

LancangMekong Round-table Dialogue
Kunmin, China 21-24th March 2018

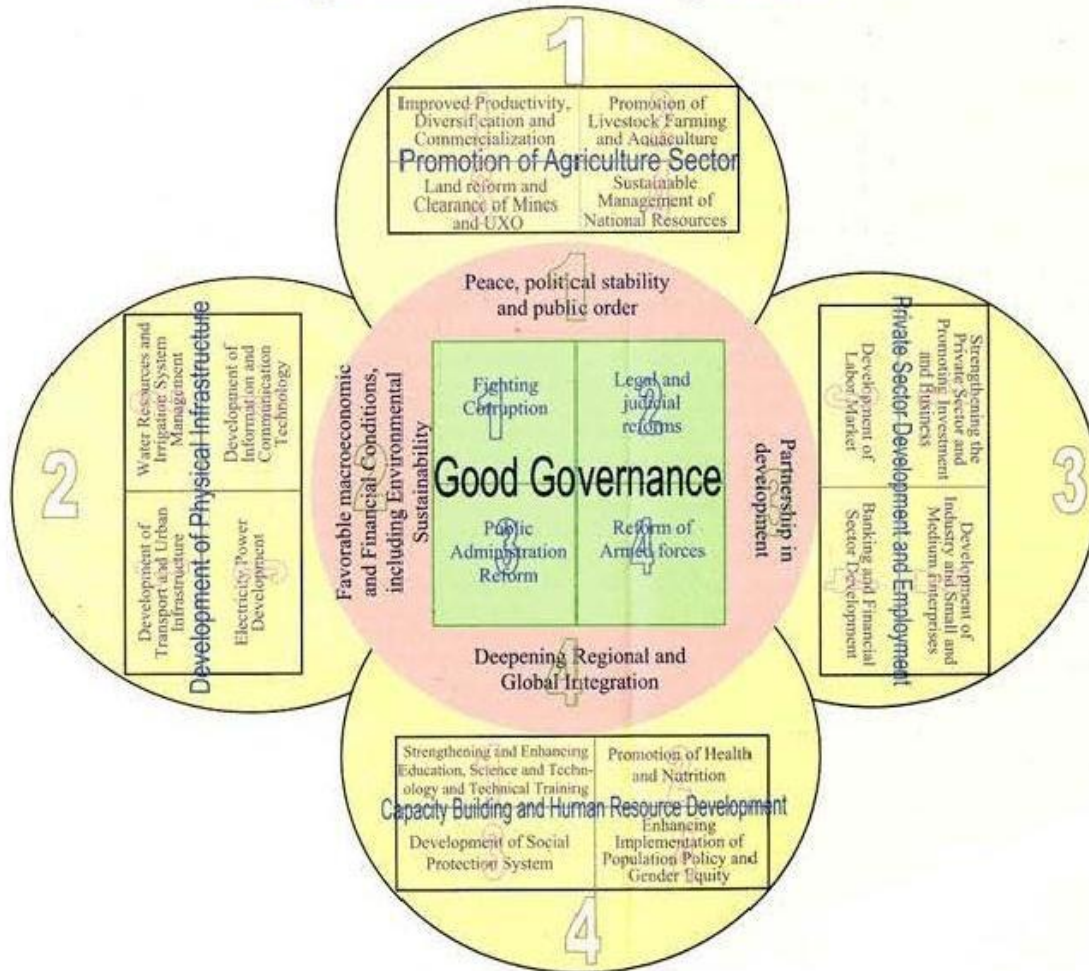
Experience Sharing on Water Pollution
Prevention and Control, Cambodia

Outline

- National Policies and Legislative tools
- Determined Effluent standard on public water area and sewage system
- Set up Water Quality monitoring program
- Actions for water pollution prevention and elimination

National Policy and Legislative Tools

Diagram of Rectangular Strategy Phase III



- In the deep reform of Royal Government of Cambodia, it is required restructuring national development plans and institutional bodies inline with SDGs.
- Rectangular Strategy III outlines the country's five year development roadmap (2014- 2018) to balance the three pillars of SD.
- It also maintains the country's commitment to furthering the unfinished progress of CMDGs.

Legislative Tools

No.	Title of legislations and regulations	Year of adoption	Responsible institution
Relevant Laws			
1	Law on Environmental Protection and Natural Resources Management	1996	MoE
2	Law on The Amendment of Investment Law in the Kingdom of Cambodia	2003	CDC
3	Law on Administration of Factory and Handicraft	2006	MoIH
4	Law on Water Resources Management in the Kingdom of Cambodia	2007	MoWRAM
5	Law on the Management of Pesticides and Fertilizers	2012	MoAFF
Relevant Sub-decrees			
6	Sub-Decree on the Establishment and Management of the Special Economic Zone		CDC
7	Sub-decree on Standards and Management of Agricultural Materials	1998	MAFF
8	Sub-decree on Water Pollution Control	1999	MoE
9	Sub-decree on Solid Waste Management	1999	MoE
10	Sub-decree on EIA Process	1999	MoE
11	Sub-decree on the Industrial Standards of Cambodia	2001	MoIH

Determined Effluent standard on public water area and sewage system

Nº	Parameters	Unit	Wastewater Discharge Standard	
			Public Water	Sewage System
1	Temperature	°C	< 45	< 45
2	pH		6 – 9	5 - 9
3	BOD ₅ (5 days at 20 °C)	mg/l	< 30	< 80
4	COD	mg/l	< 50	< 100
5	Total Suspended Solids	mg/l	< 50	< 80
6	Total Dissolved Solids	mg/l	< 1000	< 2000
7	Grease and Oil	mg/l	< 5.0	< 15
8	Detergents	mg/l	< 5.0	< 15
9	Phenols	mg/l	< 0.1	< 1.2
10	Nitrate (NO ₃)	mg/l	< 10	< 20
11	Chlorine (free)	mg/l	< 1.0	< 2.0
12	Chloride (ion)	mg/l	< 500	< 700
13	Sulphate (as SO ₄)	mg/l	< 300	< 500
14	Sulphide (as Sulphur)	mg/l	< 0.2	< 1.0
15	Phosphate (PO ₄)	mg/l	< 3.0	< 6.0
16	Cyanide (CN)	mg/l	< 0.2	< 1.5
17	Barium (Ba)	mg/l	< 4.0	< 7.0
18	Arsenic (As)	mg/l	< 0.10	< 1.0
19	Tin (Sn)	mg/l	< 2.0	< 8.0
20	Iron (Fe)	mg/l	< 1.0	< 20
21	Boron (B)	mg/l	< 1.0	< 5.0
22	Manganese (Mn)	mg/l	< 1.0	< 5.0
23	Cadmium (Cd)	mg/l	< 0.1	< 0.5
24	Chromium (Cr) ⁺³	mg/l	< 0.2	< 1.0

Nº	Parameters	Unit	Wastewater Discharge Standard	
			Public Water	Sewage System
25	Chromium (Cr) ⁺⁶	mg/l	< 0.05	< 0.5
26	Copper (Cu)	mg/l	< 0.2	< 1.0
27	Lead (Pb)	mg/l	< 0.1	< 1.0
28	Mercury (Hg)	mg/l	< 0.002	< 0.05
29	Nickel (Ni)	mg/l	< 0.2	< 1.0
30	Selenium (Se)	mg/l	< 0.05	< 0.5
31	Silver (Ag)	mg/l	< 0.1	< 0.5
32	Zinc (Zn)	mg/l	< 1.0	< 3.0
33	Molybdenum (Mo)	mg/l	< 0.1	< 1.0
34	Ammonia (NH ₃)	mg/l	< 5.0	< 7.0
35	DO	mg/l	>2.0	>1.0
36	Polychlorinated Biphenyl	mg/l	<0.003	<0.003
37	Calcium	mg/l	<150	<200
38	Magnesium	mg/l	<150	<200
39	Carbon tetrachloride	mg/l	<3	<3
40	Hexachloro benzene	mg/l	<2	<2
41	DTT	mg/l	<1.3	<1.3
42	Endrin	mg/l	<0.01	<0.01
43	Dieldrin	mg/l	<0.01	<0.01
44	Aldrin	mg/l	<0.01	<0.01
45	Isodrin	mg/l	<0.01	<0.01
46	Perchloro ethylene	mg/l	<2.5	<2.5
47	Hexachloro butadiene	mg/l	<3	<3
48	Chloroform	mg/l	<1	<1
49	1,2 Dichloro ethylene	mg/l	<2.5	<2.5
50	Trichloro ethylene	mg/l	<1	<1
51	Trichloro benzene	mg/l	<2	<2
52	Hexaxhloro cyclohexene	mg/l	<2	<2

Set up Water Quality Monitoring Program

- MoE has set up a monitoring program as measurement for water quality assessment and water pollution prevention.
- Water pollution control is undertaken through water monitoring program on wastewater discharged from pollution sources including industrial and household sectors, public water and sewage water.
- Public Water Areas: 18 points of the selected water bodies were visited monthly with 163 samplings collected.
- Water Polluted Sources (Sewage): 12 points of the selected sites were monthly visited with 123 samplings collected.

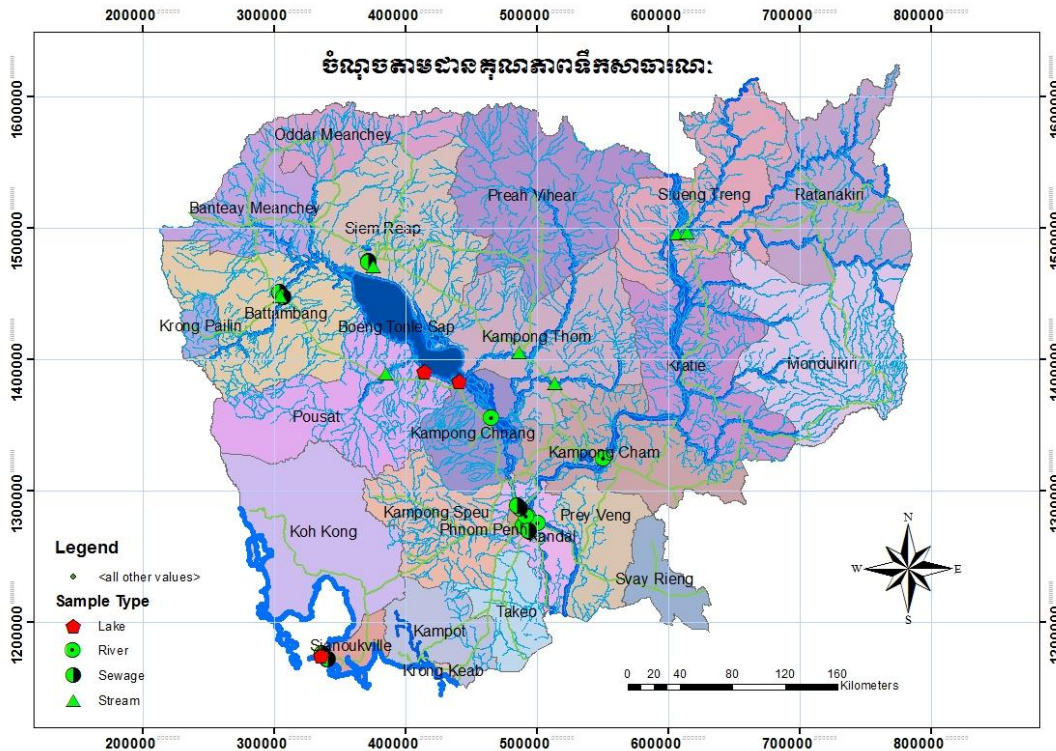
Pollution sources monitoring





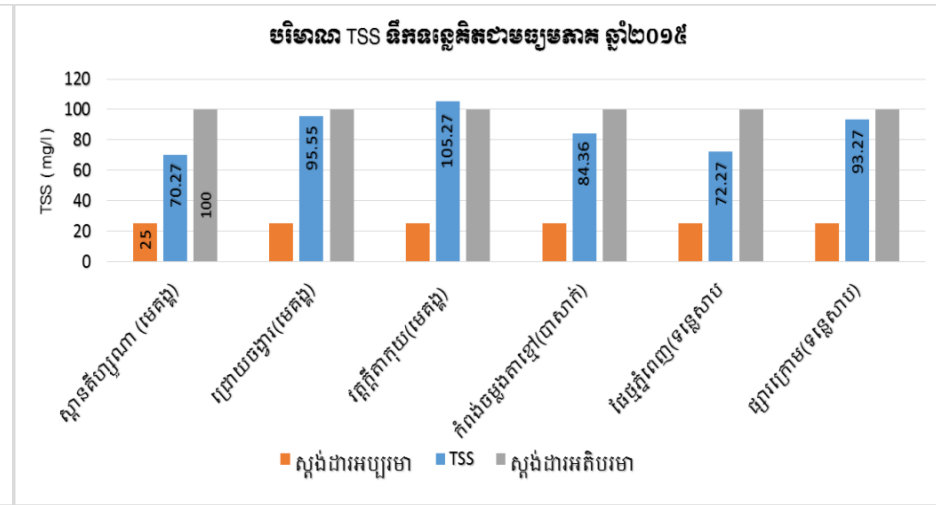
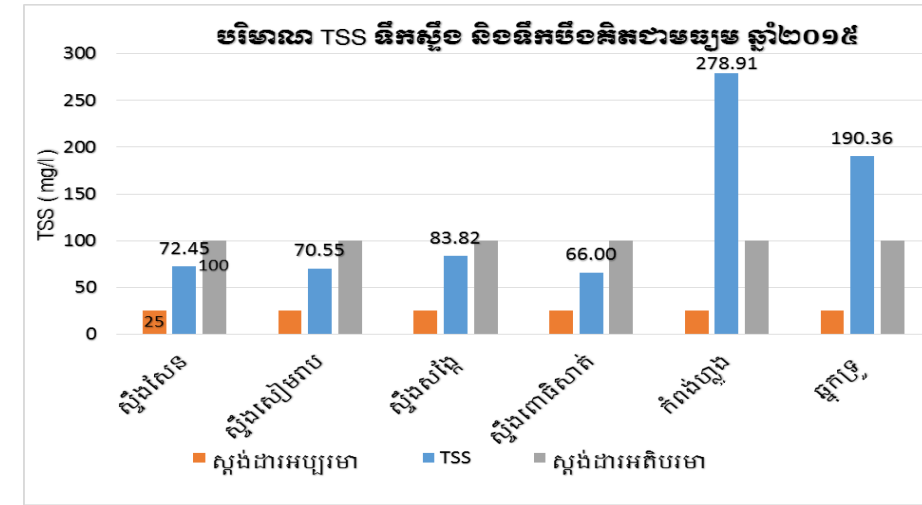
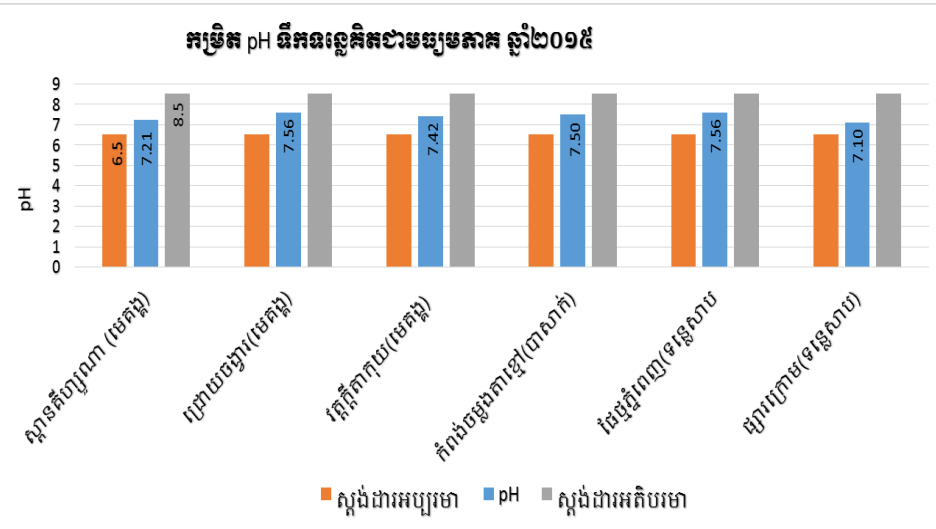
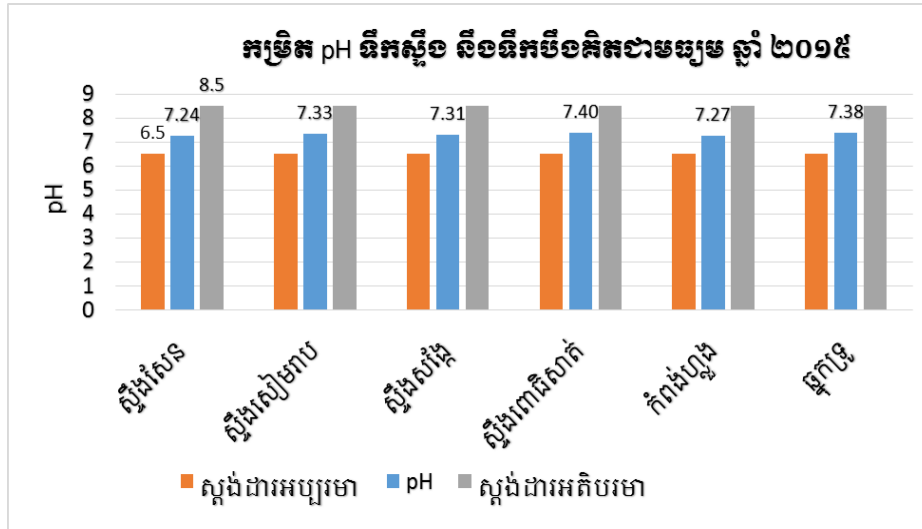
The water sampling sites

Location of the samples collected

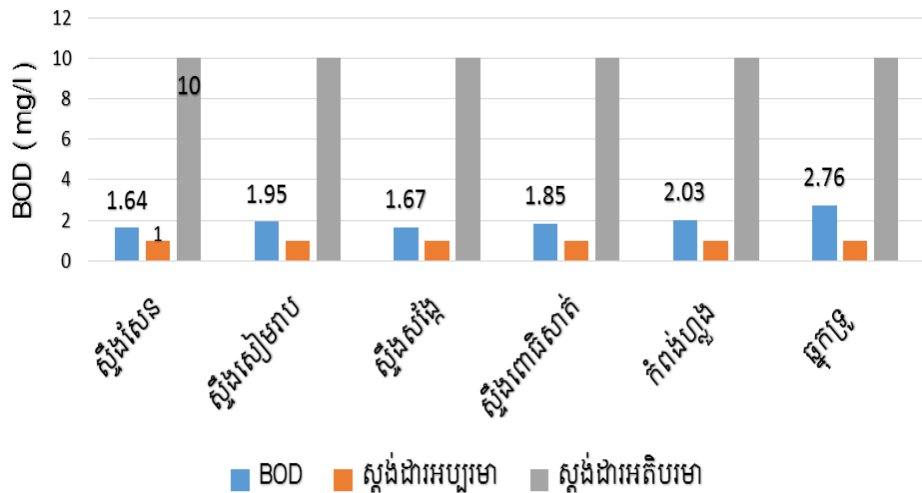


No	Locations (Provinces)	Public Water	Sewage Water	Frequency
1	Battambang	1	3	Monthly
2	Siem Reap	1	2	Monthly
3	Kampong Thom	2	-	Monthly
4	Kampong Cham	1	-	Monthly
5	Kampong Chhnang	2	-	Monthly
6	Pursat	2	-	Monthly
7	Preah Sihanouk	1	3	Monthly
8	Phnom Penh	2	-	Monthly
9	Kandal	3	4	Monthly
10	Stueng Treng	4	-	2time/year
11	Kampot	1	-	2time/year
12	Kep	1	-	2time/year
	Total	21	12	

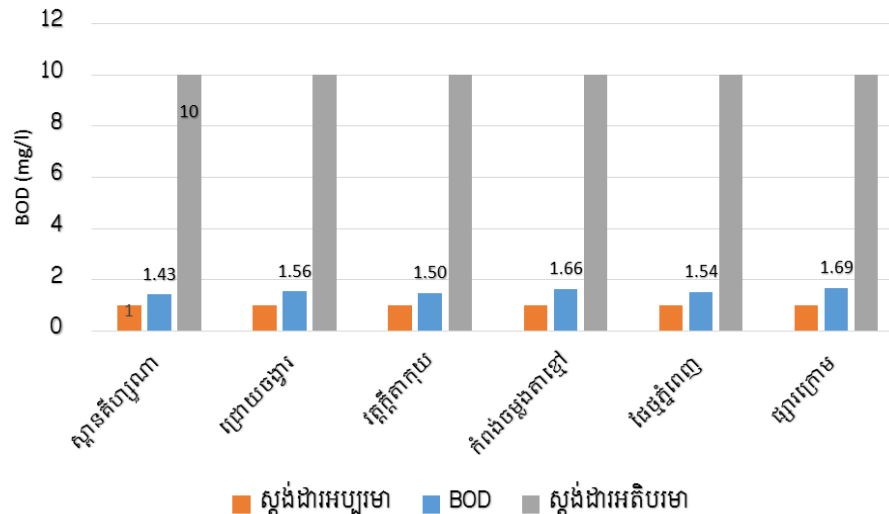
Results of the water quality monitoring



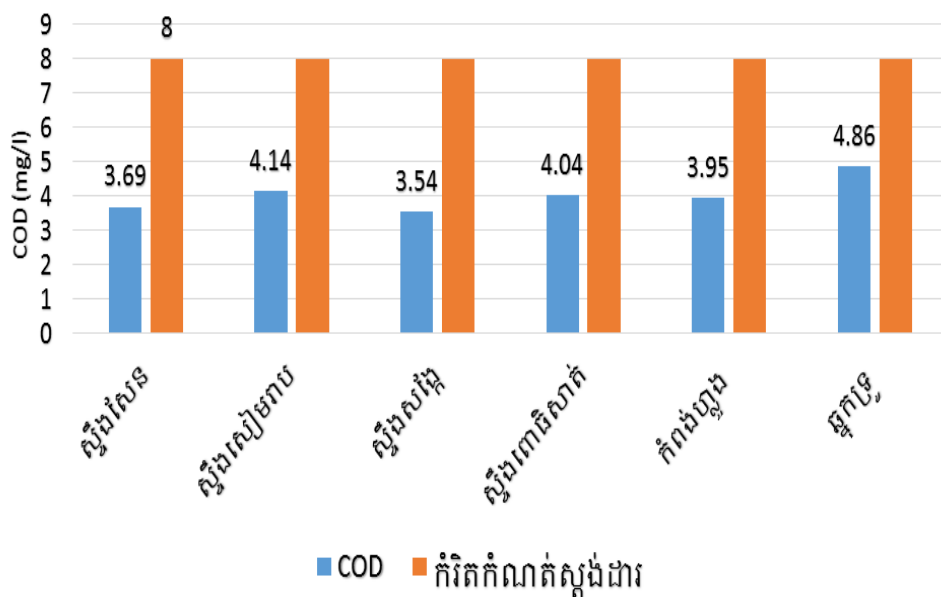
បរិមាណ BOD ទឹកស្អែក និងទឹកបិទភិតជាមធ្យម ឆ្នាំ២០១៥



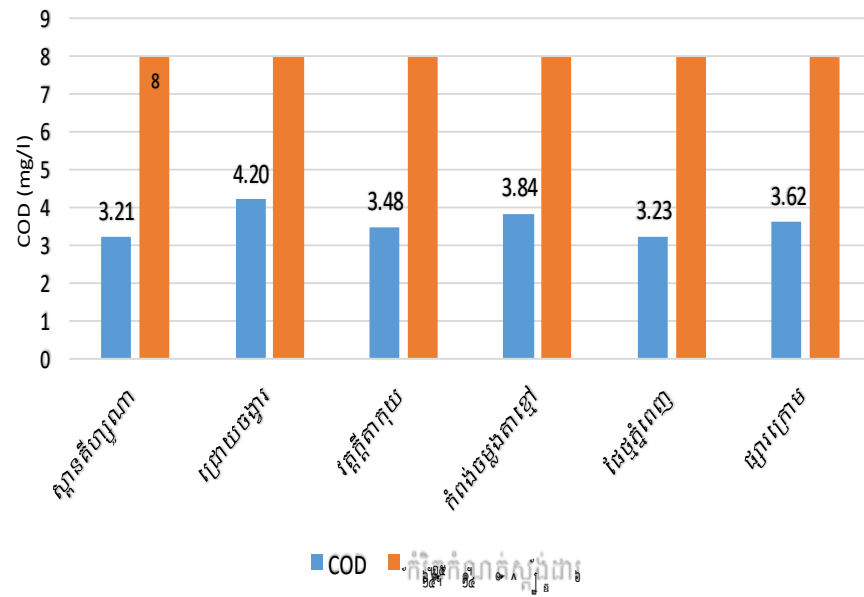
បរិមាណ BOD ទឹកទន្លេគិតជាមធ្យម ឆ្នាំ២០១៥ (mg/L)



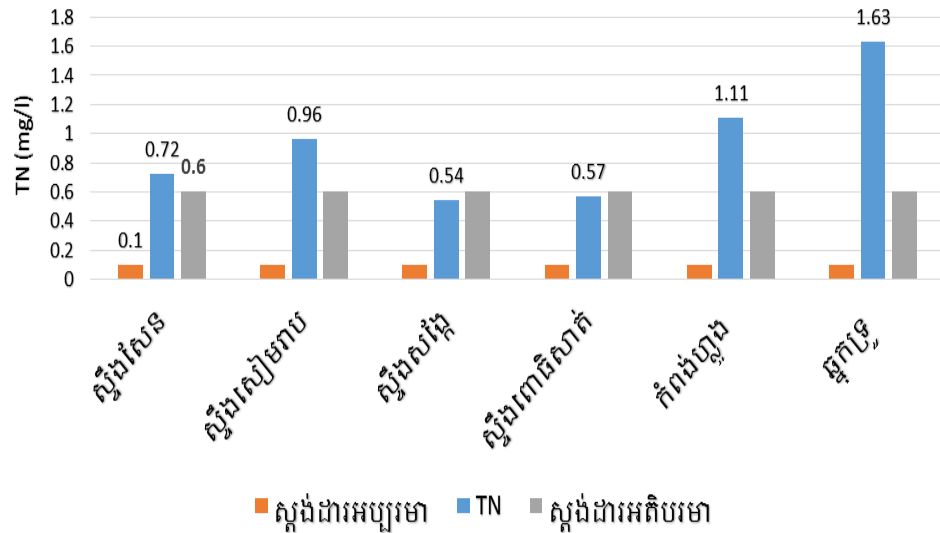
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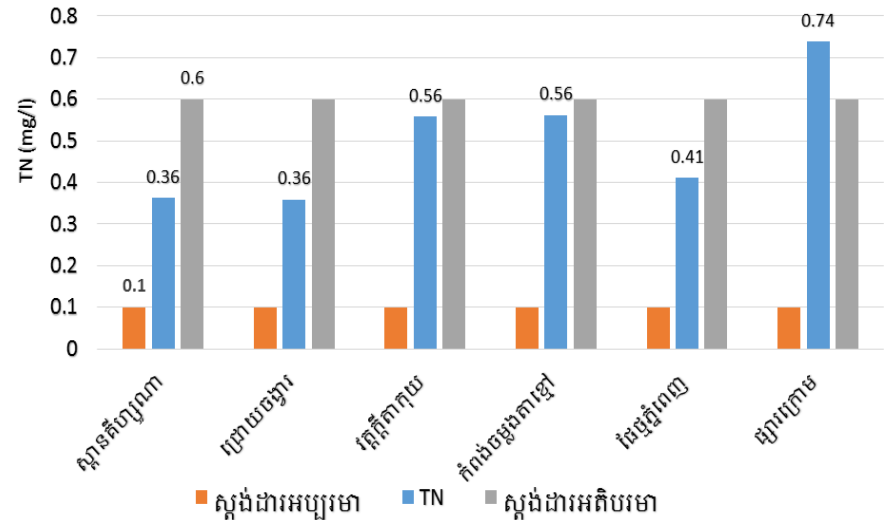
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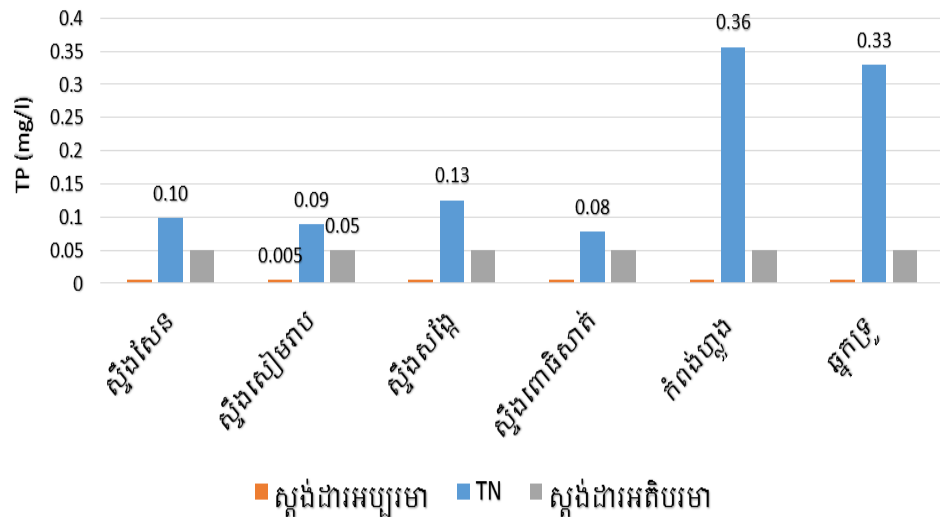
បរិមាណ TN ទឹកស្ទឹង និងទឹកបឹងកិតជាមធ្យម ឆ្នាំ២០១៥



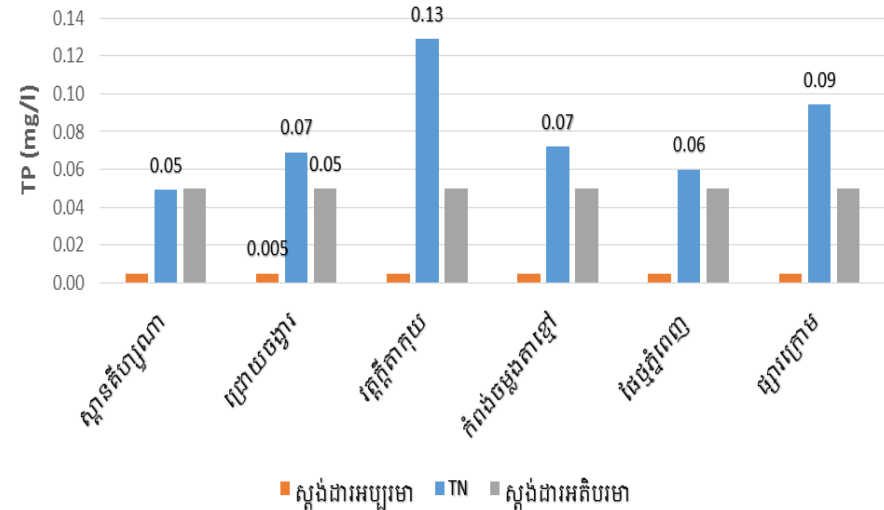
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បរិមាណ TP ទឹកស្ទឹង និងបឹងកិតជាមធ្យម ឆ្នាំ២០១៥

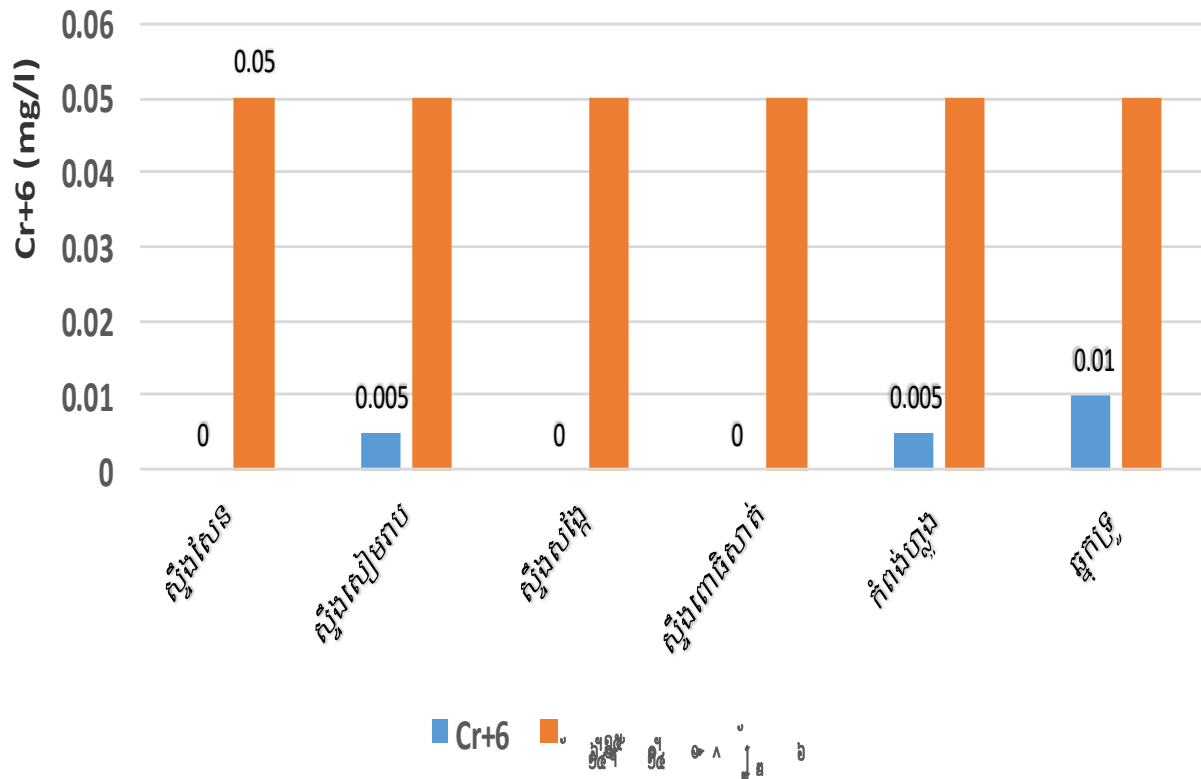


បរិមាណ TP ទឹកទន្លេកិតជាមធ្យម ឆ្នាំ២០១៥

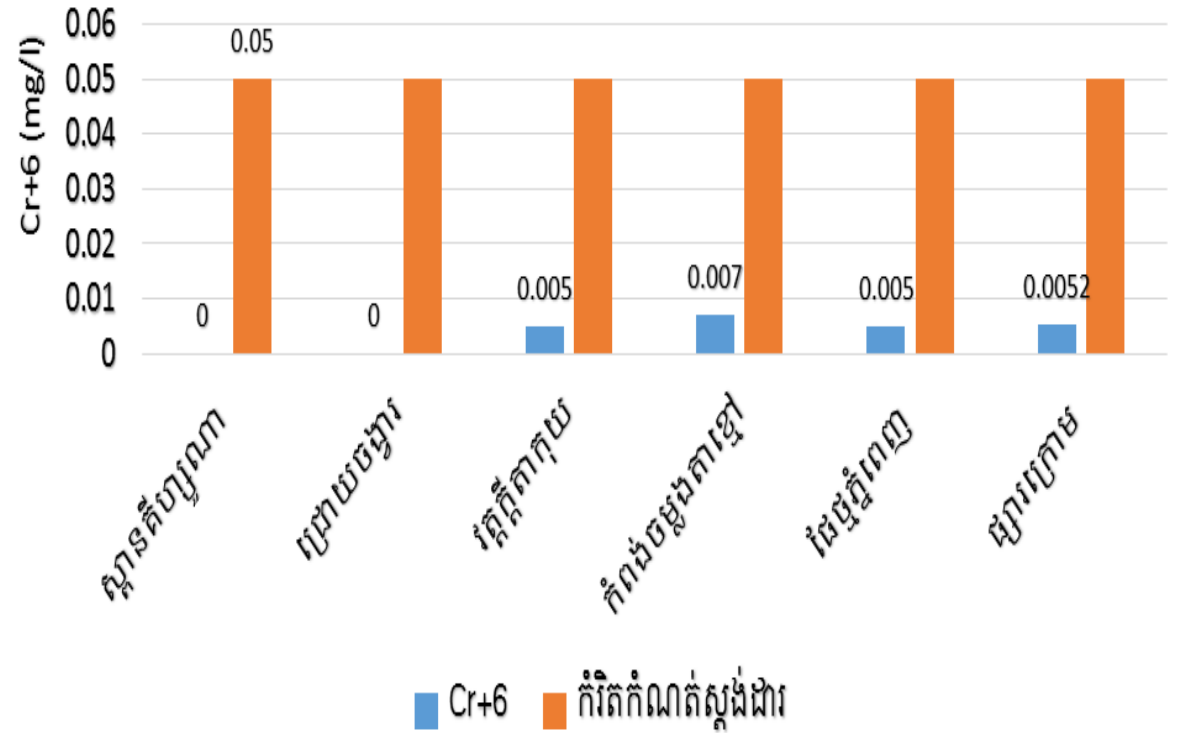


Chromium (Cr+6)

បរិមាណ Cr+6 ទឹកកន្លែងស្នាក់នៅ
ឆ្នាំ២០១៥



បរិមាណ Cr+6 ទឹកកន្លែងស្នាក់នៅ
ឆ្នាំ២០១៥ (mg/L)



Summary

- pH, TSS, BOD, COD, and Cr+6 was not changed significantly if compared to recent years. There is not over the effluent standard defined in the sub-decree on water pollution control, 1999.
- TP was significantly increased if compared to past years at Kampong Loung & Chhnok Trou, Tonle Sap Lake.

Actions for Water Pollution Prevention and elimination

□ Advice pollution source owners to:

- Select appropriate method/technology for operating WWTP
- Discharged effluent must conform to national standard,
- Apply license for discharging treated effluents
- Have enough facilities to prevent the pollution of the public water area when there is eventual danger caused from his/her pollution source;
- Install an equipment for measurement of flow, concentration and amount of pollutant contained in effluent and also keep the result for record keeping.
- Provide information and other relevant documents which are used for report making and for evidence;

- ❑ MoE officers take wastewater samples regularly at the outlets of pollution sources ;
- ❑ If find any indicators over effluent standard , MoE will issue an administrative ordering letter to:
 - correct small fault within a specific period,
 - correct fault within a specific period but fine or stop process,
 - collect and detain evidence of such offense for making statement and forward the case file to the competent agency in case of serious pollution
- ❑ Conduct an inspection/investigation at pollution sources if necessary (complain from other people).

Thank You Very Much for Your
Attention!

