



# Technical Advice on Dredging & Sand Mining on Lake Victoria

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**By**

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# Importance of capture fisheries

- Capture fisheries still contribute 395,000 t (80%) compared to 100, 000 (20%) from aquaculture
- Fish export (17,000 t in 2016) is second forex earner to coffee if we raised volume to the same as coffee could earn 1.4 B USD
- However there is a global trend in changes in fisheries from large bodied fish to small pelagic species

## Lake

Albert

Kyoga

Edward

Victoria

Tanganyika

Malawi

## Declining species

Angara/Ngasia/NP

NP/Tilapia

Tilapia/Ssemutundu

NP/Tilapia

Perches

Tilapia

## pelagic species

Ragoogi/Muziri

Mukene

Nkejje

Mukene/Nkejje

Kapenta

Kapenta

This global trends dictates that management objectives have to cope and reduce further stress to fisheries

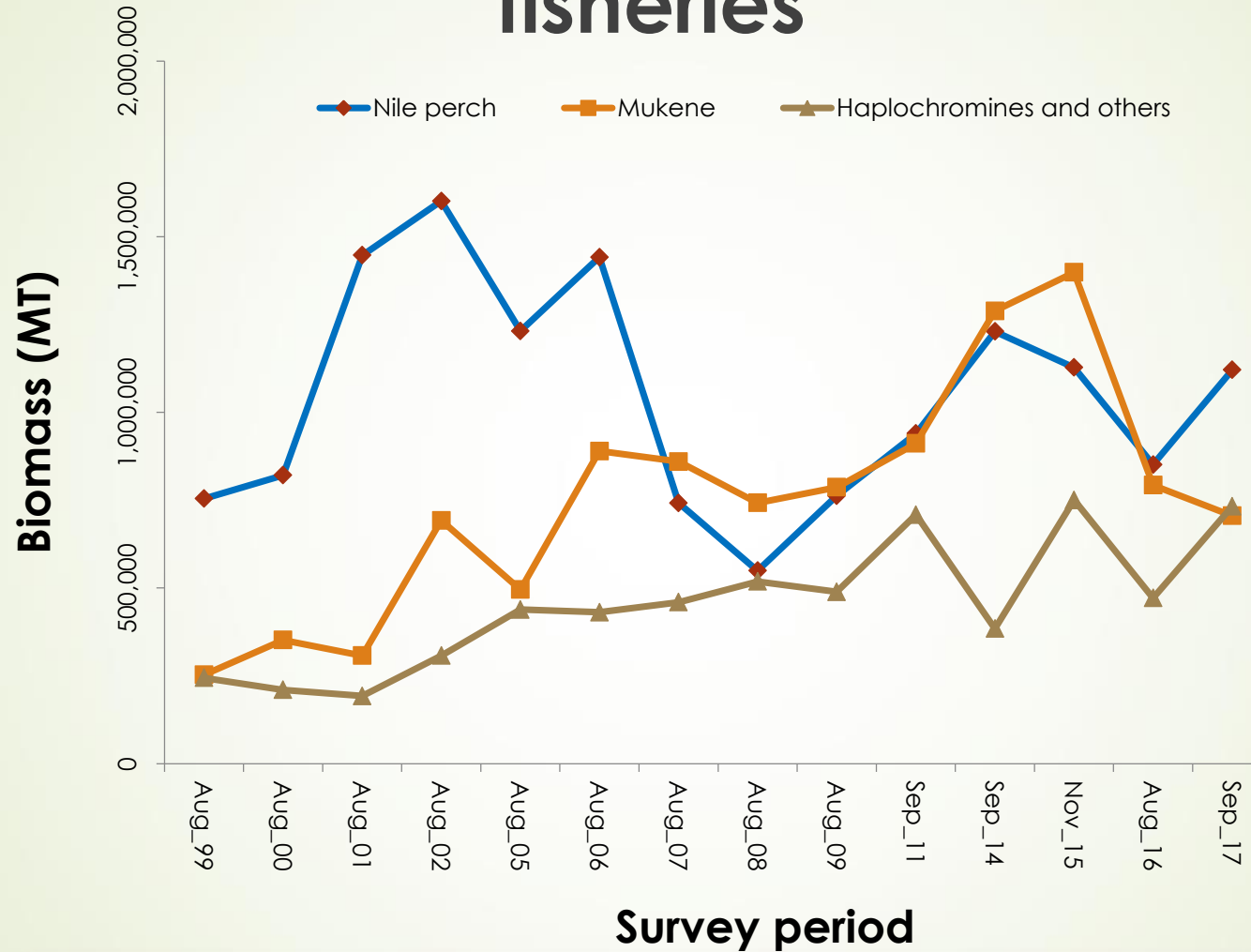


# Lake Victoria is already stressed-UNEP 2008



- Lake Victoria (a shared lake) is faced with multiple challenges
- Overfishing; habitat degradation, eutrophication, pollution, invasive species, Climate Change.
- Changes in the lake are unprecedented in gravity and rapidity
- No agreement on its current status and drivers now subject of international debate
- Lack of agreement on status and drivers makes it difficult to institute specific management measures
- Diverse signals in species compositions are evident in different areas of the lake, It is not known whether the lake can still be looked at as a single entity or as small portions in one

# The Lake now depends on four major fisheries

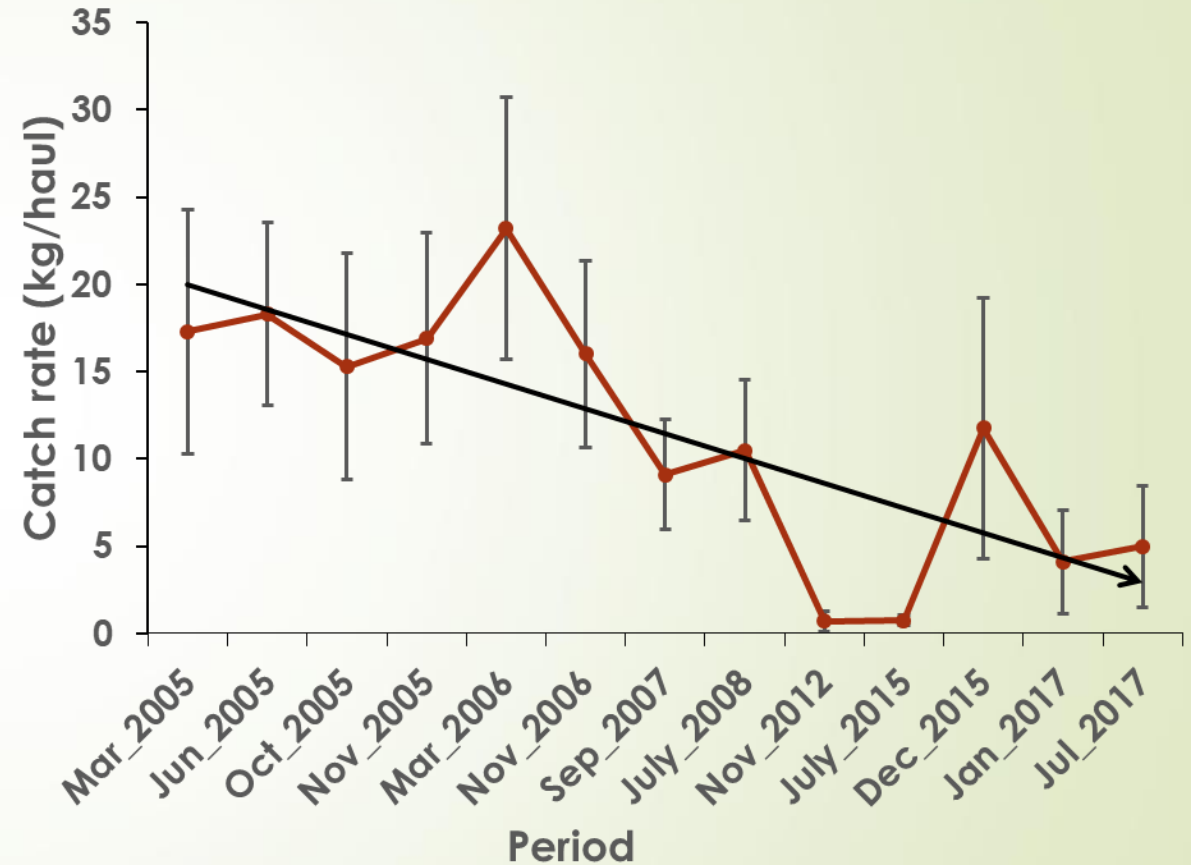


Biomass of the major three pelagic fish stocks are interlinked

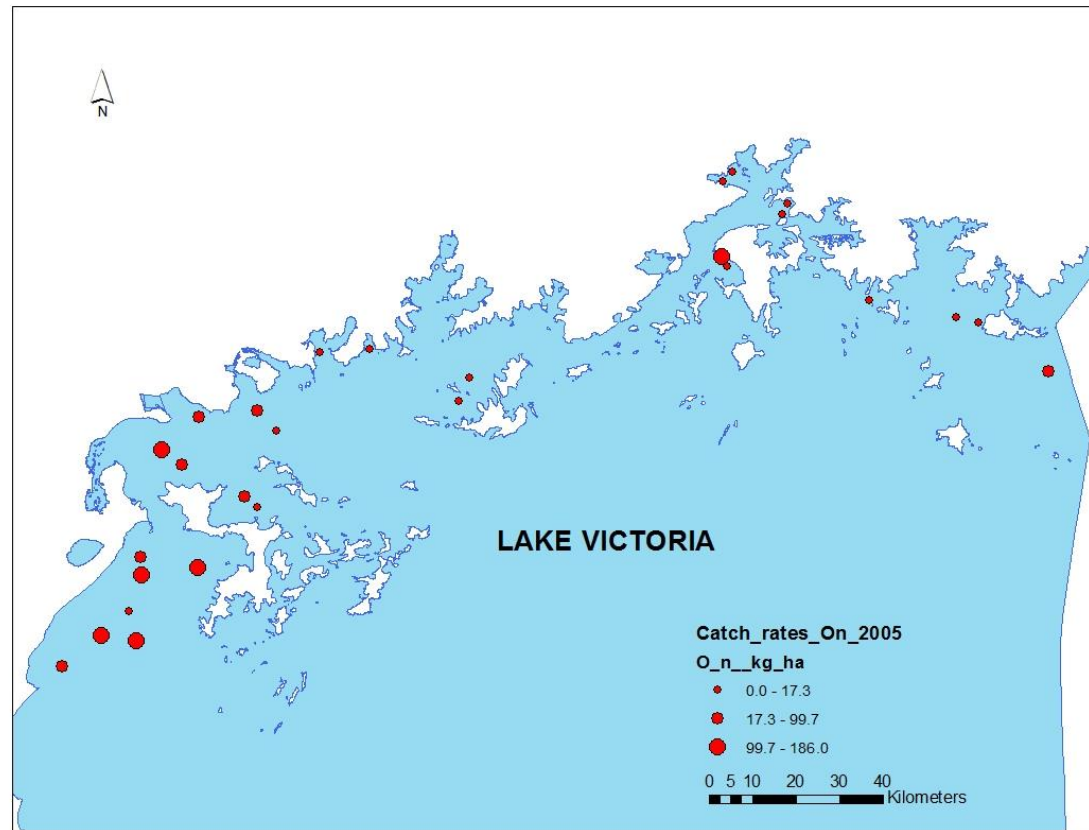


# Tilapias (ngege)

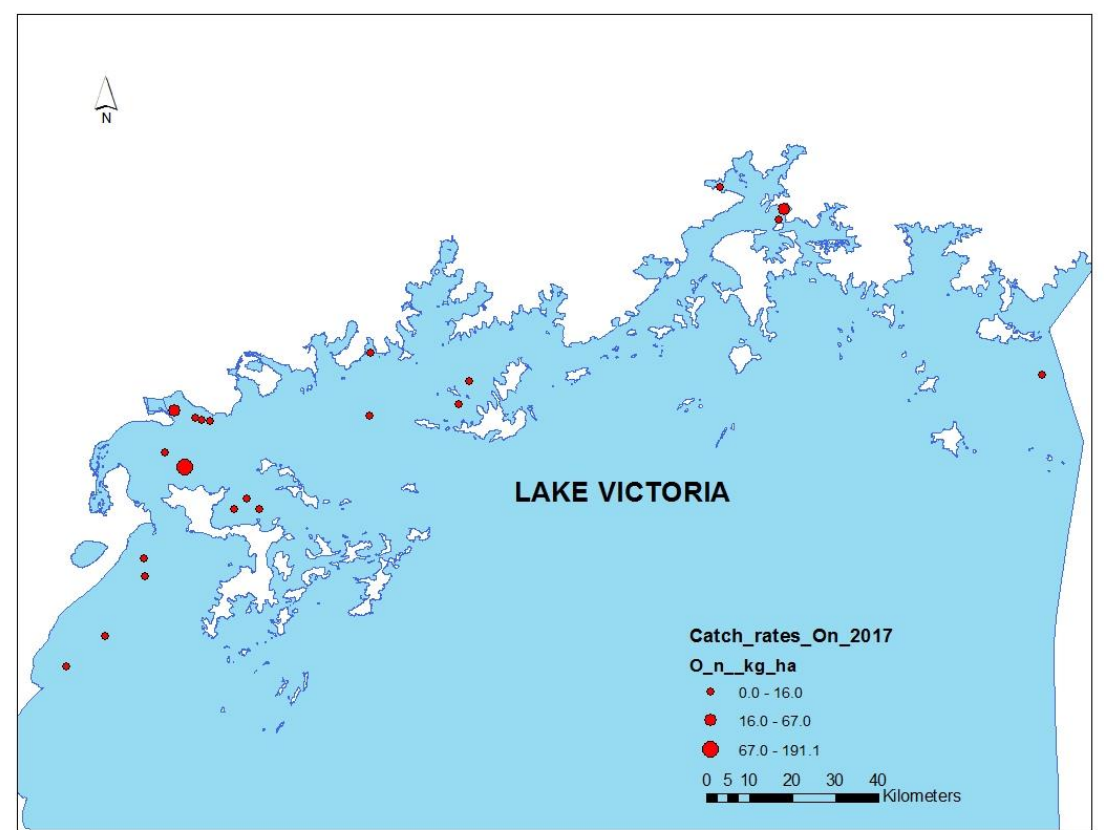
- Tilapias are a major fishery, but due to their restricted distribution inshore shallow areas their stocks are already in danger
- Estimates of their standing stock from trends of bottom trawl surveys show that the catch rates have dropped significantly since 2005
- Any further degradation of the shallow near shore areas is detrimental to their survival



# Changes in Tilapia stocks in Lake Victoria



2005



2017

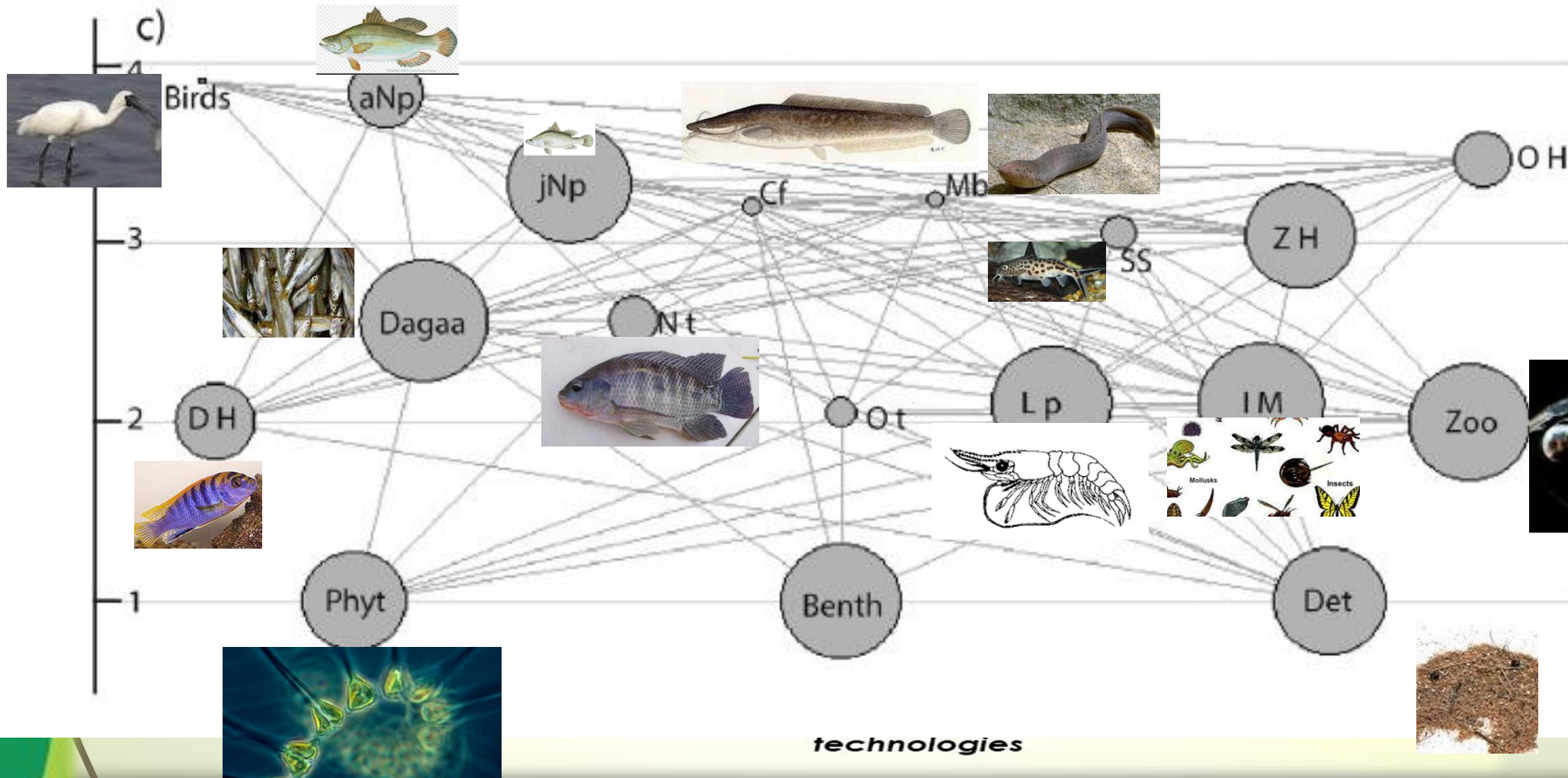
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# Expected adverse impacts of shallow near shore dredging and sand mining on water quality fish, biodiversity, and fisheries



# No fish is an Island-Every thing is connected to something





# Destruction of habitat for fish and invertebrates

Typical Tilapia nests in sandy shores

- ❖ Dredging will destroy habitats for fish, their early life history
- ❖ Will destroy habitat for invertebrates that sustain fisheries
- ❖ Maintaining these habitats was the basis for not permitting beach/boat seining and trawling, and fishing in shallow waters



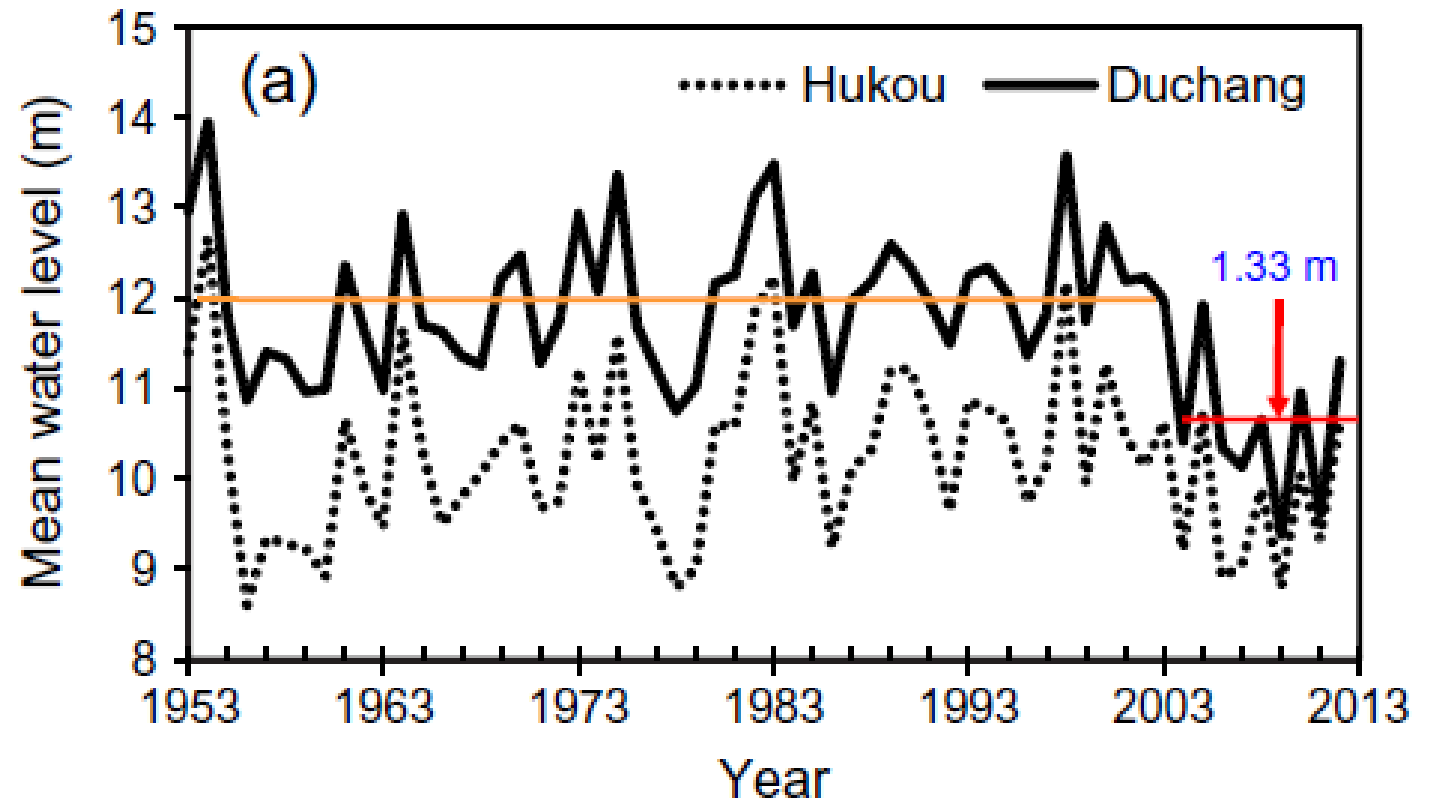
**Expected transformation at the bottom**



**Sand mining companies in L. Victoria wetlands reportedly make 12 meters deep depressions (Daily monitor, 18 May 2016)**

# Example of consequences of sand mining

- ❖ The lowest water level for Poyang Lake in China was after the commencement of sand mining in 2001



Water levels of Poyang Lake in the dry season. (a) Mean water level during the dry season (Lai et al. 2014)



# Reduction in water level

- ❖ Associated loss of habitat and fishing opportunities
- ❖ Changes in water budget

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**Poyang is China's largest fresh water lake**



Cattle graze on the dried up bed of Poyang Lake.  
Photograph: Xinhua/Barcroft Images  
(<https://www.theguardian.com/cities/2017/feb/27/sand-mining-global-environmental-crisis-never-heard>)

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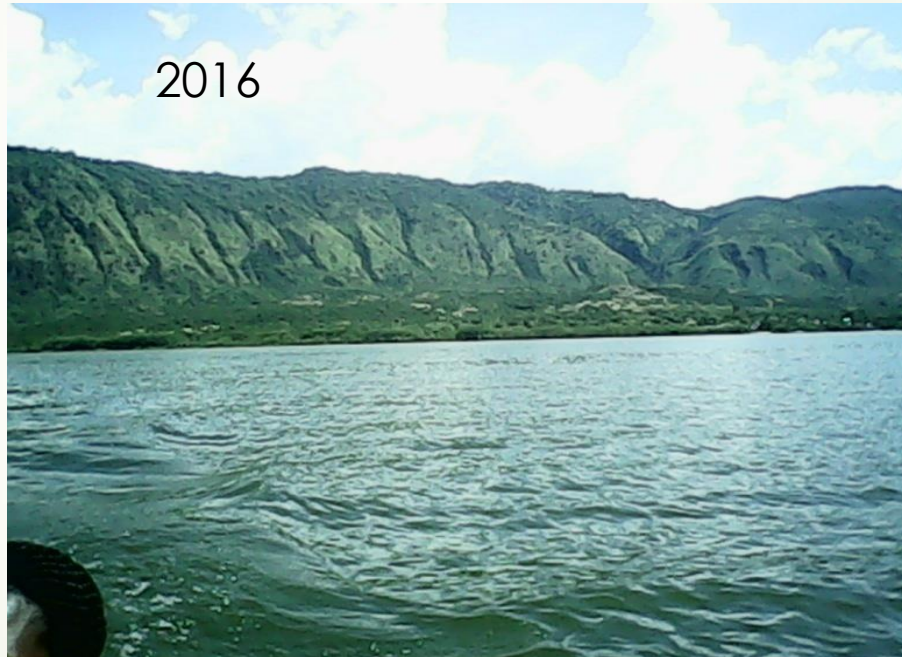


# Artisanal sand mining on lake Albert at Tugombiri

Prior 2016



2016



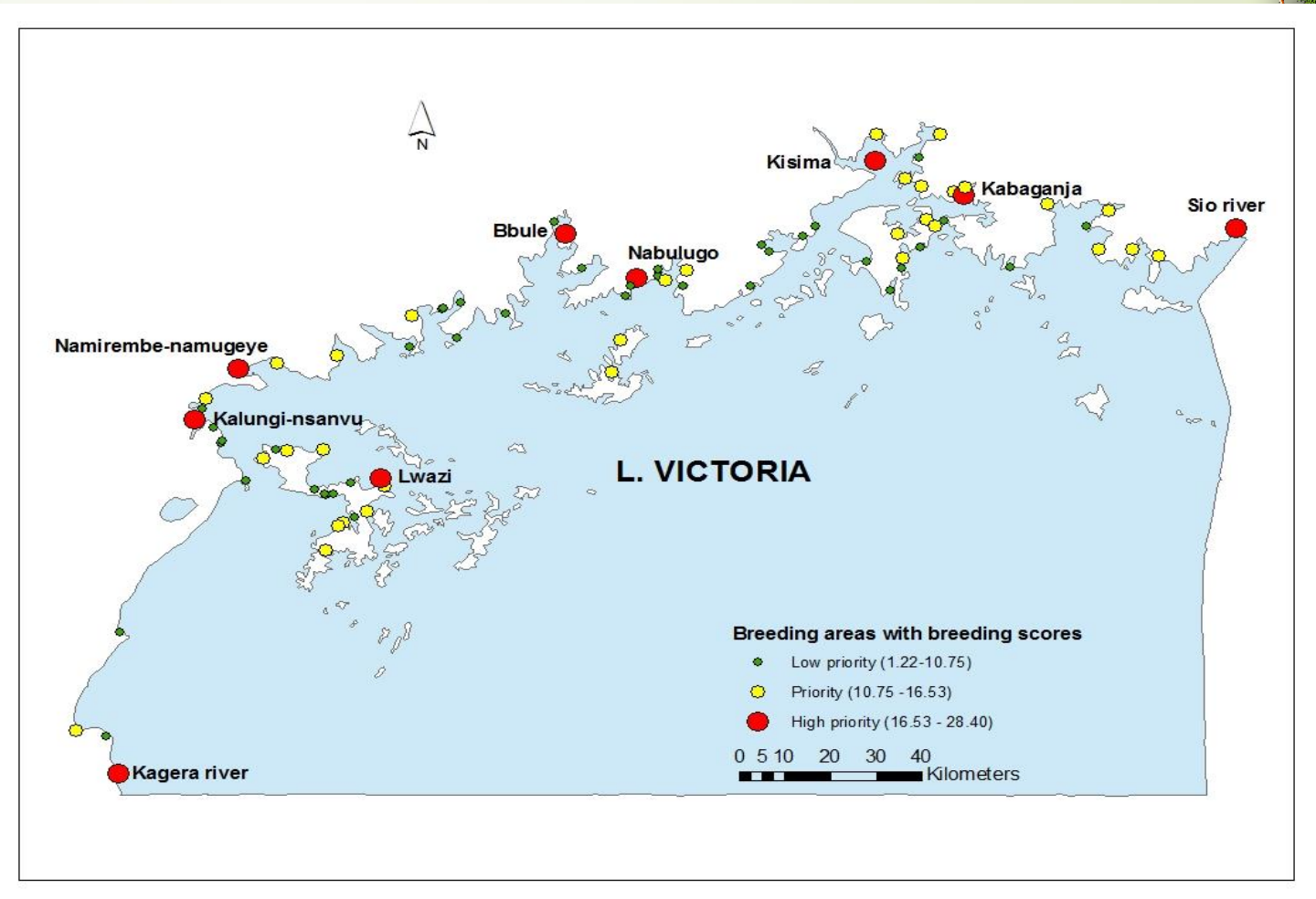
Water quality in 2016



# Breeding and nursery areas

- ❖ Nearshore sites are breeding areas for tilapiines (*Oreochromis niloticus*, *Coptodon zillii*, *Oreochromis leucostictus*) and nursery for all other fishes

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# Water quality impacts

- ❖ Reduced transparency and increased turbidity due to high sedimentation
- 14 • **Linked to production failure for cichlids that is based on visibility**
- ❖ High conductivity.





## Water quality impacts

- ❖ Reduced/loss of benthos, epilethic invertebrates and aufwuchs –food for littoral & Demersal fishes
- 15❖ Sand primary player in lake buffering and lake self cleaning (auto-euperation)
- ❖ Bottom sediment types including sand are major players in limnological profiles of both fresh and marine aquatic systems



# Cascading impacts

- ❖ Ecosystem functioning across the food web
- ❖ Loss of fish breeding and nursery areas
- ❖ Biodiversity loss (from present 300+ species)
- ❖ Reduced fisheries, unemployment, income loss, low per capita food consumption
- ❖ Water budget changes could affect the capacity of the Lake to support **HEP generation on the River Nile.**
- ❖ As a shared water body there are likely conflicts within the EAC and Nile Basin.

# Recommendations

- There is more to be considered and learned before dredging of Lake Victoria for sand; a non renewable resource
- 17 ➤ Dredging for transport ports as a one off can be accommodated with clear understanding of expanse and scope (number of ports)
- There is need to enforce effective regulatory framework and halt offshore (on-lake) mining
- Need to value the cost of fisheries to the economy of the country as we look for sand