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on the Acid Deposition Monitoring Network in East Asia
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Summary of the National Monitoring Plans in 2015

Network Center for EANET

I. Background

1. National Monitoring Plan (NMP) includes the information on monitoring sites, monitoring methods, monitoring frequency etc. in participating countries. This information is crucial for QA/QC activities in EANET. First summarization of the NMP was prepared in November 2001. NMP is required to be submitted when the participating countries submit its annual monitoring data to the Network Center (NC). Additionally, when the participating countries make some revision, the revised NMP shall be submitted to the NC as soon as possible. The NMP has been prepared using the template which was provided in the trial phase of the EANET monitoring.

2. NMP shall be reviewed every year and shall be revised by each participating country, if necessary, because
   i) The EANET activities shall be carried out according to the NMP; and
   ii) Suitability of the completed activities to the NMP shall be inspected in every year.

   Even if there is no point of revision, the existing state of the EANET activities can be re-confirmed periodically and this state should be reported to the NC.

3. However, the existing NMP template has the following issues.
   i) Description of the relationship between monitoring site, analytical laboratory and meteorological observatory is obscure.
   ii) There are many improper options in many tables, such as the sampling intervals, analytical methodology etc.
   iii) The specifying of the site location might be impossible only by referring to the site location map, latitude and longitude described in the NMP.
   iv) Existing format of NMP is difficult to be utilized for the site and laboratory audit.

II. Preparation of NMP based on the revised template

4. Considering the above mentioned background, the electronic template of NMP were newly prepared and distributed to the National QA/QC managers in March 2013. NMP shall be reviewed and/or revised for the implementation of monitoring by the National QA/QC manager in each participating countries. The NC requested the first draft NMP by the end of June, 2013 which is the same time of data submission deadline. Then, the NC compiled the submitted NMP to STM14 meeting held during 26-28 August 2013 for the confirmation and discussion.

5. The outcome of the STM16 meeting should be reflected to the secondary revision process for

the draft with communication between the NC and the National QA/QC managers in participating countries. After report at SAC15, the NC prepares the compiled NMPs submitted by the participating countries, and site information will be updated on the EANET website as appropriate. The participating countries implement their EANET monitoring activities in accordance with their own NMP for each year.

III. Development of NMP in 2015

6. Overview of the National Monitoring Plan in 2015 was shown in Attachment 1, and list of sites and monitoring items are shown in Attachment 2. The major points of the update NMPs in participating countries are shown below.

i Cambodia

- The monitoring at Siem Riap site has restarted from rainy season, May or June 2015. The samples collected the site is transported to the laboratory in Phnom Penh for analysis.
- The samples collected at the Siem Reap site are shipped and analyzed in the laboratory in Phnom Penh.
- The sampling interval of wet deposition at Siem Reap site is weekly in principle, but it may be extended to bi-weekly depending on the availability of local staff.

ii China

- The vegetation monitoring data was not included in the preliminary draft Data Report 2014 due to editorial mistake in the NC. The data will be included in the draft Data Report 2014 to be submitted to SAC15.

iii Indonesia

- The national sites in Indonesia started monitoring on $PM_{2.5}$. Sixteen sites started the $PM_{2.5}$ monitoring. GENT samplers were installed. The data is accessible to the public.
- The FP monitoring in GAW Kototabang and BMKG Maros is conducted for two weeks once a year because the sites were located in remote area.

iv Japan

- $PM_{2.5}$ monitoring at Tokyo site is not conducted because of budgetary limitation of mentoring space, but the feasibility of monitoring is under consideration.
- PM712 model is installed in all EANET stations in Japan except Tokyo site because it can measure PM_{10} and $PM_{2.5}$ simultaneously. It was informed that many PM2.5 monitors passed the equivalent test.

v Lao PDR

- The automatic air concentration monitoring will be included in the National Monitoring Plan in the future.

vi Malaysia

- A new tall building is under construction near Petaling Jaya site. The relocation of the sites is considered because the site would not be satisfying the criteria.
- As for soil and vegetation monitoring, it should be confirmed if Universiti Putra Malaysia Bintulu Campus Rehabilitation Forest site is officially registered as EANET site.

vii Mongolia

- Mongolia participated in the inter-laboratory comparison project on soil for many years. However, recently no monitoring has been done for soil and vegetation. Soil and vegetation monitoring in Bogd Khan Mountain site would be restarted within a few years.
- UB4, one of the national monitoring sites in Ulaanbaatar City, was appropriate as the new EANET site for air concentration monitoring.

viii Myanmar

- The monitoring of PM2.5 started in Mandalay site from May, 2015.

ix the Philippines

- Dry deposition monitoring in Los Banos and Metro Manila is stopped because of the contract expired. The two sites might be restarted soon.

x Republic of Korea

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xi Russia

- Automatic monitor at Listvyanka site is operated by limnological institute.

xii Thailand

- Soil monitoring in Vachiralongkorn Dam was conducted two times a year for every 3 years, according to the National Monitoring Plan. The variation between dry and wet seasons has been observed. However, soil monitoring was stopped after 2009. Soil monitoring would be restarted with the frequency of two times a year.
- A new system of automatic monitors was installed in Bangkok site. The parallel monitoring was conducted at beginning, so both data should be compared.

xiii Vietnam

- Cuc Phuong and Da Nang sites belong to the National Monitoring Center. Submission of automatic monitor data of air concentrations at both sites should be confirmed.
- In February 2015, Ha Noi site relocated to Hoai Duc Meteorology station that is 20km apart from the old stations.

Attachment 1

Overview of the National Monitoring Plan in 2015

Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data(2014)
<Cambodia>	Wet deposition	Phnom Penh	Urban	weekly	All required items	January 2005	✓
		Siem Reap	Urban	weekly	All required items	October 2011	
	Dry deposition	Phnom Penh	Urban	FP(biweekly)	SO_2,HNO_3,HCl,NH_3,PMC	Februray 2010	✓
	Inland aquatic environment	Sras Srang Lake	Remote	2times/years	Water quality of Sras Srang Lake	2012	✓
<China>	Wet deposition	Chongqing -Haifu	Urban	daily	All required items + F^-	January 2008	✓
		Chongqing -Jinyunshan	Rural	daily	All required items + F^-	April 1999	✓
		Xi'an -Shizhan	Urban	daily	All required items	April 1999	✓
		Xi'an-Jiwozi	Remote	daily	All required items	April 1999	✓
		Xiamen-Hongwen	Urban	daily	All required items + F^-	April 1999	✓
		Xiamen-Xiaoping	Remote	daily	All required items + F^-	April 1999	✓
		Zhuhai-Xiang Zhou	Urban	daily	All required items + F^-	April 1999	✓
		Zhuhai-Zhuxiandong	Urban	daily	All required items + F^-	December 1999	
	Dry deposition	Chongqing -Jinyunshan	Rural	AT(Daily)	SO_2, NO, NO_x, PM_{10}	January 2001	✓
		Xiamen-Hongwen	Urban	AT(Daily)+ FP	SO_2,NO_2,PM_{10},HNO_3,HCl,NH_3,PMC	January 2000	✓
		Zhuhai-Xianf Zhou	Urban	AT	SO_2,NO_2, PM_{10}	2014	✓
	Soil and vegetation	Chongqing -Jinyunshan	Rural	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		
		Xi'an-Jiwozi	Remote	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		
		Xiamen-Xiaoping	Remote	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		
		Zhuhai-Zhuxiandong	Urban	Every 3 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)		
	Inland aquatic environment	Chongqing-Jinyunshan Lake	Rural	4times/years	Water quality of Jinyunshan Lake	2001	✓
		Xi'an-Jiwozi River	Remote	4times/years	Water quality of Jiwozi River	2001	✓
		Xiamen-Xiaoping Dam	Remote	4times/years	Water quality of Xiaoping Dam	2001	✓
		Zhuhai-Zhuxiandong Stream	Urban	4times/years.	Water quality of Zhuxiandong Stream	2004	✓
<Indonesia>	Wet deposition	Jakarta (BMG)	Urban	weekly	All required items	April 1998	✓
		Serpong (EMC)	Rural	daily	All required items	April 1998	✓
		Kototabang (BMG)	Remote	weekly	All required items	April 1998	✓
		Bandung (LAPAN)	Urban	daily	All required items	January 1999	✓
		Maros(BMG)	Rural	weekly	All required items	January 2008	✓
	Dry deposition	Serpong (EMC)	Rural	FP (Bi-weekly)	SO_2,HNO_3,HCl,NH_3,PMC	July 2001	✓
		Kototabang (BMG)	Remote	PS	SO_2,NO_2	January 2007	
		Jakarta (BMG)	Urban	FP (Bi-weekly)	SO_2,HNO_3,HCl,NH_3,PMC	2014	
		Jakarta (BMG)	Urban	PS	SO2,NO2	2007	✓
		Bandung (LAPAN)	Urban	FP (Bi-weekly)	SO_2,HNO_3,HCl,NH_3,PMC	2014	
		Bandung (LAPAN)	Urban	PS	SO_2,NO_2	2008	✓
	Soil and vegetation	Bogor Research Forest (Darmaga Experimental Forest)	Rural	once/3-5 years	Decline, K etc. in leaves & ions in soil	2002	✓
	Inland aquatic environment	Patenggang Lake	Rural	4times/yr.	Water quality of Patenggang Lake	2001	
		Gunung Lake	---	4times/yr.	Water quality of Situgunung	2007	
<Japan>	Wet deposition	Rishiri	Remote	daily	All required items	April'98	✓
		Ochiishi	Remote	daily	All required items	April'03	✓
		Tappi	Remote	daily	All required items	April'98	✓
		Ogasawara	Remote	daily	All required items	May'99	✓
		Sado-seki	Remote	daily	All required items	April'99	✓
		Happo	Remote	daily	All required items	April'98	✓
		Oki	Remote	daily	All required items	April'98	✓
		Yusuhara	Remote	daily	All required items	December'99	✓
		Hedo	Remote	daily	All required items	December'99	✓
		Ijira	Rural	weekly	All required items	June'99	✓
		Banryu	Urban	weekly	All required items	May'99	✓
		Tokyo	Urban	daily	All required items	April'07	✓
<Japan>	Dry deposition	Rishiri	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3, HCl,NH_3,PMC	AT FP January 2002	✓
		Ochiishi	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2008	✓
		Tappi	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2003	✓
		Ogasawara	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2003	✓
		Sado-seki	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3, HCl,NH_3,PMC	FP from 2003	✓
		Happo	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2003	✓

		Oki	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3, HCl,NH_3,PMC	FP from 2002	✓
		Yusuhara	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2003	✓
		Hedo	Remote	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2003	✓
		Ijira	Rural.	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2003	✓
		Banryu	Urban	AT+ FP(biweekly)	SO_2,NO,NO_{x*},O_3,$PM_{10/2.5}$ HNO_3,HCl,NH_3,PMC	FP from 2003	✓
		Tokyo	Urban	FP(biweekly)	SO_2,$NO_2$$HNO_3$,$NH_3$, PMC	FP from 2007	✓
	Soil and vegetation	Ijira	Rural	Once in 5 years	All required items		✓
		Banryu	Urban	Once in 5 years	All required items		✓
	Inland aquatic environment	Ijira Lake	Rural	4times/yr.	Water quality of Ijira Lake	From 2001	✓
		Banryu Lake	Urban	4times/yr.	Water quality of Banryu Lake	From 2001	✓
	Catchment-scale	Ijira	Rural	1times/yr.	Input, output, biochemical process		
<Lao PDR>	Wet deposition	Vientiane	Urban	daily	All required items	October 2003	
	Dry deposition	Vientiane	Urban	FP(weekly)	SO_2,HNO_3,HCL,NH_3, PMC		
	Inland aquatic environment	Nam Houm Lake	Urban	4times/yr.	Water quality of Nam Houm Lake	September 2009	
<Malaysia>	Wet deposition	Petaling Jaya	Urban	weekly	All required items+Organic acid	April 1998	✓
		Tanah Rata	Remote	weekly	All required items+Organic acid	January 1999	✓
		Danum Valley	Remote	weekly	All required items+Organic acid	January 2006	✓
		Kuching	Urban	weekly	All required items+Organic acid		✓
	Dry deposition	Petaling Jaya	Urban	FP (weekly)	SO_2,HNO_3,HCl,NH_3, PMC		✓
		Tanah Rata	Remote	FP (weekly)	SO_2,HNO_3,HCl,NH_3, PMC	FP from 2001	✓
		Danum Valley	Remote	FP (biweekly)	SO_2,HNO_3,HCl,NH_3, PMC	FP from 2006	✓
	Soil and vegetation	Pasoh Reserve Forest	Urban	Every 3-5 years	Tree decline, description tree & ions in soil etc.	2014	✓
		Universiti Putra Malaysia Rehabilitated Forest	Urban	Every 3-5 years	Tree decline, description tree & ions in soil etc.	2009	
	Inland aquatic environment	Semenyih Dam	Urban	4 times/yr.	Water quality of Semeynyih Dam	February 2005	✓
		Tembaling River	Remote	4 times/yr.	Water quality of Tembaling River	March 2007	✓
<Mongolia>	Wet deposition	Ulaanbaatar	Urban	daily	All required items+HCO_3^-	August 1998	
		Terelj	Remote	daily	All required items+HCO_3^-	September 1998	
	Dry deposition	Ulaanbaatar	Urban	FP (biweekly)	SO_2,HNO_3,HCl,NH_3,PMC		
		Terelj	Remote	FP (biweekly)	SO_2,HNO_3,HCl,NH_3,PMC		
	Soil and vegetation	Ulaanbaatar (Bogdkhan mountain)	Urban/Ecolog	Every 3-5 years	PH(H_2O),pH(KCl),Exchangeable acidity, Tree decline, description tree	From 2002	
	Inland aquatic environment	Terelj River	Remote	4-5 times/yr.	Water quality of Terelj River	From 2002	
<Myanmar>	Wet deposition	Yangon	Urban	weekly	All required items	June 2007	✓
	Dry deposition	Yangon	Urban	FP (biweekly)	SO_2,HNO_3,HCl,NH_3, PMC	November 2011	✓
		Mandalay	Rural	AT	PM2.5	May 2015	
<Philippines>	Wet deposition	Metro Manila	Urban	weekly	All required items	April 1999	
		Los Banos	Rural	weekly	All required items	April 1999	
		Mt. St. Tomas	Rural	weekly	All required items	October 2006	
	Dry deposition	Metro Manila	Urban	FP (Weekly)	SO_2,HNO_3,HCl,NH_3,PMC		
		Los Banos	Rural	FP (Weekly)	SO_2,HNO_3,HCl,NH_3,PMC		
		Mt. St. Tomas	Rural	FP (Weekly)	SO_2,HNO_3,HCl,NH_3,PMC	October 2006	
	Soil and vegetation	Los Banos	Rural	Once in 3 years	(Tree decline, description tree & ions in soil etc.)	2001	
		UP Quezon- Laguna Land Grant	Rural	Once in 3 years	(Tree decline, description tree & ions in soil etc.)		
		Metro Manila(La Mesa Dam Watershed)	Urban	Once in 3 years	(Tree decline, description tree & ions in soil etc.)	November 2007	
		Boneco Long Term Ecological Research Site	Remote	Once in 3 years	(Tree decline, description tree & ions in soil etc.)	April 2008	
	Inland aquatic environment	Pandin Lake	Rural	4 times a year	Water quality of Pandin Lake	From 2004	
		Ambulalakao Lake	Remote	4 times/yr	Water quality of Ambulalakao River	From 2005	
<Republic of Korea>	Wet deposition	Kanghwa	Rural	daily	All required items	March 1999	✓
		Cheju(Kosan)	Remote	daily	All required items	April 1999	✓
		Imsil	Rural	daily	All required items	January 2001	✓
	Dry deposition	Kanghwa	Rural	FP(5 days a month)	SO_2, O_3, PM_{10}, Ions in $PM_{2.5}$	2001	✓
		Cheju(Kosan)	Remote	FP(5 days a month)	SO_2, O_3, PM_{10}, Ions in $PM_{2.5}$	2001	✓
		Imsil	Rural	FP(5 days a month)	SO_2, O_3, PM_{10}, Ions in $PM_{2.5}$	2001	✓
	Soil and vegetation	Imsil (Mt.Naejang)	Rural	Every 3 years	(Tree decline, description tree & ions in soil)	2001	

<Russia>	Wet deposition	Mondy	Remote	daily	All required items (+F-, NO_2^-, Br^-, HCO_3^-)	May 1999	✓
		Listvyanka	Rural	daily	All required items (+F-, NO_2^-, Br^-, HCO_3^-)	January 2000	✓
		Primorskaya	Rural	daily	All required items ($+NO_2^-$, Br^-, HCO_3^-)	February 2002	✓
		Irkutsk	Urban	daily	All required items (+F-, NO_2^-, Br^-, HCO_3^-)	January 2001	✓
	Dry deposition	Mondy	Remote	FP(biweekly)	SO_2,HNO_3,HCl,NH_3,PMC	2001	✓
		Listvyanka	Rural	FP(weekly)	SO_2,HNO_3,HCl,NH_3,PMC	2001	✓
		Primorskaya	Rural	FP(weekly)	SO_2,HNO_3,HCl,NH_3,PMC	2001	✓
		Irkutsk	Urban	FP(weekly)	SO_2,HNO_3,HCl,NH_3,PMC	2001	✓
	Soil and vegetation	Mondy	Remote	Once/5 years	Tree decline, description tree & ions in soil	2001	
		Listvyanka (Bolshie Koty)	Rural	Once/5 years	Tree decline, description tree & ions in soil	2001	
		Irkutsk	Urban	Once/5 years	Tree decline, description tree & ions in soil	2001	
		Primorskaya	Rural	Once/5 years	Tree decline, description tree & ions in soil	2002	
	Inland aquatic environment	Pereemnaya River	Rural	3times/yr	Water quality of Pereemnaya River	2004	✓
		Komarovka River	Rural	5times/yr	Water quality of Komarovka River	2005	✓
<Thailand>	Wet deposition	Bangkok	Urban	daily	All required items+Organic acid, Phosphate	April 1999	✓
		Samutprakarn	Urban	daily	All required items+Organic acid, Phosphate	January 2000	✓
		Patumthani	Rural	daily	All required items+Organic acid, Phosphate	March 1999	✓
		Khanchnaburi (Vachiralongkorn Dam)	Remote	daily	All required items+Organic acid, Phosphate	April 1999	✓
		Chiang Mai(Mae Hia)	Rural	daily	All required items+Organic acid, Phosphate	January 2001	✓
		Nakhon Ratchasima	Rural	daily	All required items+Organic acid, Phosphate	January 2006	✓
	Dry deposition	Bangkok	Urban	AT+ FP(10 days)	SO_2,NO,NO_2,O_3,PM_{10},$PM_{2.5}$,HNO_3,HCl,NH_3,PMC		✓
		Samutprakarn	Urban	AT	SO_2,NO,NO_2,O_3		
		Khanchnaburi (Vachiralongkorn Dam)	Remote	AT+ FP(10 days)	SO_2,NO,NO_2,O_3,HNO_3,HCl,NH_3,PMC		✓
		Chiang Mai(Mae Hia)	Rural	AT+ FP(10 days)	SO_2,NO,NO_2,PM_{10},$PM_{2.5}$,O_3,HNO_3,HCl, NH_3,PMC		✓
		Nakhon Ratchasima	Rural	FP(10 days)	SO_2,HNO_3,HCl,NH_3,PMC	January 2006	✓
	Soil and vegetation	Vachiralongkorn Dam	Remote	Once/3-5 years	Tree Decline, Ions in soil		
	Inland aquatic environment	Vachiralongkorn Dam	Remote	4 times/year	Water quality of Vachiralongkorn Dam		✓
<Viet nam>	Wet deposition	Hanoi	urban	weekly	All required items	August 1999	✓
		Hoa Binh	rural	weekly	All required items	August 1999	✓
		Cuc Phuong	remote	weekly	All required items+HCO_3^-	January 2010	✓
		Da Nang	urban	weekly	All required items+HCO3-	January 2010	✓
		Can Tho	Rural	weekly	All required items+F	April 2014	✓
		Ho Chi Minh	Urban	weekly	All required items+F	February 2014	✓
	Dry deposition	Hanoi	urban	FP(weekly)	SO_2,HNO_3,HCl,NH_3,PMC		✓
		Hoa Binh	rural	AT+ FP(weekly)	PM2.5 SO_2,HNO_3,HCl,NH_3,PMC	February 2015	✓
		Can Tho	Rural	FP	SO_2,HNO_3,HCl,NH_3,PMC		
		Ho Chi Minh	Urban	FP	SO_2,HNO_3,HCl,NH_3,PMC		
	Soil and vegetation	Cuc Phuong	rural	Once/3-5 years	Tree decline, description tree & ions in soil		
	Inland aquatic environment	Hoa Binh Reservoir	rural	4 times/year	Water quality of Hoa Bin Reservoir	1999	✓
	PMC; Particulate matter components						

Attachment 2

List of sites and monitoring items

Table1. Wet deposition monitoring

Country/items	City	Monitoring sites	Classification	Monitoring interval	Mandatory items:										Optional items:	Meteorology
					pH	EC	SO_4^{2-}	NO_3^-	Cl^-	Na^+	K^+	Ca^{2+}	Mg^{2+}	NH_4^+		
<Cambodia>		Phnom Penh	Urban	Weekly	x	x	x	x	x	x	x	x	x	x		
		Siem Reap	Urban	Weekly	x	x	x	x	x	x	x	x	x	x		
<China>	Chongqing	Haifu	Urban	Daily	x	x	x	x	x	x	x	x	x	x	F^-	x
		Jinyunshan	Rural	Daily	x	x	x	x	x	x	x	x	x	x	F^-	x
	Xi'an	Shizhan	Urban	Daily	x	x	x	x	x	x	x	x	x	x		x
		Jiwozi	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
	Xiamen	Hongwen	Urban	Daily	x	x	x	x	x	x	x	x	x	x	F^-	x
		Xiaoping	Remote	Daily	x	x	x	x	x	x	x	x	x	x	F^-	x
	Zhuhai	Xiang Zhou	Urban	Daily	x	x	x	x	x	x	x	x	x	x	F^-	x
		Zhuxiandong	Urban	Daily	x	x	x	x	x	x	x	x	x	x	F^-	x
<Indonesia>		Jakarta(BMG)	Urban	Weekly	x	x	x	x	x	x	x	x	x	x		x
		Serpong(EMC)	Rural	Daily	x	x	x	x	x	x	x	x	x	x		x
		Kototabang(BMG)	Remote	Weekly	x	x	x	x	x	x	x	x	x	x		
		Bandung(LAPAN)	Urban	Daily	x	x	x	x	x	x	x	x	x	x		
		Maros(BMG)	Rural	Weekly	x	x	x	x	x	x	x	x	x	x		
<Japan>		Rishiri	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Ochiishi	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Tappi	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Ogasawara	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Sado-seki	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Happo	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Oki	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Yusuhara	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Hedo	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Ijira	Rural	Weekly	x	x	x	x	x	x	x	x	x	x		x
		Banryu	Urban	Weekly	x	x	x	x	x	x	x	x	x	x		x
		Tokyo	Urban	Daily	x	x	x	x	x	x	x	x	x	x		
<Lao PDR>		Vientiane	Urban	Daily	x	x	x	x	x	x	x	x	x	x		
<Malaysia>		Petaling Jaya	Urban	Weekly	x	x	x	x	x	x	x	x	x	x	Formic,Acetic, Oxalic acid	x
		Tanah Rata	Rural	Weekly	x	x	x	x	x	x	x	x	x	x	Formic,Acetic, Oxalic acid	x
		Danum Valley	Remote	Weekly	x	x	x	x	x	x	x	x	x	x	Formic,Acetic, Oxalic acid	
		Kuching	Urban	Weekly	x	x	x	x	x	x	x	x	x	x	Formic,Acetic, Oxalic acid	
<Mongolia>		Ulaanbaatar	Urban	Daily	x	x	x	x	x	x	x	x	x	x	HCO_3^-	x
		Terelj	Remote	Daily	x	x	x	x	x	x	x	x	x	x	HCO_3^-	x
<Myanmar>		Kaha-Aya, Yangon	Urban	Daily	x	x	x	x	x	x	x	x	x	x		x
<Philippines>		Metro Manila	Urban	Weekly	x	x	x	x	x	x	x	x	x	x	PO_4^{3-}	x
		Los Banos	Rural	Weekly	x	x	x	x	x	x	x	x	x	x	PO_4^{3-}	x
		Mt. Sto. Tomas	Rural	Weekly	x	x	x	x	x	x	x	x	x	x		x
<Republic of Korea>		Kanghwa	Rural	Daily	x	x	x	x	x	x	x	x	x	x		x
		Cheju(Kosan)	Remote	Daily	x	x	x	x	x	x	x	x	x	x		x
		Imsil	Rural	Daily	x	x	x	x	x	x	x	x	x	x		x
<Russia>		Mondy	Remote	Daily	x	x	x	x	x	x	x	x	x	x	F^-, NO_2^-, Br^-, HCO_3^-	x
		Listvyanka	Rural	Daily	x	x	x	x	x	x	x	x	x	x	F^-, NO_2^-, Br^-, HCO_3^-	x
		Irkutsk	Urban	Daily	x	x	x	x	x	x	x	x	x	x	F^-, NO_2^-, Br^-, HCO_3^-	x
		Primorskaya	Rural	Daily	x	x	x	x	x	x	x	x	x	x	NO_2^-, Br^-, HCO_3^-	x
<Thailand>		Bangkok	Urban	Daily	x	x	x	x	x	x	x	x	x	x	$HCOOH$,CH_3COOH,PO_4^{3-}	x
		Samuyprakan	Urban	Daily	x	x	x	x	x	x	x	x	x	x	$HCOOH$,CH_3COO,HPO_4^{3-}	x
		Patumthani	Rural	Daily	x	x	x	x	x	x	x	x	x	x	$HCOOH$,CH_3COO,HPO_4^{3-}	x
		Khanchanaburi (Vachralongkorn Dam)	Remote	Daily	x	x	x	x	x	x	x	x	x	x	$HCOOH$,CH_3COO,HPO_4^{3-}	x
		Chiang Mai(Mae-Hia)	Rural	Daily	x	x	x	x	x	x	x	x	x	x	$HCOOH$,CH_3COO,HPO_4^{3-}	x
		Nakhon Ratchasima	Remote	Daily	x	x	x	x	x	x	x	x	x	x	$HCOOH$,CH_3COOH,PO_4^{3-}	x
<Viet nam>		Hanoi	Urban	Weekly	x	x	x	x	x	x	x	x	x	x	F^-	x
		Hoa Binh	Rural	Weekly	x	x	x	x	x	x	x	x	x	x	F^-	x
		Cuc Phuong	Remote	Weekly	x	x	x	x	x	x	x	x	x	x	HCO_3^-	x
		Da Nang	Urban	Weekly	x	x	x	x	x	x	x	x	x	x	HCO_3^-	x
		Can Tho	Rural	Weekly	x	x	x	x	x	x	x	x	x	x	F^-	x
		Ho Chi Minh	Urban	Weekly	x	x	x	x	x	x	x	x	x	x	F^-	

Table2. Dry deposition(Air concentration) monitoring

Country/items	City	Monitoring sites	Classification	Monitoring method	Priority of the chemical species												
					SO_2	O_3	NO	NO_2, NOx	PM_{10}	$PM_{2.5}$	HNO_3	HCl	NH_3	SO_4^{2-}	NO_3^-	NH_4^+	Ca^{2+}
<Cambodia>		Phnom Penh	Urban	FP	x						x	x	x	x	x	x	x
<China>	Chongqing	Jinyunshan	Rural	AT	x		x	x	x								
	Xiamen	Hongwen	Urban	AT,FP	x			x	x		x	x	x	x	x	x	x
	Zhuhai	Haibin Park	Urban	AT	x			x	x								
<Indonesia>		Jakarta	Urban	FP	x						x	x	x	x	x	x	x
		Jakarta	Urban	PS	x			x									
		Serpong(EMC)	Rural	FP	x						x	x	x	x	x	x	x
		Serpong(EMC)	Rural	PS	x			x									
		Kototabang	Remote	PS	x			x									
		Bandung	Urban	FP	x						x	x	x	x	x	x	x
		Bandung	Urban	PS	x			x									
<Japan>		Rishiri	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Ochiishi	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Tappi	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Ogasawara	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Sado-seki	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Happo	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Oki	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Yusuhara	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Hedo	Remote	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Iiira	Rural	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Banryu	Urban	AT,FP	x	x	x	x	x	x	x	x	x	x	x	x	x
		Tokyo	Urban	FP	x						x	x	x	x	x	x	x
<Malaysia>		Petaling Jaya	Urban	FP	x						x	x	x	x	x	x	x
		Tanah Rata	Remote	FP	x						x	x	x	x	x	x	x
		Danum Valley	Remote	FP	x						x	x	x	x	x	x	x
<Mongolia>		Ulaanbaatar	Urban	FP	x						x	x	x	x	x	x	x
		Terelj	Remote	FP	x						x	x	x	x	x	x	x
<Myanmar>		Yangon	Urban	FP	x						x	x	x	x	x	x	x
		Mandalay	Rural	AT						x							
<Philippines>		Metro Manila	Urban	FP	x						x	x	x	x	x	x	x
		Los Banos	Rural	FP	x						x	x	x	x	x	x	x
		Mt. Sto. Tomas	Remote	FP	x						x	x	x	x	x	x	x
<Republic of Korea>		Kanghwa	Rural	AT,FP	x	x		x	x		x	x	x	x	x	x	x
		Cheju(Kosan)	Remote	AT,FP	x	x		x	x		x	x	x	x	x	x	x
		Imsil	Rural	AT,FP	x	x		x	x		x	x	x	x	x	x	x
<Russia>		Mondy	Remote	FP, AT	x	x					x	x	x	x	x	x	x
		Listvyanka	Rural	FP, PS	x						x	x	x	x	x	x	x
		Irkutsk	Urban	FP	x						x	x	x	x	x	x	x
		Primorskaya	Rural	FP	x						x	x	x	x	x	x	x
<Thailand>		Bangkok	Urban	AT,FP	x	x	x	x			x	x	x	x	x	x	x
		Samutprakarn	Urban	AT	x	x	x	x									
		Khanchanaburi(Vachralongkorn Dam)	Remote	AT,FP	x	x	x	x			x	x	x	x	x	x	x
		Chiang Mai(Mae-Hia)	Rural	AT,FP	x	x	x	x	x		x	x	x	x	x	x	x
		Nakhon Ratchasima	Rural	FP	x						x	x	x	x	x	x	x
<Viet nam>		Hanoi	Urban	FP	x						x	x	x	x	x	x	x
		Hoa Binh	Rural	FP	x						x	x	x	x	x	x	x
		Can Tho	Rural	FP	x						x	x	x	x	x	x	x
		Ho Chi Minh	Urban	FP	x						x	x	x	x	x	x	x

AT:Automatic Monitor,FP:Filter pack,

Table3. Soil & Vegitation monitoring

Country/items	City	Monitoring sites	Classification	Monitoring interval (Soil)	Monitoring interval (Forest)	Soil											Forest monitoring				
						Mandatory items:							Opetinal items			Voluntary item	mandatory item(3-5years)			Optional items	
						Moisture contents	pH (H_2O)	pH (KCl)	Exchangeable base cataions (Ca,Mg,K,and Mg)	Exchangeable Acidity	Effective cataion exchngeable capacity (ECEC)	Carbonate contents	Exchangeable acid cations (AL,H)	Total carbon content	Total nitrogen content	Available phosphate/ Sulfate	Description of trees	Understory vegetation survey	Observation of tree decline	Photographic record of tree decline	Estimation of decline causes
<China>	Chongqing	Jinyunshan	Rural	Once/3years	Once/3years	x	x	x	x	x	x	x	x				x	x	x		
	Xi'an	Jiwozi	Remote	Once/3years	Once/3years	x	x	x	x	x	x	x	x	x	x	x	x				
	Xiamen	Xiaoping	Remote	Once/3years	Once/3years	x	x	x	x	x	x	x	x	x	x	x	x				
	Zhuhai	Zhuxiandong	Urban	Once/3years	Once/3years	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<Indonesia>		Bogor Research Forest (Darmage Experimental Forest)	Rural	Once/3years	Once/3years		x	x	x		x	x	x	x	x	x	x		x		
<Japan>		Ijira	Rural	Once/5years	Once/5year	x	x	x	x	x	x		x				x	x	x	x	x
		Banryu	Urban	Once/5years	Once/5year	x	x	x	x	x	x		x	x	x	Phosphate	x	x	x	x	x
<Malaysia>		Pasoh Reserve Forest	Urban	Once/3years		x	x	x	x	x			x	x	x	x	x		x		x
		Universiti Putra Malaysia Rehabilitated Forest	Urban	Once/3years		x	x	x	x	x							x		x		
<Mongolia>		Ulaanbaatar (Bogdkhan mountain)	Urban	Once/3-5years	Once/3-5years	x	x	x	x	x	x	x	x	x	x	Phosphate	x		x		
<Philippines>		Los Banos Laguna (Makiling Forest Reserve)	Rural	Once/3years	Once/3years	x	x	x	x	x	x		x	x	x		x	x	x	x	
		UP Quezon- Laguna Land Grant	Rural	Once/3years	Once/3years	x	x	x	x	x	x		x	x	x		x	x	x	x	
		Metro Manila (La Mesa Dam Watershed)	Urban	Once/3years	Once/3years	x	x	x	x	x	x		x	x	x		x	x	x	x	
		Mt. Sto. Tomas(ERDS Research Station)	Remote	Once/3years	Once/3years	x	x	x	x	x	x		x	x	x		x	x	x	x	
<Republic of Korea>		Imsil (Mt.Naejang)	Rural	Once/3years	Once/3years	x	x	x	x	x	x		x				x	x	x		
<Russia>		Mondy	Remote	Once/5years	Once/5years	x	x	x	x	x	x	x	x	x	x		x		x		
		Listvyanka	Rural	Once/5years	Once/5years	x	x	x	x	x	x	x	x	x	x		x		x		
		Primorskaya	Rural	Once/5years	Once/5years	x	x	x	x	x	x	x	x	x	x		x		x		
		Irkutsk	Urban	Once/5years	Once/5years	x	x	x	x	x	x	x	x	x	x		x		x		
<Thailand>		Vachralongkorn Dam	Remote	Once/3-5years	Once/3-5years	x	x	x	x	x	x		x				x		x		
<Viet nam>		Hoa Binh	Rural	Once/3-5years	Once/3-5years		x	x	x		x								x		

Table4. Inland aquatic environment monitoring sites and items in 2014

Country/items	City	Monitoring sites	Classification of the neartest deposition site	Monitoring interval	Mandatory items(4times/year)												Mandatory items(Once/year)					Optional								
					W.T	pH	EC	Alkalinity	SO_4^{2-}	NO_3^-	Cl^-	Na^+	K^+	Ca^{2+}	Mg^{2+}	NH_4^+	Transparency	water color	DOC (COD)	NO^{2-}	PO_4^{3-}	T-N	T-P	TOC	diss-Al	Si	Fe	Mn	Chlorophyll a	DO
<Cambodia>		Sras Srang Lake	Remote	2times/years	x	x	x	x	x	x	x	x	x	x	x	x	x													x
<China> :	Chongqing	Jinyunshan Lake	Rural	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x									
	Xi'an	Jiwozi River	Remote	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x									
	Xiamen	Xiaoping Dam	Remote	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x									
	Zhuhai	Zhuxiandong Stream	Urban	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x									
<Indonesia>		Patenggang Lake	Rural	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x									
		Gunung Lake	---	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x									
<Japan>		Ijira Lake	Rural	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x		x	x
		Banryu Lake	Urban	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<Lao-PDR>		Nam Houm Lake	Urban	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x			x		x									
<Malaysia>		Semenyih Dam	Urban	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x			x		x									
		Tembaling River	Remote	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x			x		x									
<Mongolia>		Terelj River	Remote	4-5 times/year	x	x	x	x	x	x	x	x	x	x	x	x				x	x									
<Philippines>		Pandin Lake	Rural	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		BOD5	x	x									x
		Ambulalakao River	Remote	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		BOD5	x	x									x
<Russia>		Pereemnaya River	Rural	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x				
		Komarovka River	Rural	5 times/year	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x					x	x			x
<Thailand>		Vachiralongkorn Dam	Remote	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x									
<Viet nam>		Hoa Binh Reservoir	Rural	4 times/year	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x									