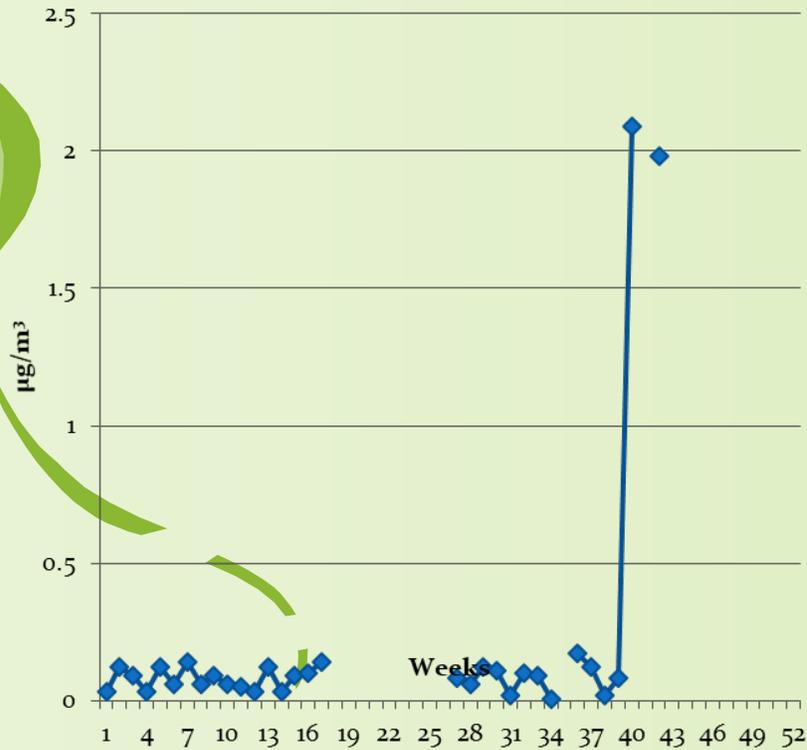
PM₁₀ in Nay Pyi Taw (2018)



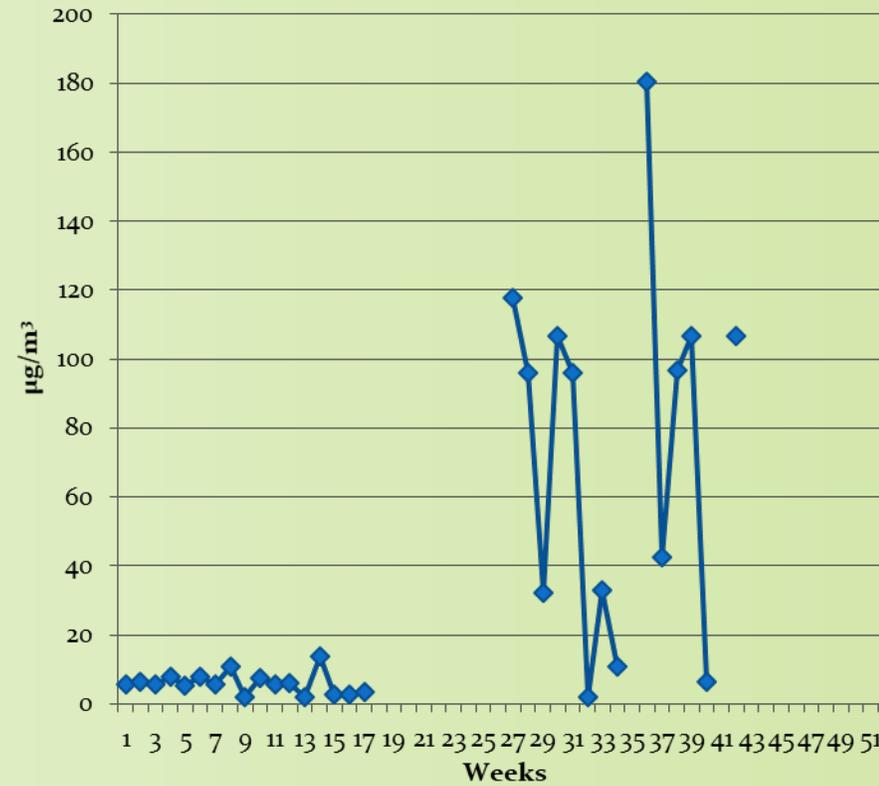
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SO₂ in Nay Pyi Taw (2018)



NO₂ in Nay Pyi Taw (2018)

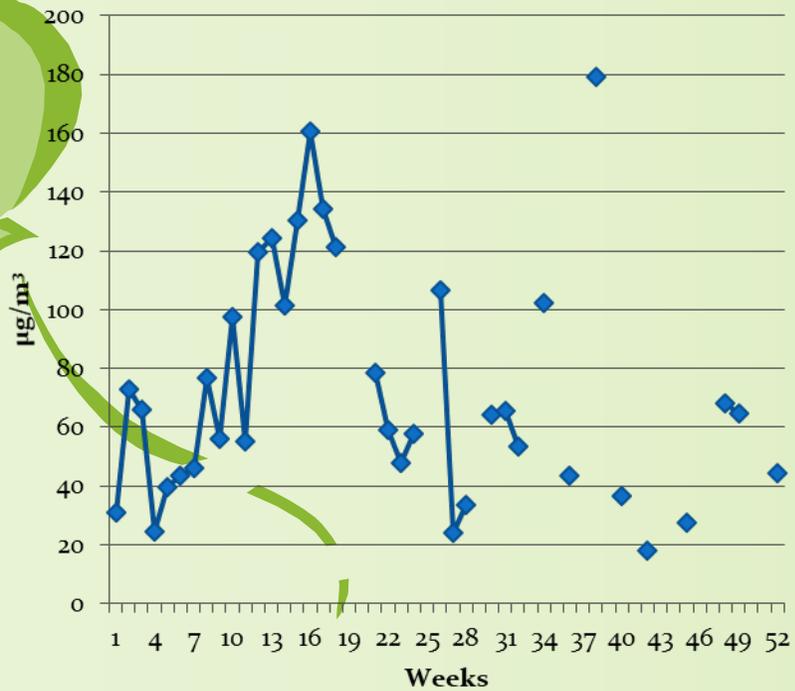


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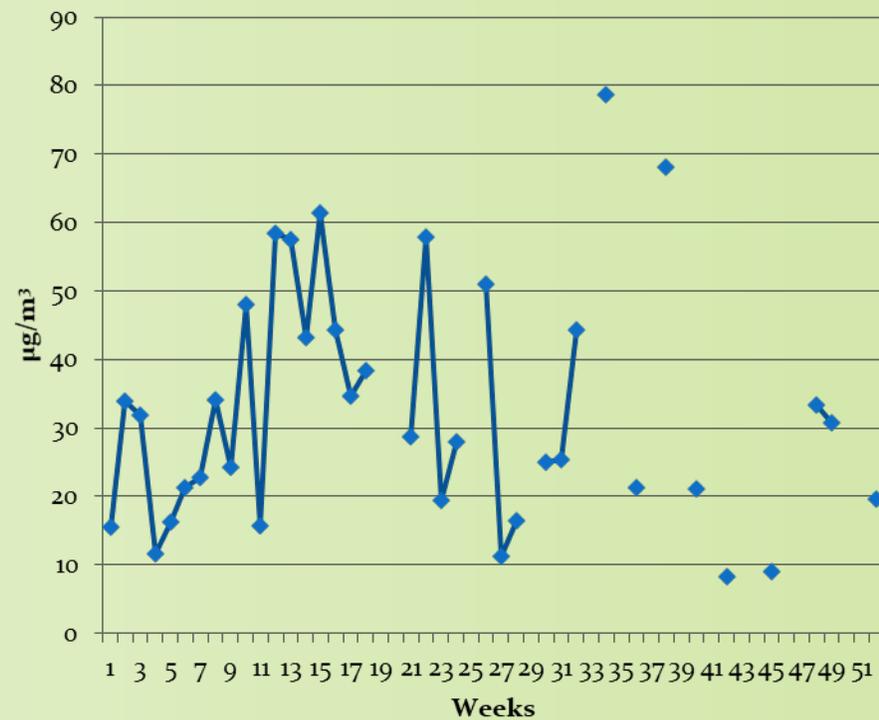
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Ambient Air Quality Monitoring in Yangon(2018)

TSPM in Yangon (2018)

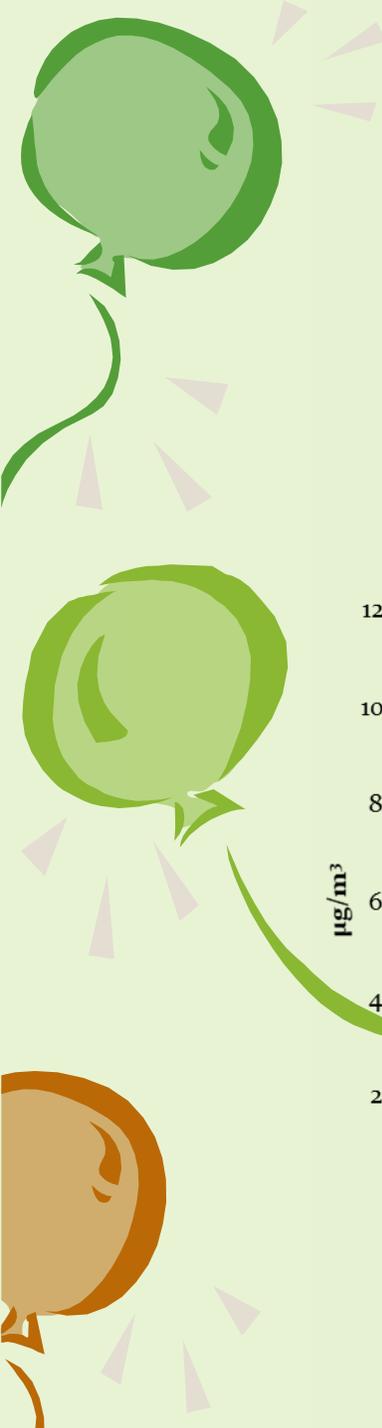


PM₁₀ in Yangon (2018)

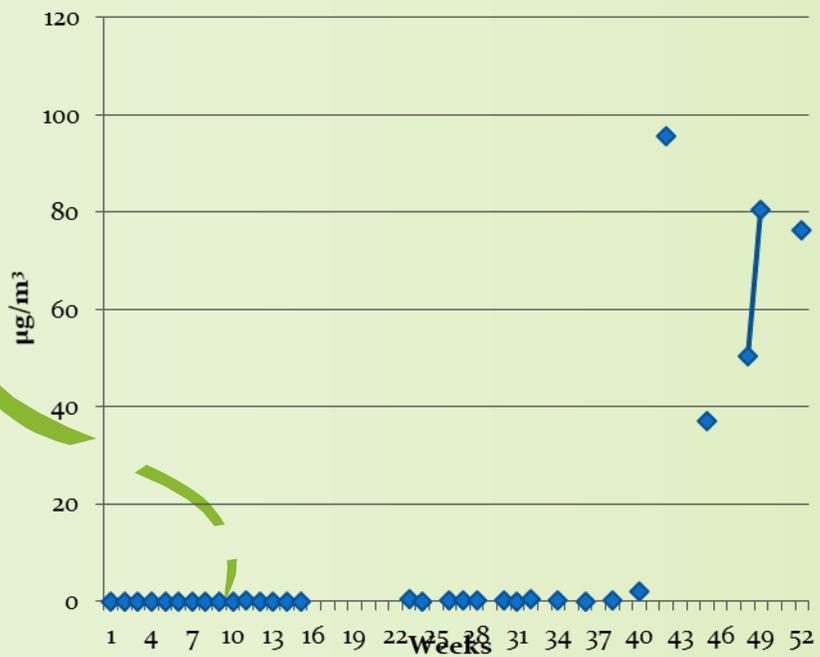


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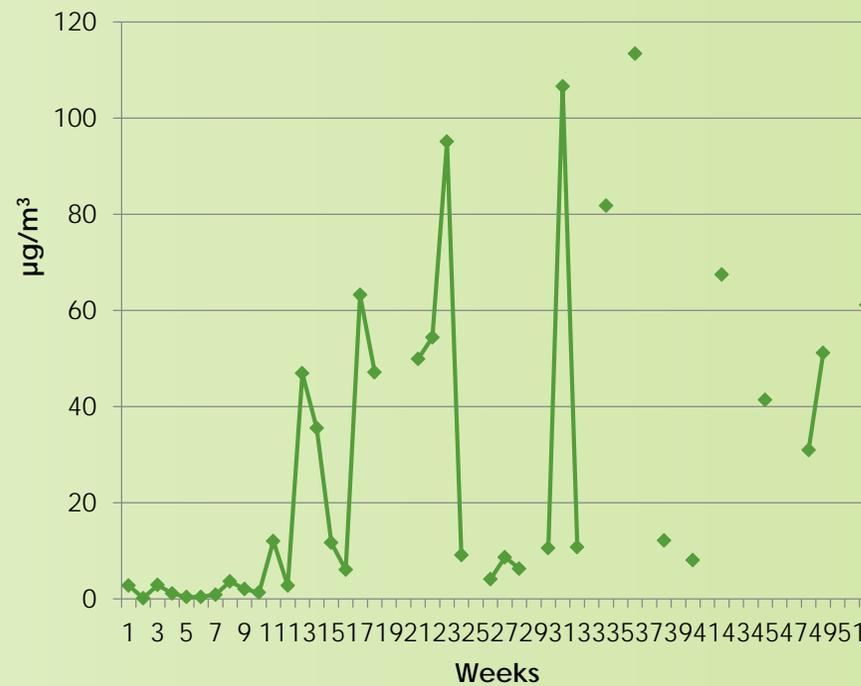
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SO₂ in Yangon (2018)



NO₂ in Yangon (2018)



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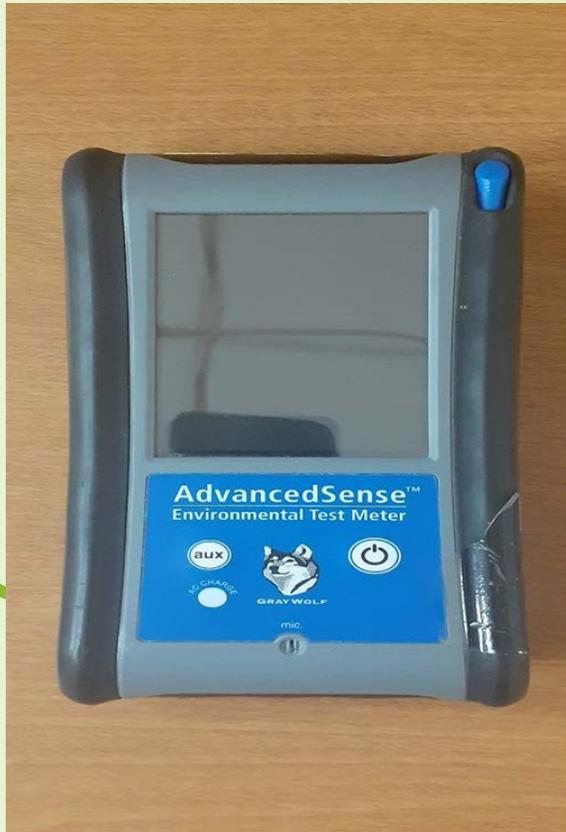


Indoor Air Quality Monitoring

- › OEHD conducted IAQ monitoring survey in **2017**, with the support of WHO
- › **Sites:** 57 rural houses from 4 townships
 - › **Hilly Region - Hakha Township**
 - › **Delta Region - Hinthada Township ,**
 - › **Central Dry Region - Thaingtha Township**
 - › **Central Plain Region - Zeekone Township**
- › Parameters : TSPM, PM 2.5, CO and CO₂

Instruments

- GrayWolf Indoor Air Quality (IAQ) meter



Area and Personal Samplers



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PM 2.5, PM 4 & PM 10 Sampler



Old and New pumps for Dragger Detector tubes



**Thank You very much for your kind
attention**

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