



EAST AFRICAN COMMUNITY
LAKE VICTORIA FISHERIES ORGANIZATION



Environmental management in shared freshwater ecosystems and their impacts on fisheries and Aquaculture development



Lake Victoria Fisheries Organization
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6th General Assembly of APRIFAAS
Tangier, Morocco

Introduction

- Shared fresh water ecosystems are water bodies that **cross or border two or more countries** and are shared by different jurisdictions and stakeholders.
- They include rivers, lakes, wetlands, groundwater aquifers, and coastal and marine areas.

Benefits

Water supply, generation, Food production, Hydropower

Climate regulation, Recreation, Cultural values

Rich in diversity both flora and fauna

Economic and strategic importance for regional integration and development

Introduction

Environmental management in shared
Freshwater Ecosystems involves managing
multidimensional challenges and threats

- Pollution
- Overexploitation
- Habitat degradation
- Invasive species
- Climate change
- Conflicting interests among users and countries
- Effect on health and sustainability ;
- Risks to the ecological integrity and resilience of these transboundary aquatic ecosystems
- Risk to the livelihoods and security of the people who depend on them

This calls for development and implementation of Policy Measures and Strategic Actions for sustainable management of of shared water bodies and Environmental Sustainability

Environmental management in shared freshwater ecosystems

- Environmental management in shared freshwater ecosystems is crucial for sustaining fisheries and aquaculture development as it safeguards the natural environment, maintains biodiversity, prevents overexploitation, and ensures the sustainability of fisheries and aquaculture .
- These ecosystems are often delicate and can be significantly impacted by human activities.
- Effective environmental management strategies are essential to ensure the health of these ecosystems and the livelihoods that depend on them.

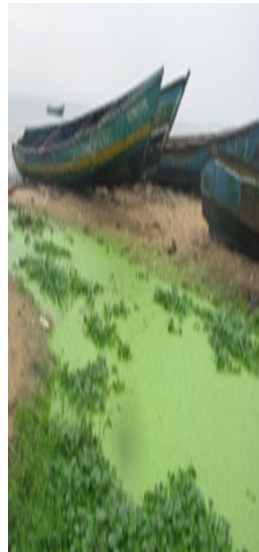
Environmental management in shared freshwater ecosystems

- **Challenges in Shared Freshwater Ecosystems:**
- **Pollution:** mainly due to human activities such as Agricultural runoff, industrial discharge, and improper waste disposal can lead to water pollution, affecting the quality of water in freshwater ecosystems. Pollutants can harm aquatic life and contaminate fish, making them unsafe for consumption.
- **Overfishing:** Overfishing can deplete fish populations, disrupt the balance of the ecosystem, and negatively impact the income of local communities that depend on fishing for their livelihood.
- **Habitat Destruction:** Deforestation, urbanization, and dam construction can lead to habitat destruction and fragmentation, impacting the breeding and feeding grounds of fish and other aquatic species.
- **Climate Change:** Changes in temperature and precipitation patterns, as well as extreme weather events, can affect water levels and water quality, disrupting the natural habitat of aquatic species.
- **Competition for resources:** as water do not have limit, users of shared water bodies tend to over exploiting the resources

Challenges and threats(Water pollution)

Pollution from agricultural, industrial, illegal mining of sand and minerals and urbanization are major sources

Wastes from agriculture, industry, urbanization and mining include pesticides, toxic chemicals and agrochemicals and plastic wastes



Plastic pollution/
Poverty

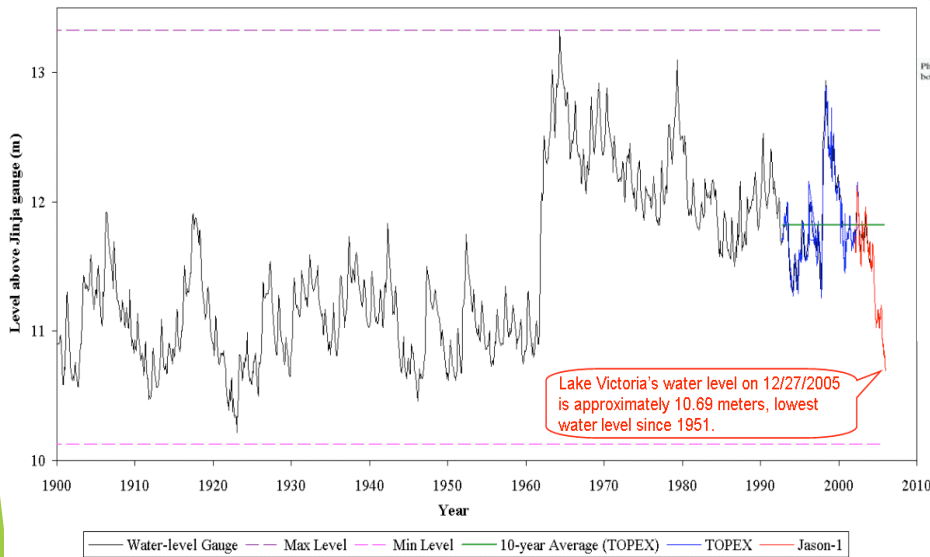


Urban waste

Challenges and threats (Climate Change)

- Like in other transboundary resources in Africa, climate change is a major leading to reduction in water availability and higher temperatures with increased evapo-transpiration and overall decline of fish stocks and other key species of biodiversity importance in Lake Victoria

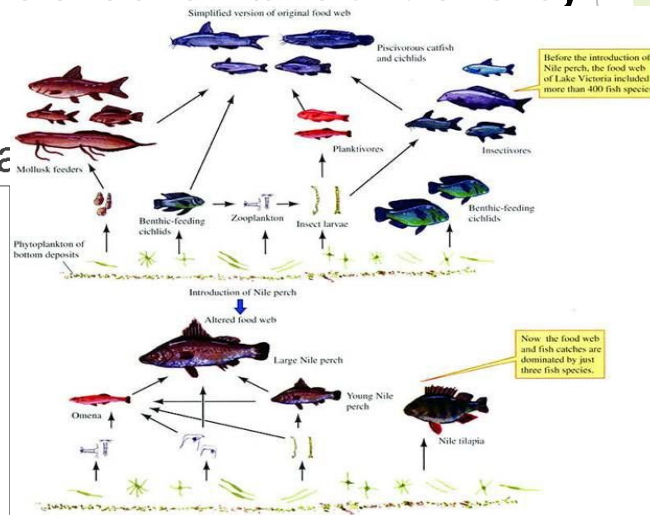
Historical Water Level Elevations for Lake Victoria



Data Source:
 Historical water level gauge data from Jinja, Uganda (near Lake Victoria's outlet).
 Satellite radar altimeter data from USDS/NASA/UMD at:
http://www.pecad.fas.usda.gov/cropeplorer/global_reservoir/



U.S. Department of Agricultural (USDA)
 Foreign Agricultural Service (FAS)
 Production Estimates & Crop
 Assessment Division (PECAD)



Challenges and threats(Habitat Degradation)

Human activities such as excavation of river sand, channelization of river courses alters freshwater basins which leads to loss of some aquatic organisms and subsequent reduction in biodiversity.



Deforestation

Wetland degradation



Shoreline



Sand mining

Challenges and threats(Overexploitation)

- Excessive use of freshwater resources to the point of diminishing returns has been identified as a major threat to the sustainability of freshwater ecosystems.
- The growing human population has increased the demand of goods and services derived from freshwater resources in Lake Victoria.
- The freshwater basins are over exploited as a major source of income/livelihood and its over exploitation is attributed to poverty and unemployment and gradual increase in fishing effort.

Over exploitation of Natural Resources

- This problem is the exploitation of nature in an unsustainable way.



Challenges and threats (Invasive species and Diseases)

Invasive species were identified as threat to biodiversity in Lake Victoria. Freshwater invasive species are plants and animal organisms that are not native to a particular ecosystem but often times occupy larger surface area because of their prolific nature and their ability to easily adapt to new environments

Impacts range from extinction of native plants and animals, and permanent altering of ecological habitats which affects biodiversity



Water hyacinth and Kariba weeds exist on Lake Victoria



Critical issues (Invasive species and Diseases)

Diseases especially fish diseases are a major concern to biodiversity conservation

With the growing of cage and pond culture in Lake Victoria special biosecurity concerns can be real if there are no proper biosecurity



Challenges and threats (Illegal Unreported Unregulated (IUU) fishing)

IUU fishing is a major threat to biodiversity in Lake Victoria leading to unsustainable fisheries, reduced benefits for resource users, resource use conflicts and danger to food security and fish species extinction



Illegal fishing gears and methods

Challenges and threats(Cross cutting)

- **HIV prevalence in fishing communities** is estimated to be 5-7 times higher than in the general population (Kiwanuka *et. al* 2017). One study estimated the HIV prevalence among people aged 18-24 years in fishing communities along the shores of Lake Victoria to be 12% in men and 26% in women (Asiki *et. al* 2011).

A SICK LABOUR FORCE WILL NEVER SUSTAINABLY MANAGE NATURAL RESOURCES

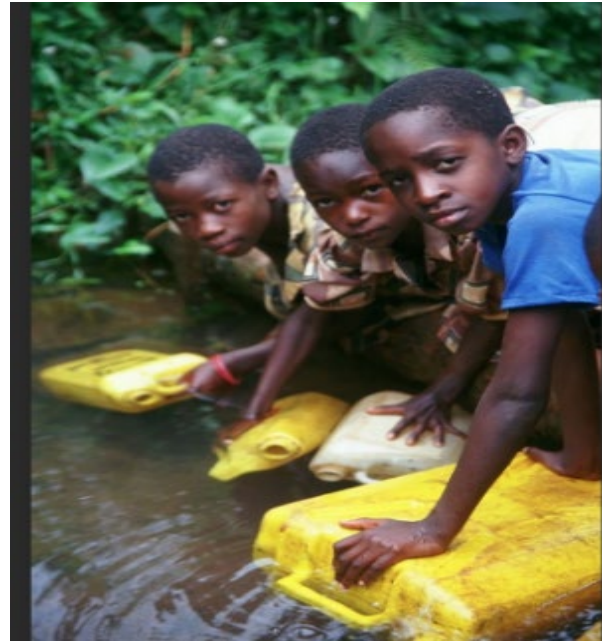


Challenges and threats(Cross cutting)

- **Schistosomiasis** mostly affects poor and rural communities, particularly agricultural and fishing populations. Women doing domestic chores in infested water, such as washing clothes, are also at risk. Inadequate hygiene and contact with infected water make children especially vulnerable to infection.
- **A SICK LABOUR FORCE WILL NEVER SUSTAINABLY MANAGE NATURAL RESOURCES**



Bilharzia



Challenges in Shared Freshwater Ecosystems

❖ Climate Change and variability and associated Global Warming, Lake level raise, and flooding

We are eating up the earth by activities like deforestation, use of fossil fuels, and as a result the earth is warming up to the extent that our Fish may need oxygen masks and we shall lose most of the species.

We must therefore take action



Challenges in Shared Freshwater Ecosystems

AFRICA'S BLUE ECONOMY: CROWDED AND CONTESTED



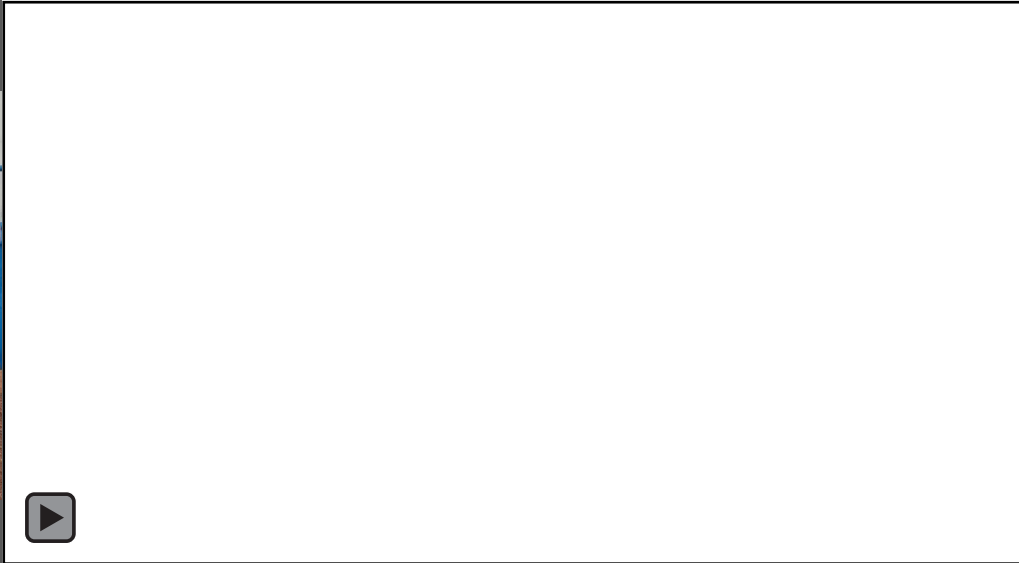
Leading to overfishing, capture of immature fish and trade disagreements and conflicts

Strategies for Environmental Management:

- **Water Quality Management:** Implement strict regulations and monitoring systems to control industrial and agricultural runoff. Promote wastewater treatment facilities to ensure that pollutants are removed before they enter freshwater bodies.
- **Sustainable Fishing Practices:** Enforce regulations to prevent overfishing, including size and catch limits. Implement community-based fisheries management programs that involve local communities in the decision-making process.
- **Habitat Restoration and Conservation:** Protect and restore critical habitats such as wetlands and spawning areas. Implement reforestation programs to prevent soil erosion and maintain water quality.
- **Climate Change Adaptation:** Develop strategies to adapt to the impacts of climate change by implementing climate-resilient water management practices.
- **Integrated Aquaculture-Fisheries Systems:** Promote integrated aquaculture-fisheries systems where aquaculture activities are combined with traditional fisheries, mimicking natural ecosystems. This approach can enhance biodiversity and provide a buffer against environmental disturbances.

Strategies for Environmental Management:

- **Community Engagement and Education:** Raise awareness among local communities about the importance of sustainable environmental practices. Involve communities in environmental monitoring, protection, and conservation efforts.
- **Transboundary Cooperation:** Facilitate cooperation and collaboration among countries sharing freshwater resources by ensuring the equitable and sustainable use of shared freshwater resources. Fostering collaboration, countries can address challenges collectively, enhance environmental conservation efforts, and promote the long-term well-being of communities reliant on these valuable water sources.

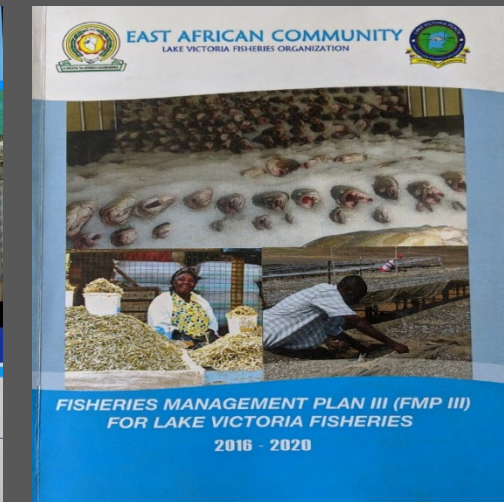
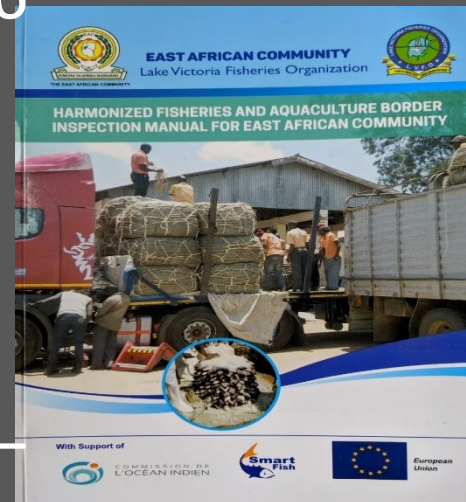
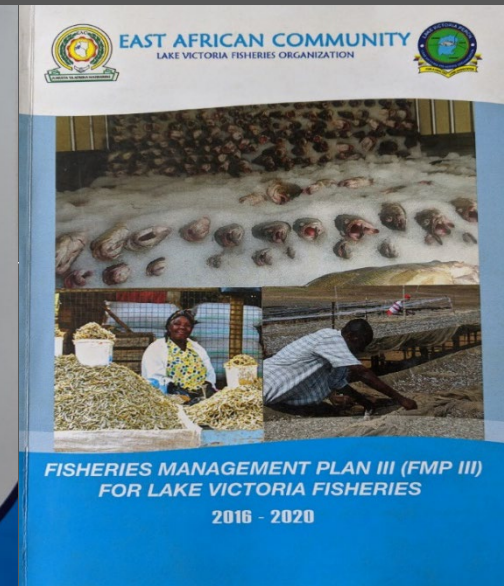


Trawl Samples used in verification of acoustic signals



Harmonized policies & Plans

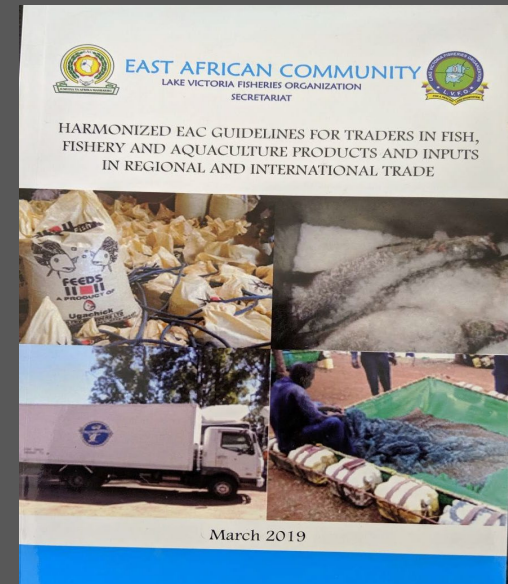
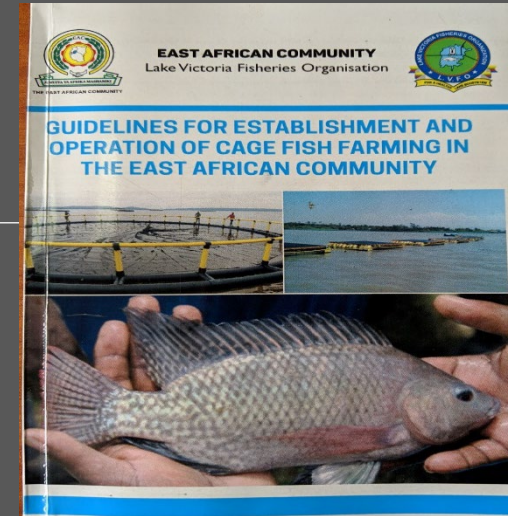
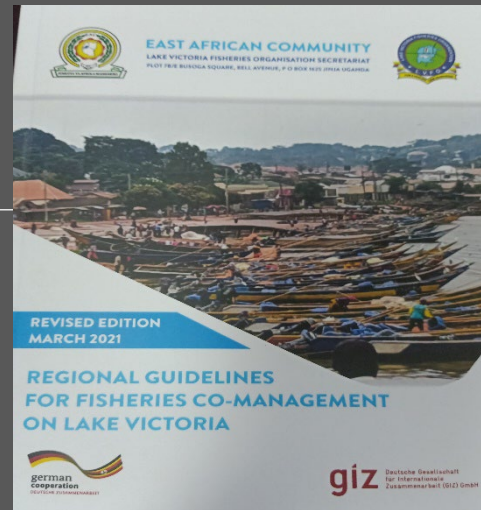
- EAC Fisheries and Aquaculture Policy 2018
- EAC Cage Fish Farming Policy
- Strategic plans – EAC Development strategies - Latest 2021-22 – 20225-26
- Fisheries Management Plans I, II, III, Latest IV (2021-2025)
- Nile Perch Management plans I, II, Latest III (2021 – 2025)



Regionally harmonized guidelines, Protocols, and SOPs

- Species Specific Licencing
- Co-management
- Management of Fish breeding Areas
- Cage fish farming
- Fish handling and Trade
- Extraction, processing & trade in fish maws
- Monitoring Control and surveillance (MCS)

Examples



Impacts of Environmental management in shared freshwater ecosystems on Fisheries and Aquaculture Development

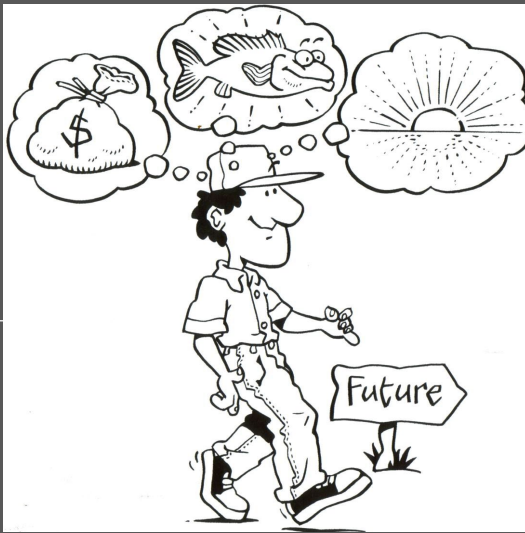
- ✓ **Sustainable Resource Availability:** Proper environmental management ensures the preservation of aquatic habitats and the conservation of fish stocks. This sustained availability of resources forms the backbone of both fisheries and aquaculture industries, providing a continuous supply of fish for commercial and subsistence purposes.
- ✓ **Biodiversity Conservation:** Environmental management efforts protect diverse aquatic species and their habitats. Preserving biodiversity is not only crucial for the ecosystem but also for fisheries and aquaculture. It ensures the availability of a wide range of species for both commercial and ornamental purposes, promoting economic diversity.

Impacts Continued

- ✓ **Economic Growth and Livelihoods:** Sustainable fisheries and aquaculture provide employment and income opportunities for millions of people globally. growth and poverty reduction in many communities.
- ✓ **Food Security:** Well-managed fisheries and aquaculture sectors are critical for global food security. Fish is a vital source of protein for billions of people.
- ✓ **Tourism and Recreation:** Healthy aquatic environments also attract eco-tourism and recreational activities. Well-managed natural habitats and sustainable aquaculture practices contribute to eco-tourism, bringing additional economic benefits to regions with rich aquatic biodiversity.

Take home message for effective management of shared resources

- International Cooperation and Agreements
- Harmonized Integrated Management Plans
- Community Engagement and Public Awareness
- Regulatory Frameworks and Enforcement
- Capacity Building and Technical Assistance
- Continuous Monitoring and Research
- Mitigation and adaptation to external forces



Thank You

