CSE's preliminary findings: Lake Victoria

Stakeholder Consultation: Developing Monitoring Strategy for Lake Victoria

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Introduction

- CSE –NEMC collaborating to clean Lake Victoria
  - Step 1: Formation of multi-level working group
  - Step 2: Preparation of monitoring plan
  - Step 3: Development of action plans

Step 1: Formation of working group

- National Environment Management Council
- Lake Victoria Basin Water Board
- Tanzania Fisheries Research Institute
- Environmental Management officers-Mara region
- Regional environmental management experts – Simiyu, Shinyanga, Mwanza region
- District environmental management officer – Busega District Council
- Government Chemistry Laboratory Agency -Mwanza
- Centre for Science and Environment, India

Next step: *2-3 officers from each organization to be nominated for the working group which will meet on regular basis*

Step 2: Preparation of Monitoring plan

- Data Collection
  - Number of drains/ rivers discharging into the lake
  - Discharge location of the drains/rivers
  - Characteristics of the drains/rivers at the discharge point
    - Total quantity of wastewater discharged
    - Pollutant concentration in the discharged waste water (BOD, COD, Total N, Total P, heavy metals)
  - Sources of pollution in each drain/river
  - Type of Industries discharging wastewater in each river
  - Population of each town discharging wastewater for each river
  - Monitoring results for heavy metals
- Field Visit
- Hotspot Identification

Monitoring Strategy

- To develop monitoring strategy plan for Lake Victoria, identification of hotspots is mandatory
- The river basins will be divided into high priority, medium priority and low priority based on the pollutant concentration and discharge of each river
- Monitoring locations, sampling parameters and frequency will be decided on the basis of the category of the river
- Additionally, monitoring for the lake may be proposed through grid system

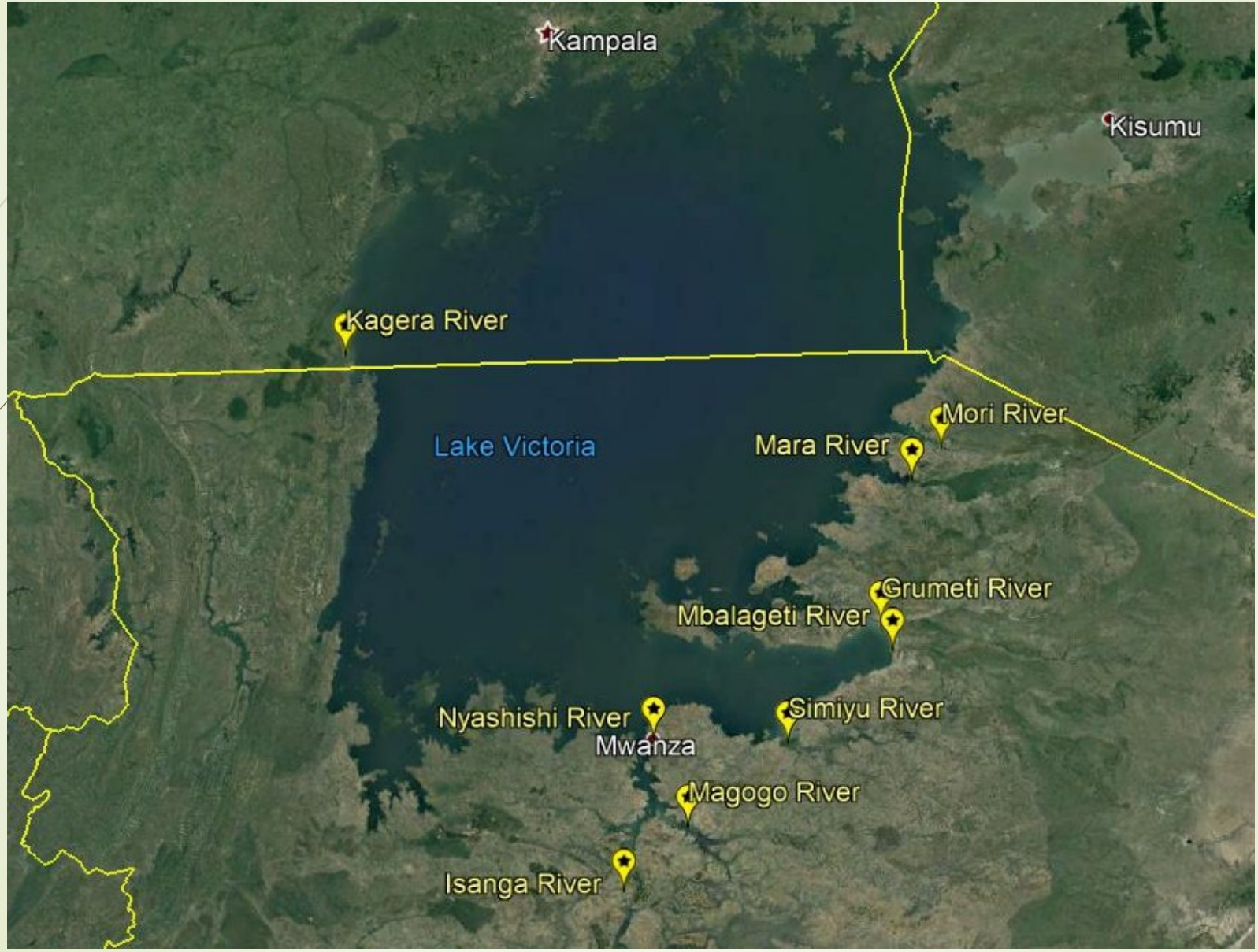
Why efforts required in Tanzania?

Name of Country	Number of river basin discharging to Lake	Discharge (m3/sec)	Percentage
Tanzania	12	476.9	61.2
Kenya	08	292.1	37.6
Uganda	03	9.8	1.3
Total	**23**	**778.3**	

Discharge point analysis: Tanzania

S. No	River Basin	Discharge (m3/s)	Percentage (%)
1.	Mara	37.5	7.9
2.	Grumeti	11.5	2.4
3.	Mbalageti	4.3	0.9
4.	E. shore stream	18.6	3.9
5.	Simiyu	39.0	8.2
6.	Magogo moame	8.3	1.7
7.	Nyashishi	1.6	0.3
8.	Issanga	30.6	6.4
9.	S. shore stream	25.6	5.4
10.	Biharamulo	17.8	3.7
11.	W. shore stream	20.7	4.4
12.	Kagera	260.9	54.8
	Total	**476.40**	**100**

Location of various river basins



Runoff Pollution load: Highest in Tanzania

Country	No. of basins	Area (km2)	Discharge (m3/s)	Total-N (tons/year)	Total-P (tons/year)
Tanzania	12	253,176	458.1	37,820	3,675
Kenya	08	36,378	285	9,764	1,925
Uganda	03	27,924	9.1	1,925	92
Total	**23**	**197,478**	**752.2**	**49,509**	**5,693**

Runoff Pollution load: Kagera is the hotspot

S. No	Basin	Area (km2)	Discharge (m3/s)	Total-N (t/y)	Total-P (t/y)
1.	Mara	13,393	38.50	1,701	304
2.	Grumeti	13,363	12.7	561	185
3.	Mbalageti	3,591	4.9	216	50
4.	E. shore stream	6,644	20.2	892	159
5.	Simiyu	11,577	34.1	1,507	435
6.	Magogo moame	5,207	6.3	278	50
7.	Nyashishi	1,565	1.4	62	11
8.	Issanga	6,812	5.1	225	40
9.	S. shore stream	8,681	27.0	1,193	213
10.	Biharamulo	1,928	21.5	950	170
11.	W. shore stream	733	21.1	932	166
12.	Kagera	59,682	265.3	29,303	1,892
	Total	**253,176**	**458.1**	**37,820**	**3,675**

Industrial Pollution load: Highest from Tanzania

Major industrial town:

- Mwanza and Musoma in Tanzania
- Kisumu in Kenya
- Kampala and Jinja in Uganda

Country	No of Industries	Loading to Lake Victoria (tons/year)		
		BOD	Total N	Total P
Tanzania	36	3,259 (58%)	324 (78%)	208 (61%)
Kenya	25	1,487 (27%)	33 (8%)	88 (26%)
Uganda	18	860 (15%)	57 (14%)	46 (13%)
Total	**79**	**5,606**	**414**	**342**

Industrial Pollution Load: Mwanza is the hotspot

Catchment area	District/Town	Number of industries	Pollution load (tons/year)		
			BOD	Total-N	Total-P
Eastern Shore Streams	Musoma / Mara	08	170	23	15
Grumeti	Bunda / Mara	02	142	6	3
Kagera	Kyaka / Kagera	01	9	4	2
Nyashishi	Mwanza	20	2838	289	185
Simiyu	Magu / Mwanza	01	0.73	0.03	0.02
Western Shore Streams	Bukoba / Kagera	04	99	3	4
Total		**36**	**3259**	**324**	**208**

Domestic Pollution load: Highest from Kenya

- Total 87 large towns in Lake basin: 51 in Kenya, 30 in Tanzania, 6 in Uganda
- Major Towns: Mwanza in Tanzania, Kisumu in Kenya and Kampala in Uganda

Country	Total Population	Loading to Lake Victoria (Tons/year)		
		BOD	Total N	Total P
Tanzania	1,020,613	5,069	729	292
Kenya	3,366,907	10,724	2,019	848
Uganda	926,879	2,145	767	484
Total		**17,938**	**3,515**	**1,624**

Domestic pollution load: Mwanza is the hotspot

Catchment area	Town or province area	Population (Year 2001)	Pollution Loading (Tons/year)		
			BOD	Total-N	Total-P
Biharamulo	Biharamulo	8,048	22	4	2
	Chato	13,278	37	6	3
Eastern Shore Streams	Musoma	120,025	394	66	26
	Tarime	22,079	73	12	5
	Nansio	33,038	108	18	7
Grumeti	Bunda	15,190	50	8	3
	Mugumu	9,879	33	6	2
	Kyabakari	9,000	30	5	2
Isanga	Kharumwa	6,482	21	4	2
	Malya	6,390	21	4	2
Kagera	Ngara	5,671	16	3	1
	Rulenge	7,146	20	3	2
	Kaisho	5,867	16	3	1
	Kayanga	8,631	24	4	2
Magogo	Ngudu	11,461	38	6	3
	Missungwi	10,718	35	6	2
	Misasi	10,387	34	6	2
Mara	Butiama	10,918	36	6	3
Mbarageti	Ramadi	7,918	26	4	2
Ngono	Kamachumu	4,539	12	2	0.7
	Nshamba	8,338	23	4	2
Nyashishi	Mwanza	500,000	3431	456	183
	Nyanguge	5,726	19	3	1
Simiyu	Magu	17,470	57	10	4
	Kisesa	9,901	33	6	2
Southern Shore Streams	Geita	34,743	114	19	8
	Kasamwa	9,814	32	6	2
	Sengerema	36,893	121	20	8
Western Shore Streams	Bukoba	61,467	168	28	11
	Muleba	9,595	26	4	2

CSE's findings

- **Mwanza** is the hotspot
- **No monitoring network** over Lake Victoria
- Location of **discharge points** not available
- **Pollution data** at discharge points not available
- Data available in public domain is **old**
- No information on **toxic metal** discharge e.g mercury from gold morning
- **Sector-specific characteristics** of industrial wastewater missing

THANK YOU