

PHOTO ESSAY:

African Great Lakes Dagaa in
Transcontinental market
networks: Socioeconomic and
ecological impacts

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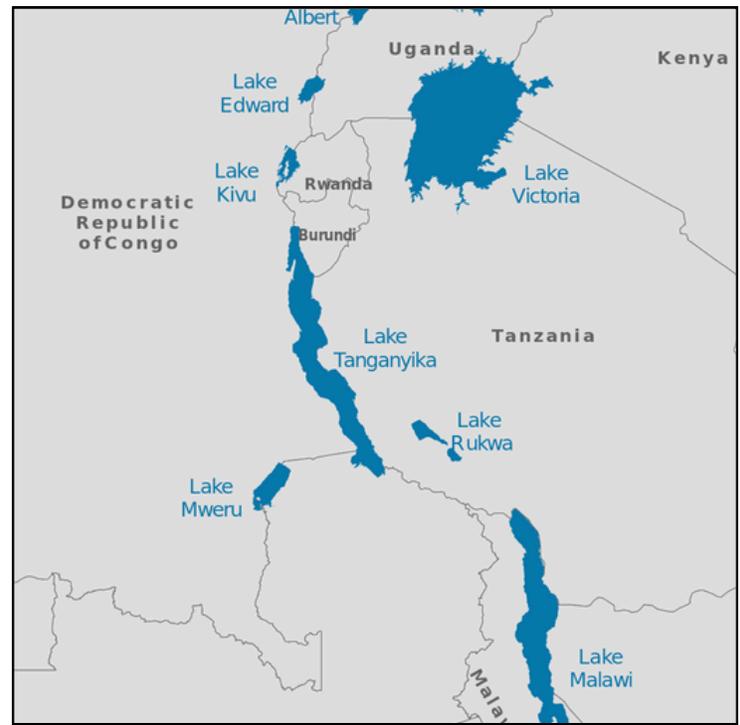
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 **Dried Fish Matters**

Overview

The African Great Lakes (AGL) are amongst the most important freshwater ecosystems globally, with fisheries that employ over 5 million people, of which 3 million people are involved in small-scale fisheries (WorldFish, 2021), with women representing 44%, of whom 88% are fish processors and traders (FAO in WorldFish, 2021). Small fish species, in dried form, dominate fish supplies in markets.

AGL small species, named Dagaa, make up 75% of catches from nearly all African lakes. Lake Tanganyika and Lake Victoria are leading fish-producing inland lakes, mainly where Dagaa are fished and processed, with contributions of over 60% to the catches of both lakes. Thus, the second-most important species traded and consumed locally and across the region and the world.



This photo essay maps out the value chain of the African Great Lakes (AGL) small pelagic fish of Lake Tanganyika (fished from Tanzania and DR Congo) and Lake Victoria (fished mainly from Uganda and Kenya). It shows the context of socioeconomic value and environmental impact that the transcontinental women-led dried fish markets have on people's livelihoods and fisheries' sustainability.

Photos are organized in categories of identified segments of the Dagaa value chain, mapping the export/import women-led dried fish business networks between the AGL region and Canada. Using the Structure-Conduct-Performance model and Political Ecology thinking, the essay highlights that AGL Dagaa fisheries use small-scale assets. While men handle fishing and distribution, women dominate processing and trading at landing sites. Imported Dagaa in Canada primarily serves the African diaspora, with high prices reflecting its cultural value.

The essay underscores the need for research and policies for markets balancing exported and Canadian small fish to reduce pressure on AGL fisheries and create economic opportunities in Canada.

STRUCTURE: Production Supply Chain to Output Chain

A) Lakes



Lake Victoria by Homa Bay in Kenya



Lake Tanganyika by Katonga, Tanzania



Lake Tanganyika, DR Congo side



Lake Victoria by Siaya, Kenya



Lake Kivu in Bukavu, DR Congo



Lake Tanganyika near Uvira, DR Congo

Lake Tanganyika and Lake Victoria are leading fish-producing inland lakes, especially where Dagaa are fished and processed. Dagaa contributes over 60% to the catches of both lakes. Lake Kivu has also a sizeable Dagaa fisheries.

B) Actors & Assets



Fishers & motor boats, Homa Bay, Kenya



Fish traders in Kibirizi, Kigoma



Net makers & repairers, Ujiji, Tanzania



Fisheries officer Katosi, Uganda



Fish trader, Uganda



Women cooks at Kibirizi, Tanzania



Men boat repairers at Katongo, Tanzania



Solar Tent drier, Uganda



Raised drying racks, Kiyindi, Uganda.

The supply chain actors include fishers, processors, traders, porters and fisheries officers. The fisheries of the two lakes use small-scale assets.

C) Fishing



Regulatory check of fishing nets, Tanzania Setting out for fishing, Homa Bay, Kenya



Mukene - Ugandan Dagaa Lates stapecii & Tilapia Tanzania Shrimps - Siaya, Kenya



Omena - Kenya Dagaa Lake Victoria Haplochromines Juvenile Nile Perch, Kenya

The names of small pelagic clupeidae vary by location: Dagaa in Tanzania for *Limnothrissa miodon*, Ndakala in DR Congo for *Stolothrissa tanganicae*, or Mukene in Uganda for *Ratrineobola argentea* and Omena in Kenya for Silver Cyprinid.

CONDUCT: Landing, Processing, Trading, Shipping & Retailing

A) Landing



Landing maneuvers, Kalemie, DR Congo



Lake Victoria's Landing, Siaya Kenya



Unloading Dagaa, Kikondo - Uganda



Woman fishmonger, L. Victoria, Tanzania



Porter girl in Siaya, Kenya



Fish porter women in Homa Bay Kenya

Crowded landing sites, with mainly women. They wait for fish, bargain purchases, sort and transport fish for processing.

B) Processing



Drying, Kalemie, Congo



Drying, Kikondo, Uganda



Drying, Dunga, Kenya



Drying, Homa Bay, Kenya



Drying, Kikondo, Uganda



Kibirizi in Kigoma, Tanzania



Kibirizi in Kigoma, Tanzania

Dagaa is processed through sun drying on tarps (Kenya, Uganda, & Tanzania) and the ground (DR Congo). While equipment such as racks and sun shelters are visible, most processors don't use them. The reasons for the low adoption of drying technology are complex.

C) Trading - Mongering



Dagaa in the market, Homa Bay, Kenya



Dagaa in the market, Mulongwe, Congo



Selling Dagaa, Kibirizi, Tanzania



Kibirizi, Tanzania



Dagaa sales in Mwanza, TZ



Packaged Dagaa, Uganda



Kiyindi, Uganda



Wakiso, Uganda

Dagaa is sold fresh at landing sites by fishers to processors and dried in the nearby markets by processors to local consumers and distant and regional merchants.

D) Shipping



Packing mukene, Kiyindi, Uganda



Weighing Mukene, Kiyindi, Uganda



Dagaa warehouse, Mwanza, Tanzania



Dagaa bicycle transport, Kikondo, Uganda



Shipment lorries, Kiyindi, Uganda



Dagaa exporter service Kibirizi , Tanzania

While the majority of processors are women, the majority of merchants are men. At least 300 tons of dried Dagaa are shipped out of the Mwanza market daily, using large lorries.

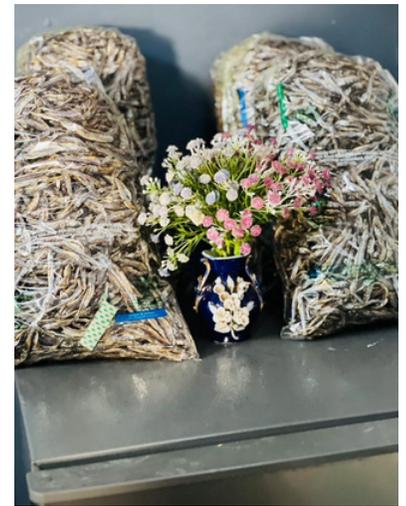
E) Procurement & Retailing



Dried Dagaa market, Homa Bay, Kenya



Selling dried Dagaa, local market, Congo



Selling Dagaa, Kenya Selling Dagaa, Congo Dagaa market, TZ Dagaa for export, TZ



Afro market selling Dagaa, Toronto



Afro Superstore selling Dagaa, Ottawa

While the AGL-supplied Dagaa are increasingly imported into Canada, their primary consumers, African diaspora groups, still find them sporadically in major urban markets in Canada, consisting of ethnic food stores and homes. The demand is higher than the supply.

F) Product quality & Cultural factors



Dagaa in a Gatineau store, Quebec



Store selling Dagaa, Gatineau Quebec



Hamilton, Ontario



Winnipeg, Manitoba



Mukene in a store, Montreal



Supermarket in Ottawa



Dagaa In a store, Toronto



Dagaa sold in Ottawa

Dagaa comes in various sizes and packages. In Canada, 1 kg is sold at \$80. This price surpasses that of any other locally sourced or imported fish.

PERFORMANCE: Socioeconomic benefits & externality effects

A) Consuming & end usage forms



Dagaa, Lethbridge



Dagaa, Calgary



Dagaa, Ottawa



Dagaa, Gatineau



Omena meal, Kenya



Dagaa meal, Quebec



Dagaa meal, Brandon



Dagaa meal, Kigoma



Dagaa meal, Steinbach



Dagaa meal, Winnipeg



Dagaa meal, Hamilton

The popularity of the AGL-sourced Dagaa is high, owing to its profound cultural value within the African diaspora groups. Dagaa meals are believed to be the most excellent meals they can have.

B) Environmental impact trends



Lakeside farming, Kiyindii, UG



Lake gravels, Katosi, Uganda



Erosion, Kibirizi, TZ



Pollution, Homa Bay, Kenya



Dirty water, Homa Bay, Kenya



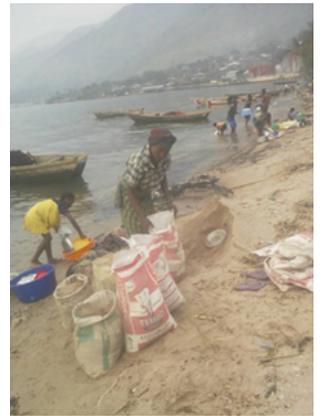
Uvira, Congo



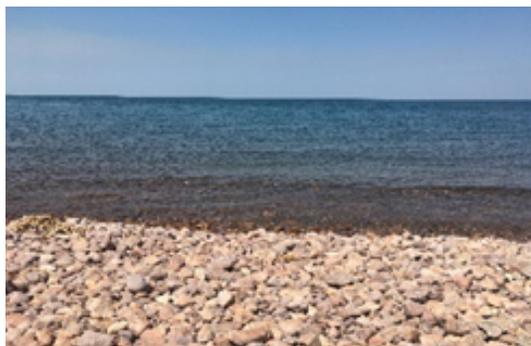
Fish wastes, Kibirizi, Tanzania



Lakeside houses, Kiyindi, Uganda



Uvira, Congo



Protected areas, Katonga, TZ



Homa Bay Kenya



Ujiji, Tanzania

Pollution was evident in the nearshore areas where most fishers land, mainly due to extensive human activities, affecting the wider ecology of these lakes and disturbing fish spawning areas.

Impacts and implications



This photo essay attempted to visualize possible connections between emerging dried fish international markets and their socioeconomic and environmental impacts on people's livelihoods and fisheries sustainability. With the focus on Dagaa fisheries at both ends of the international markets value chain, visualizing resources, actors, and activities showed potential implications for policies and strategies to develop formal markets that could combine exported and locally sourced Dagaa with sustainable economic and social-ecologic benefits. In the Canadian market, given the increasing demand for small dried fish by mainly African diaspora communities and the need to decrease ecological pressure on African fisheries for small fish, more research is needed to look into the possible development of fisheries for small Canadian fish that might complement imported fish. More supply for Canadian retailers who service the immigrant groups would reduce consumer prices, reduce pressure on African Great Lakes fisheries, and provide a new economic opportunity for Canadian fishers and fish processors.