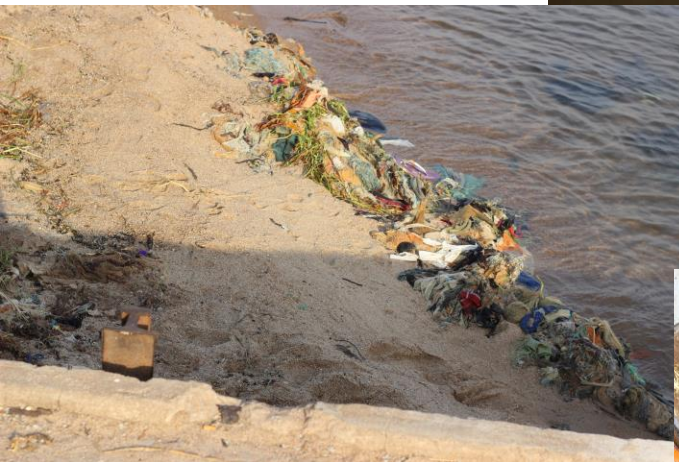




CLEAN SHORES, Great Lakes



Dr. Farhan R. Khan
Senior Researcher, NORCE
fakh@norceresearch.no



African Great Lakes (AGL)

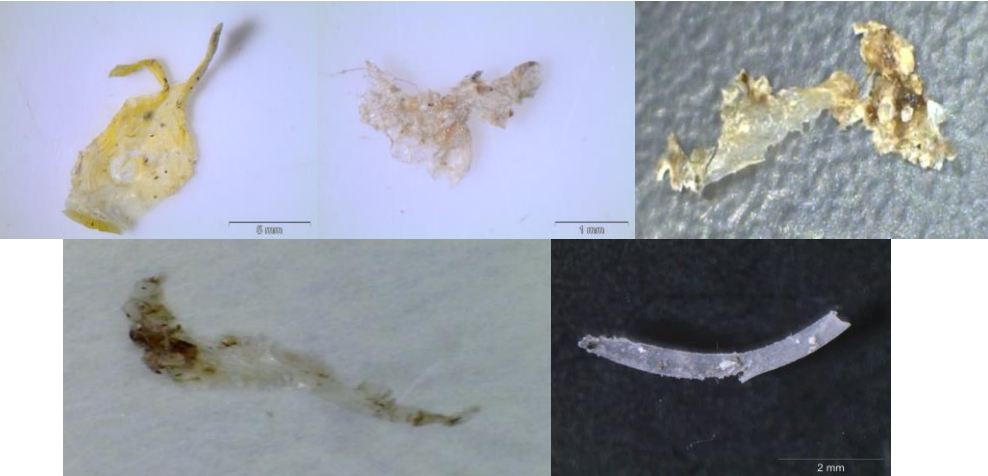
- Lakes Victoria, Tanganyika, and Nyasa (Malawi) are the 3 largest.
- Borders shared by several countries.
- Ecological and Economic importance:
 - Lakes support amongst the highest levels of freshwater biodiversity.
 - Support the livelihood of approx. 40 mil people.
- **Nile, Congo and Zambezi Rivers connect AGL to Mediterranean Sea, Atlantic and Indian Oceans.**
 - **Rivers known pathways in the transport of plastic litter.**



Plastics and MPs in Lake Victoria





- In 2016 we first looked at microplastics in Perch and Tilapia from Lake Victoria.



- Plastic waste on the banks of lake Victoria were an obvious source.



Notes
First evidence of microplastics in the African Great Lakes: Recovery from Lake Victoria Nile perch and Nile tilapia

[Fares John Biginagwa](#)^{a b 1}, [Bahati Sosthenes Mayoma](#)^{a c 1}, [Yvonne Shashoua](#)^d, [Kristian Syberg](#)^a, [Farhan R. Khan](#)^a  

Clean Shores, Great Lakes

- Norwegian Retailers Environment Fund (**Handelenmiljøfond**) International Program to Reduce Plastic Litter.
- Proposed clean-ups in 3 regions:
 - Mwanza, Lake Victoria
 - Kigoma, L. Tanganyika
 - Kyela, L. Nyasa
- Aspects of citizen science and community engagement.
- We were awarded 1.8 milNOK for a 2-year project.
- Project start-up in April 2022...



Our Partners

- **UDSM (University of Dar es Salaam)**, the Tanzanian lead partner of the project. Bahati Mayoma was the Co-PI.
- **ARENA Recycling Industry** is a leading social venture in plastics recycling ARENA has organised and led many clean-ups. The main contact person is CEO Hellena Sailas.
- **EMEDO (Environmental Management and Economic Development Organization)** is an NGO for community involvement and organizer of clean-ups Founder and Executive Director Editrudith Lukanga.



5 objectives of CSGL

- **Reduce** litter, especially plastic litter, along the Tanzanian shorelines of the African Great Lakes.
- **Train** and **mobilise** local **communities** as environmental ambassadors through active involvement in the clean-ups.
- **Record** clean-up data through citizen science and online to pinpoint hotspots and sources.
- **Promote circular economy** and sustainable solutions.
- **Provide data-led advice** to regional and national policymakers on mitigation strategies.
- Start “something” that would have life after the project period.



I. Reduce

- 2 Campaigns February – April 2023 & August- September 2023.
- 35 sites in Campaign 1 & 34 in Campaign 2
- Beaches, landing sites, fisheries, markets, rivers drainage ditches, tourism spots.
- Clean-up strategy was to be early and fast - typically 1-2 hours starting at 7 or 8 am as not to disrupt the workday.



I. Reduce



Kamanga Garden, Mwanza City

II. Train

- Training sessions on waste sorting, waste audit, and brand audit (WABA).
- Participants from:
 - Women's Group Representatives
 - Scouts
 - Fisheries Union
 - University Environmental Club
 - Recent Aquatic Science Graduates
 - Partner Staff
- The trained volunteers were then entrusted to lead clean-ups with our CSGL Citizen Scientists.



II. Mobilise

- Before clean-ups we went into communities to raise awareness and built connections with many community groups:
- Local Government Authorities (LGAs)
- NGOs
- Media outlets
- Other organizations – jogging clubs, scouts, waste pickers, students
- The general public



II. Community/schools outreach

- An important part of the project is to inspire the next generation into environmental awareness.
- We visited 21 schools, 11 primary and secondary
- Engaged over 1300 students
- Explained 4Rs – refuse, reduce, reuse, recycle.
- Hands on exercises and discussion on strategies to solve plastic waste.



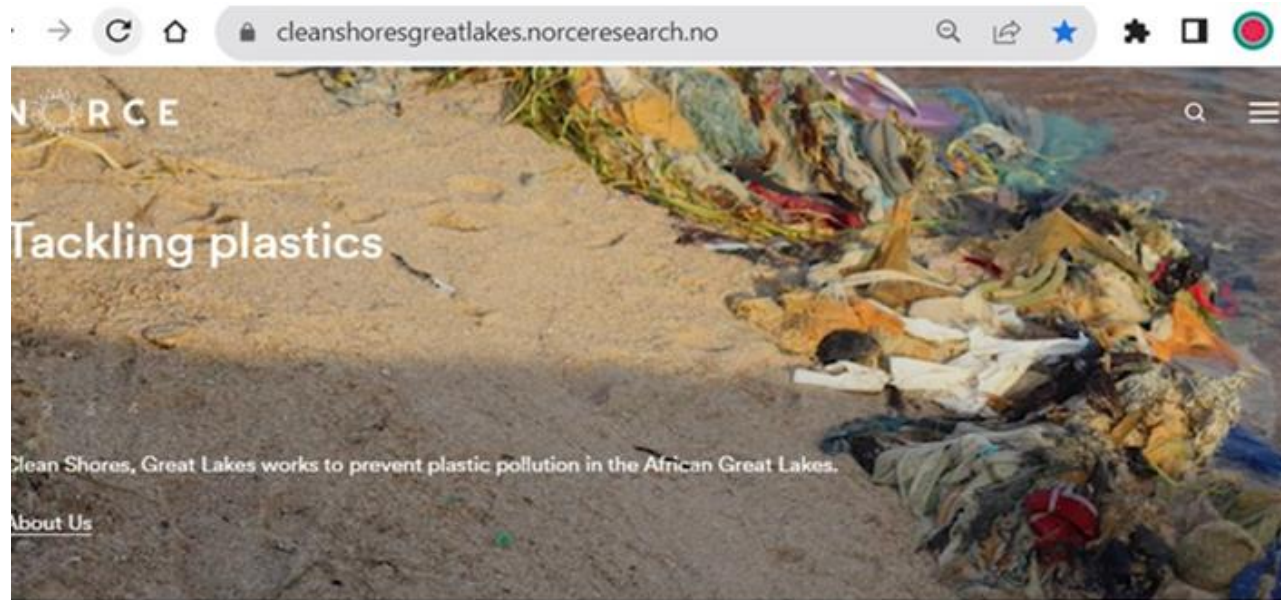
III. Record - Citizen Science

- At each site the trained citizen scientists collected data:
- All litter was weighed.
- Waste audit was conducted on a % of the litter, categorized into types of litter/items and enumerated.
- Brand audits in the 2nd campaign to find manufacturers.
 - Extended Producer Responsibility.
- Datasheets were validated before the data was captured online.



III. Record - website

- Website designed as tool to collect and display data



The Clean Shores, Great Lakes

Plastic pollution is a global environmental crisis affecting all areas of the world, the animals that live in them and human health. The breakdown of larger plastic litter into smaller microplastics makes this problem even harder to remove from the environment. Clean-ups, education, circular models, and science-led mitigation strategies offer valuable solutions to stopping plastic pollution. The Clean Shores, Great Lakes project works to train local communities as environmental ambassadors to participate in clean-ups, collect clean-up data through citizen science, promote waste management and circular economy, and provide data-led advice to regional and national policymakers on prevention strategies.



69

Clean-ups



25981

Total Weight in kg



431328

Number of items



5483

Volunteers

IV. Promote circular economy

- An aim of the project is to promote 2nd life solutions for plastic debris.
- These interlocking bricks, made from recycled plastic waste.
- Waste sorted into different groups and shredded into small pieces.
- These pieces are mixed with sand, which are the key components in the eco-brick.



IV. Data-driven advice

- Dissemination workshop – 14 September 2023.
- Government Departments (e.g., Ministry of Fisheries and the Office of the Environment)
- Lake Victoria Region Local Authorities Cooperation (LVRAC)
- Mayoral representatives of Mwanza City and neighbouring districts
- Academics from UDSM and other institutions in Africa.
- Affected communities – Fisheries workers and union representative
- **Handelensmiljofond – project funders joined from Norway**
- PETPro Tanzania – Extended Producer Responsibility PET bottle recycling company
- Local and national media – the meeting was featured across the Tanzanian media



Headline results



69

Clean-ups



25981

Total weight in kg



431328

Number of collected items



5483

Volunteers

- Covered 688602 m² of African Great Lakes shoreline.
- Biggest campaign of coordinated freshwater clean-ups in Tanzania and in East Africa.

Sites



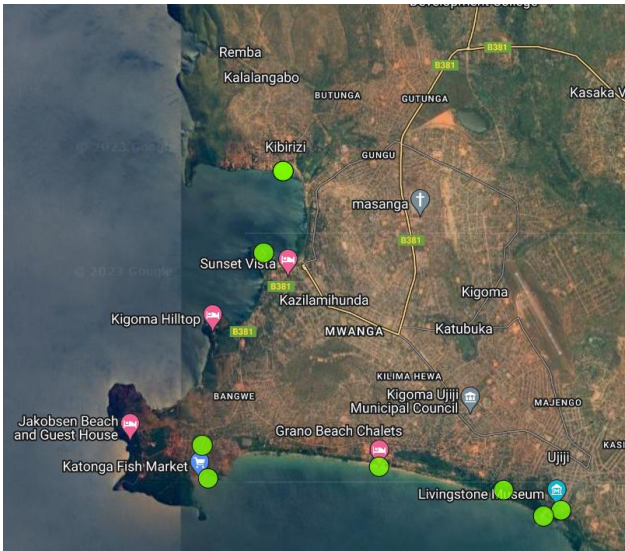
69

Clean-ups

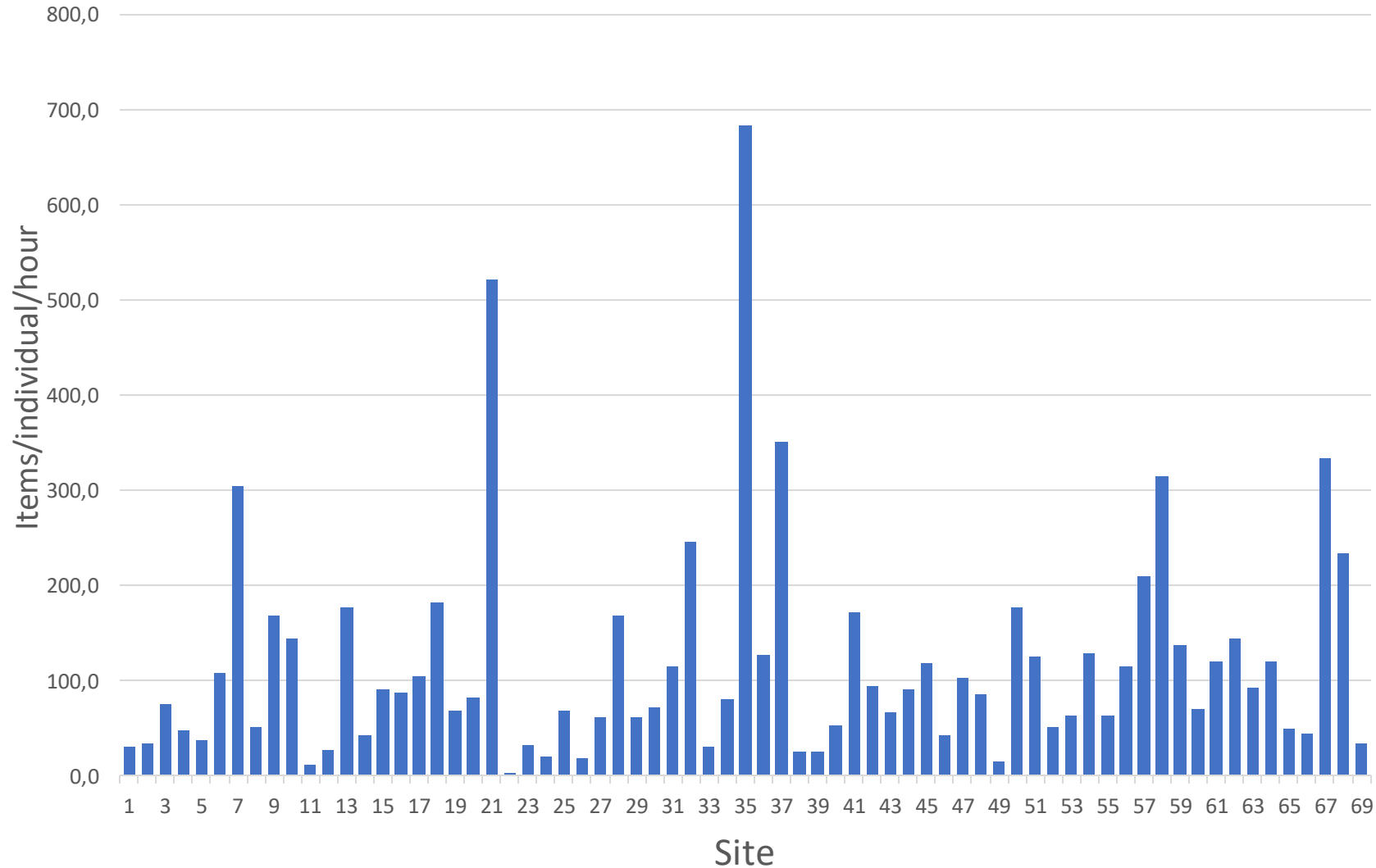
48 at Lake Victoria

12 at Lake Nyasa

9 in Lake Tanganyika



Sites



- Normalise items collected by time spent and volunteer numbers
- Top 5 sites for litter had more than 300 items/individual/hour
- 4 of the top 5 sites had their main activity as fishing camp or landing site.
- Ports and Markets were other important sites/activities.
- Tourist sites had typically less litter.

What we found – waste audit



431328

Number of collected items



- **Litter problem is a plastics problem.**
- 75% of all litter is plastic.
- Clothes are 2nd most abundant – 11%
- Clothes are a source of microfibers
- All other categories of litter combined was 15% of the total collected.

Waste Audit

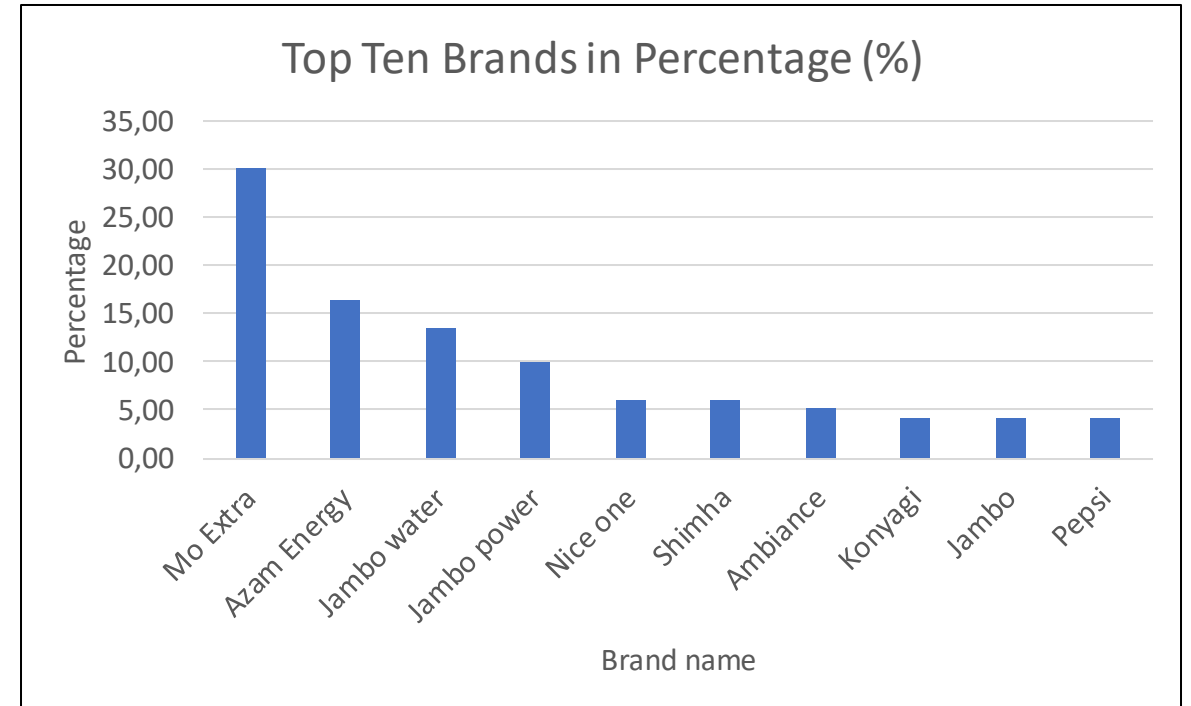
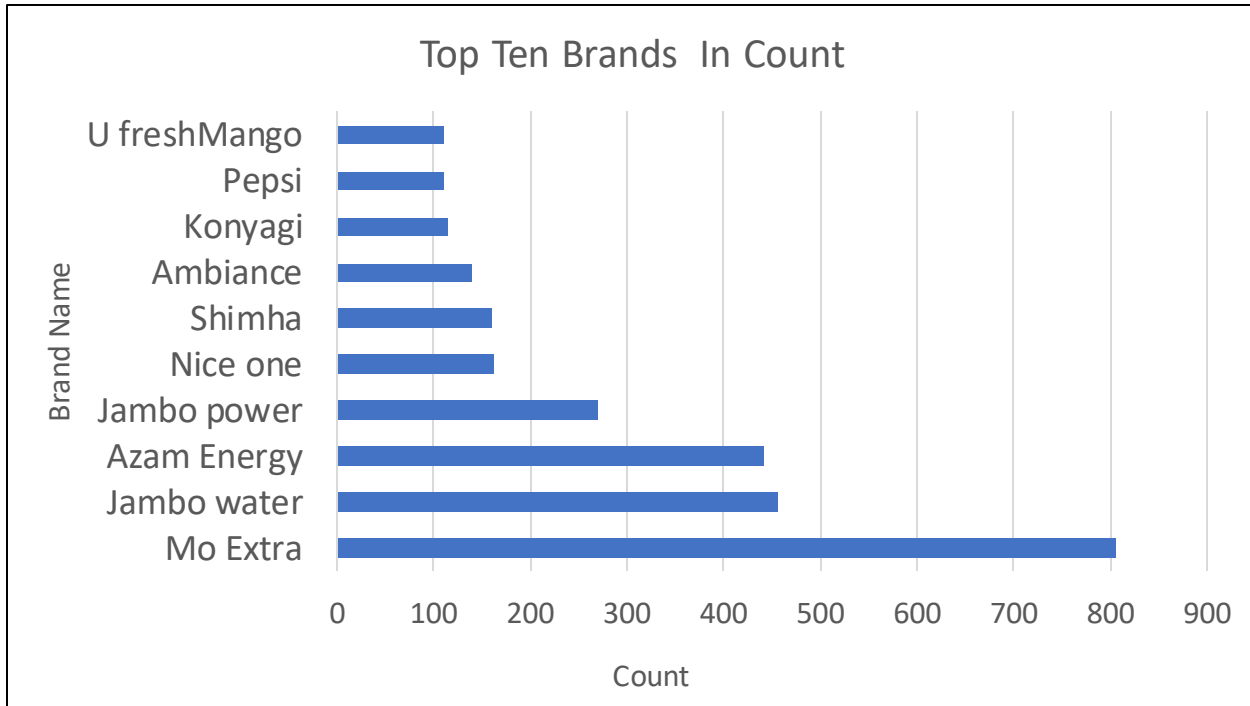
- Plastic bottles and bags are 40% of all litter
- 8/10 top items are plastics
- Drinks bottles could be an easy item for mitigation.
 - Bottle return or collection points.
 - Extended Producer Responsibility
- Plastic bags are banned in Tanzania
 - Lag-phase before environmental reduction?
 - Black market trade

Top 10 items found

①	Plastics beverage bottles	89766	21%	⑥	Plastics bottle caps	20301	5%
②	Plastics bags	85605	19%	⑦	Other food related plastics	20039	5%
③	Clothing	33883	8%	⑧	Cardboard boxes	11592	3%
④	Food wrappers	29450	7%	⑨	Industrial plastic sheeting	8119	2%
⑤	Packaging material	22297	5%	⑩	Fishing nets and pieces	6805	2%

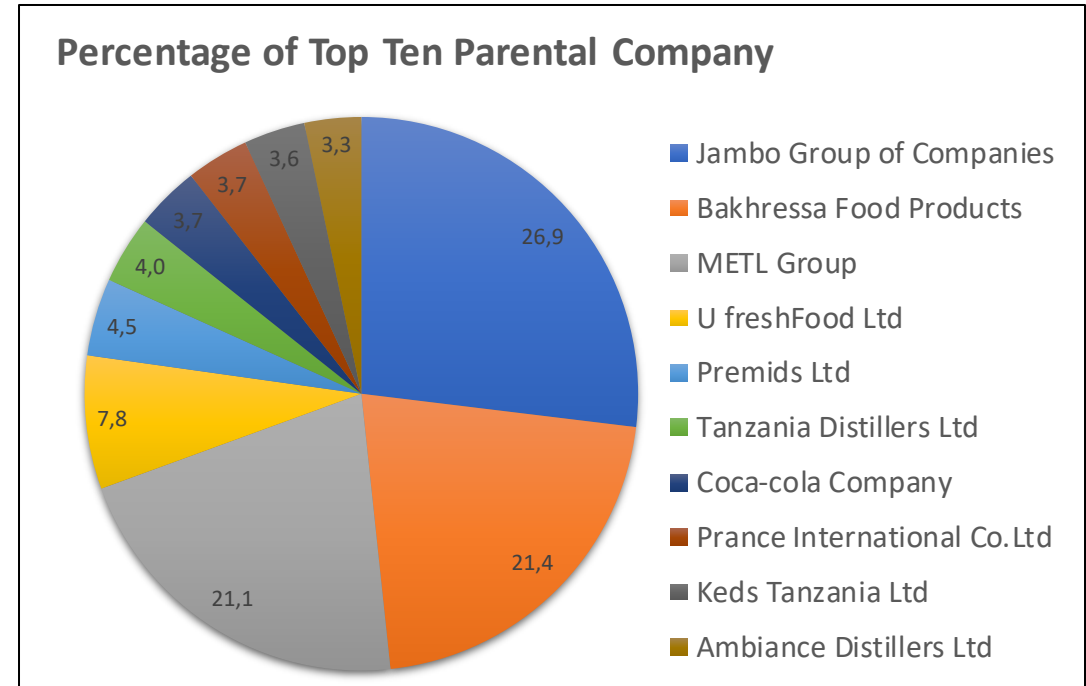
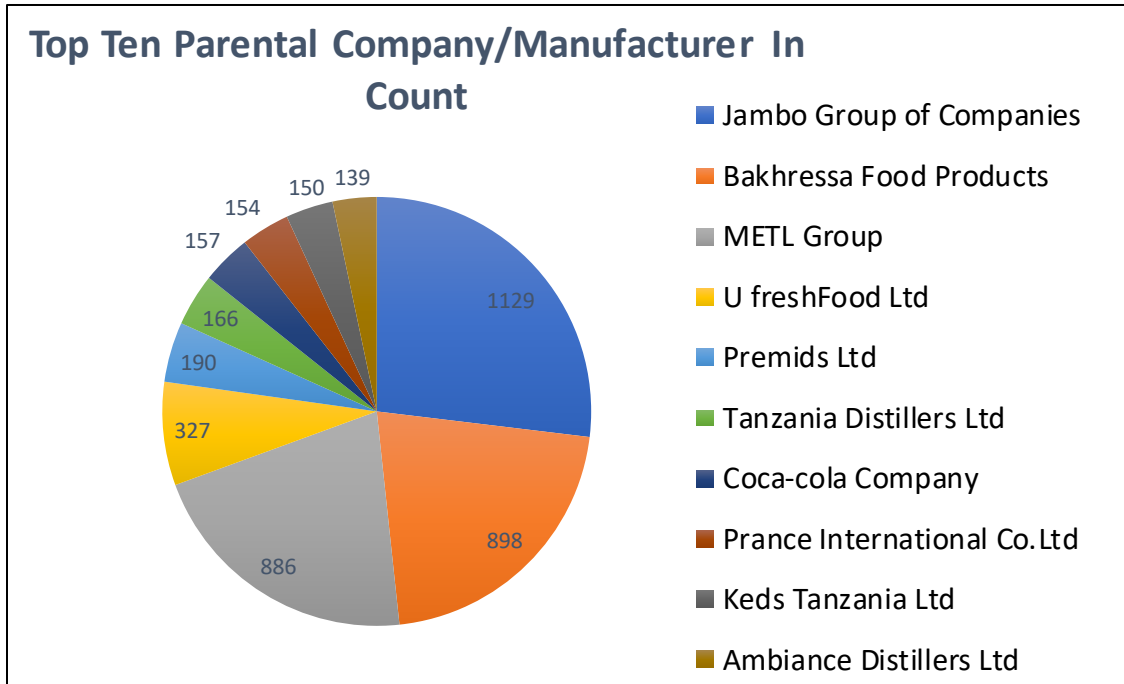


Brand audit



- Brand audit from Phase II of Clean-ups only.
- Brands related to plastic bottles and food packaging were most prominent

Brand audit - manufacturers



- Several manufacturers identified from the litter.
- The top 3 manufacturers make up > 60% of identified litter

Clean Shores, Great Lakes

2nd Campaign Summary from the African Great Lakes



69
Clean-ups



5483
Volunteers



25981
Total weight (kg)



431328
Total items
collected



688602
m² of lake
shoreline



Top 5 categories of litter



Top 10 items found

1	Plastics beverage bottles	89766	21%	6	Plastics bottle caps	20301	5%
2	Plastics bags	85605	19%	7	Other food related plastics	20039	5%
3	Clothing	33883	8%	8	Cardboard boxes	11592	3%
4	Food wrappers	29450	7%	9	Industrial plastic sheeting	8119	2%
5	Packaging material	22297	5%	10	Fishing nets and pieces	6805	2%

Funded by Handelensmiljofond
Partners: NORCE, University of Dar es Salaam, ARENA Recycling, EMEDO

Data-led recommendations

1. Focus clean-up strategies on fishing and landing sites.
2. Collection points or return schemes for bottles would be a simple measure to start.
3. Brands and manufacturers to be held more accountable i.e. EPR
4. Improve education/awareness on the impact of plastic pollution.
5. Support projects on clean-ups and sustainability
 - Actively seeking new funding