Lancang-Mekong Roundtable Dialogue on Water Environment Governance and Water Quality Monitoring Technical Solution

Standards and Technical Solution of Water Quality Monitoring Sharing

Introduction of Water Quality Monitoring Standards in Cambodia

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Department of Freshwater Wetlands Conservation

Outline

- Introduction
- Standards and sampling sites
- Challenges
- Conclusion and Way Forwards

Part 1.-

Introduction

Based on the rectangular strategy of the Royal Government of Cambodia phase III, the ministry of environment has placed the 4 important pillars:

- Modernization of the institution;
- Environmental protection;
- Biodiversity conservation;
- Sustainable living.

Part 2.-

Standards and sampling sites

Kingdom of Cambodia
Nation Religion King

ROYAL GOVERNMENT
Council of Ministers
No: 27 ANRK.BK

Phnom Penh, April 06, 1999

SUB-DECREE
on
WATER POLLUTION CONTROL

- Has seen the Constitution of the Kingdom of Cambodia (1993);
- Has seen the Royal Decree No. NS.RKT 1198.72 dated 30 November, 1998 on the Formation of the Royal Government of Cambodia of the Kingdom of Cambodia;
- Has seen Preah Reach Kram No. 02/NS/94 dated 20 July 1994, announcing to allow using the Law on the Establishment and Implementation of the Council of Ministers;
- Has seen Preah Reach Krom No. NS.RKM 0194/21 dated 24 January 1996, announcing to use the Law on the Establishment of the Ministry of Environment;
- Has seen Preah Reach Krom No. NS.RKM 1296/36 dated 24 December 1996. Announcing to use the Law on the Environmental Protection and Natural Resources Management;
- Has received an approval from meeting of the council ministers on March 12, 1999.

Decision

Annex 4

Water Quality Standard in public water areas for bio-diversity conservation

1-River

N°	Parameter	Unit	Standard Value
1	pH	mg/l	6.5-8.5
2	BOD_5	mg/l	1-10
3	Suspended Solid	mg/l	25-100
4	Dissolved Oxygen	mg/l	2.0-7.5
5	Coliform	MPN/100ml	<5000

2-Lakes and Reservoirs

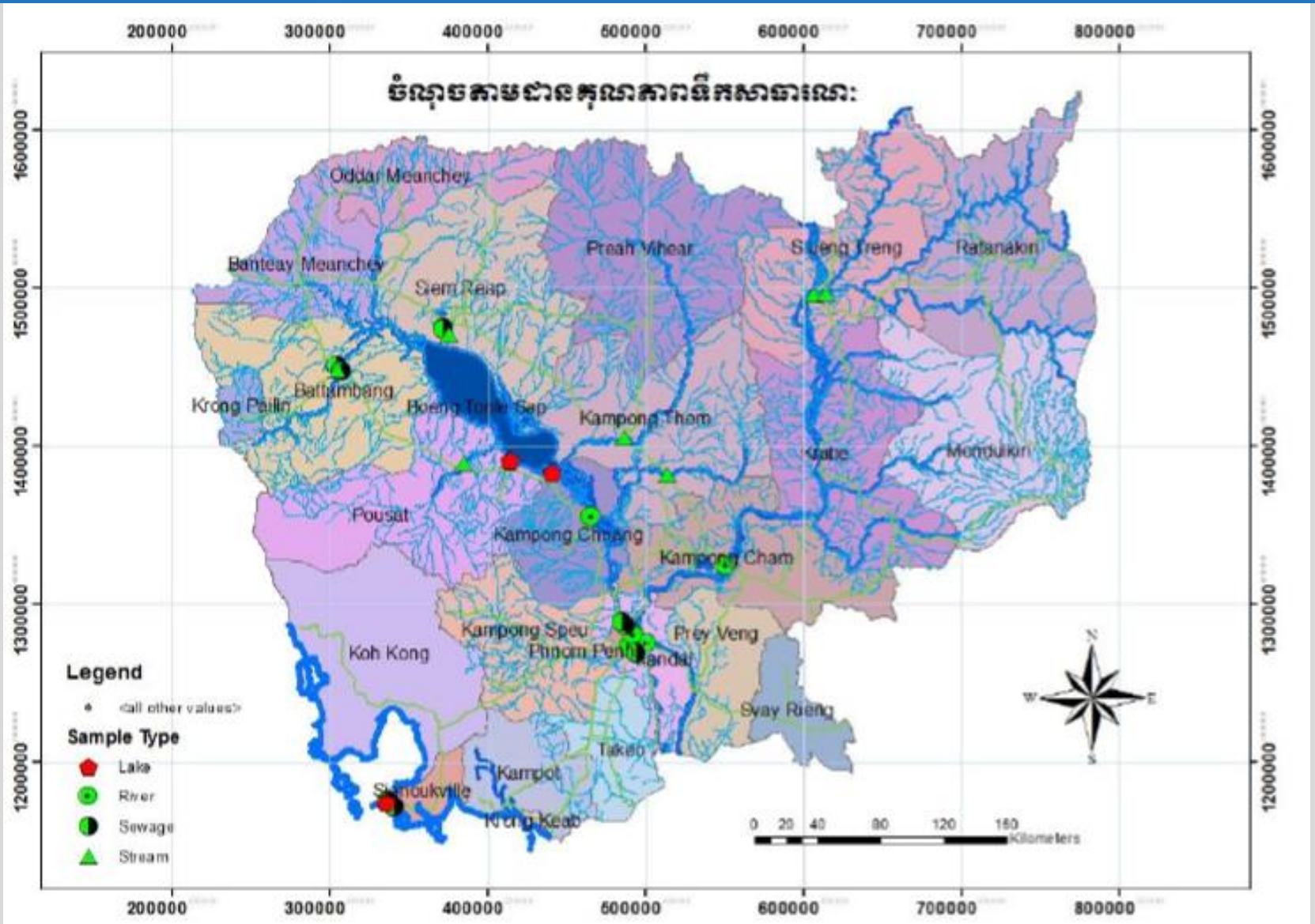
N°	Parameter	Unit	Standard Value
1	pH	mg/l	6.5-8.5
2	COD	mg/l	1-8
3	Suspended Solid	mg/l	1-15
4	Dissolves Oxygen	mg/l	2.0-7.5
5	Coliform	MPN/100ml	<1000
6	Total Nitrogen	mg/l	0.1-0.6
7	Total Phosphorus	mg/l	0.005-0.05

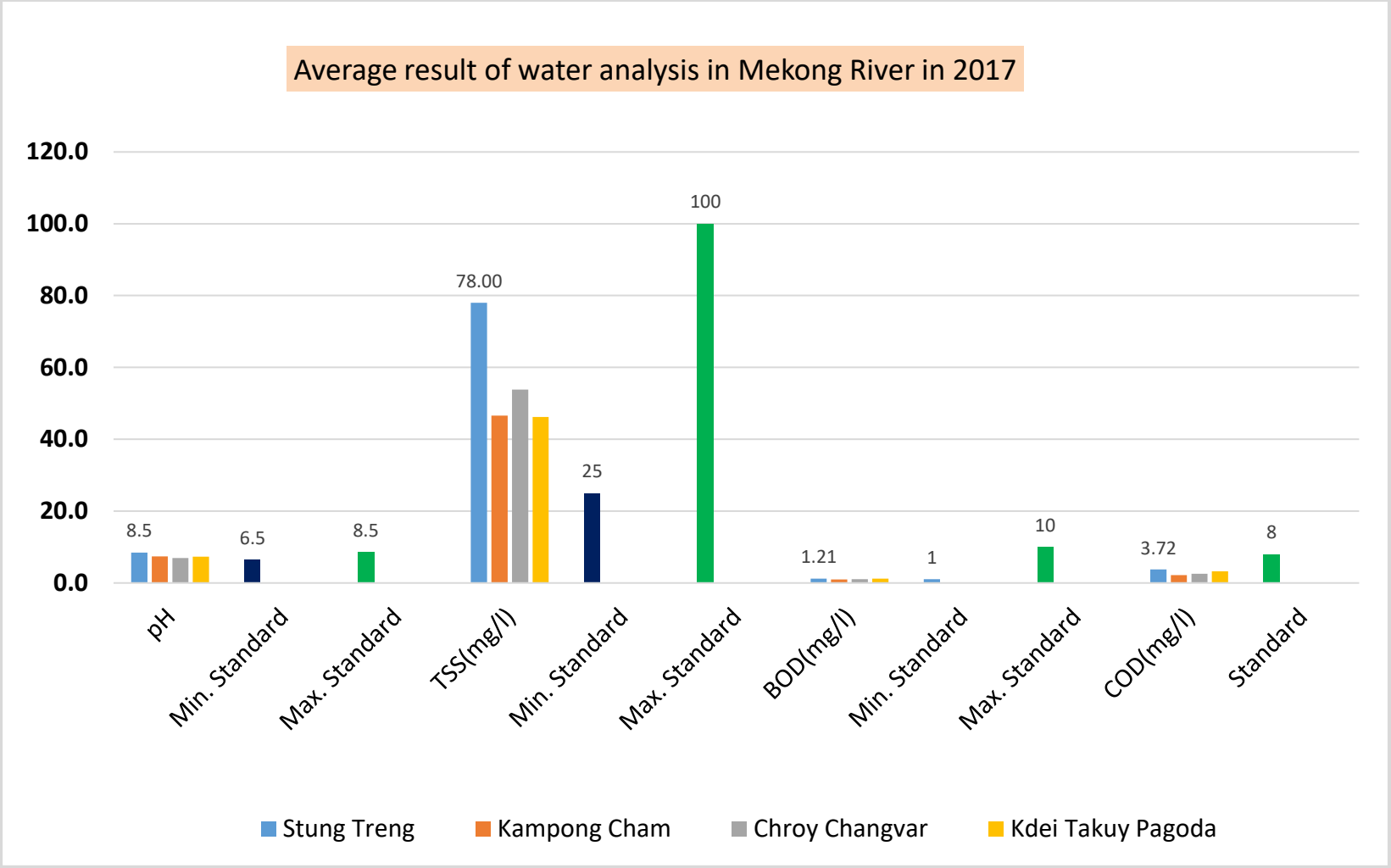
3-Coastal water

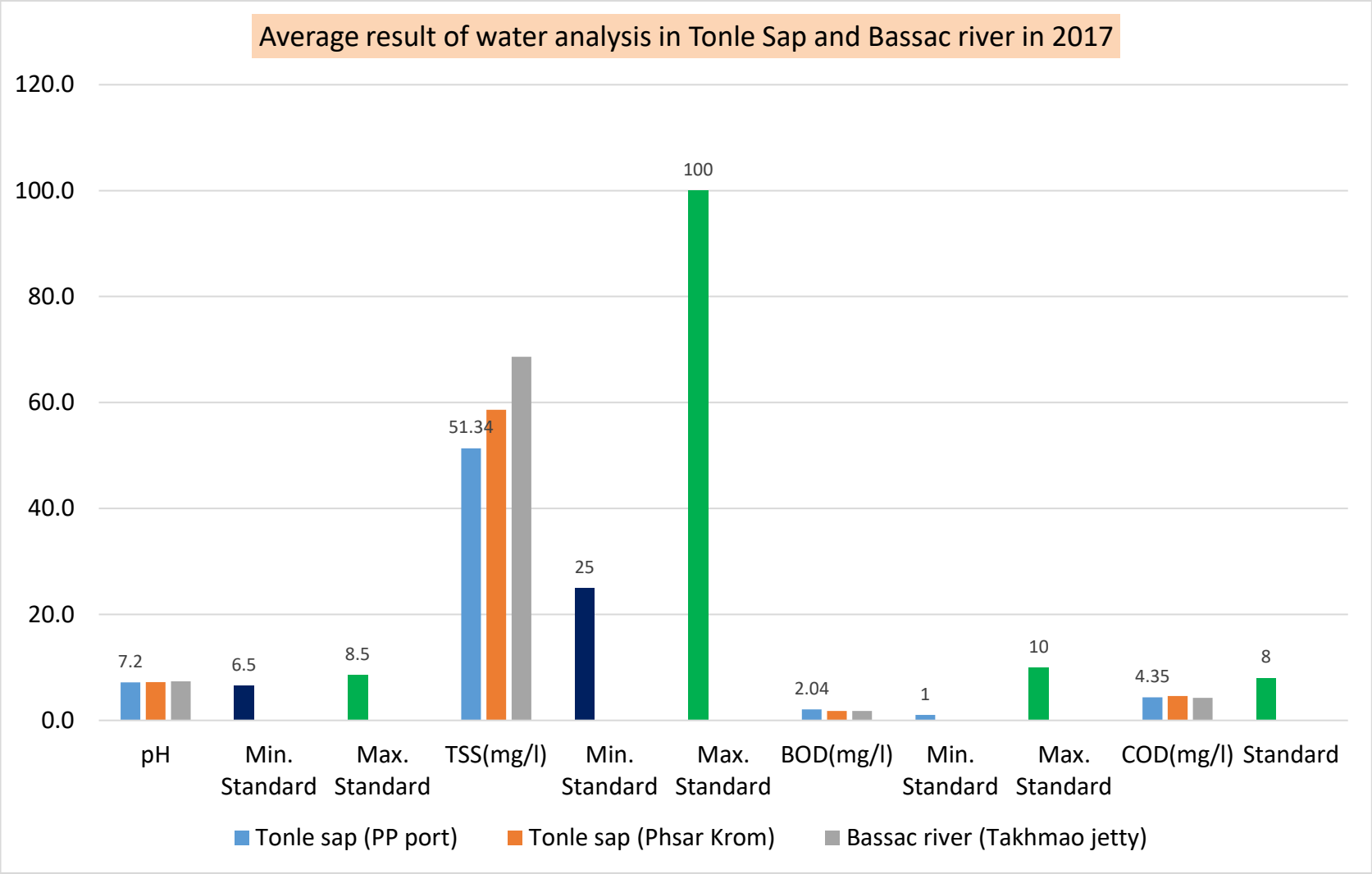
N°	Parameter	Unit	Standard Value
1	pH	mg/l	7.0-8.3
2	COD	mg/l	2-8
3	Suspended Solid	mg/l	2-7.5
4	Dissolves Oxygen	mg/l	<1000
5	Coliform	MPN/100ml	0
6	Total Nitrogen	mg/l	0.2-1.0
7	Total Phosphorus	mg/l	0.02-0.09

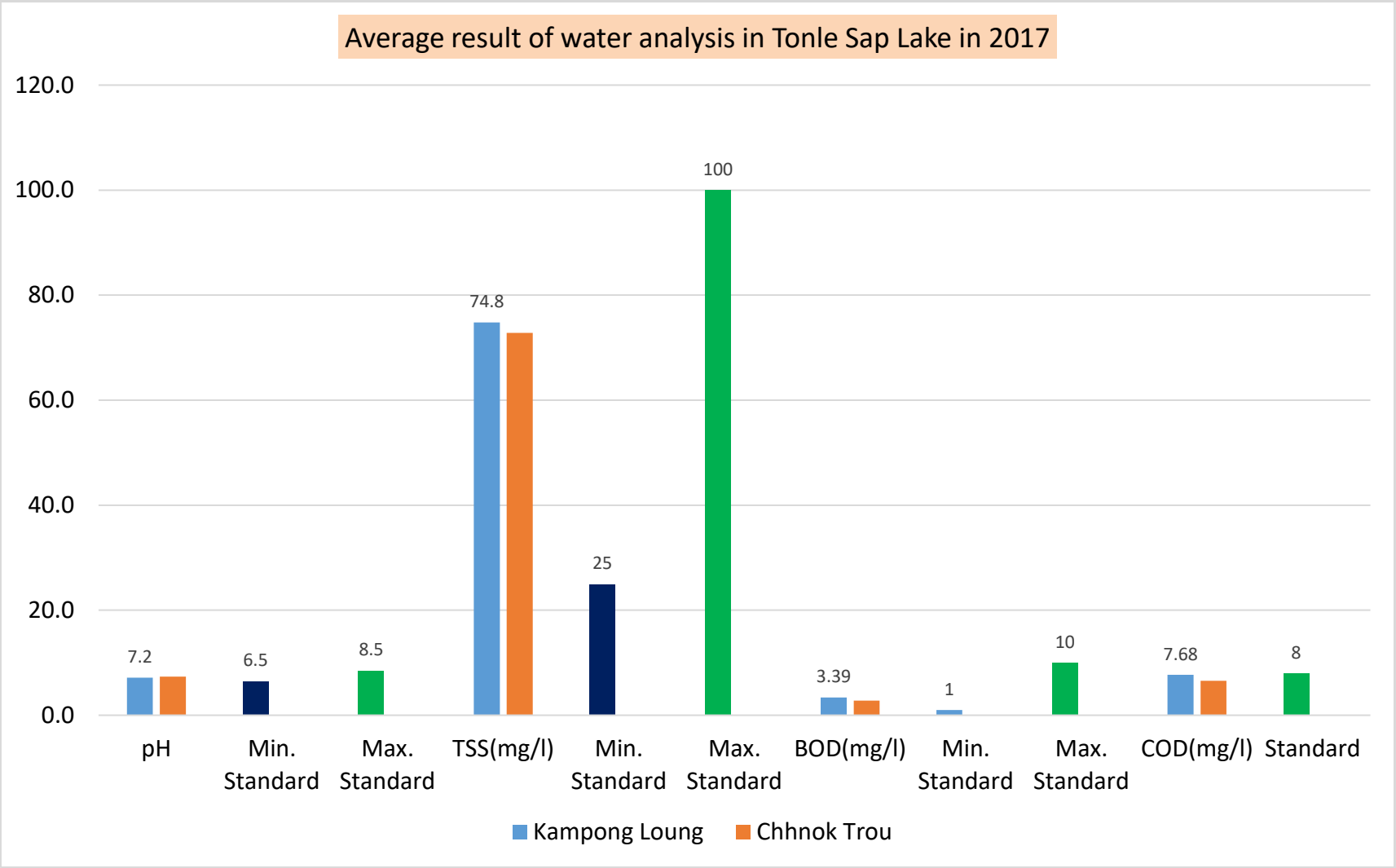
Sampling sites

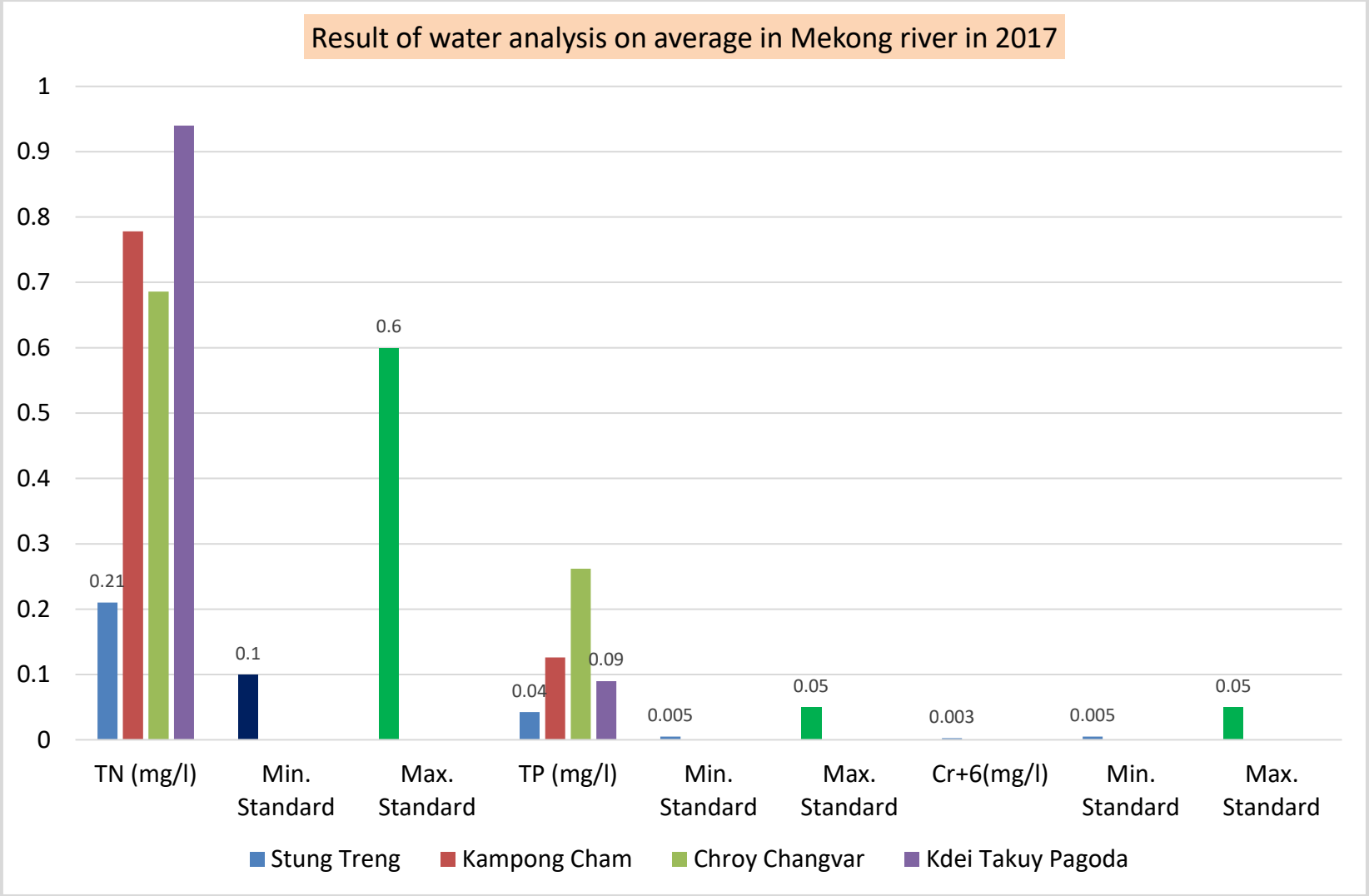
- 18 sites countrywide have been designated to monthly collect water samples located in Mekong river, Tonle sap river, Bassac river, and the Tonle sap great lake.
- Parameters tested are: pH, TSS, BOD5, COD, TP, and TN.
    - Heavy Metal Chromium, Cr^{+6}

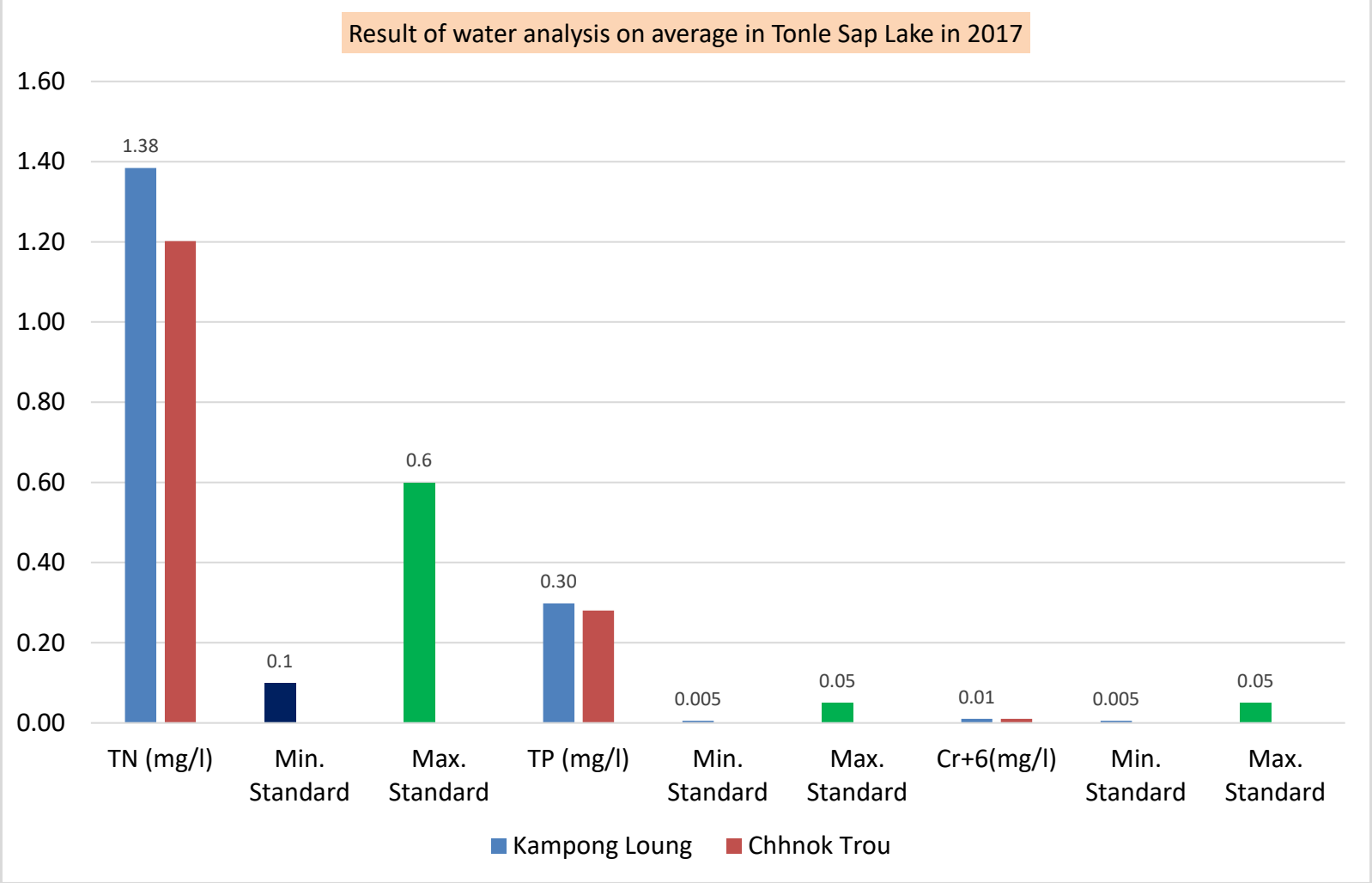

ចំណុចតាមដានគុណភាពទឹកសាធារណៈ
200000
300000
400000
500000
600000
700000
800000
1600000
1500000
1400000
1300000
1200000
Oddar Meanchey
Banteay Meanchey
Siem Reap
Preah Vihear
Stueng Treng
Ratanakiri
Battambang
Krong Pailin
Kampong Thom
Mondulkiri
Pousat
Kampong Chhang
Kampong Cham
Kampong Speu
Phnom Penh
Prey Veng
Koh Kong
Svay Rieng
Takeo
Kampot
Sihanoukville
Krong Kep
Legend
<all other values>
Sample Type
Lake
River
Sewage
Stream
N
W
E
S
0 20 40 80 120 160
Kilometers

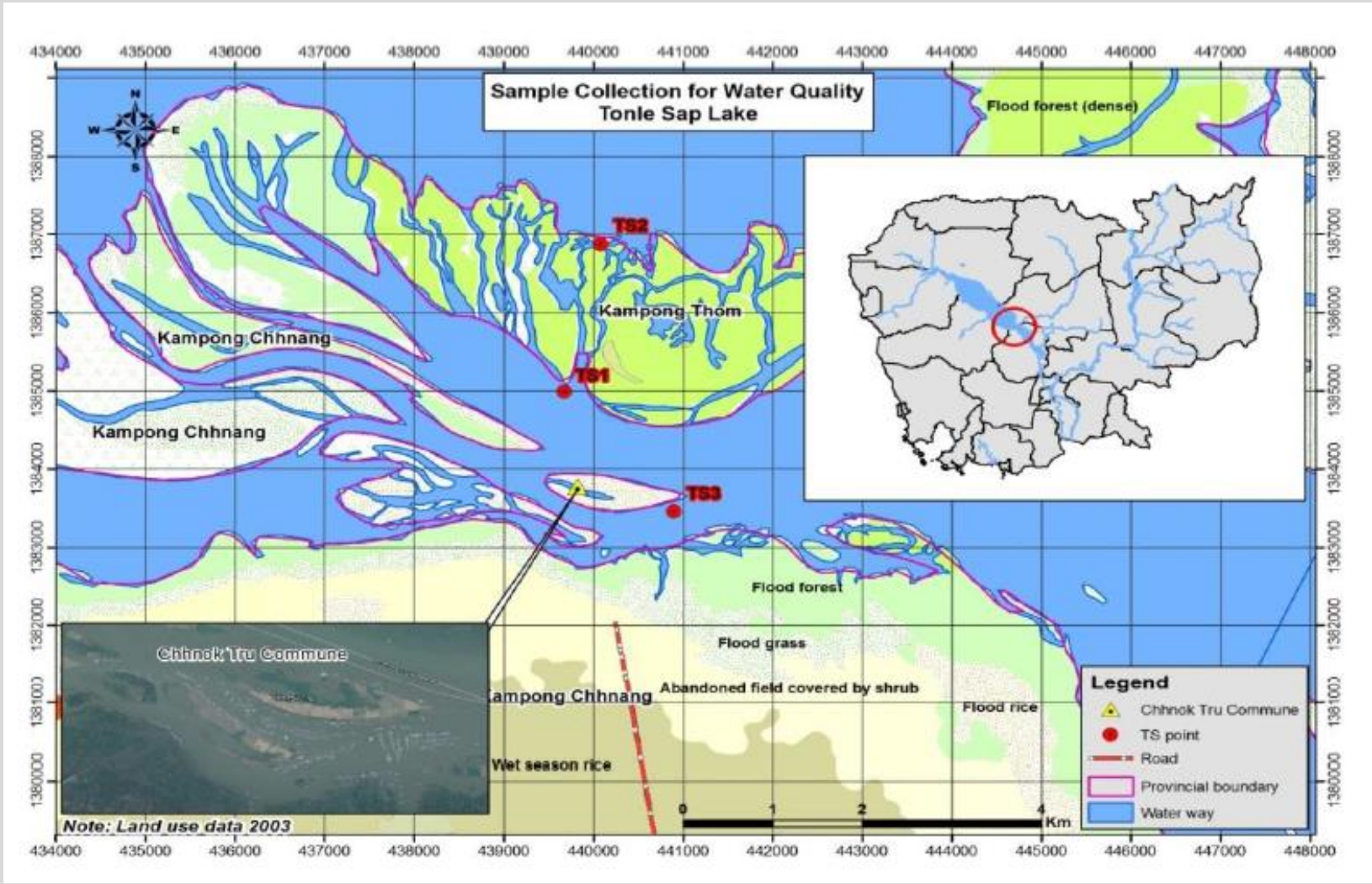

Average result of water analysis in Mekong River in 2017
120.0
100.0
80.0
60.0
40.0
20.0
0.0
8.5
6.5
8.5
78.00
25
100
1.21
1
10
3.72
8
pH
Min. Standard
Max. Standard
TSS(mg/l)
Min. Standard
Max. Standard
BOD(mg/l)
Min. Standard
Max. Standard
COD(mg/l)
Standard
Stung Treng
Kampong Cham
Chroy Changvar
Kdei Takuy Pagoda


Average result of water analysis in Tonle Sap and Bassac river in 2017
120.0
100.0
80.0
60.0
40.0
20.0
0.0
7.2
6.5
8.5
51.34
25
100
2.04
1
10
4.35
8
pH
Min. Standard
Max. Standard
TSS(mg/l)
Min. Standard
Max. Standard
BOD(mg/l)
Min. Standard
Max. Standard
COD(mg/l)
Standard
Tonle sap (PP port)
Tonle sap (Phsar Krom)
Bassac river (Takhmao jetty)

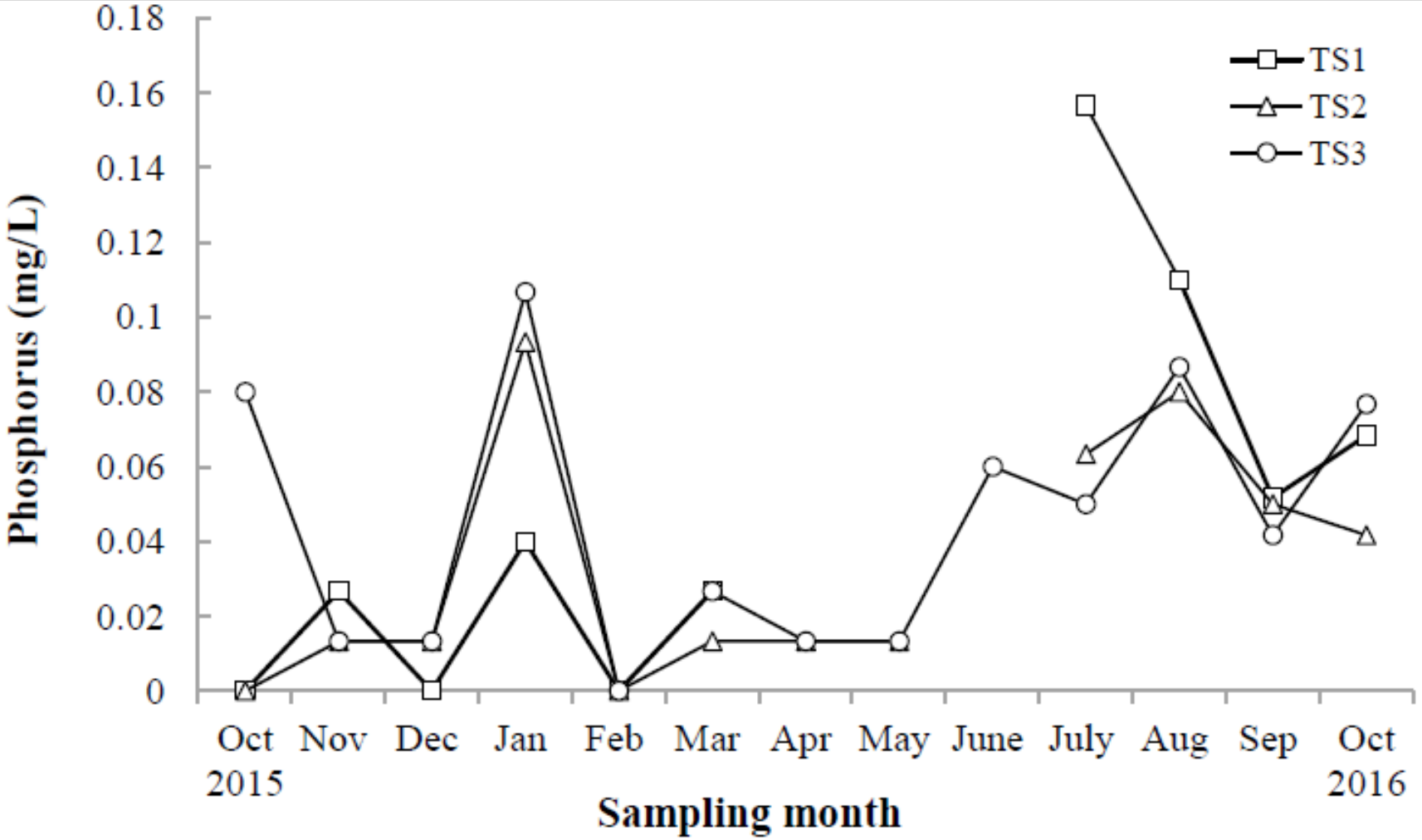

Average result of water analysis in Tonle Sap Lake in 2017
120.0
100.0
80.0
60.0
40.0
20.0
0.0
7.2
6.5
8.5
74.8
25
100
3.39
1
10
7.68
8
pH
Min. Standard
Max. Standard
TSS(mg/l)
Min. Standard
Max. Standard
BOD(mg/l)
Min. Standard
Max. Standard
COD(mg/l)
Standard
Kampong Loung
Chhnok Trou


Result of water analysis on average in Mekong river in 2017
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.21
0.1
0.6
0.04
0.09
0.005
0.05
0.003
0.005
0.05
TN (mg/l)
Min. Standard
Max. Standard
TP (mg/l)
Min. Standard
Max. Standard
Cr+6(mg/l)
Min. Standard
Max. Standard
Stung Treng
Kampong Cham
Chroy Changvar
Kdei Takuy Pagoda

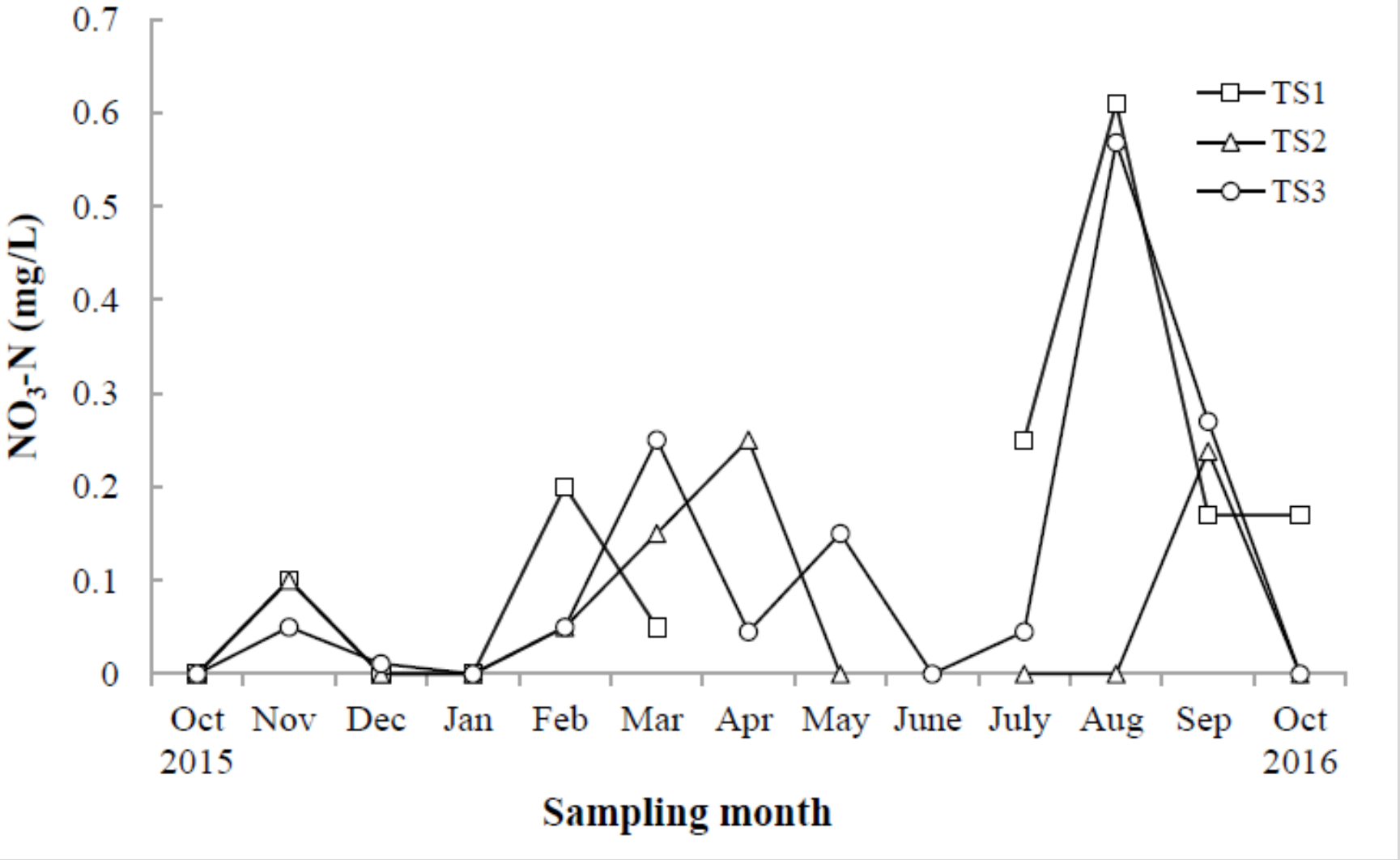

Result of water analysis on average in Tonle Sap Lake in 2017
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1.38
0.1
0.6
0.30
0.005
0.05
0.01
0.005
0.05
TN (mg/l)
Min. Standard
Max. Standard
TP (mg/l)
Min. Standard
Max. Standard
Cr+6(mg/l)
Min. Standard
Max. Standard
Kampong Loung
Chhnok Trou



(Source: Sophea, 2017)



(Source: Sophea, 2017)



(Source: Sophea, 2017)

Some result of water quality monitoring in-situ in 7-8 March 2018

列1	列16	列2												列14	列15	列152
No	Date	Site	N	E	Start time	End time	Total depth (m)	W.tem (°C)	EC (ms/m)	pH	ORP (mv)	DO (mg/L)	Solar R (LUX) ×100	Turbidty	TDS	TSS (mg/L)
1	07/03/2018	JS1	12°30'32.94"N	104°27'17.28"E	16:10	16:15	1.0	33.7	80.6	7.1	366	1.2	450			
2	08/03/2018	JS2	12°30'54.59"N	104°26'09.1"E	10:55	11:11	1.1	31.5	10.1	7.2	333	2.7	1270			
3	08/03/2018	JS3	12°30'49.25"N	104°25'17.72"E	11:31	11:48	0.8	30.8	10.7	7.4	386	6.2	1372			
4	08/03/2018	JS4	12°31'29.54"N	104°25'25.25"E	11:58	12:05	1.7	30.9	20.4	7.3	388	5.5	1275			
5	07/03/2018	JS5	12°32'29.61"N	104°26'32.53"E	15:08	15:12	5.5	32.6	21.5	7.6	337	8.3	1000			
6	07/03/2018	JS6	12°31'39.53"N	104°26'32.53"E	14:24	14:30	1.5	33.1	27.2	7.1	360	5.9	1000			
7	07/03/2018	JS7	12°31'07.72"N	104°27'37.62"E	11:00	11:07	-	31.2	20.4	7.6	323	6.1	1325			
8	07/03/2018	JS8	12°31'27.79"N	104°27'45.43"E	11:24	11:31	-	31.2	8.2	6.7	351	3.2	1300			
9	07/03/2018	JS9	12°31'52.63"N	104°26'45.35"E	14:47	14:53	4.9	31.4	10.5	7.5	340	6.7	1100			
10	08/03/2018	JS10	12°30'57.22"N	104°26'35.66"E	13:05	13:14	2.3	31.5	16.6	7.2	323	4.8	1389			
11	07/03/2018	JS11	12°32'29.49"N	104°28'48.83"E	11:55	12:00	2.3	32.0	5.4	7.4	371	5.1	1200			
12	07/03/2018	JS12	12°34'09.16"N	104°30'32.29"E	12:27	12:33	-	33.9	14.1	6.9	355	6.5	1200			
13	08/03/2018	JS13	12°31'00.7"N	104°28'40.55"E	10:22	10:32	3.9	30.7	13.9	7.6	337	4.5	1300			
14	08/03/2018	JS14	12°30'33.27"N	104°29'36.17"E	10:00	10:13	2.5	30.7	17.5	7.4	327	5.0	1185			
15	07/03/2018	JS15	12°32'23.63"N	104°26'43.94"E	15:25	15:30	5.7	32.5	13.6	7.4	400	7.5	1000			
16	07/03/2018	JS16	12°30'52.19"N	104°27'02.81"E	15:52	15:58	1.8	32.3	16.4	7.0	344	3.4	600			
17	08/03/2018	JS17	12°30'55.51"N	104°27'22.1"E	13:22	13:40	2.3	31.3	13.7	7.1	371	3.8	1362			
18	08/03/2018	JS18	12°30'42.36"N	104°27'16.24"E	13:43	13:55	1.5	32.1	37.4	7.0	399	3.3	1363			
19	08/03/2018	JS19	12°30'24.76"N	104°27'16.63"E	14:00	14:07	0.4	34.3	80.0	7.7	378	11.1	1303			
	Recorder															
	07/03/2018	Yoshimura														
	08/03/2018	Sato														

Part 3.-

Challenges

Challenges

- Sampling sites cannot cover most parts of the country;
- Lack of transportation and testing materials;
- Insufficient Human resource and financial support;
- Awareness raising on law enforcement;
- Lack of engagement from relevant stakehodlers at all level to comply with the law.

Part 4.-

Conclusion and Next steps

Thank for your listening!