

# FISHING WITH DIGNITY





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## ABBREVIATIONS AND ACRONYMS

<b>AEA</b>	Annual Environmental Audits
<b>AVC</b>	Aquaculture Value Chain
<b>BMU</b>	Beach Management Unit
<b>CPRs</b>	Common Property Resource
<b>CoK</b>	Constitution of Kenya
<b>EIA</b>	Environmental Impact Assessment
<b>ENA</b>	Echo Network Africa
<b>ESP</b>	Economic Stimulus Programme
<b>FFEPP</b>	Fish Farming Enterprise Productivity Program
<b>FAO</b>	Food and Agricultural Organization
<b>FGD</b>	Focus Group Discussion
<b>FVC</b>	Fisheries Value Chain
<b>HIV</b>	Human Immunodeficiency Virus
<b>KII</b>	Key Informant Interview
<b>KSHs</b>	Kenya Shillings
<b>LBDA</b>	Lake Basin Development Authority
<b>MT</b>	Metric Tonnes
<b>NEMA</b>	National Environmental Management Authority
<b>NGAAF</b>	National Government Affirmative Action Fund
<b>USD</b>	United States Dollar
<b>VAW</b>	Violence against Women
<b>HDPE</b>	High-density polyethylene



## FOREWORD

Echo Network Africa (ENA) has implemented the Aquaculture Initiative since 2012 in Homa Bay County and intensified its work in 2019 to Kaugege, Mrongo, Litare and Wakula beaches. Our special thanks go out to the 83 Women beneficiaries from ENAs Aquaculture initiative who embraced women's entry into the male-dominated aquaculture farming.

We are deeply indebted to our partners Open Society Foundation (OSF) and Mennonite Economic Development Associates (MEDA) for providing financial and technical support to ensure sustainability of the Program.

We are also grateful to the County Government of Homa Bay County and State Department of Fisheries for their technical guidance and unwavering support towards the implementation of the Aquaculture Initiative.

Finally, for the Team of dedicated staff at ENA who are directly involved in the day to day running of the implementation of this program, I say a big THANK YOU!

It is my hope and prayer that this publication will leave you inspired.

**Dr. Jennifer N. Riria**

PhD, EBS, MBS, HRH/Goodwill Ambassador, ICON/HP, Chairperson AWLN Kenyan Chapter,  
Patron DTF & Group CEO ENA



## BACKGROUND

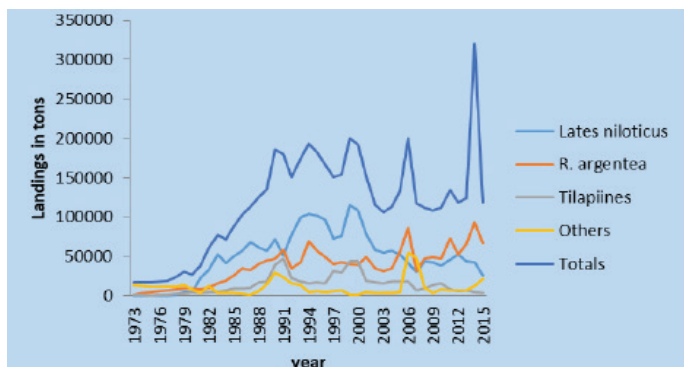
Fisheries development is one of the key global development goals embodied in agenda 2030 under the fourteenth Sustainable Development Goal (SDG), in which countries seek to support the restoration of fish stocks to improve safe and diversified healthy diets (World Fish Center, 2011).

Lake Victoria's capture fishery has gradually been on the decline over the last three decades due to overfishing, Ecosystem degradation, environmental pollution and climate change (Figure 1) (Nyandat & Owiti, 2013).

Consequently, fish production for human consumption has declined, leading to food and nutrition insecurity and poverty in the larger East African region. Today, there have been both national and regional efforts to address the declining fish stocks through innovative technologies.

At the national level, fish cage culture and aquaculture parks have been identified as strategic cutting edge technologies with the potential to increase fish production and as potential mitigation measures to reduce fishing pressure on the lake and bridge the gap between fish demand and supply (Aura *et al.*, 2018).

Aquaculture, through its value chain linkages has become an important pillar for rural livelihoods in situations where increasing population pressure and environmental degradation limit catches from wild fisheries.



**Figure 1:** Annual fish landing from Lake Victoria, Kenya (Trends between 1973 to 2015).

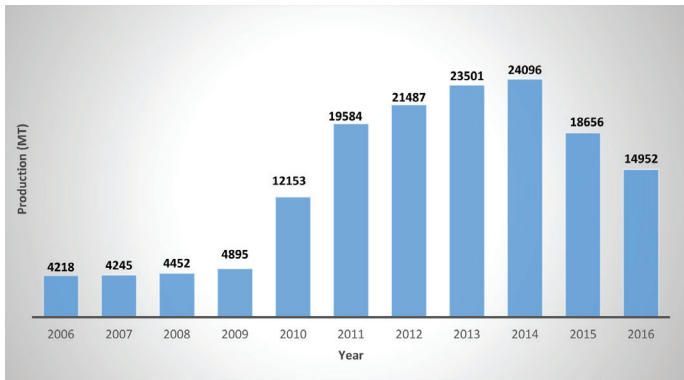
## KENYAN AQUACULTURE

Freshwater aquaculture in Kenya started in 1920's and became popular in 1960's. However, it stagnated until 2003 when the production rose from 1000 MT to 4000 MT following numerous efforts to boost production through the “Eat More Fish Campaigns” championed by the government (Kariuki, 2013).

Between the years 2006 and 2009, aquaculture production remained below 4895 MT until 2010 when 12,153 MT was realized (Fig. 2) (FAO, 2018) . The government nationwide Economic Stimulus Project - Fish Farming Enterprise Productivity Program (ESP- FFEPP), which for the first time, received substantial funding triggered a rapid growth in



the sub-sector and supported fish farmers by subsidizing fingerlings, feed and pond construction.



**Figure 2:** Aquaculture production in Kenya (metric tonnes, MT) trends between 2006 and 2015. Source ( source: (FAO, 2018)

## CULTURE SPECIES

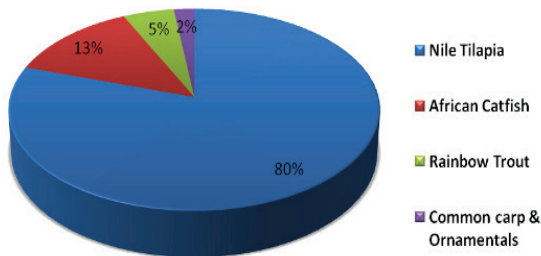
The main species in Kenya's fresh water aquaculture are the Nile tilapia (*Oreochromis niloticus*) at about 69% of the yields and the African catfish (*Clarias gariepinus*) at 21% of the yields. Trout (*Oncorhynchus mykiss*) was introduced in 1948 as a game (sport) fish.

Common carp (*Cyprinus carpio*) was introduced in mid 70s from Japan, and taken to central Kenya by fisheries officers. The rest of the farmed fish include black bass, koi carp and goldfish (Fig 3).





## Aquaculture Production by species 2015



**Figure 3:** Production by species (Source: Fisheries Bulletin 2015)

## CAGE CULTURE VALUE CHAIN

Cage culture is the fastest growing aquaculture production technology within Lake Victoria in Kenya. In order for cage culture investors to realize the underlying objective (profits) for their investment, there is need to conceptualize the value of technology and its supportive enterprises for faster transformation from subsistence to commercialization.

This will greatly contribute towards a more vibrant value chain leading to increased jobs, poverty alleviation and food security. The Blue Economy commercialization concept is geared towards transiting aquaculture value chain actors from their current livelihood status to middle income levels pegged at an annual per capita of USD 4,000 (Orina, et al., 2019).



**Figure 4:** Various Cage culture designs adopted in Lake Victoria Kenya  
(Source: Consultant).

Cage culture in Lake Victoria has largely boosted production of farmed fish in the country. A 2017 survey recorded a rapid rise of cages from 1,663 (in 2015-2016) to 3,696 with current production estimated at 3.18 MT valued at 9.6 million USD (Orina, et al., 2019). The sub-sector's value chain, its supportive value chains and associated enterprises are rapidly expanding thus creating, enhancing incomes and ensuring food security in rural and urban areas.

This culture system has various advantages including free exchange of water and removal of wastes from the cages, high productivity, ease of harvesting, monitoring and the fact that it uses the existing water resources such as lakes, reservoirs, dams, ponds and Oceans thereby removing the need for land as a factor of production.



## SITE SELECTION

Selection of a suitable site for a fish cage investor should involve adherence to strict criteria since each site may have specific laws governing the use of public waters. Moreover, poor cage siting may result to poor fish growth, mortalities as well as conflict with other water users. Cages should be located at a depth of 10m and above, and away from areas that can obstruct other users.

Moreover, it should be at a distance of not less than 300 meters from the shore. KMFRI has developed a suitability map on the recommended sites for location of cages by incorporating factors like bathymetry and fish breeding sites. This has assisted in delineation of the lake Ecosystem for other uses along Lake Victoria, Kenya. Some factors to be considered before placement of cages in public water bodies include:

- The water surface area should be at least one half acre and must have good water quality;
- The cages should not be close to erodible watershed to avoid accumulation of large amounts of organic debris;
- The area should not have chronic problems with aquatic weeds, surface scums, or oxygen depletion problems;
- The area should be open with adequate prevailing winds blowing across it.



Good site selection for cages is critical as it may considerably affect construction, operating costs, growth, survival rate and durability of the cages. Recent survey determined that cages were located where there were weak currents (Bays) with an average of 2 m gap between cage bottom and the lake bottom thus limiting better water circulation.

Using bathymetry tools, suitability mapping sites for cages and the recent cage assessment exercise, its apparent the current location of cages in Lake Victoria has not been done properly (Njiru, *et al.*, 2018) .

Even though it is recommended to avoid cage placement in river mouths, fishing and breeding grounds, navigation routes, and other critical habitats for fish as well as macrophytes prone areas. This has not been considered by most cage investors in Lake Victoria in the recent survey.

## CAGE DESIGN

A cage is made up of a frame, floats, anchors, weights and a top cover as is illustrated in Fig. 5. All the components work together to ensure that the entire structure is intact. Material used for cage frame should be considered to avoid pollution.

Paints used on the steel for the frame should not contain lead which is potential pollutant. This was pointed out during the assessment by the NEMA officer.

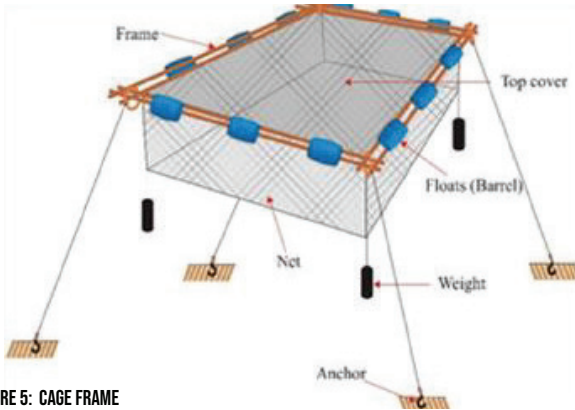


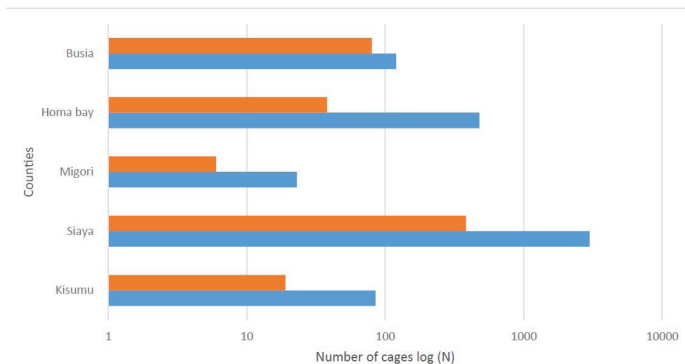
FIGURE 5: CAGE FRAME

## FISH PRODUCTION IN LAKE VICTORIA

The Kenyan side of Lake Victoria has a total of 3,696 fish cages, of which majority ( $n=3,141$ ; 85%) are located in Siaya County. Homa Bay County has demonstrated great potential with longest shoreline, clear waters and good depths. Meanwhile Migori and Busia face a technology adoption challenge due to capture fisheries influx from Tanzania and Uganda waters respectively.

Though culture in Kisumu County is gradually increasing, it is faced by many Ecological issues including pollution, eutrophication and limited water mixing.

The current production from cages in lake Victoria is estimated at 3,180 MT valued at Kshs 955.4 Million (9.6 million USD)



**Figure 6:** Cage numbers in the five riparian Counties in Kenya

## STATUS OF WOMEN IN AQUACULTURE VALUE CHAIN (AVC)

It is acknowledged worldwide that fisheries value chains are dominated by men. It is evident though that women and sometimes children do make enormous and often unpaid contributions within the value chains (Manyung-Pasani, *et al.*, 2017) key informant interviews and gender transformative approaches were used to analyse for instance in Kenya, the women are engaged in a range of aquaculture production and value chain activities.

In particular, women are predominant in marketing and processing, with their involvement estimated to be 1.5 to 1.7 times higher than men's.



Despite this, there is currently a lack of information regarding women's roles and more fundamentally the outcomes for women and factors that enable or constrain them from participating at the production level. This represents a critical gap in the knowledge needed for effective aquaculture programmes and policies.

Addressing this gap is of particular importance given the significance of the aquaculture sub-sector as such a vital economic sector.

Aquaculture has notable potential to contribute to women's economic and social empowerment, as well as to support Kenya to realize performance on gender equality and economic development indicators.



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## ENA's ENTRY INTO AQUACULTURE FARMING

A research study conducted by ENA in 2014 and 2019 indicated that fishing was the major economic activity for communities living along the Lake Victoria basin and was considered to be the main source of their livelihood.

The research also indicated that women and girls continue to be abused along the aquaculture value chain and forced to engage in transactional sex to secure fish stock for sale (Jaboya).



**Catalytic Collaborations:** ENA Group CEO Dr. Jennifer Riria (right) addressing the former Homa Bay County Deputy Governor, H.E. Mr. Hamilton Orata (center) and County Executive Committee Members during the cage fish farming inception meeting held on 23rd May 2019.





Women are only involved as small traders along the value chain due to lack of financial resources and knowledge to actively engage in cage farming. Gender discrimination and disenfranchised cultural beliefs are still in play along the lake region thus hindering women from participating in the fishing practice.



The research also indicated that women and girls continue to be abused along the aquaculture value chain and forced to engage in transactional sex to secure fish stock for sale (Jaboya).

Echo Network Africa has implemented the Aquaculture Initiative since 2019 in Kaugege, Mrongo, Litare and Wakula beaches in Homa Bay County with 83 women beneficiaries from the four beaches.

## CHALLENGES FACED BY THE WOMEN IN THE AQUACULTURE VALUE CHAIN.

### 1. Socio-cultural and Economic Challenges

Fishing business is predominantly run by men while women continue to engage mainly as traders along the fish value chain particularly in processing and marketing which makes them vulnerable to exploitation by the fishermen who have a higher bargaining power.



## 2. **High incidences of poverty associated with high prevalence of HIV.**

The women in the county bear the greatest brunt of the scourge. Poverty levels and female vulnerability to economic means are at the heart of high incidences of female HIV/AIDS risk. Due to women's economic vulnerability and dependence on men, their ability to control the conditions like sexual abstinence, condom use and multiple sexual partners are constrained.

These women are forced to give sexual favors to the male fishermen to be guaranteed of fish stock for sale at the market for their families' livelihoods. This "sex for fish" practice is locally known as "*Jaboya*". Rapidly coming up is also the "*thuol Odonje Koo*" practice which majorly physical & sexual abuse (rape & defilement) occurring among relatives. This shapes their risk of HIV infections and contributes to their high infection rates compared to men.

## 3. **Climate Change and uncontrolled fishing** have negatively impacted the environment and contributed to fish depletion in the lake. Fishing activities in Lake Victoria are culturally dominated by men thus leading to less women engaging in fishing activities.

ENA conducts yearly Environmental Assessment Audit reports to ensure adherence to standards and guidelines for maintenance of the natural ecosystem of the water.



One of the four High-Density Polyethylene (HDPE) cages installed on Lake Victoria.

According to The Kenya Marine and Fisheries Research Institute (KeMFRI) extreme weather patterns and climate change, causes the water in Lake Victoria to warm and algae to bloom, which depletes oxygen in the water, thus suffocating the fish and causing a rise in fish mortality.

Excessive dumping of wastes and chemical from local companies and industries; and oil spillage in the lake has also deteriorated the natural balance of water PH and natural habitat for fish in the Lake, thus reduction in fish production.

Excessive fishing activities are also overburdening the Lake resulting to depletion of organic materials and



nutrients in the lake contributing to the death of fish - most of the deaths occur in shallow waters – farmers are advised to install their cages in deeper waters.

Due to this, ENA seeks to diversify opportunities for women in the aquaculture value chain so that these risks are mitigated.

4. **Gender inequality** - Gender discrimination and disenfranchised cultural beliefs are still in play along the lake region thus hindering women from participating in the fishing practices. Women's control of the fishery resources is still very limited due to them under representation in the Beach Management Units. Fishing communities are organized by Beach Management Units (BMU) that bring together everyone involved in fisheries at a beach i.e., boat owners, boat crew, traders, processors, boat builders, boat repairers and net repairers, who work with government and key stakeholders in managing fishery resources for improved livelihoods of the community members.

## ACHIEVEMENTS

The following are the current key achievements of the project:

1. **Aquaculture Cage Farming**
  - 1.1. 4 high-density polyethylene (HDPE) cages procured and installed for the 4 WGs to support cage farming .



**Women Groups undergoing training on aquaculture best practices and fish feed production.**

4 WGs officially registered with the department of social services and successfully trained on group management (each group had 25 members). Tax exemption on behalf of the women groups from the State department of fisheries. (ENA successfully applied and got the exemption approved).

1.2. 83 women have gained skills and knowledge on cage farming, financial literacy, record keeping, gender roles & GBV and Value addition training on how to utilize fish byproducts to increase income (fish burgers, fish samosas & fish fingers).

1.3. 79 women are currently involved in ongoing individual group Merry-Go-Rounds where the women contribute Kshs.100 each, weekly towards



**Kaugege women group are taken through a fish value addition training to help them maximize on profit through development of diversified products.**



**Women from Mrongo Women Group participating in their weekly table banking meeting.**



their kitty as a means of saving. This has further promoted cohesion of the group model and enabled sustaining of other group activities.

- 1.4. Improved household-level income and economic empowerment of 83 women in 4 beaches, namely Kaugege (21 women), Morongo (17 women), Wakula (22 women) and Litare (23 women) in Homa Bay County from, US\$ 0.16 a day in 2019 to US\$ 3.00 a day by August 2022. This has gone up to USD 2.8 per day.
- 1.5. Improved self-confidence of the women as they are now able to identify and negotiate with service providers for goods and services-before they relied solely on ENA.



**Select women from the four women groups showcase their value added fish products and fish feed ingredients to the guest of honor Mama Ida Odinga during the 2023 Homa Bay County International Womens Day Exhibition at Tom Mboya University.**





## 2. Technological Innovations

2.1. Four women group have been supported with technological equipment to support cage farming and increase fish production including: (i) 4 oxygen sensors to test oxygen levels in the cages, (ii) 4 weighing scale to sue to during fish offtake, (iii) 4 cooler boxes for post-harvest management and fish preservation and (iv) 16 scoop nets for sampling fish for quality observation and analysis.



*A fish feed processing machine in operation. This and many other equipment were received through support from ENA and MEDA.*





2.2. Additional technological equipment provided to the women to enhance cage farming include: (i) Solar freezers for fish preservation which is integral for postharvest management, (ii) Fish feeds processing machines for production of fish feed pellets for the caged fish to minimize cost of fish feeds purchase from service providers with overpriced feeds (iii) Solar lamps which are meant to provide sustainable and affordable lighting during the fishing activities as well as act as security lights in the fish cages and (iv) Motor boat for fish feeding and transportation of fish & fingerlings during harvest and restocking, respectively, thus minimizing initial costs of hiring & fueling boats per day.



***This motorised fishing boat was donated to the women group to enhance their capacity to manage their fish feeding and harvesting.***



This is a huge aspect of enhancing sustainability, increased production and reduced costs of the fish cage farming, thereby improve the livelihoods of the women by a huge margin. In effect, this will enhance their livelihoods and improve other indexes such as purchasing power, quality of life and economic independence.

### 3. **Special Revolving Loan Fund (RLF) Initiative**

- 3.1. Improved livelihoods of 83 women through periodic (cycle-based) cage farming during which the women harvested a total of **12.9** tons of fish worthy Kshs **3,503,182.00**, repaid Kshs **2,317,474.69** as part of the loan while Kshs **988,918.05** was their income.
- 3.2. 77 women out of the 83 are engaged in other income generating activities such as sale of Omena, groceries, dress making and shop keeping, as a result of trainings conducted and the skills gained by the women,
- 3.3. Increased revenue generation as a result of additional technological equipment support through (i) Fish feeds processing machines for production of fish feed pellets for their own fish and also for sale to local fish farmers and (ii) Motor boat renting to fishermen.

### 4. **GBV, Gender Mainstreaming and Inclusion**

- 4.1. Increased knowledge on GBV reporting pathways. 23



(14 females and 9 male) community representatives from women groups, opinion leaders, Nyumba Kumi leaders, church leaders, the chief and the police trained as first contact persons and therefore linking communities with the services.

- 4.2. Consistent & gradual increase in GBV reporting at community level through Gender Focal Persons (GFPs). In 2021, 1,773 (51%) GBV cases were reported which is an increase from 1,676 (49%) GBV cases reported in 2020. This means the community is breaking the silence on GBV.
- 4.3. Supported the development of a gender-sensitive, responsive BMU policy and service charter for the four beaches which has led to the inclusion of women in the BMU leadership at Sub County and County level.
- 4.4. Enhanced women's access to leadership positions and their increased participation in decision-making processes in the fish value chain as a result of leadership and negotiation skills training conducted for 90 women. Currently 10 women have so far been elected to be part of the BMU leadership which was previously predominantly led by Men. Increased women engagement in aquaculture value chain through involvement in BMU activities and decisions in the beach.



Group Name	GROUP MEMBERSHIP		
	2022	2021	2020
Litare	23	24	25
Wakula	17	19	25
Mrongo	17	17	25
Kaugege	22	23	25
<b>Total</b>	<b>79</b>	<b>83</b>	<b>100</b>

ENA has built strong partnerships with GBV service providers at the community level. This has enabled survivors to access services and hopefully justice will finally be realized. ENA established relationships with legal and medical service providers. There has been reported increase in GBV reporting at community level through the trained Gender Focal Persons (8 GFPs) and paralegals (2).

In 2021, 1,773 (51%) GBV cases were reported which is an increase from 1,676 (49%) GBV cases reported in 2020. The survivors are then referred for services to Humanist Health Facility and Kolunga dispensary for medical services and further linked to legal services. 267 survivors (207 females and 960 males) received services.

The following services were provided: Emergency Contraceptives, HTS (ARVs, PrEP & PEP) and psychosocial support (PSS). 60 GBV cases (52 females and 8 male) have accessed legal services where their cases have been filed in court and litigation is ongoing. Most of the cases reported are domestic violence, physical abuse, defilement and rape.



## 5. Collaborations & Partnerships

5.1. Established a strong collaboration and partnership with the County Government of Homa Bay to support Women's resilience and livelihood through the Aquaculture, Pond and Anchor Cluster Model Initiative. Some of the departments and offices actively engaged include: The Governor's office, Ministry of Agriculture, Livestock and Fisheries Department, National Environmental Management Authority (NEMA), Department of Health, Water and Natural Resources Department, Department of Finance, and the Department of Gender.



**Beneficiaries from the Aquaculture Initiative pose for a group photo with ENA GCEO Dr. Jennifer Riria (center) together with Mr. Jacob Obonyo from National Affirmative Action Fund and MEDA Programme Manager Mr. Walter Tinega (2nd right) after the launch of the Aquaculture technological equipment.**



5.2. Ministry of Fisheries has been fully supportive and assigned a Fisheries Extension Officer to work closely with the women and guide on standard measures of cage farming operations.

5.3. Close working relationships with existing civil societies in the region including CBOs and NGOs (Mfangano Paralegals, Redeemer CBO and DEVLINK). This majorly anchored on ENA's catalytic approach of working with Local Implementing Partners (LIP) to lead efforts in implementation of interventions.

## 6. Job Creation

6.1 Since 2020 79 women have diversified into individual businesses such as Omena fish trade, selling of cereals, running retail shops and selling second hand clothes.



6.2 2 women fish farmers from the women groups have now learnt how to operate the engine boats and are able to navigate the Lake during fish feeding thus have reduced costs usually paid for the boat riders. This is an added skill and asset at the group level.



Every woman has the potential to make this world a better place. ENA has just made that possible for us by presenting us with numerous opportunities for both intellectual and socio-economic growth. I have gained confidence in myself and now I have a seat at the negotiation table including Beach Management Unit (BMU). It took me a long time to gain confidence but now that I have it, I never want to loose it.

*Esther Otieno - Litare Women Group*

*Fishing With Dignity* is a publication of Echo Network Africa (ENA) that highlights the journey, achievements and lessons learnt during ENA's quest to empower women along the aquaculture value chain.



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