



## African Center for Aquatic Research and Education

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# Lake Kivu Advisory Group: Lake Overview



Strengthening Capacity in Research, Policy and Management through  
Development of a Network of African Great Lakes Basin Stakeholders

Entebbe, Uganda  
November 5, 2019



Rwanda



DRC

# Lake Kivu

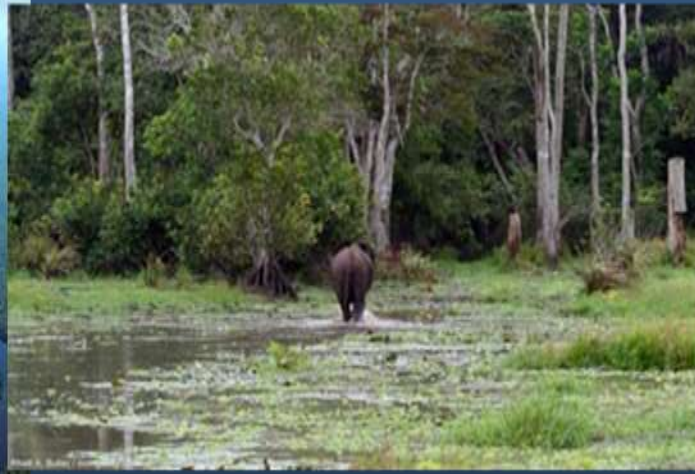
## Lakes Overview



# Lake Kivu

## Lakes Overview

DRC a fascinating environment to study:  
a big physical space (8% of Africa,  
2<sup>nd</sup> biggest country in Africa behind  
Algeria) and human and biodiversity  
hotspots (80 millions/450 tribes, 4th  
most populated in Africa), a mosaic of  
landscapes (cuvettes, mountains,  
valleys, big rivers, Great lakes , large  
wetlands, etc)



# Lake Kivu

## Lakes Overview

Morphometric and hydrological parameters of Lake Kivu.

Parameter	Value
Volume	560 km <sup>3</sup>
Maximum depth <sup>a</sup>	485 m
Mean depth (volume / lake area)	245 m
Lake area <sup>b</sup>	2370 km <sup>2</sup>
Catchment area (excluding lake) <sup>b</sup>	5097 km <sup>2</sup>
Precipitation over lake surface <sup>c</sup>	3.3 km <sup>3</sup> yr <sup>-1</sup>
Inflow from surface tributaries <sup>d</sup>	2.4 km <sup>3</sup> yr <sup>-1</sup>
Specific inflow <sup>e</sup>	17 L s <sup>-1</sup> km <sup>-2</sup>
Internal sub-aquatic sources <sup>f</sup>	1.3 km <sup>3</sup> yr <sup>-1</sup>
Evaporation lake surface <sup>g</sup>	3.4 km <sup>3</sup> yr <sup>-1</sup>
Outflow <sup>h</sup>	3.6 km <sup>3</sup> yr <sup>-1</sup>
Annual lake level fluctuations <sup>h</sup>	0.17 to 1.17 m
Flushing time (volume / outflow)	160 years
Residence time (volume / (precipitation + inflow))	100 years

After Muvundja et al. 2009 and references therein

# Lake Kivu

## Lakes Overview

### Main Resources:

- Fisheries based on the tanganyika sardine (*Limnothrissa miodon*) for DRC and Rwanda
- Hydropower energy at the outflow for DRC, Rwanda and Burundi
- Water resource to riparian towns (e.g. Goma)
- Methane resource (e.g. Rwanda)
- Transport
- Research and education
- non-tangible resources: Tourism and recreation, soft microclimate, culture preservation, etc.

# Lake Kivu

## Lakes Overview

- Most critical players:
  - Methane extraction companies in Gisenyi and Kibuye
  - Research institutes (DRC and Rwanda)
  - Environmental Agencies and Fisheries dept/ministries (DRC and Rwanda)
  - Fishries communities and fish farmers
  - Transport agencies

# Lakes Kivu

## Issues on the lakes

1. Environmental problems (pollution, invasive species, climate change effects, urbanization effects, etc.)
2. Unsustainable fisheries management (uncontrolled human pressure on fish resources) and methane extraction risks
3. Lack of long term data series and where available difficulties in data sharing,
4. Lack of funding for local researchers and weak global networking
5. Lack of harmonization of transboundary resource management policies



# Lakes Kivu

## Challenges to addressing Issues

What prevents positive change from happening?

- Less confidence between the riparian countries to deal effectively together for success
- Lack of environmental awareness and less engagement for adequate resource management
- Poverty among the riparian population
- In-country and in-region conflicts and insecurity
- Lack of infrastructure and commodities around the lake

# Lakes Kivu

## Current collaborative efforts

- Research industry: ISP Bukavu, Rwanda IHEs and Belgian as well as Swiss universities and research centers (**projects ended but parties are still willing to implement common projects**)

ISP Bukavu, Observatoire Volcanologique de Goma (OVG) and Lake Kivu Monitoring Program, University of Rwanda, INES-Ruhengeri (Rwanda) and the Rwanda Agriculture Board (projects ongoing): **Heavy to manage due to a lot of bureaucracy of High level managers!**

- At the political level: Cellule ad hoc for the observation of methane exactraction (Congolese Ministry of Hydrocarbons and Rwanda Ministry of Infrastructure) (**Not really working!**) and ABAKIR

# Lakes Kivu

## Challenge to current and past collaborative efforts

- Policy reforms are needed to be made by the two Governments after harmonization of respective laws and practices
- Create in each country a framework for information sharing between scientists and policy makers in- and between the two countries
- Strengthen the capacity of universities and researchers to effectively play on ground (Lab equipment and consumables, human resource training and motivation, science dissemination, access to public data repositories on open access)

# Lakes Kivu

## Summary and Conclusion

- Lake Kivu is obviously very important for both riparian countries for its tangible and non-tangible resources
- These lakes are important (obviously)
- These lakes have a lot of challenges which are known by the communities
- To address these challenges we need:
  1. Enhance our understanding, our collaboration and global networking
  2. Strengthen the capacity of our researchers, managers and policy-makers (eg. on science and sustainability principles of natural resource management)
  3. Bolsters include economical and educational exchanges, diplomatic relationships, Regional/Sub-regional agreements and international conventions on transboundary waterbodies