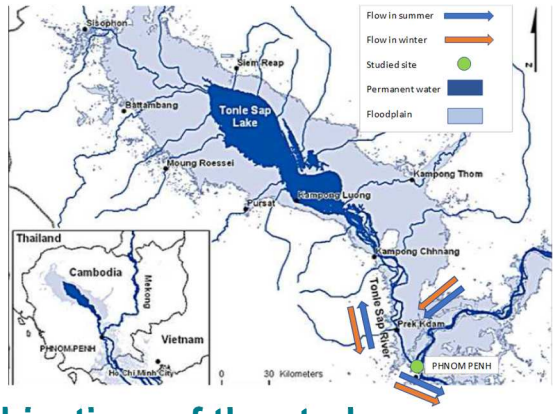
I.S.RIVERS
LYON 2018

Water quality trends in the Mekong and Tonle Sap rivers at Phnom Penh city

Introduction

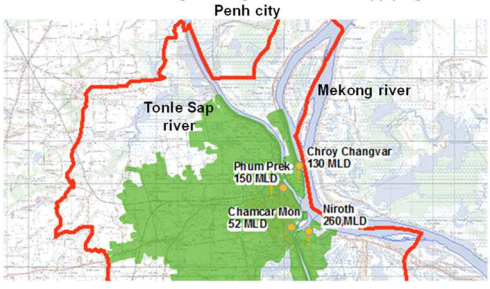
- The 4350km-long Mekong river travels through Cambodia prior to arrival in the sea. While traveling through Phnom Penh, capital city of Cambodia, it is strongly influenced by urban contaminations of this 2,2 million inhabitant's city, and by the Tonle Sap river. This river has a singular functioning: It flows from Mekong to the lake Tonle Sap in the summer rainy season, and from the lake to the Mekong river at the dry season



Objectives of the study

- A new drinking water treatment plant had to be built in Phnom Penh city. It could take water from Mekong or Tonle Sap rivers, depending of the present/future raw water quality to be treated. The raw water quality of both Mekong (at Chroy Changvar and Chamcar Mon) and Tonle Sap (at Phum Prek) surveyed by PPWSA (Phnom Penh Water Supply Authority) between 2006/2008 and 2014 was used for that purpose.

Location of the existing drinking water intakes supplying Phnom Penh city

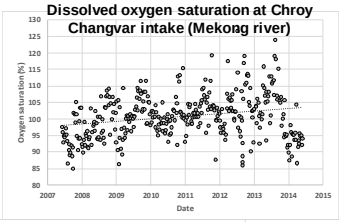


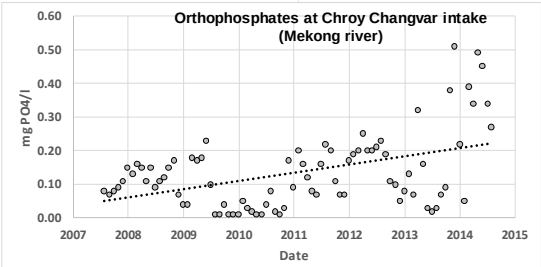
Trend of Mekong water quality

- Several parameters have a long term trend (refer to table). It could be due to concomitant modification of rural soil occupancy, of eutrophication, and to a urban pollutions increase.

Water quality trend at Phnom Penh city		
Parameters	Mekong river	Tonle Sap river
Turbidity	=	=
Peak of iron	+	+
Heavy metals	+	=
Phosphorus (Orthophosphates)	+	+
Peak of ammonium	+	+
Nitrates	-	-
Organic matter (BOD5)	+	+
Dissolved oxygen max oversaturation	+	=
Dissolved oxygen min concentration	=	-
Enterobacteria	+	=

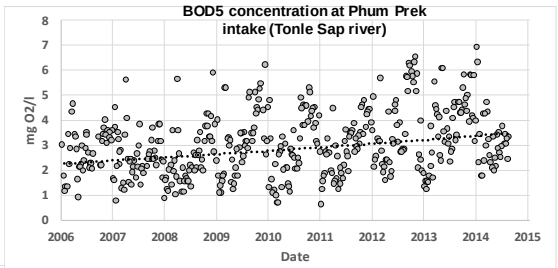
Legend	
=	No clear long term trend
+	Tend to increase
-	Tend to decrease

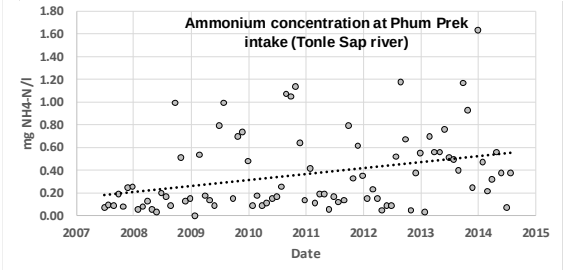




Trend of Tonle Sap water quality

- Several parameters present a long term trend (refer to table). It could be due to an increase of urban pollutions and of eutrophication.





- It could end with anoxia at the bottom of the river, then to cascading water quality degradation with contaminants releasing from sediments.

Conclusions

These river's water quality is impacted by urban and rural pollutions. Two key issues have to be solved: Organic matter/nutrients inputs, and micropollutants inputs. Both could complicate water treatment and have potential detrimental environmental impact in the forthcoming 10 years.

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Michel Lafforgue – Suez Consulting
michel.lafforgue@suez.com