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# The state of the ecosystem of Lake Victoria

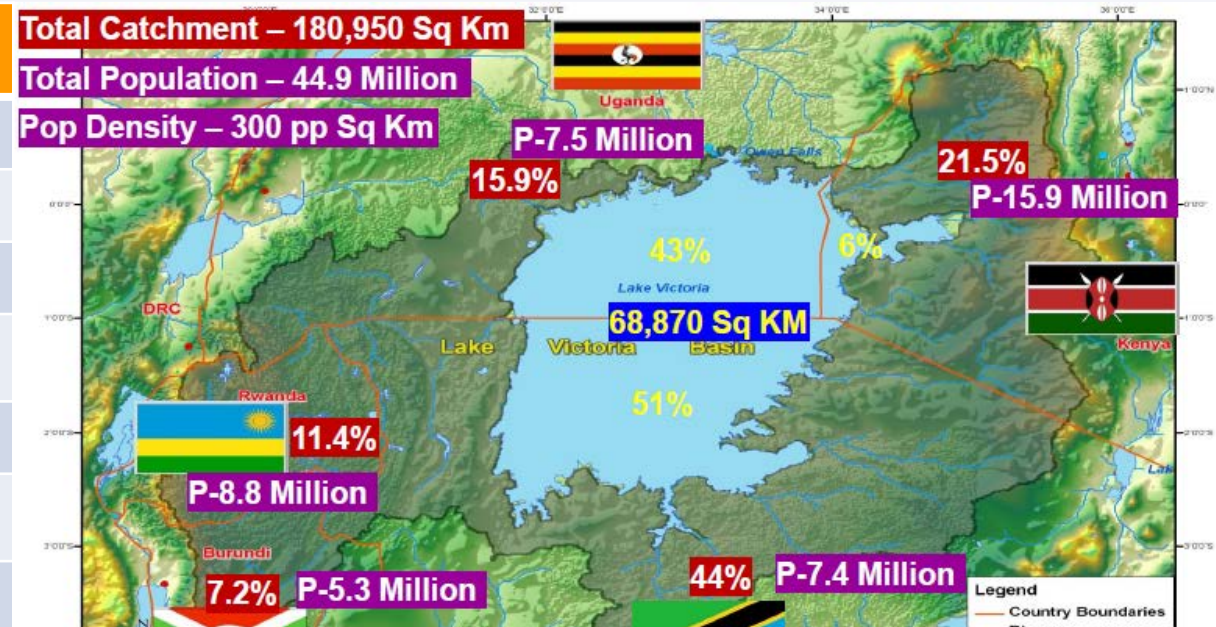
Mr. Paul N. Kariuki



# The present state of Lake Victoria



Parameter	Figures
Catchment area	180,950 Km <sup>2</sup> (pop 44.9M)
Surface Area	68,870 Km <sup>2</sup>
Average Depth	40m
Maximum Depth	84 Meters
Shore line length	4828 Km
Volume	2750 Cubic Kilometers
Source of water	Precipitation- 82% Rivers – 18%
Loss of water	Evaporation – 76% River Nile Outflow – 24%
Water Residence Time	23 Years
Flushing Time	123 Years





# The present state of Lake Victoria



Lake Victoria Ecosystem has undergone substantial changes over the last 2 decades including:

- i. *Water quality:*** BOD levels improved from an average of 250 mg/l in 2015 to 87.5 mg/l in 2016 and to 57.5 mg/l in 2017;
- ii. *Algal blooms:*** Massive algal bloom increasingly dominated by the potentially toxic blue-green varieties especially in hotspots such as Winam Gulf, Murchison bay, Mwanza Gulf among others;
- iii. *Colour/Turbidity:*** Lake water transparency has over the years has declined from 5m to now an average of 1m for most part of the year;
- iv. *Excessive water hyacinth*** proliferation which chokes most of the navigation routes/water ways, fishing grounds, fish landing sites, ports and piers, hydropower generation units, water abstractions etc – currently under manageable levels;
- v. *Micro-pollutants:*** Pollution of the lake from heavy metals (Cu, Hg, Cr, Cd, Pb, Zn) is localized to hotspots near major and not to levels of bioaccumulation that can be considered dangerous indicating their origin from local urban & industrial effluent except Hg which mainly emanates from mining activities;



# The present state of Lake Victoria



Lake Victoria Ecosystem has undergone substantial changes over the last 2 decades including:

## **Fish species:**

- i. The Lake has experienced dramatic ecosystem change over time resulting into loss of more than 500 endemic haplochromine fish species.
- ii. Currently, the Lake ecosystem and its satellite wetlands is home for more about 200 different fish species.
- iii. Commercial fishery is however dominated by three species; the predatory Nile perch (*Lates niloticus*), Nile tilapia (*Oreochromis niloticus*) and Dagaa (*Rastrineobola argentea*) constituting over 95 % of total fish catch in Lake Victoria
- iv. The total fish landings from Catch Assessment Surveys from 2011 to 2014 has been about 1 Million tons with a beach value increasing from about US\$ 550 Million in 2011 to about US\$ 840 Million in 2014;
- v. The total biomass (amount of fish in the lake) estimated during hydro-acoustic survey in 2014 was at 2.89 million tons with notable increase in Dagaa and Nile perch since the last survey in 2011

**Wetlands:** There are 422 wetlands units occupying an area of 4,322 km<sup>2</sup> around Lake Victoria out of which:

- i. 34 units are large units greater than 10 km<sup>2</sup> comprising of 90% of the total Lake Victoria wetlands areas, (49 % in Uganda, 42% in Tanzania and 9% in Kenya)
- ii. 23% of the Lake Victoria wetlands are considered to be moderately-highly degraded, which means
- iii. that they are polluted or utilized more than authorized; and
- iv. Another 23% of the Lake Victoria wetlands are considered to be moderately to highly threaten
- v. by encroachment, especially for those surrounded by high-density population areas



# The main factors and drivers responsible for current state of Lake Victoria



- Stresses within the lake – over-fishing & introduced species, Water quality, fluctuating water level;
- Stresses on littoral zones – construction and farming in shoreline, conversion of wetlands;
- Stresses from the basin – Poor land use practices in the catchment areas which leads to land degradation, deforestation, nutrient & sediment loading & eutrophication which drives water hyacinth proliferation, toxic algal blooms, oxygen depletion, and reduced water visibility;
- Stresses from outside the basin – nutrients (N and P) transported into the basin by air (through both dry and wet atmospheric deposition),
- Population Explosion driven by rapid urbanization & industrialization;
- Climate change (floods and severe droughts)



# Impacts of Lake State on uses of water & other resources



- Reduced navigability through the water hyacinth infested water ways/routes thereby affecting fishing, water transport, trade and lake tourism activities;
- Fluctuating lake levels affects water abstraction units serving most of the cities and towns around
- High turbidity, excess sediment and other pollutants increases the cost of water treatment for domestic use by Water Utilities around the lake;
- Parts of Lake Victoria, especially the deeper areas, are now considered dead zones, unable to sustain life due to oxygen deficiency in the water leading to decline in fisheries & other aquatic resources;
- Reduced biodiversity of the lake's fauna, most notably the phytoplankton and fish;

In general the stresses on the lake pose a major threat to the regional economy and livelihoods of the communities that directly or indirectly depend on the lake & its basin



**Urgent need for more partnerships & funding to sustain ecosystem monitoring and investments in both preventive and remedial/corrective interventions**



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**THANK YOU!**

