

Summary of the National Monitoring Plans in 2022

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 the EANET. First summarization of the NMP was prepared in November 2001. The 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 Quality assurance/Quality control (QA/QC) Guidebook for Acid Deposition Monitoring Network in East Asia -2016 (November 2016, Network Center for EANET).
2. The 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 needs to be checked 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.

II. Preparation of NMP based on the revised template

3. The electronic template (https://www.eanet.asia/wp-content/uploads/2019/04/QAQC_Guidebook_Appendix.doc) of the NMP was newly prepared and available as a part of the QA/QC Guidebook 2016 (https://www.eanet.asia/wp-content/uploads/2019/04/QAQC_Guidebook2016.pdf). The NMP needs to be reviewed and/or revised for the implementation of monitoring by the National QA/QC manager in each participating country. The NC has prepared the final draft template of the NMP as the part of the QA/QC Guidebook (Fig.1).
4. The outcome of the STM23 meeting should be reflected to the secondary revision process for the draft with communication between the NC and the National QA/QC managers in the participating countries. After report at the SAC22, 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.

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Attachment 1**Overview of the National Monitoring Plan 2022**

Yellow: The NMP for 2022 was already submitted to NC.

Green: The NMP for 2022 is assumed to be the same as the actual results for 2020.

								As of 2022/9/2	
Country	Items	Monitoring sites	Classification	Monitoring interval	Measurement Parameters	Remarks (Start time)	Available Data (2020)	Plan (2022)	
<Cambodia>	Wet	Phnom Penh	Urban	weekly	All required items	JAN 2005		✓	
		Siem Reap	Urban	weekly	All required items	OCT 2011			
	Dry	Phnom Penh	Urban	AT(hourly)	PM _{2.5} , O ₃ (AUG 2019-)	FEB 2010	✓	✓	
				FP(biweekly)	SO ₂ ,HNO ₃ ,HCL,NH ₃ ,PMC	FEB 2010		✓	
Inland	Sras Srang Lake	Remote	2 times/y	Water quality	2012		✓		
<China>	Wet	Chongqing -Haifu	Urban	daily	All required items + F	JAN 2008	✓	✓	
		Chongqing -Jinyunshan	Rural	daily	All required items + F	APR 1999	✓	✓	
		Xi'an -Shizhan	Urban	daily	All required items	APR 1999	✓	✓	
		Xi'an-Jiwozi	Remote	daily	All required items	APR 1999	✓	✓	
		Xiamen-Hongwen	Urban	daily	All required items + F	APR 1999	✓	✓	
		Xiamen-Xiaoping	Remote	daily	All required items + F	APR 1999	✓	✓	
		Zhuhai-Xiangzhou	Urban	daily	All required items + F	APR 1999	✓	✓	
		Zhuhai-Zhuxiandong	Urban	daily	All required items + F	DEC 1999	✓	✓	
		Wuzhishan-Wuzhishan	Remote	daily	All required items + F	JAN 2019	✓	✓	
	Lijang-Lijang	Remote	daily	All required items + F	JAN 2019	✓	✓		
	Dry	Chongqing -Jinyunshan	Rural	AT(Daily)	SO ₂ , NO, NO _x , PM ₁₀	JAN 2001	✓	✓	
		Xiamen-Hongwen	Urban	AT(Daily)	SO ₂ ,NO ₂ ,PM ₁₀ ,	JAN 2000	✓	✓	
		Zhuhai-Haibin-Park	Urban	AT(Daily)	SO ₂ ,NO ₂ , PM ₁₀	2014	✓	✓	
		Wuzhishan-Wuzhishan	Remote	AT(Daily)	SO ₂ ,NO ₂ , PM ₁₀	JAN 2019	✓	✓	
		Lijang-Lijang	Remote	AT(Daily)	SO ₂ ,NO ₂ , PM ₁₀	JAN 2019	✓	✓	
	Soil & vegetation	Chongqing -Jinyunshan	Rural	Every 5 years	Tree decline, Abnormalities of leaves and branches(Ions			✓	
		Xi'an-Jiwozi	Remote	Every 5 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)			✓	
		Xiamen-Xiaoping	Remote	Every 5 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)			✓	
		Zhuhai-Zhuxiandong	Urban	Every 5 years	Tree decline, Abnormalities of leaves and branches(Ions etc.in soil)				
	Inland	Chongqing-Jinyunshan Lake	Rural	4 times/y	Water quality	2001	✓	✓	
		Xi'an-Jiwozi River	Remote	4 times/y	Water quality	2001	✓	✓	
		Xiamen-Xiaoping Dam	Remote	4 times/y	Water quality	2001	✓	✓	
		Zhuhai-Zhuxiandong Stream	Urban	4 times/y	Water quality	2004	✓	✓	
	<Indonesia> The plan for 2022 was decided based on the results of 2020.	Wet	Jakarta	Urban	weekly	All required items	APR 1998	✓	✓
			Serpong	Rural	daily	All required items	APR 1998	✓	✓
			Kototabang	Remote	weekly	All required items	APR 1998	✓	✓
Bandung			Urban	daily	All required items	JAN 1999	✓	✓	
Maros			Rural	weekly	All required items	JAN 2008	✓	✓	
Jembrana			Rural	weekly	All required items	2020	✓	✓	
Lombok			Rural	weekly	All required items	2020	✓	✓	
Dry		Serpong	Rural	FP(bi-weekly)	SO ₂ ,HNO ₃ ,HCL,NH ₃ ,PMC	JUL 2001	✓	✓	
		Kototabang	Remote	PS (weekly)	SO ₂ , NO ₂	JAN 2007	✓	✓	
		Jakarta	Urban	FP(bi-weekly)	SO ₂ ,HNO ₃ ,HCL,NH ₃ ,PMC	2014	✓	✓	
		Jakarta	Urban	PS (weekly)	SO ₂ ,NO ₂	2007	✓	✓	
		Jakarta	Urban	AT(hourly)	PM _{2.5}	2017	✓	✓	
		Bandung	Urban	FP(bi-weekly)	SO ₂ ,HNO ₃ ,HCL,NH ₃ ,PMC	2014	✓	✓	
		Bandung	Urban	PS (weekly)	NO ₂ , O ₃ , NH ₃ , SO ₂ NH ₃	2008	✓	✓	
		Bandung	Urban	AT(hourly)	O ₃		✓	✓	
Soil and vegetation		Darmaga-Bogor	Rural	once/5 years	Decline, K etc. in leaves & ions in soil	2002			
Inland		Patenggang Lake	Rural	4 times/y	Water quality	2001		✓	
		Gunung Lake	Rural	4 times/y	Water quality	2007		✓	

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<Japan>	Wet	Rishiri	Remote	daily	All required items	APR 1998	✓	✓	
		Ochiishi	Remote	daily	All required items	APR 2003	✓	✓	
		Niigata-Maki	Rural	daily	All required items	APR 2019	✓	✓	
		Ogasawara	Remote	daily	All required items	MAY 1999	✓	✓	
		Sado-seki	Remote	daily	All required items + HCO ₃ ⁻	APR 1999	✓	✓	
		Happo	Remote	daily	All required items	APR 1998	✓	✓	
		Oki	Remote	daily	All required items	APR 1998	✓	✓	
		Yusuhara	Remote	daily	All required items + F, NO ₂ ⁻ , PO ₄ ³⁻	DEC 1999	✓	✓	
		Tsushima	Remote	daily	All required items	APR 2019	✓	✓	
		Hedo	Remote	daily	All required items	DEC 1999	✓	✓	
		Ijira	Rural	weekly	All required items	JUN 1999	✓	✓	
		Tokyo	Urban	daily	All required items F, NO ₂ ⁻	APR 2007	✓	✓	
		Dry	Rishiri	Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	AT FP JAN 2002	✓	✓
			Ochiishi	Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	FP: 2008	✓	✓
	Niigata-Maki		Rural	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	AT(PM)&FP: 2020	✓	✓	
	Ogasawara		Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	FP: 2003	✓	✓	
	Sado-seki		Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ , HCLNH ₃ ,PMC	FP: 2003	✓	✓	
	Happo		Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	FP: 2003	✓	✓	
	Oki		Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ , HCLNH ₃ ,PMC	FP: 2002	✓	✓	
	Tsushima		Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	AT(exPM&O ₃)&FP: 2020	✓	✓	
	Yusuhara		Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	FP: 2003	✓	✓	
	Hedo		Remote	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	FP: 2003	✓	✓	
	Ijira		Rural	AT(hourly) FP(biweekly)	SO ₂ ,NO,NO _x ,O ₃ ,PM _{10/2.5} HNO ₃ ,HCLNH ₃ ,PMC	FP: 2003	✓	✓	
	Tokyo		Urban	FP(biweekly)	SO ₂ ,HNO ₃ ,NH ₃ , PMC	FP: 2007	✓	✓	
	Soil and vegetation		Ijira	Rural	Once in 5 years	All required items		✓	
			Sekido-san, Horyu-san	Rural	Once in 5 years	All required items	2019	✓	
	Inland	Ijira Lake	Rural	4 times/y	Water quality	2001	✓	✓	
		Futago-ike	Remote	4 times/y	Water quality	2019	✓	✓	
Catchment-scale	Ijira	Rural	1 times/y	Input, output, biochemical process		✓	✓		
<Lao PDR> The plan for 2022 was decided based on the results of 2020.	Wet	Vientiane	Urban	daily	All required items	OCT 2003		✓	
	Dry	Vientiane	Urban	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ , PMC				
				AT(hourly)	NO,NO ₂ ,PM ₁₀ , PM _{2.5}		✓	✓	
Inland	Nam Houm Lake	Urban	4 times/y	Water quality	SEP 2009				

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<Malaysia>	Wet	Petaling Jaya	Urban	weekly	All required items+HCO ₃ ⁻ , F	APR 1998	✓	✓
		Tanah Rata	Rural	weekly	All required items+HCO ₃ ⁻ , F	JAN 1999	✓	✓
		Danum Valley	Remote	weekly	All required items+HCO ₃ ⁻ , F	JAN 2006	✓	✓
		Kuching	Urban	weekly	All required items+HCO ₃ ⁻ , F		✓	✓
	Dry	Petaling Jaya	Urban	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ , PMC		✓	✓
		Tanah Rata	Rural	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ , PMC	FP: 2001	✓	✓
		Danum Valley	Remote	FP(biweekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ , PMC	FP: 2006	✓	✓
	Soil and vegetation	Pasoh Reserve Forest	Urban	Every 3-5 years	Tree decline, description tree & ions in soil etc.	2014		
		Universiti Putra Malaysia Bintulu Rehabilitated Forest	Urban	Every 3-5 years	Tree decline, description tree & ions in soil etc.	2009		
Inland	Kuala Tahan	Remote	4 times/y	Water quality			✓	
<Mongolia>	Wet	Ulaanbaatar	Urban	daily	All required items	AUG 1998	✓	✓
		Terej	Remote	daily	All required items	SEP 1998	✓	✓
	Dry	Ulaanbaatar	Urban	AT+FP(biweekly)	SO ₂ ,NO ₂ ,O ₃ ,PM _{10/2.5} ,HNO ₃ ,HCLNH ₃ ,PMC	AT: 2014- FP: 2000-	✓	✓
		Terej	Remote	FP(biweekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC	2000	✓	✓
	Soil and vegetation	Ulaanbaatar(Bogdkhan mountain)	Urban/Ecologist	Every 3-5 years	pH(H ₂ O),pH(KCl),Exchangeable acidity, Tree decline, description tree	2005-		
		Terej	Remote	Every 3-5 years	pH(H ₂ O),pH(KCl),Exchangeable acidity, Tree decline, description tree	2014-		
Inland	Terej River	Remote	6-12 times/y	Water quality	2002-	✓	✓	
<Myanmar>	Wet	Yangon	Urban	weekly	All required items	JUN 2007	✓	✓
	Dry	Yangon	Urban	FP(biweekly), AT	SO ₂ ,HNO ₃ ,HCLNH ₃ , PMC, PM _{2.5}	NOV 2011 MAR 2018	✓	✓
		Mandalay	Urban	AT	PM _{2.5}	MAY 2015	✓	
<Philippines>	Wet	Metro Manila	Urban	weekly	All required items	APR 1999	✓	✓
		Los Banos	Rural	weekly	All required items	APR 1999		✓
		Mt. St. Tomas	Remote	weekly	All required items	OCT 2006		✓
	Dry	Metro Manila	Urban	AT	SO ₂ ,NO ₂ ,O ₃ ,PM _{10/2.5}	2015	✓	✓
			Urban	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC		✓	✓
		Los Banos	Rural	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC			✓
		Mt. St. Tomas	Remote	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC	OCT 2006		✓
	Soil and vegetation	Mt. Makiling Forest Reserve (Los Banos)	Rural	Once in 3-5 years	(Tree decline, description tree & ions in soil etc.)	2001		
		UP Quezon- Laguna Land Grant	Rural	Once in 3-5 years	(Tree decline, description tree & ions in soil etc.)			
		La Mesa Watershed (Metro Manila)	Urban	Once in 3-5 years	(Tree decline, description tree & ions in soil etc.)	NOV 2007		
		Boneco Long Term Ecological Research Site	Remote	Once in 3-5 years	(Tree decline, description tree & ions in soil etc.)	APR 2008		
	Inland	Lake Pandin	Rural	4 times/y	Water quality	2004	✓	✓
		Ambulalakao Lake	Remote	4 times/y	Water quality	2005		✓
	Catchment-scale	La Mesa Watershed (Metro Manila)	Urban	1 times/y	Input, output, biochemical process	2019	✓	✓
<Republic of Korea>	Wet	Kanghwa	Rural	daily	All required items	MAR 1999		✓
		Cheju(Kosan)	Remote	daily	All required items	APR 1999		✓
		Imnil	Rural	daily	All required items	JAN 2001		✓
	Dry	Kanghwa	Rural	AT + FP(5 days a month)	SO ₂ , NO ₂ , O ₃ , HNO ₃ , NH ₃ , HCl, PM _{10/2.5} , Ions in PM _{2.5}	2001	✓	✓
			Remote	AT + FP(5 days a month)	SO ₂ , NO ₂ , O ₃ , HNO ₃ , NH ₃ , HCl, PM _{10/2.5} , Ions in PM _{2.5}	2001	✓	✓
		Imnil	Rural	AT + FP(5 days a month)	SO ₂ , NO ₂ , O ₃ , HNO ₃ , NH ₃ , HCl, PM ₁₀ , Ions in PM _{2.5}	2001	✓	✓
	Soil and vegetation	Imnil(Mt.Naejang)	Rural	Every 3 years	(Tree decline, description tree & ions in soil)	2001		

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<Russia> The plan for 2022 was decided based on the results of 2020.	Wet	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 ⁻)	JAN 2000	✓	✓
		Primorskaya	Rural	daily	All required items	FEB 2002	✓	✓
		Irkutsk	Urban	daily	All required items(+F, NO ₂ ⁻ , Br ⁻ , HCO ₃ ⁻)	JAN 2001	✓	✓
	Dry	Mondy	Remote	AT(hourly)+FP(biweekly)+PS	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC O ₃	2001 2016	✓	✓
		Listvyanka	Rural	FP(biweekly)+PS	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC O ₃ , SO ₂ , NO _x	2001	✓	✓
		Primorskaya	Rural	FP(biweekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC	2001	✓	✓
		Irkutsk	Urban	FP(biweekly)+PS	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC O ₃	2001 2016	✓	✓
	Soil and vegetation	Mondy	Remote	Once/3-5 years	Tree decline, description tree & ions in soil	2001		
		Listvyanka (Bolshie Koty)	Rural	Once/3-5 years	Tree decline, description tree & ions in soil	2001		
		Irkutsk	Urban	Once/3-5 years	Tree decline, description tree & ions in soil	2001		
		Primorskaya	Rural	Once/3-5 years	Tree decline, description tree & ions in soil	2002		
	Inland	Pereemnaya River	Rural	4 times/y	Water quality	2004	✓	✓
		Komarovka River	Rural	5 times/y	Water quality	2005	✓	✓
<Thailand>	Wet	PCD/PRD (Bangkok)	Urban	daily	All required items+Organic acid, Phosphate	APR 1999	✓	✓
		TMD (Samutprakarn)	Urban	daily	All required items+Organic acid, Phosphate	JAN 2000	✓	✓
		ERTC (Patumthani)	Rural	daily	All required items+Organic acid, Phosphate	MAR 1999	✓	✓
		Vajiralongkorn (Khanchaburi)	Remote	daily	All required items+Organic acid, Phosphate	APR 1999		✓
	Dry	PCD (Bangkok)	Urban	AT(hourly,Daily)+FP(10 days)	NO,NO ₂ ,O ₃ ,PM ₁₀ ,PM _{2.5} , HNO ₃ ,HCLNH ₃ ,PMC		✓	✓
		TMD (Samutprakarn)	Urban	AT	SO ₂ ,NO,NO ₂ ,O ₃ ,PM ₁₀ ,PM _{2.5}		✓	✓
		Vajiralongkorn (Khanchaburi)	Remote	AT+FP(10 days)	SO ₂ ,NO,NO ₂ ,O ₃ ,PM ₁₀ ,PM _{2.5} , HNO ₃ ,HCLNH ₃ ,PMC			✓
	Soil and vegetation	Vajiralongkorn Dam	Remote	Once/3-5 years	Tree decline, description of trees, pH & ions in soil			
		Vajiralongkorn Puye	Remote	Once/3-5 years	Tree decline, description of trees, pH & ions in soil			
	Inland	Vajiralongkorn Dam	Remote	4 times/y	Water quality		✓	✓
<Viet Nam>	Wet	Hanoi	Urban	weekly	All required items + F ⁻	AUG 1999	✓	✓
		Hoa Binh	Rural	weekly	All required items + F ⁻	AUG 1999	✓	✓
		Cuc Phuong	Remote	weekly	All required items + F ⁻ , HCO ₃ ⁻	JAN 2010	✓	✓
		Da Nang	Urban	weekly	All required items+HCO ₃ ⁻	JAN 2010	✓	✓
		Can Tho	Rural	weekly	All required items + F ⁻	APR 2014	✓	✓
		Ho Chi Minh	Urban	weekly	All required items + F ⁻	JAN 2014	✓	✓
		Yen Bai	Rural	weekly	All required items + F ⁻	MAY 2015	✓	✓
	Dry	Hanoi	Urban	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC		✓	✓
		Hoa Binh	Rural	AT(hourly) FP(weekly)	PM _{2.5} SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC	FEB 2015	✓	✓
		Can Tho	Rural	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC		✓	✓
		Ho Chi Minh	Urban	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC		✓	✓
		Yen Bai	Rural	FP(weekly)	SO ₂ ,HNO ₃ ,HCLNH ₃ ,PMC	MAY 2015	✓	✓
	Soil and vegetation	Cuc Phuong	Remote	Once/3-5 years	Tree decline, description tree & ions in soil	1999		
Inland	Hoa Binh Reservoir	Rural	4 times/y	Water quality	2001	✓	✓	

PMC; Particulate matter components

PS; Passive sampler

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Attachment 2

Fig. 2 Wet deposition sites planned in 2022

Fig. 3 Dry deposition (Gas and Aerosol) sites planned in 2022

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Fig. 4 Soil and vegetation sites

Fig. 5 Inland aquatic environment sites planned in 2022

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Fig. 6 Catchment scale monitoring sites planned in 2022