Modesta Medard (PhD)

Social scientist: NR Governance, Fisheries co-Management & Gender studies

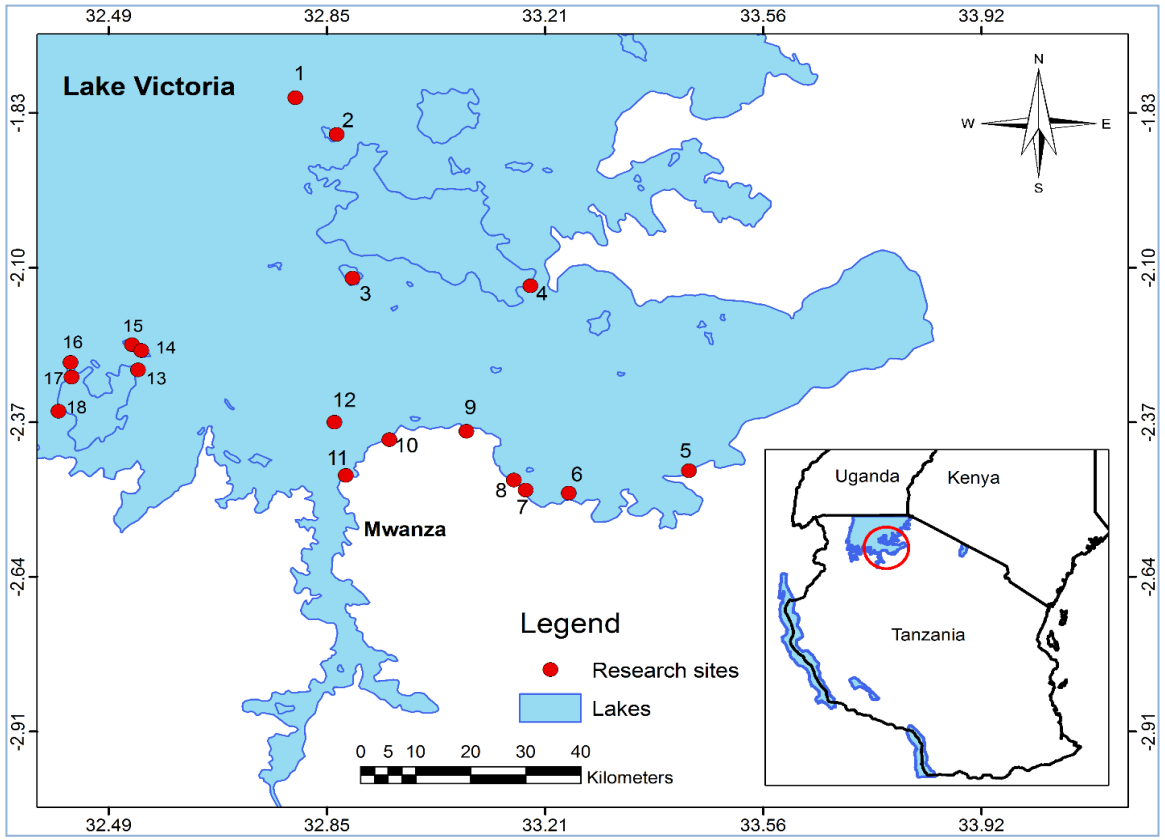
Marine Programme Lead

WWF Tanzania (East Africa)

SPF Symposium: 7-11th Nov 2022

Lisbon, Portugal

Study areas for SEDEC (2009-2011) & SFF (2019-2021) in Lake Victoria, Tanzania

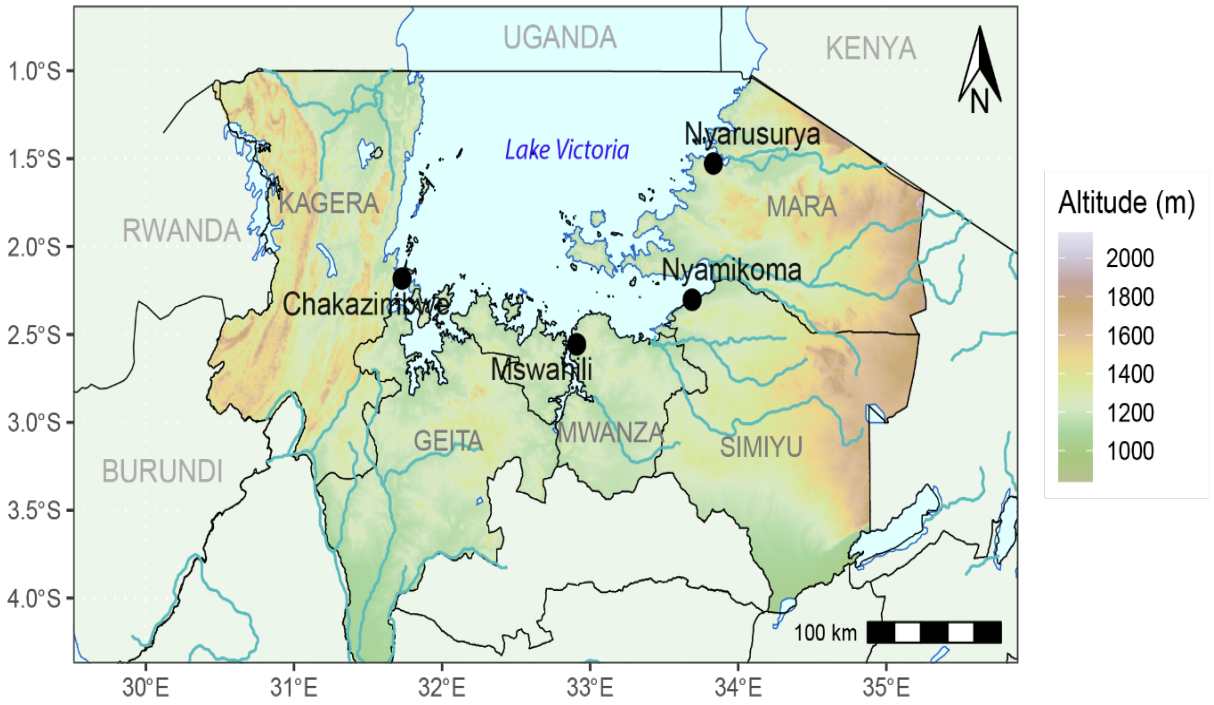


PhD study project SEDEC- Social Ecological Drivers of Ecosystem Changes in Lake Victoria

Wageningen University.

Netherlands Organization for Scientific Research (WOTRO/NWO, Grant W01.65.304.00)

2010-2011 Field work



SmallFish for Food (SFF)

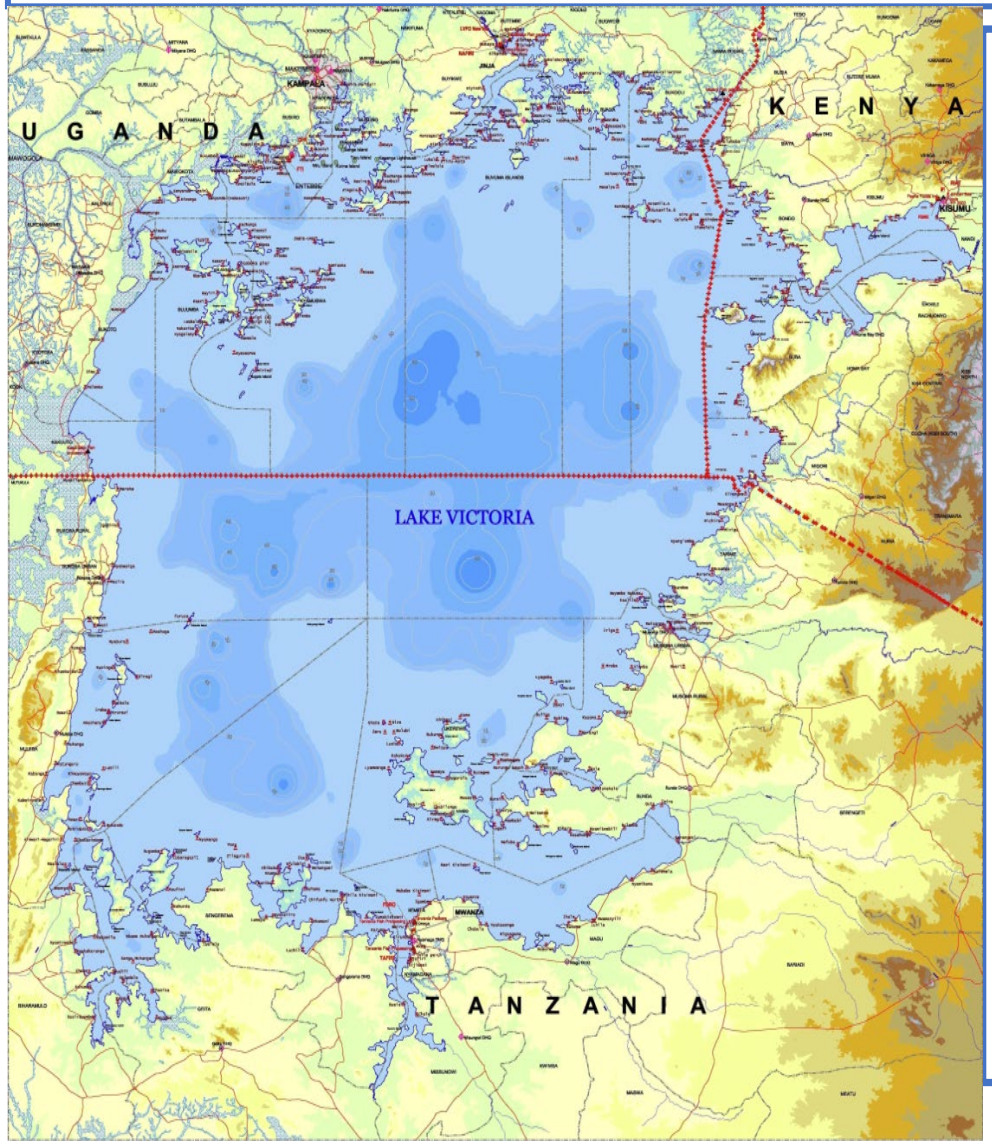
Amsterdam University, Wageningen University and University of Belgen

2019

CENTRAL ARGUMENT

The central argument for my story is that, the global market for exotic species, notably the **Nile Perch** which were introduced to the Lake in the 1950s to more efficiently exploit the Lake's fish resources, is a significant **DRIVER OF CHANGE IN LAKE VICTORIA'S FISHERIES.** It has transformed Lake Victoria's fishery landscape from local market oriented economy to one that is increasingly **shaped by global and regional market demands for Nile Perch and the sardines (Dagaa/Omena/Mukene)**.The **combination of global and local forces** has produced a very specific **site of struggle** between **actors,** in their attempts to reap the benefits **of the biological and social resources of the lake especially when it was discovered that Nile Perch is a fish which thrives in Lake Victoria.**

A key driver of change in small pelagic fishery (*dagaa*) in Lake Victoria, Tanzania



- It is one of the Africa's Great Rift Valley lakes covering 68,000km^2 and shared by **Kenya (6%), Uganda (43%)** and **Tanzania (51%)**
- It is the **second largest** lake in the world after the Lake Superior (Canada)
- It has a **mean depth of 40 m**, **a max depth of 84 m**, a shoreline of **3,450 km** and a catchment area of **193,000 km^2**.
- Supports inland fisheries at both **domestic, regional** and **internationa**l markets
- The Lake Basin is inhabited by more than **40M people** and majority depend directly and indirectly on the lake resources for various uses (LVFO, 2017).

- Historically (1960-1980) the lake was a multi-species fishery comprising more than 500 ***Haplochromis spp*** which was almost 90% of the Lake's biomass (Seehausen 1996)
- During this time the fishery comprised of artisanal inshore gillnet for Tilapia and other fish species (Bagrus, Protopterus, Synodontis, Clarias, Alestes, Rastrineobola Argentia etc) and a commercial offshore fishery for Haplochromines
- In Early **1950's** the colonial authorities **introduced Nile Perch** to **supplement the volume of Haplos in the lake because it had little economic value, bony and unsuitable for export (Seehausen, 1996)**
- The introduction of **Nile Perch** were to radically transform the lake, both **ecologically and economically.**

These introductions had 5 major consequences:

1ST: Nile Perch peaked **from 1980** and became commercially the most important fishery on the lake and developed multimillion dollar export industry for fresh and frozen fillets.

Weighing Nile Perch

Trucks lined-up for Nile Perch at the mainland site


Weighing (weights & measures introduced)
19/6/2013 12:28


55Cm TL for NP
19/6/2013 9:57


Temperature control
19/6/2013 9:53


GENERAL CLEANING PROCEDURES STEPS
Filleting
19/6/2013 9:52

Nile Perch fillets

Packing for export

Emerging of New products & new markets:

Nile Perch by-products (Fish frames) consumed in local and regional markets (Medard, 2015)

Fish frames, in local & regional markets

Salted& dried heads exported to DRC, Burundi, Sudan

Emerging of New Markets & New Products:

Nile Perch by-products (KAYABO: Sun-dried and salted) consumed in local and regional markets (DRC, Burundi, South Sudan, Zambia)

https://doi.org/10.1007/s40152-019-00146-1

RESEARCH

Check for updates

Competing for kayabo: gendered struggles for fish and livelihood on the shore of Lake Victoria

Modesta Medard[1,2] · Han van Dijk[2] · Paul Hebinck[2,3]

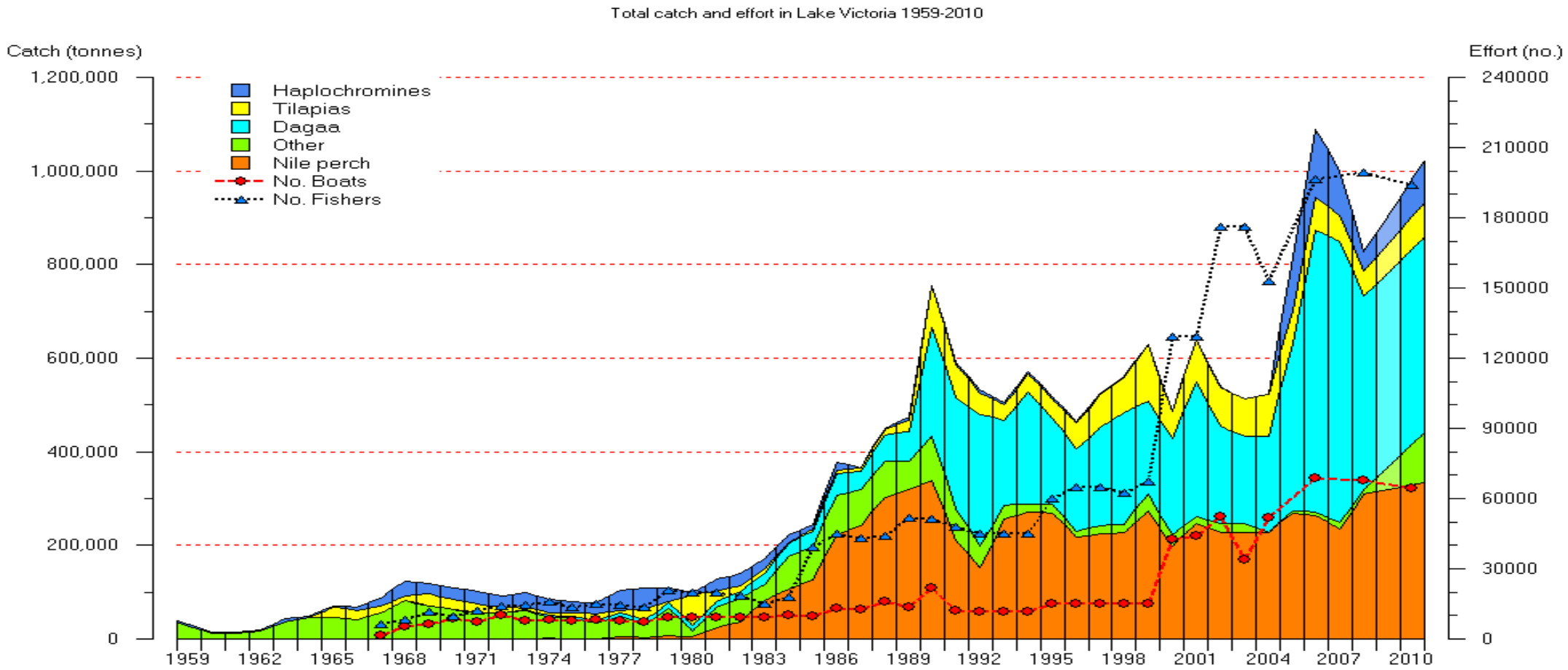
Received: 29 April 2018 / Accepted: 3 September 2019 / Published online: 5 November 2019

Abstract

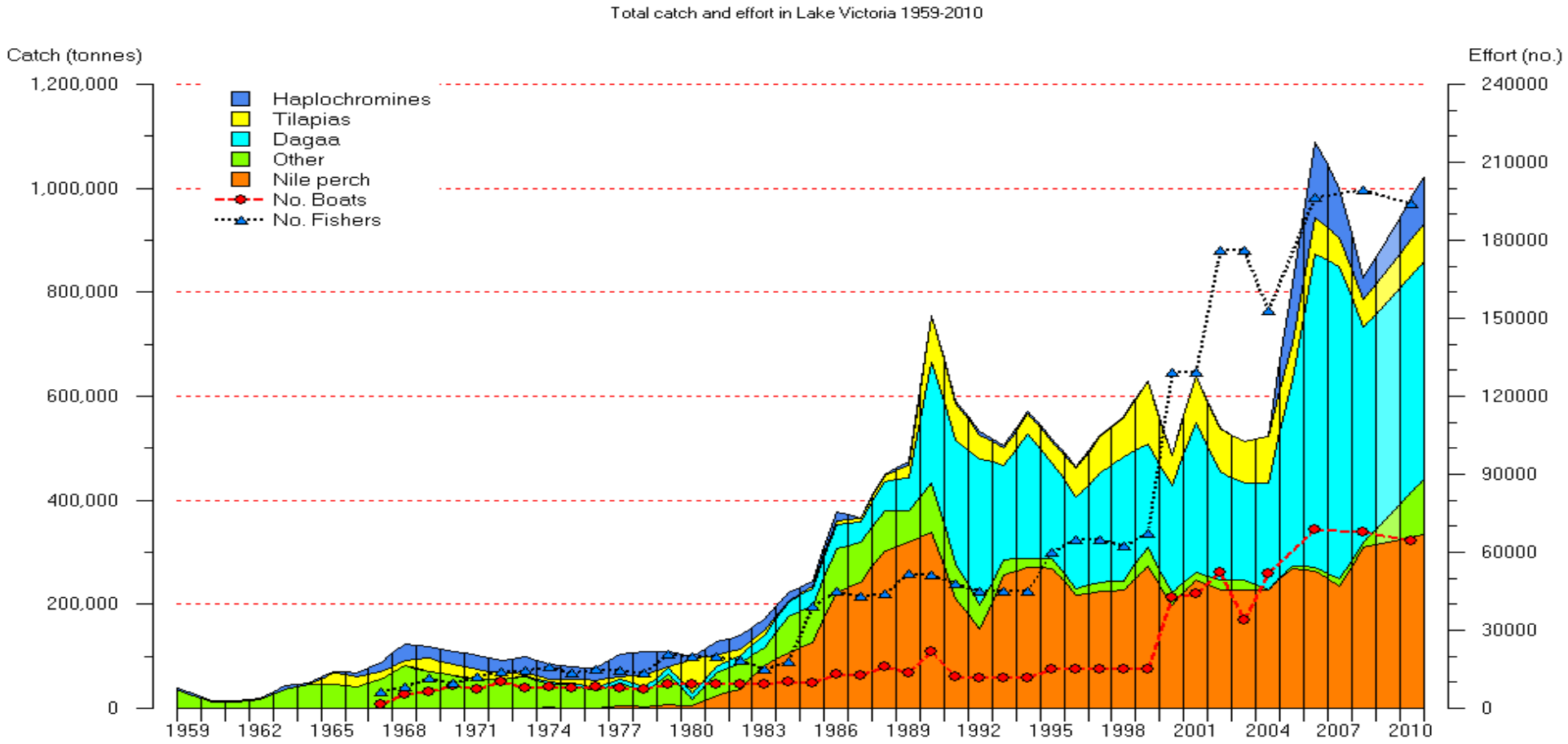
The dry-salted trade of Nile perch or kayabo is important for many along the shores of Lake Victoria. The kayabo trade started inthe 1990s and has been increasingly restructured due to changing regional and global trade relationships. This shift has led to the emergence of hierarchical trading relations, which create an exploitative network in which powerful middlemen control theaccess of trade for women from the Democratic Republic of Congo (DRC) and marginalizes the Tanzanian women, changing the organization from a poly-centric to a more centralized trade organization in the hands of a small group of powerful business men.We show in this paper that whereas the women traders from the DRC manoeuvred themselves in positions from which they couldmanipulate the network through bribery and conniving to derive substantial capital gains from the kayabo trade, their Tanzanian counterparts however are excluded from the decision-making processes, access to fish resources, financial capital, and negoti-ation power. They persevere by operating in increasingly competitive markets, relying on illegal fish that they sell with little profitat local and domestic markets. They survive in jobs that are insecure and risky by nature.

Keywords Gender · Networks · Fish trade · Markets · Lake Victoria

2nd Outcome was the Nile Perch's destruction of the Haplochromis species, it became the main **food source for Nile Perch. From around 1985 – 1990** the NP stock reached its maximum, the contribution of Haplos to the lake's fish biomass had declined from 90% to less than 1% (1989-2002)and **200 species of Haplos** were driven to extinction **(Seehausen et al 1996)**



3rd and recent transformation is the rapid growth of '**bait fishery'(from other species)** – as 'commercial sub-sector(s) of Nile Perch fishery'. The major baits are Clarias *spp* (*Mumi*) and Haplochromis *spp*. These baits are harvested in various ecological sites: in bays and fish breeding areas, … rocky areas, rivers, satellite lakes, wetlands areas – causing another ecological and economic destruction (Medard 2015)



Bait fishery: a 'commercial' subsector in Nile Perch fishing sector (Medard, 2015)

Local names (Kiswahili)	Scientific name
(a) Neke or Mumi	**(a) Clarias**
(b) Furu	**(b) Haplochromis**
(c) Mbete	**(c) Momyrus**
(d) Nembe	**(d) Schilbe**
(e) Gogogo	**(e) Synondontis**
(f) Dagaa	**(f) Rastrineobola argentea (sardines)**

CLARIAS AND HAPLOS (SPECIES) BAIT FOR NILE PERCH PRESERVED IN A SUBMERGED BOAT IN KOME ISLAND, TANZANIA

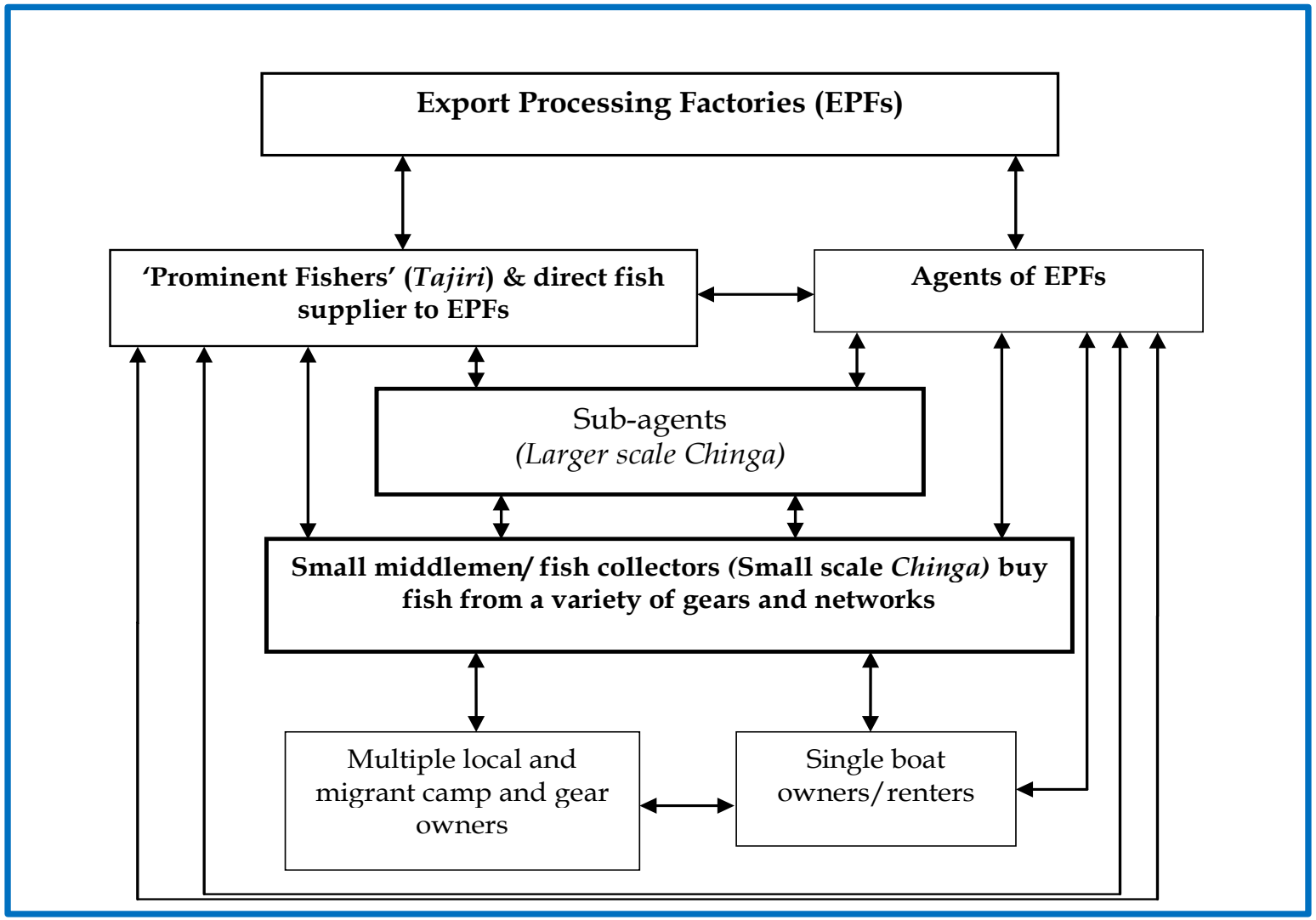
CLARIAS BAIT PRESERVATION IN A NILE PERCH FISHING CAMP (KOME ISLAND, TANZANIA)

Catfish/Protopterus

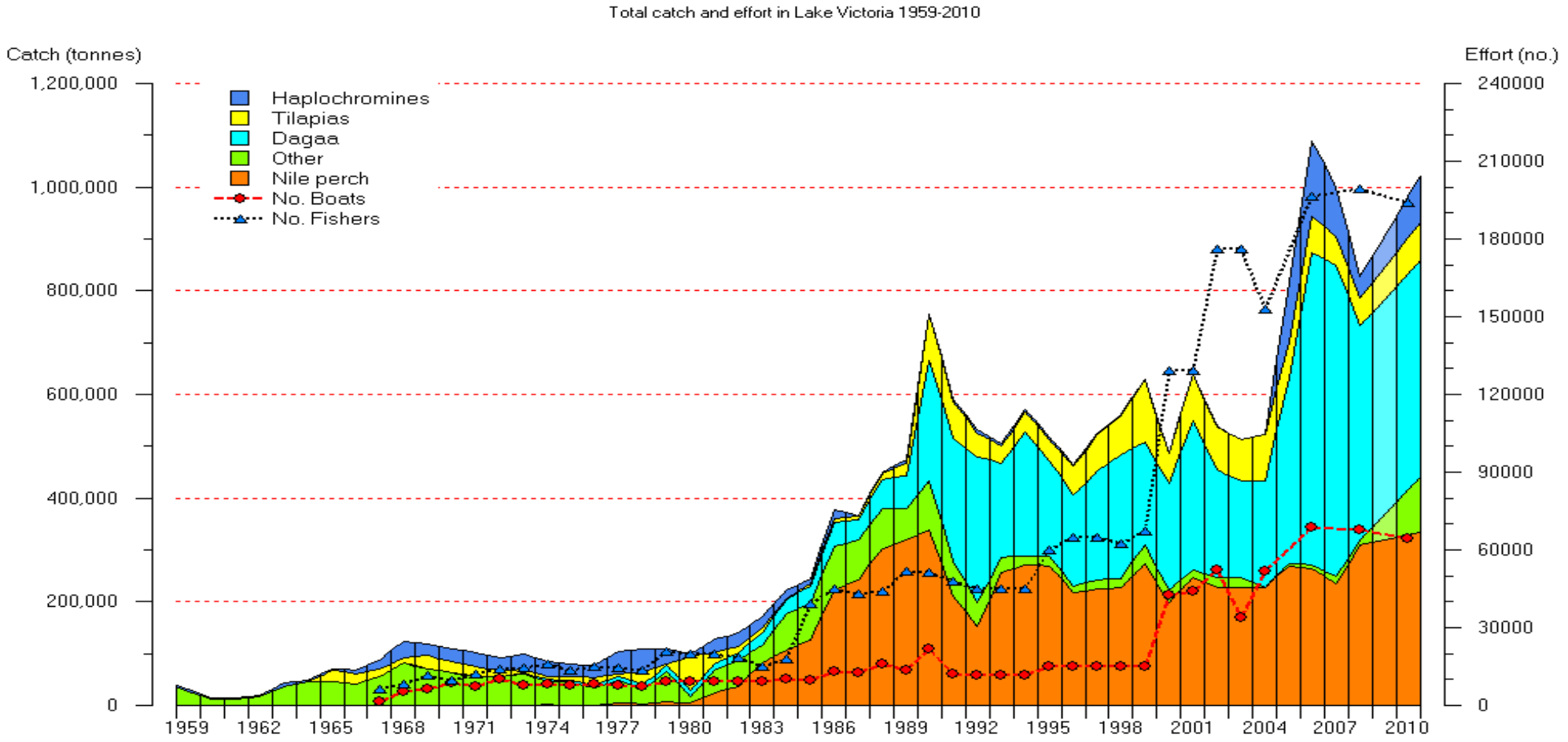
Catfish/Synodontis

Haplochromis mixed with Nile perch

A SIMPLIFIED Nile Perch Supply channel (Medard 2015)



4th Impact is, the lake is now dominated by three important fisheries; the **Nile perch, Nile Tilapia** and the **Sardine/ Rastrineobla Argentia –** (Dagaa/Omena/Mukene)

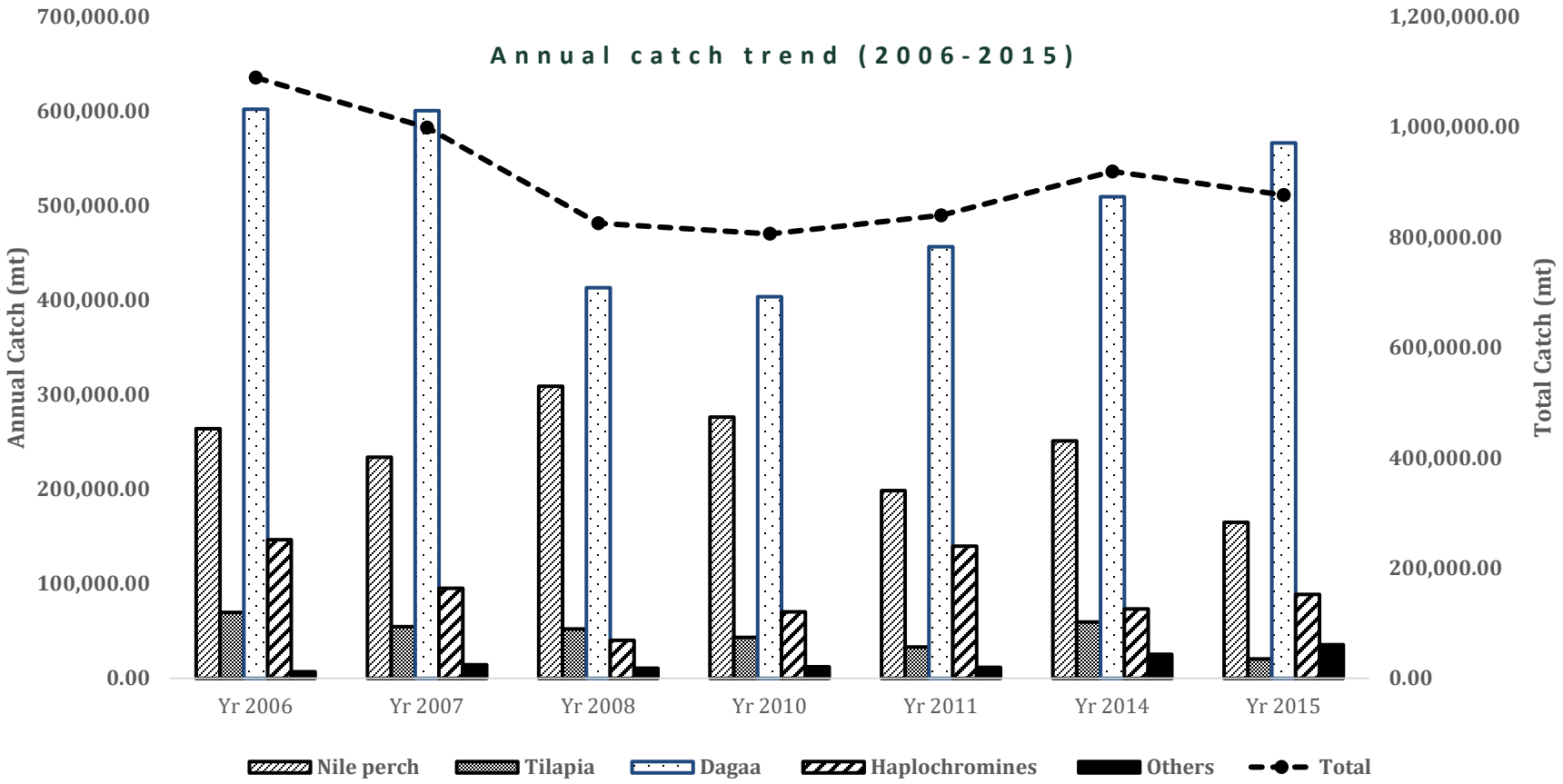


NILE PERCH

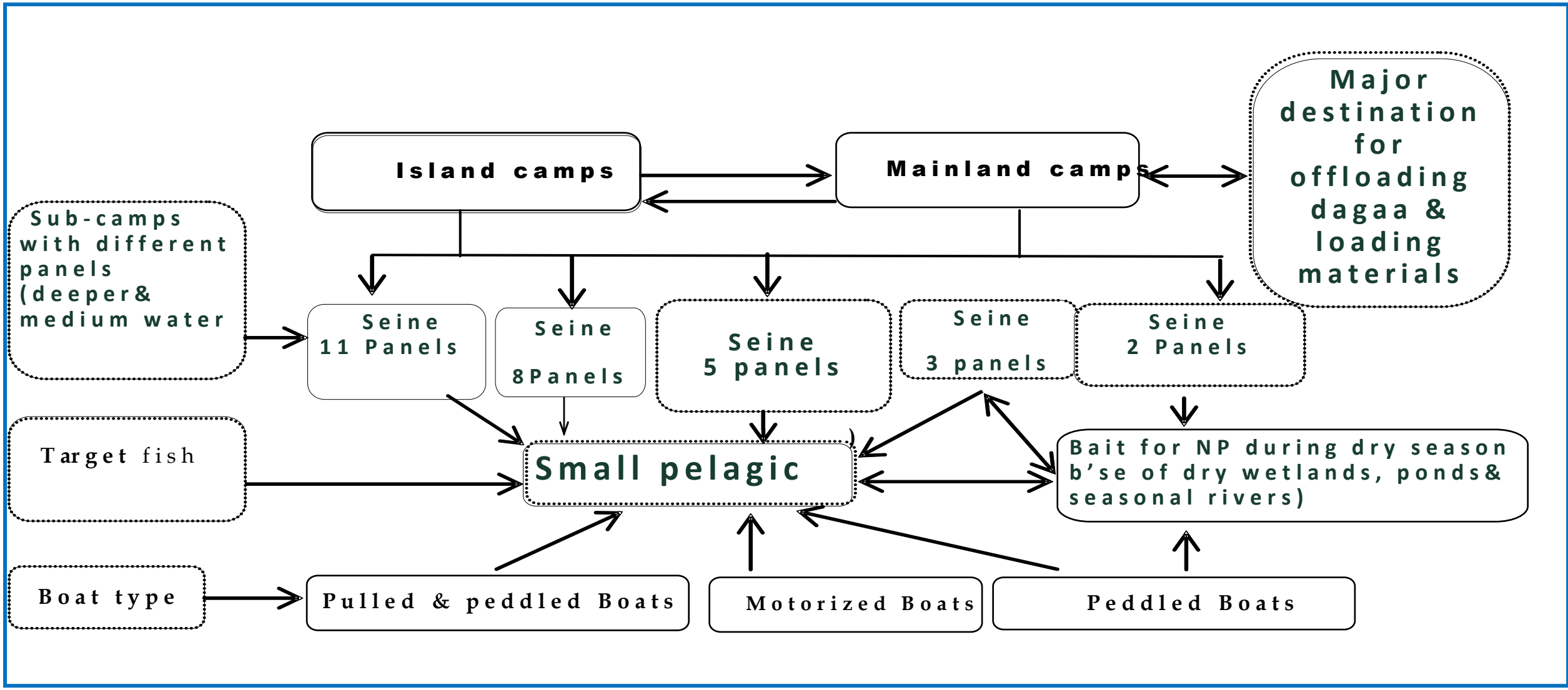
RASTRINEOBOLA ARGENTIA
(DAGAA/OMENA/MUKENE)
SARDINES

TILAPIA

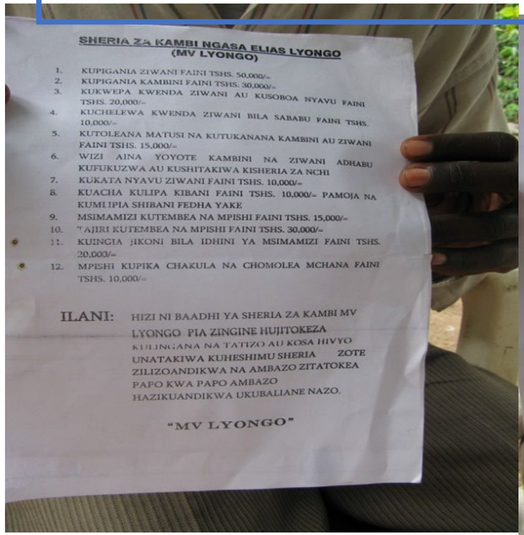
5th Impact is, **Dagaa boomed because it was not the main prey for Nile Perch**. Dagaa catches increased from 13,000 metric tons in 1975 and by 2006 it almost doubled to 650,000 tons (LVFO, 2008) and in recent years Dagaa biomass (tons) stood at ~1,000,000 tons (936,247 Lake-wide)with Tanzania having almost ½ of it **(LVFO/GIZ 2019)**



6th Major transformation is the change in fishing organization and the rise of **camp empire, power & Networks** in Fishing, marketing and trade) in Small pelagic fishery (**Dagaa**)



FEATURES OF CAMP EMPIRE NILE PERCH & DAGAA IN HIGH FISHING INTENSITY ISLANDS



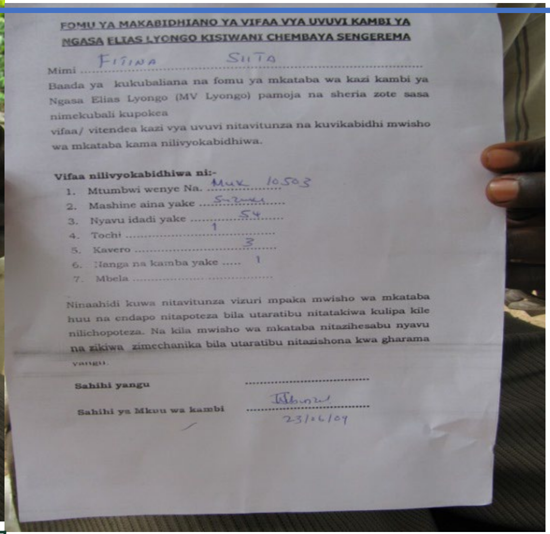
SHERIA ZA KAMBI NGASA ELIAS LYONGO
(MV LYONGO)

1. KUPIGANIA ZIWANI FAINI TSHS. 50,000/=
2. KUPIGANIA KAMBINI FAINI TSHS. 30,000/=
3. KUKWEPA KWENDA ZIWANI AU KUSOBOA NYAVU FAINI TSHS. 20,000/=
4. KUCHELEWA KWENDA ZIWANI BILA SABABU FAINI TSHS. 10,000/=
5. KUTOLEANA MATUSI NA KUTUKANANA KAMBINI AU ZIWANI FAINI TSHS. 15,000/=
6. WIZI AINA YOYOTE KAMBINI NA ZIWANI ADHABU KUFUKUZWA AU KUSHITAKIWA KISHERIA ZA NCHI
7. KUKATA NYAVU ZIWANI FAINI TSHS. 10,000/=
8. KUACHA KULIPA KIBANI FAINI TSHS. 10,000/= PAMOJA NA KUMLIPIA SHIBANI FEDHA YAKE
9. MSIMAMIZI KUTEMBEA NA MPISHI FAINI TSHS. 15,000/=
10. TAJIRI KUTEMBEA NA MPISHI FAINI TSHS. 30,000/=
11. KUINGIA JIKONI BILA IDHINI YA MSIMAMIZI FAINI TSHS. 20,000/=
12. MPISHI KUPIKA CHAKULA NA CHOMOLEA MCHANA FAINI TSHS. 10,000/=

ILANI: HIZI NI BAADHI YA SHERIA ZA KAMBI MV LYONGO PIA ZINGINE HUJITOKEZA KULINGANA NA TATIZO AU KOSA HIVYO UNATAKIWA KUHESHIMU SHERIA ZOTE ZILIZOANDIKWA NA AMBAZO ZITATOKEA PAPO KWA PAPO AMBAZO HAZIKUANDIKWA UKUBALIANE NAZO.

"MV LYONGO"

Form no. 1: Prints of camp bylaws



FOMU YA MAKABIDHIANO YA VIFAA VYA UVUVI KAMBI YA NGASA ELIAS LYONGO KISIWANI CHEMBAYA SENGEREMA

Mimi FITINA SIITA

Baada ya kukubaliana na fomu ya mkataba wa kazi kambi ya Ngasa Elias Lyongo (MV Lyongo) pamoja na sheria zote sasa nimekubali kupokea vifaa/ vitendea kazi vya uvuvi nitavitunza na kuvikabidhi mwisho wa mkataba kama nilivyokabidhiwa.

Vifaa nilivyokabidhiwa ni:-

1. Mtumbwi wenye Na. MUK 10503
2. Mashine aina yake Suzuki
3. Nyavu idadi yake 54
4. Tochi 1
5. Kavero 3
6. Nanga na kamba yake 1
7. Mbela

Ninaahidi kuwa nitavitunza vizuri mpaka mwisho wa mkataba huu na endapo nitapoteza bila utaratibu nitatakiwa kulipa kile nilichopoteza. Na kila mwisho wa mkataba nitazihesabu nyavu na zikiwa zimechanika bila utaratibu nitazishona kwa gharama yangu.

Sahihi yangu

Sahihi ya Mkuu wa kambi

23/06/09

Form no. 2 Allocation of number to crew for job offer

Camp supervisor and security guard ensure a patrol boat is available in a fishing camps

Solar lights for dagaa fishing replaced pressure lamps (2015-2016)

Theft is also high (fish & fishing gears):

Firewood for use at the campsites

Clarias bait preservation at the camp

Net mounting at the campsite

Fleets of multi-panelled gillnets ready for use

Cooks preparing food for camp dwellers

Camp crew eating at the camp

Boats with nets packed at the lake shore ready for the trip

Tanks filled with fuel (petrol) for fishing

Store for keeping life jackets

Pull table for holding crew before fishing

Fish being weighed and selected

Spoiled & rejected fish sold to a bicycle trader

Commercial *Dagaa* seine net (11 panels)

- Many new entrant (crew) learn fishing through dagaa fishery because labour demand is high (4-6 crew)
- Demand for Dagaa is very high in local, domestic and regional markets

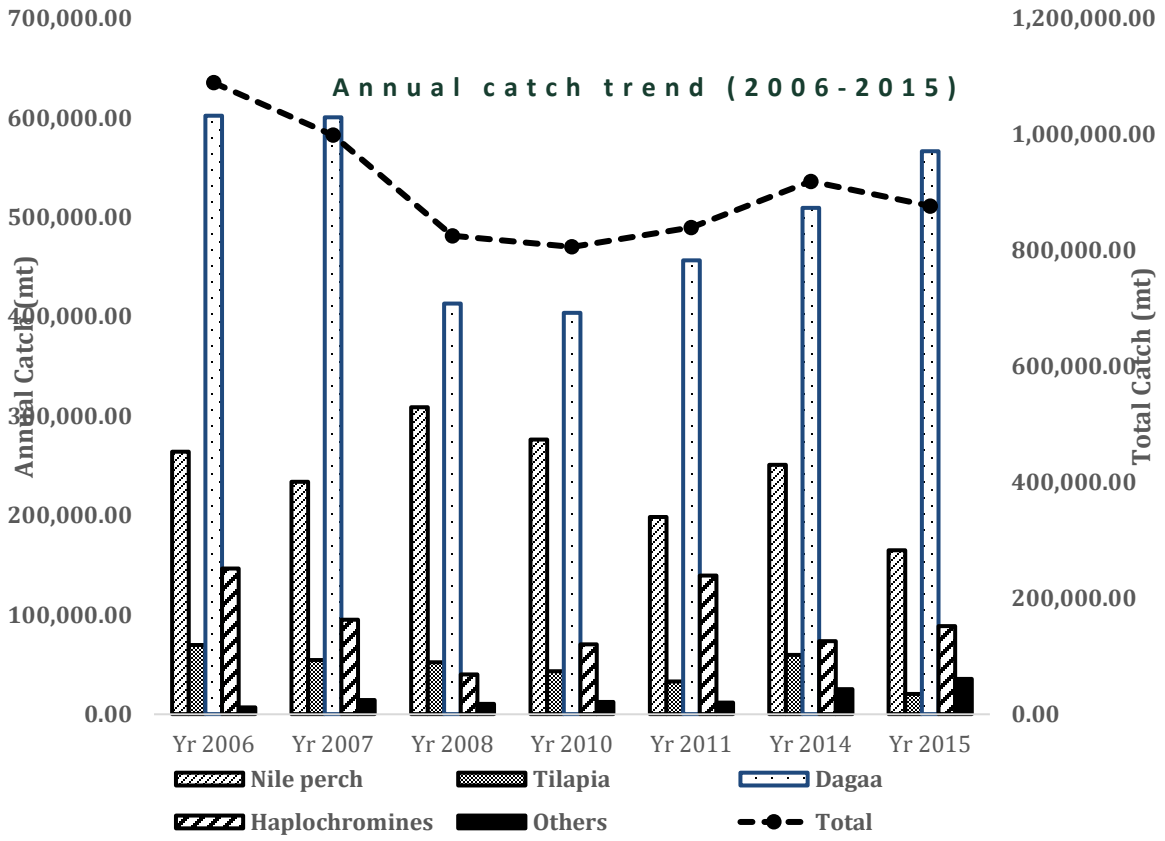
Some rich Dagaa camp owners in Kome Island(Medard 2015)

- They have powerful network of relation (they control production, distribution, trade)
- Use of boat charter as identity and protection (logo names)
- High capital investment & powerful boat charter (identity, security & protection, financial & social power/status)
- Recruitment of skilled-labour, control & management
- Provision of incentives to boat crew

Example of Investment level in a Commercial Dagaa fishing camps in Mchangani - Kome Island(Medard 2015)

Charter names	Boats	Engines	Seine nets	Life jackets	Pressure lamp	Labourers (est.)
MV Mabutus-sukita	25	25	25	100	150	177
MV Bwire	20	20	20	80	120	140
MV Majukumu	20	20	20	80	120	140
MV Ikimba-1	19	19	19	76	114	140
MV S. Wadeya	15	15	15	60	90	115
MV Upendo	14	14	14	56	84	105
MV Cossovo	14	14	14	56	84	105
MV Tenda Haki	9	9	9	36	54	70
MV Jerry	8	8	8	32	48	70
MV C. Shoma	8	8	8	32	48	70
MV Maltha	8	8	8	32	48	70
MV Ikimba-2	8	8	8	32	48	70
MV Willingtone	7	7	7	28	42	70
MV Kamanda	6	6	6	24	36	65
MV Dunia	5	5	5	20	30	60
Total	186	186	186	744	1,117	1,467

6th transformation is the **commercialization of Rastineobla Argentia** (Dagaa/Omena/Mukene). The Fishery has become part of commercial fisheries in Tanzania & it has followed the Nile Perch production processes and trade (Medard 2015)



- It is one of the few native fish species to have survived after the introduction of the Nile Perch in the mid-1950s
- Recent catch trends indicates that all fish stocks in the lake have declined by 8.2% (2005-2015)with the exception of Dagaa
- The decline resulted to socio-economic consequences, include loss of income and livelihoods, food and nutritional insecurity and conflicts over the limited resources (Namisi 2005; Medard 2015)
- It is now the main dependable fish resource for human consumption in domestic and regional markets

Camp owners Results on Decision criteria in Fishing camps (Medard 2015)

Which factor(s) determines your decision criteria in your fishing camp? (N=154) (100NP; 42DG; 12 Til)					
Investment & marketing decision criteria	1=Market factor	2= Fish buyer	3=Both (1&2)	4= Owner's decision	5=Others factors
1. Sourcing capital	83	83	71	11	2
2.Which fish to fish	62	68	81	10	2
3.Fish sizes to be caught	49	56	59	6	7
4.Where to fish on a daily basis	0	0	0	3	7
5.Where to camp	38	62	30	72	3
6.Replacement of worn out gear	42	51	34	11	4
7. No. crew to employ in each boat	0	0	0	100	7
8.Whom to hire at the camp	0	0	0	100	7
9.Remuneration/share system	8	12	10	83	2
10. Whom to sell fish to	55	70	95	1	1
11. Prices	78	74	80	3	3
12.Where to buy fishing inputs	90	66	87	22	2
13.Gear type to use	41	81	72	36	2

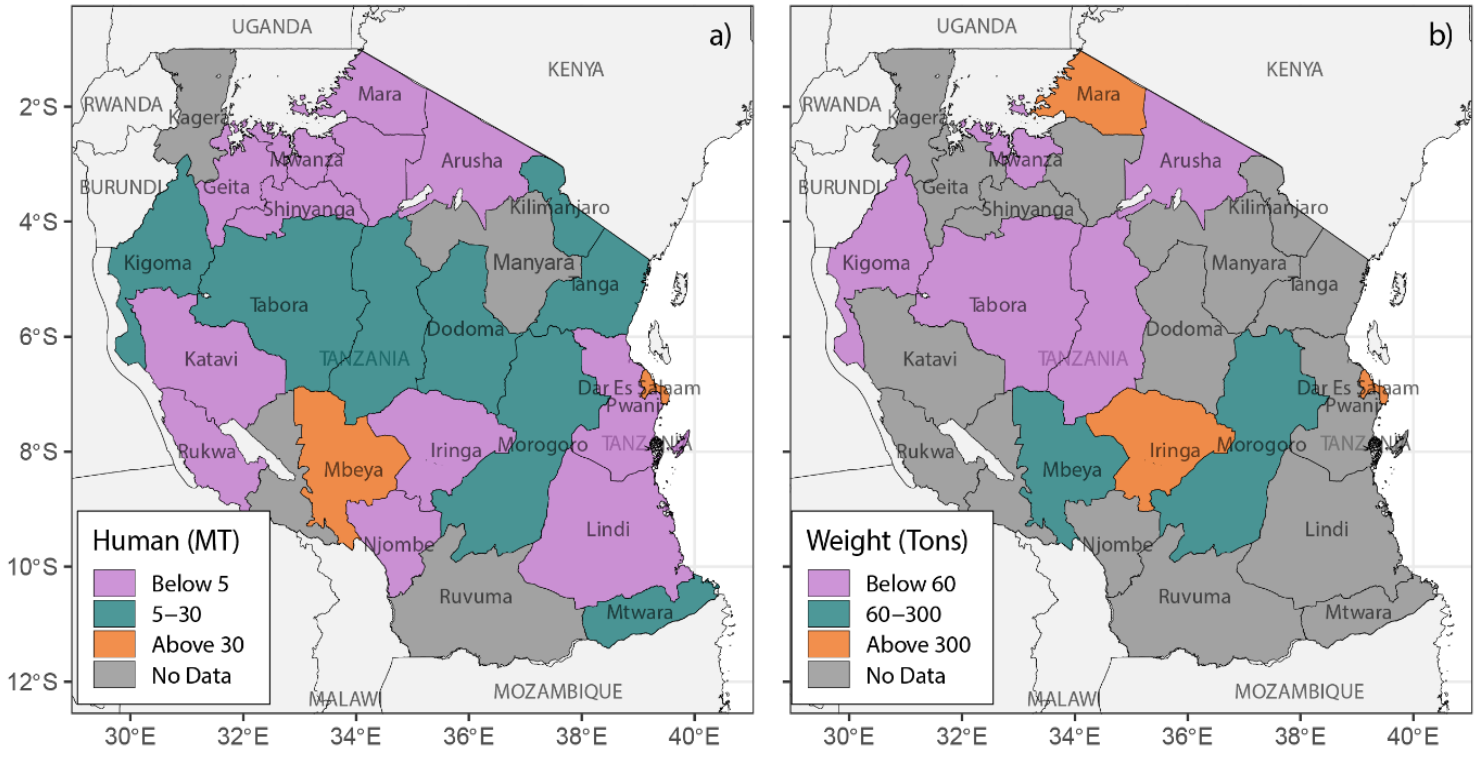
Camp owners acquiring Fishing inputs from buyers in % (Medard, 2015)

Fishing equipment/input	Nile Perch (N=100)	Dagaa (N=42)	Tilapia (N=12)
Which equipment/material did you acquire/mobilize through your fish buyer?			
1.Fishing boats	46	24	5
2.Outboard engines	57	22	0
3.Fuel	82	68	0
4.Nets	78	62	0
5.Kerosene/paraffin	NA	64	NA
6.Pressure lamps	NA	32	NA
7.Ice flakes & storage facilities	100	NA	50
8. Packing material	NA	100	12
9.Bait fish	45	NA	10

Types of information supplied through the market channels (in %)

A: What information do you receive from your fish buyers (EPFs/CDTs)?	Nile Perch N=100		Dagaa N=42		Tilapia N=12	
	Yes	No	Yes	No	Yes	No
1.Proper size of fish to be caught	71	29	86	14	75	25
2.Fish prices	87	13	79	21	58	42
3.Where to go and camp	5	95	10	90	0	100
4.Fish handling	77	23	79	21	75	25
5.Loan possibilities	73	27	62	38	33	67
6.Fishingequipment supplies	77	23	71	29	83	17
7. New legislation	93	7	95	5	83	17
B: What information do you (camp owner) provide to your fish buyers?						
1.Fish availability	80	20	74	26	73	27
2.Proper fishing nets	73	27	60	40	91	9
3.Available fish sizes	69	31	60	40	73	27
4.Proper fishing method	89	11	83	17	100	0
5.Available fish species	75	25	52	48	73	27
6.Gear theft	75	25	48	52	19	81

Emerging New Markets & New Products from Small pelagic (Dagaa) for Human and Fish meal industries (Animal feed)-



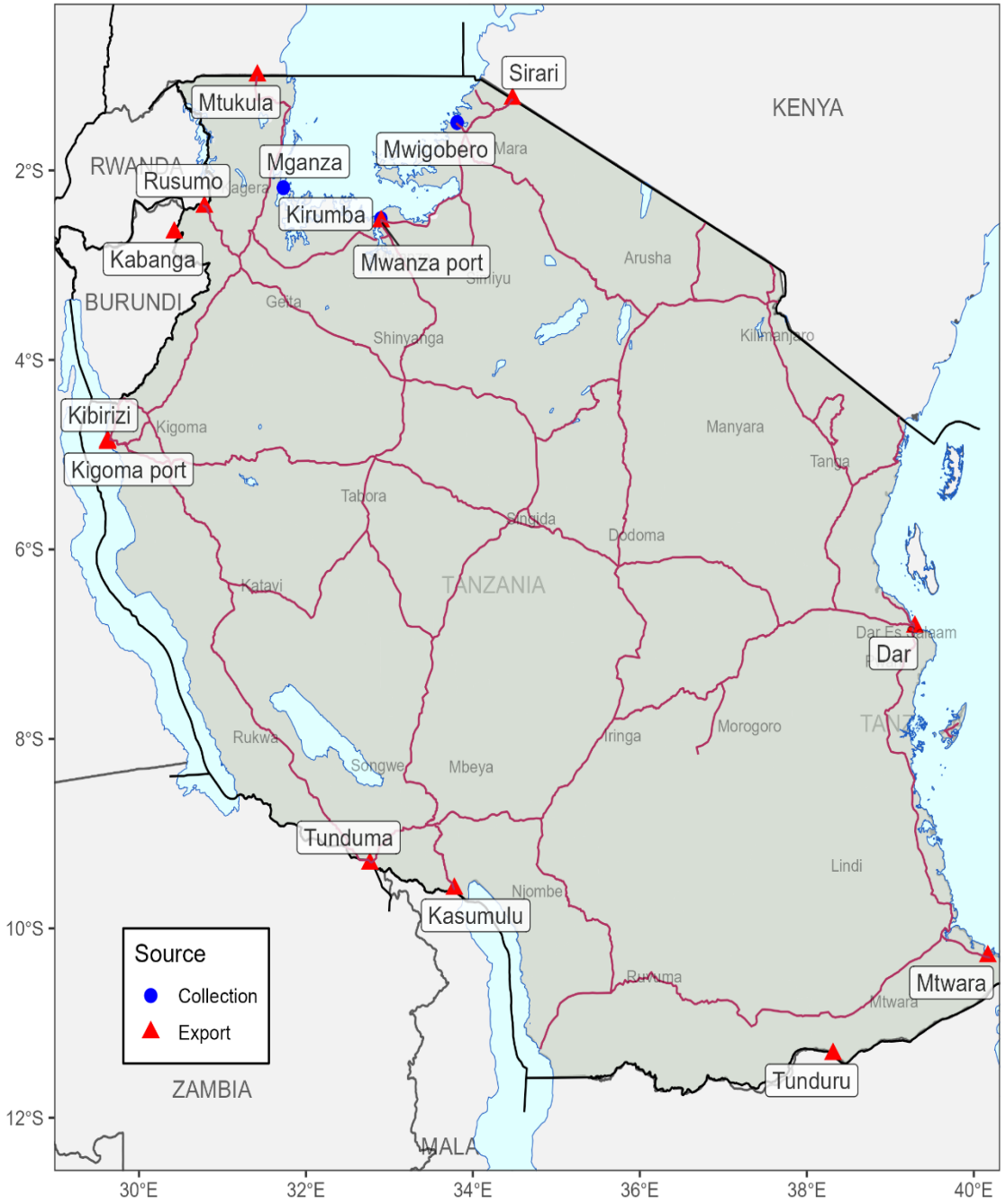
The domestic consumption of dagaa for a) human and b) for fishmeal.

Estimated 470 tons of fishmeal is shipped annually

78% dagaa for fish meal is going to Kenya

74% products of Fish meal in are made from Dagaa (SFF study 2020)

The remaining **26%** is made from **Caradina, NP Fish Frames, shells of lake snails and Haplos** (SFF 2020)



A map of Tanzania showing regional and international markets through land-based border posts, waterways and airports. The red lines indicate the major roads in Tanzania. **Medard 2015; SIS Field study 2019-2020)**

More dagaa is going to regional markets through border posts:

- **Rusumo**: (Rwanda, DRC)
- **Mtukula**: (Uganda & South Sudan)
- **Kambanga:** (DRC,Rwanda& Burundi)
- **Sirari** (Kenya & South Sudan)
- **Tunduma** (Malawi, Zambia)
- **Kasumulo** (Malawi)
- **Mtwara & Tunduru** (Mozambique)

Women: risk & insecure jobs

Relations between People, Relations about Things: Gendered Investment and the Case of the Lake Victoria Fishery, Tanzania

M. MedardPublished 1 March 2012SociologySigns: Journal of Women in Culture and Society

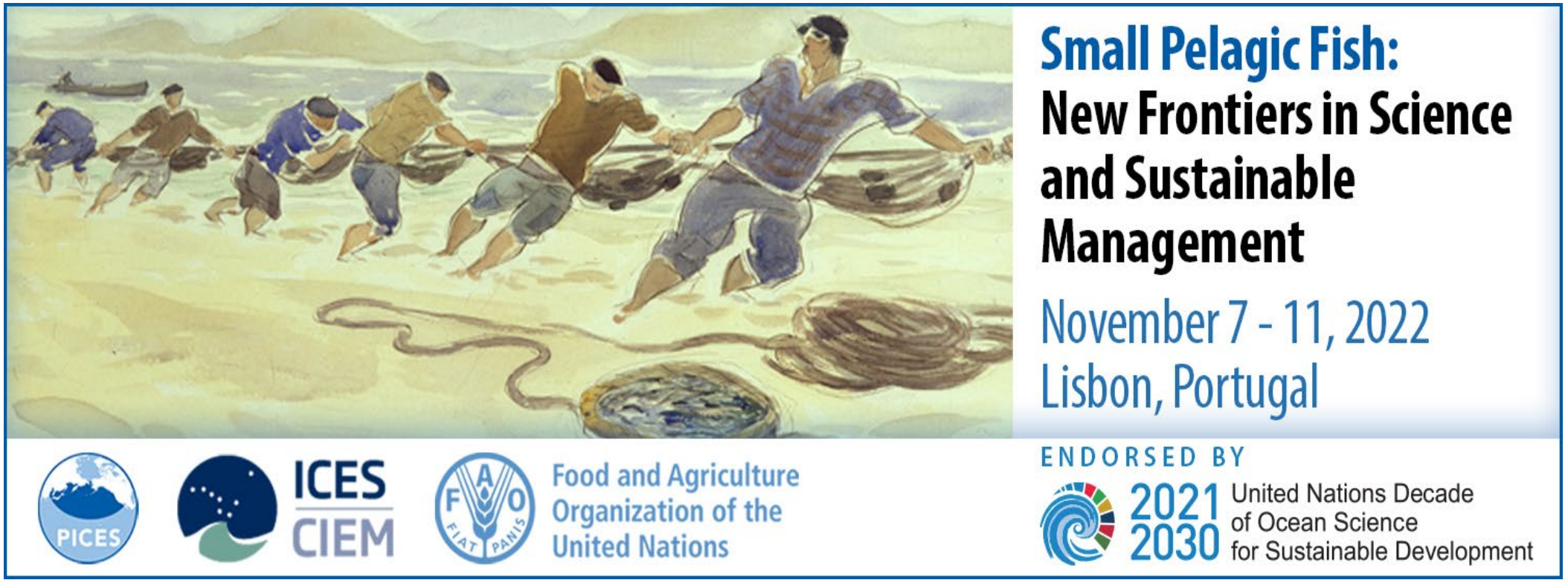
Using the example of one of the African fisheries that has been most significantly transformed from family based to commercialized—that on Lake Victoria in Tanzania—this article considers the social nexus of decision making and focuses on analyzing women's place. It is true that women have never been more than a minority in fisheries due to traditional inheritance patterns and new market structures, both of which bypass women in questions of ownership and decision making. We look in vain for… Expand

Mswahili Beach, Mwanza Sept 2022)

Take away Messages

- The market is a credit market. It is controlling production, marketing (prices, fish form/quality and distribution networks)
- Aggressive form of entrepreneurship is present. Controlling fishing crew, fish resource & fishing equipment and the discipline of camp laborers
- Large, medium and small fishing empires are networked with tight security, strict communication, Strick bylaws and punishment
- It has extended from centralized to isolated beaches, on islands and mainland's and created new forms of dependence through market access and credit provision
- Within the network, prices are not dependent on quality but source of finance and the network in which the trade takes place
- Processes of inclusion and exclusion is common, and insecure livelihoods through the disconnection of local fishers and resource users from their fishing grounds
- Poor are involved in risk jobs while labouring in fishing camps & markets

Thanks



modesta_medard@yahoo.co.uk