FRESHWATER SYSTEMS · AQUATIC POLLUTION

Macro-Litter Abundance and Community Participation

Mapping shoreline macro-litter, community perceptions and participation in addressing lake litter at the Marenga, Usenge and Dunga beaches of Lake Victoria.

REFERENCE	ISSUED	REGION
C82_15(3)	June 2026	Busia · Siaya · Kisumu

FRESHWATER SYSTEMS

71.4%
of shoreline macro-litter is plastic

26.6 kg
highest transect litter load (Marenga MB03)

3
beaches surveyed under UNEP/OSPAR protocols

Wet season
runoff is the major litter transport pathway

Background

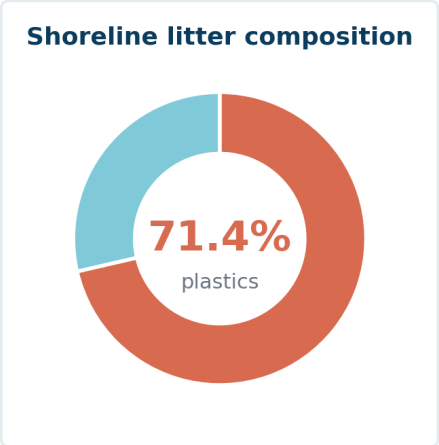
Aquatic litter, and plastic pollution in particular, is a growing threat to Lake Victoria. It is driven by urbanization, poor waste management, fishing activities and stormwater runoff. To support sustainable lake management, KMFRI assessed macro-litter abundance, community perceptions and participation at three beaches: Marenga (Busia), Usenge (Siaya) and Dunga (Kisumu). The study applied UNEP and OSPAR shoreline-monitoring protocols alongside questionnaires, focus-group discussions and field observations recorded with KoboToolbox.

Objective: to quantify and characterize macro-litter along selected shoreline transects and to assess community perceptions and participation in addressing lake litter on the Kenyan side of Lake Victoria.

Key Findings

Plastics dominate, with fishing debris close behind

Plastics accounted for about 71.4% of all shoreline macro-litter. Common items included transparent polythene bags, drinking bottles and bottle tops, food-packaging materials and straws. Fishing-related debris such as ropes, ghost nets and line fragments was particularly common at Usenge and Dunga, while Marenga recorded high amounts of consumer-packaging waste. The major pathways identified were household waste, hotel and market waste, fishing activities and abandoned gear, stormwater runoff, and river inflows and floods, with wet-season runoff the principal transport mechanism into nearshore waters.



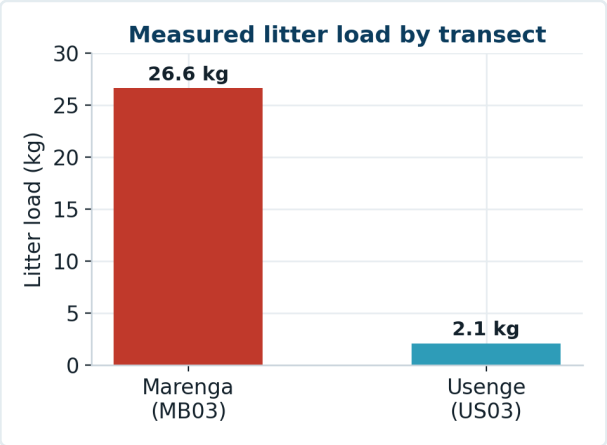


Figure 1. Plastics make up roughly 71.4% of shoreline macro-litter across the three surveyed beaches.

Figure 2. Marenga (MB03) carried the heaviest measured litter load; Usenge (US03) the lightest.

Litter type varies by site

Marenga (MB03) recorded the highest load at 26.6 kg, dominated by plastics and wrappers. Usenge transects carried lower total loads but high counts of fishing gear, bottles, electronics and hazardous waste. The Dunga transects were high and diverse, linked to urban waste, fishing gear, polythene bags and food packaging.

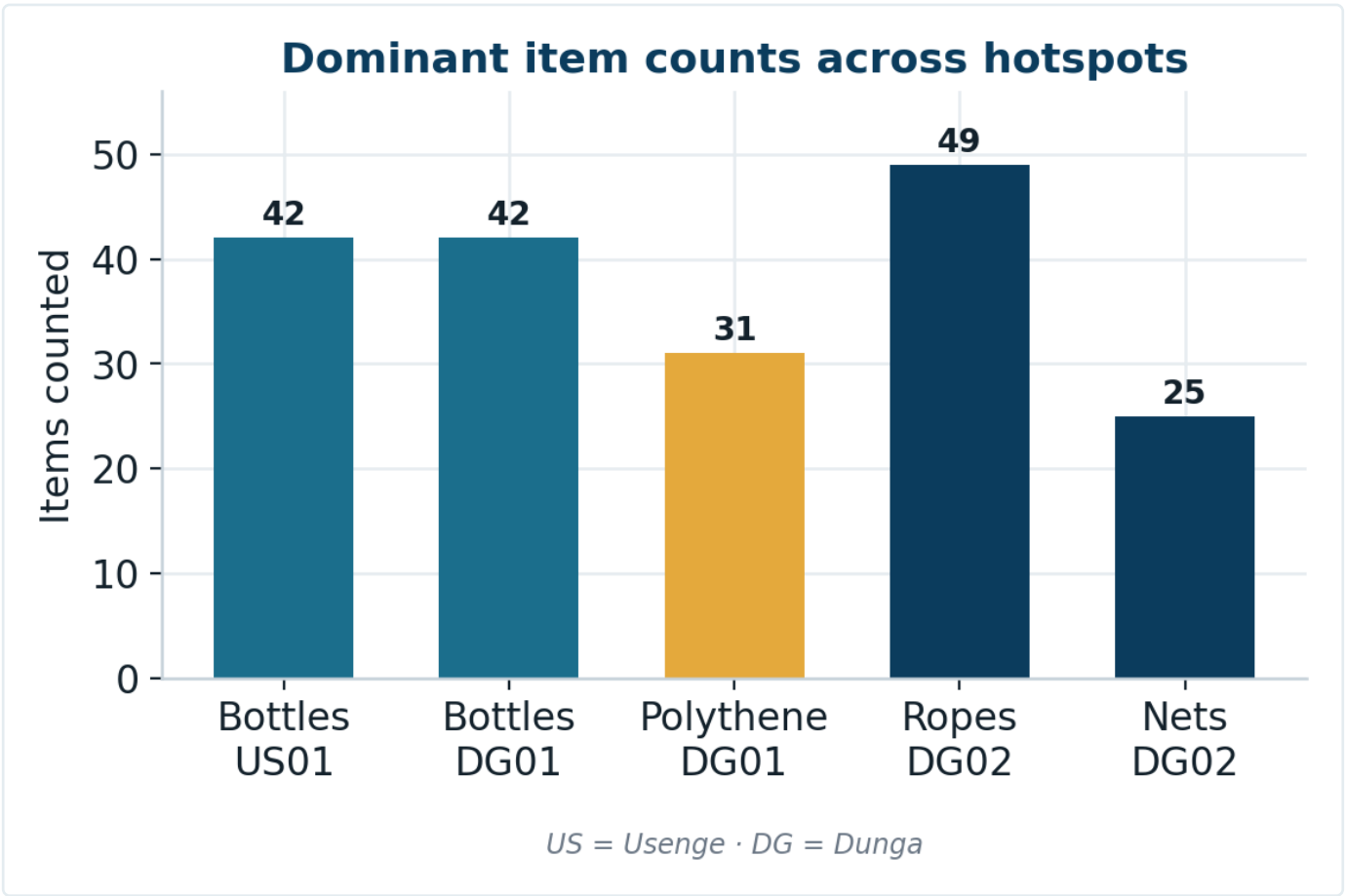


Figure 3. Dominant item counts at litter hotspots, showing the prominence of bottles, polythene bags and fishing gear (ropes and nets).

Communities see the damage clearly

Residents linked macro-litter to declining fish stocks, ghost fishing from abandoned nets, cholera and sanitation risks, flooding from blocked drainage, and lost beach aesthetics. Beach Management Units (BMUs) were identified as key institutions for regulating fishing activity and coordinating beach management. The table below summarises the main litter types, their sources and their major impacts.

Litter type	Main source	Major impact
Plastics	Households, markets	Fish ingestion, microplastics
Ghost nets and ropes	Fishing activities	Entanglement, ghost fishing
Glass and metals	Urban waste	Injury hazards to beach users
Household waste	Settlements	Health and sanitation risks

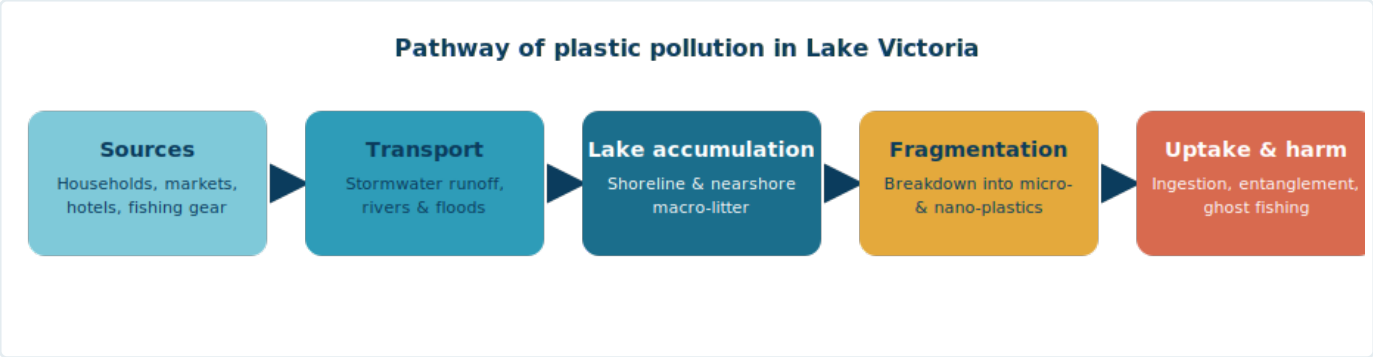


Figure 4. Pathway of plastic pollution into Lake Victoria, from land-based and fishing sources, through stormwater and rivers, to fragmentation into micro- and nano-plastics and uptake by aquatic life.

Conclusions

- Plastics and fishing-related debris are the dominant macro-litter on the Kenyan shoreline of Lake Victoria.
- Waste inflows from urban areas, fishing and weak waste systems continue to threaten aquatic ecosystems and livelihoods, with communities linking pollution to declining food security.
- Integrated action across communities, county governments, BMUs and regional bodies is essential to curb litter accumulation.

Recommendations

1. Strengthen waste collection, sorting and disposal infrastructure at landing sites and markets.
2. Enhance enforcement of single-use-plastic bans and support Extended Producer Responsibility (EPR) schemes.
3. Promote community recycling and circular-economy initiatives such as plastic reuse and briquette production.
4. Implement fishing-gear recovery through gear tagging, recycling partnerships and buy-back schemes.
5. Strengthen community awareness, BMU participation and stakeholder collaboration in lake stewardship.

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