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The Value Chain Analysis of Nile perch Maw Trade in East Africa

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to

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Abbreviations and Acronyms

AFALU	Association of Fishers and Lake Users of Uganda
DiFR	Directorate of Fisheries Resources
EAC	East African Community
FOU	Fisheries Organization of Uganda
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
IUU	Illegal Unreported Unregulated
LGA	Local Government Authority
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MoU	Memorandum of Understanding
NGO	Non-Governmental Organization
RFBC	Responsible Fisheries Business Chain
SACCOs	Savings and Credit Cooperative Organizations
TAFIRI	Tanzania Fisheries Research Institute
TAFU	Tanzania Fisheries Union
TMTA	Tanzania Maw Traders Association
TRA	Tanzania Revenue Authority
UFFCA	Uganda Fisheries and Fish Conservation Association
UFTA	Uganda Fish Maw Traders Association
UPDF	Uganda People's Defense Forces
USD	United States Dollar

EXECUTIVE SUMMARY

Fish maws in Uganda, Tanzania and Kenya are mainly traded fresh, dried and frozen. Fresh maw dominates the local and regional trade, where it is processed and exported by majorly Chinese companies as dry maw. Most of the maw which is obtained by the fish factories after filleting is sold as fresh maw to the maw processors for drying. Sometimes some of the fish processing companies export maw in frozen state. The most preferred maws are extracted from Nile perch of four (4) kilograms and above, yielding maws equivalent to or more than 80 grams. Most of the maws are exported to China through Hong Kong, whereas some are exported to Japan.

Most fish maws are extracted in fish factories after filleting. This is followed by cleaning off all the fats, and placing in containers ready for sale. At the maw factory, the maw is cleaned once again and dried in the sun, packaged into gunny bags, weighed, and labeled ready for export. Maw worth US$40 Million is reported to have been exported from Uganda in 2017. There are about 17 regional traders of maw and 20 exporters from Uganda. Some maw smuggled from Tanzania and Kenya is exported through Uganda. Tanzania, earned more than $42 Million from maw export in 2017. Tanzania has eleven maw processing factories operated by Chinese located in Mwanza. Tanzania has only one licensed local trader located in Bukoba, with collection centers in Bukoba, Mwanza and Musoma; who exports maw to Uganda. Several local traders also work in partnership with Ugandans to illegally export maw from Tanzania. Kenya exported maw worth US$ 5.6 million in 2017.

Maws were sold as separate products from fish in Uganda until a directive by Directorate for Fisheries Resources requiring all maws to be handled in gazetted factories and sold to recognized and licensed fish maw processors and exporters was issued in February 2018. In Tanzania, Kenya and Uganda it has always been a requirement not to remove maws from the fish before supply; as the factories can't purchase fish without a maw. The arrangement between factories and fish suppliers where factories would give back their maw to fish suppliers seemed to liberalize maw trade in Uganda. This caused a perception in Tanzania and Kenya that the Uganda's regulatory system favored maw trading. The absence of Chinese buyers in Kisumu (Kenya), strict licensing system for regional exporters and taxation system in Tanzania; as well as the perceive laxity in regulatory system associated with maw trade in Uganda resulted into maws being smuggled to Uganda.

The growth of maw businesses has increased the profits of fish processing companies who in addition to selling fish and fishery products gain from increased prices of maw. Maw industry has also benefited a few trusted maw factory agents and their middlemen, who in the process of searching for maw to supply to Chinese companies have created a lucrative artisanal maw trade sector. The growth of maw trade has also benefited some maw collectors and extractors. Majority of maw businesses are run by personnel aged 35 years and above. The contribution of youth in the maw industry is minimal. However, maw trade and processing businesses offer opportunities for

women employment since they are considered to be trust worthy in handling the highly valued product.

Being agents of Chinese Maw factories offers far better opportunities for business growth to traders as compared to other maw enterprises. This is so due to working capital provided by the Chinese Maw companies to agents to continuously supply maw. The existing physical and quality infrastructure in the entire maw chain is too weak to support and sustain production of world quality maw export products. Also the lack of maw handling, product and process standards impacts the quality of the maw. Artisanal processing of maw can be viable and profitable when right equipment and techniques and skills are used to produce products of similar quality to those from Chinese factories.

Tanzania and Uganda enforce regulations relating to trading of maw through issuance of maw trade license. This is not the case in Kenya where maw trade is licensed under one general license for fish and fishery products. There is ambiguity in enforcement mechanisms. In Tanzania, the government has issued an enforcement guideline under the Fisheries Regulations requiring trading in maw of sizes: 15-27cm. This requirement is strictly enforced in Tanzania. In Uganda, no specific sizes of maw have been indicated for regulating maw trade, yet enforcement officers confiscate any maw considered to be from illegal sized fish. In Kenya, no enforcement is in place regarding the sizes of maw. This ambiguity in enforcement has forced some maw chain actors to operate underground in Tanzania and Uganda. This entwined with the weakness in enforcement and porous nature of the regional borders has encouraged smuggling of maw across borders. Currently, the actors in upstream side of the fish chain such as fishing crew, boat owners and fish suppliers to the fish factories are not benefiting the increasing prices for maw. This is so, since they have to supply whole fish (with maw) to the factories, who sell the maw without rewarding the fish suppliers in terms of increased prices for fish delivered. In order to optimize benefits from the maw trade and processing businesses in the region;

1. Equal profit sharing:

   A mechanism should be devised to rationalize the benefits accruing from increasing prices of maw so that benefits can trickle down to all maw and fish chain actors instead of benefiting only Indians and Chinese nationals.

   Such mechanisms include governments, development partners and stakeholders:

   - recognizing maw as a tradable product separate from fish
   - developing a maw trade regulation requiring fish factories to return maw to fish suppliers if they cannot pay for it
   - streamlining the licensing of maw trade to include the lower actors in the value chain
   - increasing awareness among lower chain actors such as fishing crew, boat owners, fish suppliers and agents regarding the value of maw
   - Imparting skills to the lower chain actors on trading and proper handling of maw.

- Assist the private sector in accessing finances for establishing the right physical and quality infrastructure

2. Develop employment opportunities:

There is need to exploit employment opportunities, especially for the youth and women, available in maw processing and trade by Fisheries related associations, organizations dealing with quality, leading maw processing companies, donors, relevant government ministries, departments and agencies (MDAs) and training institutions:

- Encouraging the youth to get involved in maw businesses such as extraction, collection and trade which do not require larger capital yet profitable
- Training the youth to establish and run legal and registered maw businesses
- Encouraging small scale maw traders and artisanal processors who do not have access to finance capital from the Chinese maw exporters to form groups; provide them with skills for financing and credit access; and guide them on the sources of finance required to expand and sustain their maw businesses
- Providing support to existing businesses to access proper equipment including setting up initiatives to assist them in developing some of the equipment and infrastructure themselves.

3. Quality infrastructure for maw extraction and processing:

Investments are required to establish the quality infrastructure for maw extraction, handling, processing and trade by developing and implementing the necessary policies, regulations and standards required to produce and trade maw of world export quality. To achieve this

- Regional and National Government should develop and implement policies, regulations and quality standards
- Private sector should bring the facilities to a minimal standard described in the relevant government regulations.
- Fisheries related associations, organizations dealing with quality, leading maw processing companies, donors, relevant government ministries, departments and agencies (MDAs) and training institutions should support and/or train the actors in the supply chain on the quality standards and how to implement requirements of the regulations

4. Relevant government ministries, departments and agencies (MDAs), development partners and stakeholders should encourage, promote and support the use of appropriate techniques, equipment and practices in extraction, processing, transportation, storage and marketing of maw by all value chain actors.

5. Sustainability:

The EAC governments working through LVFO should implement activities to determine and mitigate the likely impacts that the maw trade may have on the sustainability of fisheries resource. This is to be achieved among others by:

- Strengthening acquisition and management of data by the Nile Perch value chain actors
- Exploring the possibility of using other fish sources apart from Nile perch from capture fishery by conducting research on reproductive biology of Nile perch and the necessary conditions for growth in aquaculture conditions; and use of fish maw from other fish species
- Conduct research on different types of maw obtained from different ecological environments
- Promote investments in the manufacture of maw value added products
- Conduct research to produce inputs for maw value chain operations using locally available materials such as drying sticks, drying racks, preservatives and packaging materials

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is implementing a Responsible Fisheries Business Chain (RFBC) project under the Global Program on Sustainable Fishery and Aquaculture. The project which is being implemented in collaboration with the Lake Victoria Fisheries Organization (LVFO) focuses on Nile perch and its products. One of the products that is contributing to the income of communities around Lake Victoria and revenues of the riparian countries is Nile perch maw. The maw which was once regarded as a waste has become a highly sought tradable commodity in China, Japan and other Asian countries. Hence there is drastic increase in demand and exports for fish maw from East Africa.

Fish maw can be traded in fresh and dried form. The maw trade is rapidly becoming a lucrative and money-spinning business in East Africa especially in Uganda; due to an environment suitable for maw businesses including favorable maw trade, taxation and regulatory enforcement policies. Despite the growing business for maw and its potential to generate income and revenue for communities in Kenya, Tanzania and Uganda; there has been limited information on its value chain. This report presents the findings of a study that analyzed the value chain of Nile perch maw in East Africa.

1.2 Background information

Fish maw is the commercial term for the swim bladders of large fish like Nile perch. Other fish with similar bladders include Catfish, Croaker and Sturgeon. The dried swim bladders are considered a treasure and delicacy in China where it is ranked number four among sea treasures (abalone – mollusks such as clams and oysters, sea cucumber, shark fin, and fish maw) in Chinese cuisine. The trade scale of fish maws in Southeast Asia is large, especially in Hong Kong and Southern China.

Fish maws have been commonly recommended and consumed in Asia over many centuries because they are believed to have some traditional medicinal properties, particularly in winter, as a tonic for those recovering form, attempting to ward off illness and for women after child delivery. Maw soups are taken by patients who have been surgically operated upon to quicken healing of wounds, and for relief from persistent coughs. Fish maws do not contain cholesterol and can be consumed in the diet for a long time. Maws are used as a source of collagen, proteins and nutrients. The collagen is believed to improve skin tissues and tone; and the proteins and nutrients help in healing weak lungs and kidneys. The maw can be made into strong, water resistant glue or used to make isinglass used in clearing up of beer and wine during manufacturing. Fish maws are also used in the manufacturing of some plane and space shuttle body parts, car parts, surgical stitching threads, melamine plates and cups and anesthetic drugs.

They are also used in the production of aphrodisiacs (drugs) used to increase libido. There are superstitions attached to maw purporting to offer good luck and health.

Fish maws are usually processed by cutting the fishes to take out the swim bladders, followed by washing them several times and drying them in the sun, then rewashing and drying. Finally they are sold directly to traders or processed in preserved forms such as dried products. In preparation for cooking, dried fish maws are rehydrated by soaking in water or thermally expanded by salt frying. The male swim bladders are preferred because they are larger in size than those obtained from female fish.

The international prices of dry maw per kilogram range between US$ 450 and US$ 1000 depending on size, product quality and market strength.

1.3 Objectives of the assignment

The overall objective of the value-chain study was to obtain information on processing and trade of the Nile perch maw needed to optimize its economic benefits to communities around Lake Victoria and regional countries.

1.4 Specific objectives

i. To investigate the extraction, handling and processing, marketing system and distribution channels for the Nile perch maw
ii. To identify and characterize the key chain players and their roles; and quantify and determine the value for the different maw products
iii. To examine the trade and investment, quality and safety aspects of fish maw businesses
iv. To assess the legal and regulatory issues associated with Nile perch maw processing and trade.

2.0 APPROACH AND METHODS

2.1 Methodology

The study was carried out in selected cities, towns, districts and landing sites located on the shores of Lake Victoria in the riparian countries of Uganda, Tanzania and Kenya. In Tanzania, the study was conducted in the three administrative regions (Makoa) around the Lake Victoria basin including Bukoba, Mwanza and Musoma. In Uganda, the districts of Buikwe, Wakiso, Kalangala, Kyotera and Kampala were covered in the study. In Kenya the study covered Kisumu areas. The study was based on secondary data obtained from literature concerning the status of maw trade and processing in the respective countries. The information was provided by key informants in government institutions responsible for Fisheries Management and Research. This information covered broad issues on maw trade and processing including the major players, policy, legal and regulatory frameworks, licensing and cross-border trade issues, organization and structure of maw trade subsector, trading volumes, revenues, tariffs and royalties, existing enforcement mechanisms, related research scopes and findings. The primary data was obtained from interviews with maw/fish chain actors using questionnaires; focused group discussions and observations at landing sites, trading premises/stores, markets, cold chain facilities and artisanal and factory processing facilities.

The key informants in Tanzania were mainly fisheries officials at the regional office (Mkoa). Other key informants were local government Fisheries Officers at the Municipal level and the landing sites, members of Beach Management Committees; Tanzania Fisheries Research Institute (TAFIRI), Members of Tanzania Maw Traders Association and Tanzania Fisheries Union (TAFU). The respondents were maw chain actors including fishing crew, suppliers of fish to fish factories, different categories of maw extractors, collectors and traders, cold chain service providers, and maw exporters. To obtain the data, visits were arranged to the following landing sites: Rushara near Kemondo in Bukoba, Igombe and Kayenze in Ilemela division of Mwanza, Bwai in Musoma and Musoma fish landing beach. In addition to landing sites, town suburbs, villages, markets, factories were visited.

The key informants in Uganda were officials of Directorate for Fisheries Resources, fisheries officers at the landing sites; Federation of Fisheries Organizations of Uganda (FFOU); Uganda Fish Maw Traders Association (UFTA), Uganda Fisheries and Fish Conservation Association (UFFCA), Association of Fishers and Lake Users of Uganda (AFALU). Eight (8) landing sites including Kigungu in Wakiso district; Kiyindi in Buikwe district; Ddimo in Masaka district; Kasensero in Kyotera district; Mwena, Nakatiba, Kananansi and Kyagalanyi landing sites in Kalangala district. Also the border town of Mutukula was visited to investigate the maw cross-border trade.

In Kenya, the key informants were officials based at Regional Fisheries Department in Kisumu and committee members of the two Beach Management Units at Wichlum and Uhanya landing sites.

2.2 Limitation and Constraints

Overall, some actors including stakeholders from the Government were not forth-coming in providing some of the required information. This mainly affected information needed from maw factory processors and fish factories. A few who allowed access to their facilities (3 maw processors and 3 fish factories) either rejected to participate in the interview, providing certain information such as costs, markets, contacts and other information; or gave utterly wrong information and figures. Efforts to obtain some of the information from the governments on those factories or validating the information provided by factories by cross-checking with that in possession by relevant government departments did not yield any results. Government officials promised to provide that information but did not do so up to the time of finalizing the report. Of the three countries, only Uganda and Tanzania were able to provide list of traders (middle men and agents) and exporters as requested. Several reminders by phone and email to provide information as promised to responsible officials were not honored.

In Kenya, interviews were arranged for two landing sites. At the landing sites visited, most fish is sold with their maw to the fish factories, hence low maw trade and processing activities are going on. One small scale extractor, one small scale collectors, and one artisanal processor who were operating at the landing sites were interviewed. These could only provide minimal information. More so, the Kisumu Fisheries Department lacked concrete data on maw trade since maw is not regulated as a separate fisheries product in Kenya hence the limited data obtained for Kenya.

3.0 STUDY FINDINGS

3.1 Respondents

The respondents interviewed in Tanzania were 37, those in Uganda were 52 including 17 from Kalangala Island landing sites, and 11 in Kenya.

In Tanzania, the respondents included 4 crew members - some of whom are maw extractors; 1 fish trader who is also a fish factory agent; 6 boat owners who at the same time are agents that supply fish to fish factories; 6 maw extractors; 8 maw collectors; 2 middlemen for maw factory agents; 4 factory agents for maw processors; 1 regional exporter for maw; 2 operators of fish processing factories; 2 operators of cold chain facilities (also used to extract maw); and 1 artisanal processor for maw.

In Uganda the respondents comprised of 5 crew members - some of whom are maw traders; 5 boat owners (some of whom are maw traders); 2 maw extractors (one of whom is a fish trader); 8 maw traders who buy from fish suppliers; 6 artisanal fish processors who extract maw for sale, 5 fish traders (two of whom were also maw traders), 2 fish processing factories and 3 maw processors/exporters. In Kalangala district the respondents included 2 fishing crew, 11 boat owners and 4 fish factory agents.

In Kenya the respondents were 8 boat owners who are factory agents, 1 maw extractor and 2 maw collectors - one of whom is a maw artisanal processor.

3.2 Extraction, handling and processing for the Nile perch maw

3.2.1 Extraction

Maw extraction takes place in different places which include:

- Island fishing camps where the fishing crew extract maw from fish consumed during the fishing expedition
- During fishing where crew members extract maws from some of the fish caught
- Homes from fish bought for domestic consumption
- Landing sites where the extractors who operate extraction facilities offer services to fish crew, boat owners and other members of the community
- Cold rooms where fish is stored by local traders before being transported to the local market
- Landing beaches where some maw traders examine and sort out fish suspected to have larger maws among fish landed
- Islands where maw traders camp and get access to large fish landed by the crew

- Slaughter facilities operated by individuals where local traders take fish for maw extraction at a fee
- Fish processing factories where all fish delivered have their maw removed.

Maw extraction requires high level of experience and skill to avoid damage. To gain experience and skill one has to work alongside a skilled extractor. Experience has shown that individuals who have been involved in gutting fish turn out to be better maw extractors. To join the extraction business one needs to have basic gutting skills to become a maw extractor. Fish from which maw is to be removed should be handled with care during transportation and movement. It should not be thrown around, or else the maw will burst and have its value reduced. However, in artisanal operations it is not uncommon for fish to be thrown around hence resulting into the bursting of maw before extraction.

To remove the maw, a slit/cut is made on the abdominal side using a sharp knife. Caution is taken to ensure that outer skin is only cut to avoid damaging the gut material with the maw which is located on the underside. Using the fingers the maw is properly located and pulled out carefully by cutting the attachment on head side of the fish.

Maw is not normally cleaned immediately after removal. However, depending on the location of the market, it is either sold immediately as is, or placed in water/ice as it is transported to the market.

Fish from which maw is to be removed should be handled properly to avoid spoilage as it affects the maw quality. The existing time-temperature abuse and prolonged holding of maw in water awaiting sale are major malpractices with a potential effect on the safety and quality of maw. It is alleged that some traders hold maws in water for a long time in order to increase its weight; that is why the water is squeezed out by the buyer before weighing the maw.

3.2.2 Processing

There are two types of maw processors - the artisanal and factory processors. The artisanal maw processors fall in two categories. There are freelancing individual maw collectors who do not have agency with particular trader/middlemen. Some do not have facilities for cold chain to hold the maw until they are sold. Such traders find it convenient to clean and dry the maws until the market conditions improve. In Tanzania such traders switch markets between the local agents of Chinese companies located in Mwanza and regional traders from Uganda. In Kenya, artisanal processors sell their maws to agents of Chinese companies in Uganda based in Kisumu or middlemen of agents in Nairobi.

The other category of artisanal processors is middlemen traders/agents of Chinese maw factories who dry the maw of low quality that cannot be bought in fresh form by the maw processors or regional buyers. There are also middlemen/agents who refuse to supply fresh low quality maw to

the Chinese because they offer low prices. Although there are fewer cases of this nature, they have indicated that drying low quality maws attracts fairer prices.

The artisanal maw processors receive maw from extractors based at the landing site. The extractors receive maw from fish (both reject and non-reject) brought by boat owners, crew members or any other members of the community who buy fish for own consumption. The artisanal processors can also receive maw collected from suppliers of fish in the local market and individual homes.

In artisanal processing the maws can be handled in two different ways depending on the intended product. When the fresh maw is the intended product, the maw is first cleaned by squeezing to remove fat and any water. When the dried maw is the intended product, the freshly extracted maw is cleaned; turned inside out, damaged maws are first repaired by stitching, carefully placed on finger-like pieces of holding materials made out of wood. The maws are placed on racks or spread on ground and/or on top of the roof to allow sun drying. Thereafter, they are weighed and placed in polyethene or gunny bags awaiting collection by traders and/or agents.

The artisanal maw extraction and processing is still rudimentary as most of the actors are not using the basic hygiene principles, recommended processing equipment, trained staff/personnel, and appropriate processing facilities. **Table 1** below gives a summary of practices observed in maw extraction and processing by artisanal processors.

Table 1: Handling practices during extraction, processing, transportation and marketing of maws

Observable Parameters	Observed practices
1. Extraction of the maw	
Use of clean and sharp knives	The knives were sharp but not clean as there was no water for cleaning in most of the cases
Use of clean and portable water	No portable water was available. Even in places where portable water source was nearby, this was not being used as required
Use of clean slabs	The slabs/work surfaces for extraction of the maw were not clean and mostly comprised of dirty rough wooden surfaces.
Use of Personal Protective gears	Aprons were notably seen being worn by very few of the actors that were extracting the maw. No other protective gears were seen.
Practice of good hygiene	Good hygienic practices such as cleaning and sanitizing, personal hygiene and food hygiene were not being observed
2. Processing of the maw	
Use of clean utensils and equipment	In most cases utensils used were not adequately cleaned. This raises the potential for transmission of germs that cause maw spoilage and reduction in its quality
Use of clean drying surfaces	Some of the maw were dried on rusted racks and on iron roofs of

	houses
Use of recommended preservatives (if any)	Some of the operators reported use of salt as a preservative (not observed). They thought the salt improves the white color and stiffness of the maw in an effort to imitate the effect of the chemical used by the Chinese processors
Use of proper packaging materials and methods	Polyethene bags and buckets were used for packaging fresh maw. Gunny bags, boxes and polyethene bags were used for packaging dry maw
Use of Personal Protective Equipment (PPE)	No use of PPE was observed
Well-designed processing facility	Tables placed outside and home verandahs were used for maw extraction and processing. The sticks used for holding maw are made of wood. Although there are some drying racks, they are of poor quality and where they are not enough, maw is dried directly on dirty iron roofs.
Existence of qualified staff	No trained staff in maw business. It is mainly owners of business, women and in some cases children who are involved. Some employ 1-2 casual workers
3. Transportation and marketing	
Use of clean containers/equipment for transportation	The maws were transported in handbags packaged in polyethene and buckets
Use of proper transportation and marketing channels	The maws are transported by the maw trader using local transport means such as vehicles, motor cycle/boda boda, public taxis and buses
Ability to meet market and regulatory requirements for both local, regional and international markets	Failure to meet regulatory requirements is due to poor handling practices and lack of access to appropriate materials, equipment and infrastructure for processing and marketing quality maws. This is exacerbated by the fact that they are able to sell the maw regardless of the poor hygienic conditions

This implies that hygiene is compromised and there are no proper standard operating procedures in carrying out maw extraction and processing. Poor infrastructure, lack of awareness and enforcement of hygiene requirements by the relevant authorities are responsible for the deplorable hygiene conditions especially in the artisanal sector.

More targeted interventions to fishing crew, extractors, collectors and traders may be necessary to improve the handling in artisanal sector to avoid potential bursts or spoilage of maw before extraction. These interventions will focus on handling of maw and fish, proper temperature time control to avoid fish spoilages, ensuring cold chain for extracted maw; and improving the condition in artisanal processing of maw. When maw is spoilt due to hygiene issues it changes color and texture which is downgraded to low priced grades.

The other type of maw processors is the factories which are exclusively operated by the Chinese maw exporters (**See Annex B1 and B2**). The factories receive maw from two different sources; fish processing factories and their own middle men and agents. The chain for the maw received from fish factories begins with the collection of fish by factory suppliers who take fish to the factory. In the factory the maw is extracted, cleaned and either chilled or frozen depending on the market. The chilled maw is then transported to the maw processing factories, whereas frozen maw is subsequently exported. The maw received from middle men and agents is weighed and processed in the same way as that received from fish factories. At the maw processing factory, maw is cleaned using portable water and stripped off the fat. A chemical (not disclosed by the maw processors) that is considered to be a preservative is added to make the maws appear whiter and stiffer. The maws are turned inside out and a wooden/glass finger-like stick inserted inside to maintain their (maw) shapes during drying. The maws still on holding sticks are put on the racks and sundried for 2-3 days or longer during the rains. After drying, the maws are weighed and sorted according to sizes; packaged in gunny bags. They are then transported in vans by road transport to Nairobi or Entebbe International airport for export to Hong Kong and China.

Factory maw processing is undertaken as a small cottage industry (with daily maw production ranging between 180-300 Kg of maw) basically made of open yard area designated for cleaning/fat removal, washing, sorting and stitching, stretching on finger-like wood/glass/plastic sticks, drying and packing. Locally, most operating yards are located in residential compounds with no basic infrastructure and facilities such as cleanable floors, drainage systems, cold rooms, ice and others. The factory maw processors employ between 20 and 50 people depending on the size of operation. All factory maw processors are registered by the Ministries responsible for Fisheries Management and pay operating licenses and taxes in accordance to the National Legislations. The hygiene practices such as use of protective gears like aprons, gumboots and headgear are not observed in majority maw factories. They are different from artisanal maw processors because are registered to operate as maw factories. The majority of maw factories are owned by Chinese with the exception of a few especially in Tanzania that operate in partnership with Tanzanians.

3.3 Key players in the maw value chain and the different maw products

3.3.1 Different players in the Nile perch maw value chain and their roles

The players in the maw value chain are diverse and include: fishing crew and fish guards, boat and fishing gear owners, fish factory agents, local fish traders, maw extractors, maw collectors, cold chain service providers, middlemen, maw factory agents, artisanal maw processors, maw factory owners and exporters (Table 2). Fish inspectors also play a key role in the maw value chain with respect to safety and quality of maw. The roles of players in the value chain are indicated in **Table 2** below.

Table 2: Players along the Nile perch maw value chain and their roles

Actor category	Role
Fishing crew	Carry out fishing and sometimes extract maw when on a fishing expedition, sell the maw to extractors or maw collectors at the landing site.
Fish guards	Fish guards (one per boat) enforce proper fishing practices during fishing. They accompany the fishing crew in the boats to supervise compliance with fishing practices on behalf of the boat owner. They are paid by the boat owners
Boat and fishing gear owners	Facilitate the fishing crew to harvest fish. Sell maw from fish rejected by factory agents or sold to the local market to maw extractor or maw collector.
Fish factory agent	Buys whole fish containing maw from boat and gear owners; and sells the fish with their maw to the fish factories
Local fish trader	Buys whole fish and fish from which maw has been removed and sells to the local market. Extracts the maw from some of the fish and sells to maw collectors, middlemen or maw factory agents.
Maw extractor	Removes maw from fish and sells to maw collectors, middlemen or maw factory agents, maw factories or (in case of fish processors they) exports directly to the International market
Maw collector	Buys maws from fishing crew members, extractors at the landing site, homes, hotels, markets and sells to middlemen or maw factory agents.
Cold Chain Service Provider	• Supplies ice to boat owners who sell fish to traders that supply fish from which maw is removed to the local market • Provides cold storage for fish from which maw has been removed that is supplied to the local market • Extract maw from some of the fish brought by the local traders for cold storage and give the maw back to the fish owners
Middlemen	Buys maw (fresh and dried) from extractors, maw collectors, artisanal processors and sell to factory maw agents or maw factories.
Maw Factory agent	Buys from middlemen and maw collectors and sells to the maw processing factories
Artisanal maw processors	Buys maw from collectors, processes it by sun drying and sells to middlemen, maw factory agents and/or maw factories Do not export maw
Maw factory processor and exporter	• Buys fresh maw, processes it by sun drying and export. • Buys dry maw from artisanal processors and exports it.
Fish inspectors	Promote use of good hygiene practices during maw handling, and enforce compliance with license and maw size requirements.

3.3.1.1 The fishing crew

In Tanzania there are two categories of crew (also called wajeshi in Tanzania) – those who set camp on the islands located several miles away from the main land landing sites to access productive fishing grounds, who are usually 3-4 days on the fishing mission, and those who fish in the nearby fishing grounds, spending 3-4 hours fishing before returning to the mainland landing site. Most of the fishing crew members (57%) were aged between 31 and 40 years. Majority (71%) of crew attained primary level education. All of them are males. They operate in groups of three along with the supervisor (fish guard) and work for boat and gear owners who finance their fishing missions.

In cases where fish crew members camp at the islands, they land with about 3-4 maws extracted from fish consumed during the fishing mission. The maws are sold to the maw extractors and/or collectors on landing. Apart from a few rejects, all the fish landed is sold to the factories with their maws.

In Uganda, the fish crew (called barias in Uganda) sometimes extracts maws during the fishing expedition. Most of the crew members (75%) are youth in the age range of 21-30 years. About half of the crew had primary level. They work in a pair per boat, sometimes including a turn boy (also called Shadiya) who helps with the fishing. Some of the crew members occasionally extract maws on the lake and throw the fish from which maw is removed into the lake. These maws are sold by the crew undetected by their bosses. They hide the maw either in the boots, trousers, jacket, and pants or under hats. The hidden maw is sold to maw traders or maw agents at the landing site. As a consequence of this behavior, the crew members live in fear of being caught and prosecuted, their maws being confiscated or sold at a price lower than the value. There is also concern among many crew members regarding the prices of fish received from fish factory agents. The prices of fish have remained low yet the prices of maw are going up. It is almost unanimous among crew members for maw to be considered a separate product by government, different from fish. The crew members believe this could enable them also to accrue benefits from maw trade.

3.3.1.2 Boat and fishing gear owners

Some boat and gear owners are crew members and fish suppliers to the factories (fish factory agents). In addition, they sell maw extracted from fish rejects. Some of the boat and gear owners, own their fish landing beaches which they are constructed on privately owned land or obtained through lease. In Tanzania, on some of such beaches, maw traders collaborate with owner to inspect all boats and determine fish with large maws landed. Fish with larger maws are spotted and bought at a price higher than offered at the fish factory. Otherwise the major role of boat and gear owners in the maw chain is to provide raw material to fish factories which extract and sell maw.

In Uganda, fish is selectively sold by boat and gear owners, with fish below 4 kg sold to the fish factories; whereas that of 5kg and above sold to the local fish traders who extract maws. The fishing crew, boat and gear owners have not benefited from the increased prices of maw got from fish supplied to factories. This is because factories require them to supply whole fish containing maw. The prices of fish offered by factories to their suppliers never change according to maw demand.

The majority of boat and gear owners in Tanzania were older than 35 years, whereas for Uganda and Kenya, they were over 31 years. Most boat owners operate as individual business people not registered as companies. All boat owners interviewed were of primary level education. Majority of them were males aged between 40 and 50 years.

3.3.1.3 Cold chain service providers

Fish traders who supply the local market need cold chain services to enable them preserve fish as they wait to accumulate enough quantities for marketing. Some of the fish is delivered at the cold rooms with their maws. The cold rooms have spaces where maw can be removed and given back to the traders before the fish is stored in the cold rooms. The cold room operators have licenses to provide cold chain services but not for extraction of maw. The extraction of the maw by these operators is illegal and it is perpetuated by weak enforcement. In Tanzania, according to the Fisheries Regulations of 2009 issued under the Fisheries Act of 2003, nobody is allowed to deal in fish or fish and fishery products without the required license.

The maws are sold to the collectors and traders in the neighborhoods. The operators of cold chain also produce ice which is procured by the maw traders to keep the maws fresh.

Although some fish is delivered at the cold room facility with the maw for extraction, most of the fish (approx. 85%) brought by the local fish trader for preservation are received without their maws.

3.3.1.4 Maw traders

Detailed information on maw trade was obtained in Tanzania. A total of 20 maw traders including extractors and collectors were interviewed 12 of whom were exclusively running a maw business. Most (75%) of them were in the age group of 41-50. Two thirds of these (66.7%) had only attained the primary level of education; a quarter (25%) had O-level education and others (8%) had no any formal education. The males were 75% and females 25%. Those that operated as individuals were 66.7% and as group/team/company were 33.3%. In the three countries of Uganda, Kenya and Tanzania three distinct categories of maw traders were identifiable along the value chain.

(i) Maw extractors and collectors

Extractors remove maw from the fish brought by clients whose fish is for consumption or sale. They also buy maw in small quantities from crew members, boat owners and other community members. In Tanzania, some maw extractors have an operating license. In this category there are also small maw collectors who buy maw from fishers or maw extractors at the landing sites. Some of these operate as itinerant traders who buy from homes. They operate small working capital and hence they can only trade in small quantity of maws. Sometimes their working capital is provided by maw traders who cannot give them a lot of money out of fear of misuse. The majority of "home to home" maw collectors does not have an operating license and therefore considered to be operating illegally. These traders do not weigh or measure maw using any scientific criteria but rather estimate the sizes based on length.

(ii) Maw traders who buy from extractors and collectors

These are mainly agents of middlemen who collect maws for factory agents or regional traders. They employ 2-3 people who keep the collection center open all day and work till late in night with female constituting 50%. They are given capital by the middlemen to assist in maw collection, but some operate independently. They operate collection centers which are basically one room located conveniently near landing sites and markets where maw is extracted or collected. They have digital balances for weighing the maw. They do not have cold chain facilities of their own but rather rely on cold storage organized by the middle men to whom they sell maw. All the fresh maws bought each day is taken to the storage facilities.

(iii) Middlemen of maw factories or regional traders

These are locals who collect maw on behalf of factory agents and/or regional exporters. They may invest their own capital for collecting maw in larger quantities. They may also receive some capital from the factory agents and regional traders. They also devise several strategies such as working with small traders mentioned in (ii) above to open up buying centres in localities where maw extraction and collection takes place. They also deploy maw extractors at landing sites and "home to home" itinerant maw collectors to maximize maw quantities. They operate cold chain facilities for receiving fresh maw. They receive daily maw collections from all the buying centres in the neighborhoods for preservation. Then the collected maws are sold directly to factories or through the factory agents. Alternatively, they can export to the region through a licensed regional exporter. They have work force ranging between 3-10 workers 50% of whom are females.

(iv) Maw factory agents or regional exporters

These work in collaboration with trusted middlemen whom they give working capital to source for maw to keep the factories operational. The majority of workers are women with the ratio of men to women being 1-2 to 8-9 (or approximately 90% women). They also operate maw handling facilities for receiving maw from all the middlemen and individual traders. The major players in the processing and export of maw are Chinese companies. The Chinese maw processors offer cash to trusted agents in Uganda, Tanzania and Kenya to look for maw. There is stiff competition for maw in Uganda because of large number of maw processors. Therefore factory agents in Uganda seek partnership with traders in the region to bring the quantities of maws. Given that the maw trade in the region is not fully formalized, Ugandan agents have deployed their proxies – who are Ugandans entering in informal partnerships with Kenyans and Tanzanians to collect maw. In Tanzania, factory agents work with middlemen located in the regional cities such as Bukoba, Musoma and Mwanza to obtain the required quantities. Likewise the Ugandan agents work through a licensed regional exporter who has middle men operating in those cities. However, there are some Ugandan agents (number not established) who work with middle men in Tanzania to smuggle maw into Uganda.

The most important market for maw according to Tanzanian traders is Uganda. The only licensed regional exporter of maw from Tanzania to Uganda is Shafik who operates in Bukoba. The major traders of Maw in Uganda are listed in **Annex A.**

Most of the maws traders are interlinked and do not necessarily obtain the maw from one source. Most middlemen and factory agents operate as family businesses or companies. Whereas maw extractors, collectors and traders; largely run their businesses individually.

3.3.1.5 Fish suppliers/fish factory agent

The fish suppliers sell fish with maws to factories or extract maw and sell the fish to the local market. They either supply directly to the factories or indirectly as sub-agents of the fish factory agents. In all the three countries, all the fish sold to the factory must contain maw. Until recently, a directive issued by the DiFR in February 2018, fish factories used to give back maw to suppliers of fish in Uganda. They employ 3-20 workers majority of whom (90%) are women working as casual workers. The casual laborers are mainly employed as cleaners with a few (1-2) working as supervisors. Then the suppliers would look for market for the maw after selling the fish. Most fish suppliers complain of low or stagnant prices of fish yet maw prices continue to increase. This is why some of the fish suppliers/factory agents prefer to sell fish to the local market where they are able to extract maw before sale.

3.3.1.6 Maw Processors

There are three types of maw processors who include the fish factory processor who extracts maw, maw factory processors and artisanal maw processors.

i) Fish factory maw processor

Fish factories extract, clean and sell maw which they consider as by products. They sell the maw to maw processing factories located in Mwanza in Tanzania or Uganda.

Some fish processors export frozen maw (see Table 4) which makes up for almost half (45%) of the maws exported. They employ 10-20 workers, 95% of whom are women. Women work as casual laborers and are involved in cleaning of maw. One to two among the workers are involved as supervisors.

ii) Artisanal Maw Processor

The artisanal processors buy maw from collectors at the landing sites, remove fat, clean, repair/or mend the damaged ones, process by drying and sell to middlemen or agents of maw exporters in Tanzania or Uganda. These are mainly men of aged above 30 years. They run their businesses individually sometimes with assistance of family members.

iii) Maw factory processors/ Exporters

The maw factories process and export mainly to China. They process fresh maws sourced from fish factories, maw factory agents or maw suppliers. The Chinese factory operators have financial partnerships based on trust with the local maw suppliers. This has led to the Chinese maw processing factories contracting several maw agents to supply them with maws. These processing companies prefer to employ women in all sections of the industry; from cleaning to, turning the maw inside out, stitching, drying and packaging. Majority of women (90%) serve as casual laborers. Few women work as supervisors.

In most maw businesses in Kenya, Uganda and Tanzania most maw traders where not educated or have acquired low education. For instance in Tanzania the wages for unskilled workers fall are 5000-10000Tshs per day ($2.2-4.4) and for skilled workers 10,000-20,000Tshs ($4.4-8.7). In Uganda the unskilled workers are paid 5000- 10,000 daily ($1.3-2.7) and for skilled 10,000-12,000 per day $2.7-3); irrespective of whether male or female. In Tanzania more than 95% of maw traders were either primary level or no education at all. In Uganda 85% of the maw traders had either Primary or Ordinary (Secondary) level of education. In Kenya the few that were interviewed had primary education. This was true for both women and men.

In Uganda there are twenty one (21) recognized maw export companies which are included in **Annex B1.** In Tanzania, there are ten (10) Chinese maw processors/exporters that operate maw drying facilities in Mwanza. They are listed in **Annex B2**

Of all these ten companies, only five are approved. Maw imports into Uganda are charged a duty of 6% with exception of those which are in transit. Some of the maw traders in Tanzania export through Uganda. This is attributed to the perceived limited bureaucracies affecting maw trade, processing and export in Uganda. This is combined with the method of determining legal maw sizes reported in grams in Uganda as opposed to length in Tanzania. It was also reported that the

Chinese exporters in Tanzania regrade the maw in grades different from the categories they buy the maw.

Based on the study, overall it is estimated that there is a total of 1,473 maw business operators in the riparian countries of Lake Victoria. These comprise of 557 extractors (240 in Uganda, 33 in Kenya, 284 in Tanzania); 557 collectors (240 in Uganda, 33 in Kenya, 284 in Tanzania); 278 middlemen (120 in Uganda, 16 in Kenya, 142 in Tanzania); 50 agents of Chinese Factories (17 in Uganda and 33 in Tanzania) and 31 Maw exporters (20 in Uganda and 11 in Tanzania). The Ugandan agents also operate in Kenya because there are no Chinese maw factories in Kisumu. A total of about 2,651 people work as employees in the maw value chain in the riparian countries of Lake Victoria. Of these 1,349 people are employed in maw businesses in Uganda, 62 in Kenya, and 1,240 in Tanzania. About 90-95 % of them are women. They earn all together approximately USD 2.41 Million per annum. They constitute skilled labor (USD 0.35million) and unskilled labor (USD Million 1.79.

3.3.2 Maw supply and marketing channels

Uganda plays a central role in the regional trade of maw. Most of the maws produced in Kenya are exported through Uganda. Conversely, most of the maws produced in Tanzania are directly exported to Hong Kong, China and Japan; although some of the companies export through Uganda (Figure 1-3). The supply and marketing channels for maw in Uganda, Tanzania and Kenya are represented in the Figures **1-3.**

3.3.3 Nile perch maw products

The main Nile perch maw products in East Africa include: dried, fresh and frozen fish maws.

The products are graded according to the weight. There is variation in the grading systems of maws in Uganda, Kenya and Tanzania. The grading is not uniform among the traders within the different countries. **Table 3** represents grades that were reported by some of the maw traders in the respective countries.

Table 3: Grades of Maw traded in Kenya, Uganda and Tanzania

Country	Serial No.	Grade	Weight(g)	Grade	Weight (g)
		Fresh Maw		**Dry Maw**	
Tanzania					
	1	Chips	<14 (illegal)		
	2	Small (1)	14-34	Small	4-12
	3	Small (2)	35-49	medium	12-60
	4	Medium Small	50-99	large	60-200
	5	Medium large	100-199	Extra large	>200
		Large	200-1000		

	6	Extra large	>1000		
Uganda					
	1	Small (1)	11 - 49	Small	5-10
	2	Small (2)	50-99	Medium	11-59
	3	Medium (1)	100-199	Large	60-199
	4	Medium (2)	200-399	Extra large	200 and above
	5	Large	400-599		
	6	Extra large	600-999		
	7	Kilo	1000		
Kenya*					
	1	Small	<20		
	2	Medium	20-35		
	3	Large	>35		

**Values as obtained from maw collector as used in purchasing of maw at landing site from extractors*

Based on measurements done by the maw collectors and extractors at the landing site the grading system in Kenya differs from that of Uganda and Tanzania. However according to the Standard Media of Kenya; https://www.standardmedia.co.ke/business/article/2000145525/the-mysterious-fish-body-part-making-fishermen-filthy-rich; the grading of maw in Kenya in 2014 was as follows: Small 100-200g, Medium 201-400g, large 401-600g, Extra-large 601-999g, 1 kilogram, 2 Kilograms.

Based on research done in Tanzania the acceptable maw size obtained from legal fish sizes of 50-85cm ranges from 14 to 27cm. The legal Nile perch size of 50-85cm has been provided for in the fishing regulations of the three riparian countries if East Africa.

The maws from fish of the same weight may vary in size. The maw size depends on the source of fish from which it is harvested. Maws extracted from fish in deeper parts of Lake Victoria are known to be thicker and firmer in texture as compared to those from Kyoga. The best Nile perch maws in Uganda are found in fish from Lake Albert.

3.4 Quantity and overall value of Nile perch maw traded, processed and exported through different market channels

It is reported that more than two (2) tons of Nile perch maw are processed and exported from maw factories in Tanzania on daily basis. Aside from China, Uganda is the main regional importer of maw from Tanzania and Kenya. The quantity of maw imported legally from Tanzania at Mutukula border is reported to vary between 30kg and 300Kg per day. However, there is a large quantity of maw that is illegal, unreported and unregulated (IUU) coming into Uganda. Illegal exports for maw impounded in Bukoba by the fisheries and revenue offices

totaled 600 Kg of maw within a few months of operation. The maw is smuggled in small quantities by travelers in buses plying Mwanza-Kampala routes.

It is reported that more of the maw is smuggled through the lake by fishermen and maw traders. It was also reported that fish is being smuggled to Uganda to remove maw. The formal exports of maw from Tanzania for 2017 are shown in the table 4 below. More maws are exported in dried form, and fetch more money than wet maw. The weight ratio of dried maw to wet maw in the exports is 0.54, while the ratio of earning from dry maw in exports is 0.64, meaning that exporting dry maw is more beneficial to the dealers than exporting wet maw. However, most of the royalties come from fresh maw. The royalties charged on fresh fish (0.42 USD per Kg) is higher compared to dry Nile perch product (USD 1.8).

Table 4: Quantity and value of fish maw exported from Tanzania in 2017

Name of maw product	Quantity (Tonnes)	Value (USD)	Value (Tsh)	Royalty (Tsh)	Royalty (USD)
Dried fish maws	403.7	27,274,132.52	61,076,392,130.70	423,717,612.67	185,573.9
Fresh fish maws	0.130	2,850.00	6,391,546.00	263,000.00	115.2
Frozen fish maws	339.7	15,131,315.00	33,914,000,063.98	629,985,078.15	275,912
Total	**743.6**	**42,408,297.52**	**94,996,783,740.68**	**1,053,965,690.82**	**461,601**

Source: Directorate of Fisheries in Ministry of Livestock and Fisheries Tanzania (June 2018)

In 2016 maws worth US$ 31.5 million were exported from Uganda (Table 5) The earnings from maw have been relatively stable between year 2010 and 2015, with a slight decrease in 2016. The decrease may be perhaps attributed formalization of trade majorly in Tanzania hence reducing the quantity of maw entering Uganda. Current figures for maw export are not available but it is estimated by DiFR to be over US$ 40 million

The quantities and value of fish and maw exported from Uganda in period between 2010 and 2016 are presented in the table **5 below**.

Table 5: Quantity and value of fish and fish maw exported from Uganda as of 2017

	Fish		Fish Maws	
YEAR	**QUANTITY (Tonnes)**	**VALUE (USD)**	**QUANTITY (Tonnes)**	**VALUE (USD)**
2010	16,697.91	86,016,910	-	-
2011	15,714.31	87,776,350	**41.14**	**840,480**
2012	18,248.27	88,293,230	**88.29**	**3,077,480**
2013	16,995.50	89,390,810	**329.42**	**24,502,060**
2014	14,221.48	86,035,530	**507.82**	**35,449,150**
2015	16,709.11	86,363,350	**491.55**	**27,441,000**
2016	14,569.57	79,462,090	**352.24**	**31,573,230**

Source: Directorate of Fisheries Resources, MAAIF, Uganda

Kenya exports annually 63 tons of maws worth US$ 5.6 million to China mainly through Uganda. It is also reported that a lot of maws are smuggled from Kenya to Uganda as illegal, unreported and unregulated (IUU).

3.5 Trade and investment, quality and safety aspects of the fish maw

3.5.1 Business profitability and opportunities in maw processing and trade

The estimates of annual volumes of maw traded by different actors in the maw value chain computed for Tanzania and Uganda are given **in table 6**. Most of the maws traded are handled by the Middle men, Agents, Fish Factories and Maw Factories who handle large quantities. Maw businesses are a profitable venture to all actors in the chain. Opportunities for investment in maw businesses are perceived to exist at various stages of the maw chain by traders (41.7%). Maw traders can earn more money when working as agents for maw factory processors because factories provide working capital with no security, mortgages or guarantees. There is also opportunity for small maw traders, collectors and extractors to upgrade to middlemen and agents of the Chinese if they obtain the necessary infrastructure and skill for better handling maw. These traders need to improve their facilities to ensure quality maw demanded by the Chinese. This can be achieved through training in proper handling of maw, providing them with business skills and assistance to improve their maw handling facilities. Artisanal maw processing is currently considered by most actors as a tedious activity with marginal profits. The maw exporters require dried maw to be of golden yellow color, with no damage, low moisture content (20%) and right predetermined sizes (small, medium, large, extra-large). Failure to meet these requirements leads to low prices. One has to be familiar with the processing techniques for maw yet some of the inputs used in preservation such as neutral saline solution and others (not disclosed by Chinese processors). However, drying of the maw offers opportunity to actors who are able adopt better handling and processing techniques that produce maw of quality needed by Chinese. Such

processors could be supported with skills and finances to develop appropriate infrastructure and techniques required to produce better quality maw.

Currently the maw value chain is dominated by the Chinese and Indians who take up a great share of the price benefits. There are opportunities for middle men, agents and artisanal processors to export both in the region and China. However, for this to happen, these maw value chain actors have to be supported with relevant market information. Middlemen and agents who are interested in exporting maw to China should be assisted to establish business to business contact with buyers in China. Taxation policies and procedures for acquiring export licenses have to be made favorable to such traders. The licensing, taxation and regulatory regimes for maw trade should be streamlined to offer incentives to such traders.

In China, it is understood that some of the maws exported are transformed into value added products. It is important therefore to explore opportunities for transforming maw into the value added products within the region; in order to stop exportation of raw materials which denies the local economies associated jobs and revenues. Governments should therefore interest investors with the right technologies and resources to manufacture final products derived from maw in the region. These products include: maw tonic, soups, maw collagens such as isinglass, low cholesterol and high protein nutritious products, maw-derived products used in manufacture of plane and space shuttle body and car parts, Surgical stitching threads, Melamine plates and cups, Anesthetic drugs, Aphrodisiac drugs use to increase libido and others; which are applied in medical, health, nutrition and manufacturing sectors.

Table 6: Annual Estimated volume of maw traded by the actors in the value chain

Category of maw actors in value chain	**Annual volume of maw traded in Kg (Tanzania)**	**Annual volume of maw traded in Kg (Uganda)**
Maw extractor	156 – 4,382	230-1,920
Collectors	156 – 1,252	96-1,440
Maw traders who buy from maw extractors and collectors	3,130-18,780	432-1440
Middlemen of the factory agents and regional traders	31,300	1440-2880
Factory agents or regional maw exporters	31,300 -36,000	5,760-14,000
Fish factory processor	62,600-75,120	57,600-86,400

Source: Computed from data obtained from interview with respondents

3.5.2 Prices and profit margins of the different maw products supplied through different channels

The prices of maw are determined by the weight, shape, freshness, thickness, colour, quantity supplied and market demand. The main driving quality attributes in East Africa for fresh maw are:

- weight, where maw has to be in known weight categories
- shape which is affected by bursts before extraction from fish or damages during extraction
- and color.

A quality fresh maw has a whitish color as opposed to brownish off-white color for spoilt maw. Fresh maws of wrong shapes and color have their prices reduced. The common practice is to buy the spoilt maw at a price of lower weight category. However, depending on the extent of quality loss, the price of spoilt maws can go down 10 times the price of quality maw of same weight. The same applies to dried maw. Better quality dry maw is golden yellowish in color. It must have a finger-like shape, better texture and properly dried with 20%w/w water content. If the maws do not meet these characteristics, they will have their prices reduced. As it is the case for fresh maw, the low quality dry maw can be bought at prices for lower weight category. However depending on the level of quality loss, the prices for maw can go 10 times lower than the price of quality maw with same weight.

Some middlemen have indicated cases where fresh spoilt maws are rejected by Chinese Processors. When very low prices are offered or fresh maw are rejected; the middlemen dry them and sell to the Chinese at much improved prices than would be offered while fresh. Whereas fresh spoilt maws are sometimes rejected, dry maws irrespective of level of quality loss are normally bought by Chinese; but at negotiated reduced prices than quality maw. There are different weight categories/grades for dried maw and fresh maw with different pricing schemes **(see Tables 7a and 7b below)**

In Uganda, the maw supplied through the artisanal supply chain is graded in two categories. Those handled properly and treated as it is done in factories are categorized as factory maw (better quality), whereas those which are improperly and unhygienic ally handled are considered as artisanal maw grade. At the maw factory the prices offered for factory maw grade differ from those offered for artisanal maw grade. This means that quality plays a big role in determination of prices and market for maw. The maw received from the fish factories are automatically recognized as factory maw grade. The prices of the different maw products in the respective grades are shown in the **Tables 7a and b** below;

Table 7a: Price for the different grades of dried maw in Uganda

		Artisanal grade		Factory grade	
Product	**Dry Maw Weight range (g)**	**Prices per kg (UGX)**	**Prices per kg (USD)**	**Prices per kg (UGX)**	**Prices per kg (USD)**
Small	5-11	90,000	24.1	250,000	66.9
Medium	11-59	180,000	48.2	400,000	107.0
Large	60-199	300,000	80.3	600,000	160.5
Extra large	200 and above	500,000	133.8	700,000	187.3

Table 7b: Price for the different grades of fresh maw in Uganda

			Artisanal grade		Factory grade	
Product		**Fresh Maw Weight range (g)**	**Prices per kg (UGX)**	**Prices per kg (USD)**	**Prices per kg (UGX)**	**Prices per kg (USD)**
Small		11 - 50	100,000	26.8	200,000	53.5
Medium		50-100	300,000	80.3	400,000	107.0
Large		100-199	400,000	107.0	500,000	133.8
Extra large		200-400	500,000	133.8	600,000	160.5
		400-600	600,000	160.5	700,000	187.3
		600-999	700,000	187.3	800,000	214.0
		1000	800,000	214.0	900,000	240.8

Source: General Prices of local and factory grade maws (UFTA) June 2018

Artisanal extractors of maw sell fresh maw as pieces at prices in the range 1000- 20,000 Uganda shillings, this corresponds to maw weight ranging 14 – 200g.

The prices of fresh maws at any given landing site in Uganda differ and range between 90,000-1,000,000 shillings per kilogram (Table 8). Even though maw factories have agents who can also work with middle men, all traders irrespective of categories can sell directly to Chinese maw processors. The maw processors negotiate with all kinds of maw suppliers the prices (not disclosed) depending on the amount and quality of maw.

Table 8: Prices of fresh maw among different operators in the value chain in Uganda

		Extractors and collectors		*Traders who buy from extractors and collectors*		*Middlemen/Factory agents*	
Category	**Weight(g)**	**Price/kg (UGX)**	**Price/ kg (USD)**	**Price /kg(UGX)**	**Price/kg (USD)**	**Price/kg (UGX)**	**Price/kg (USD)**
Small	15-49	-		100,000-140,000	26.7-37.4	140,000-200,000	37.4-53.5
Medium 1	50-99	170,000-200,000	45.5-53.5	230,000	61.5	250,000-400,000	66.9-106.9
Medium 2	100-199	300,000	80.2	330,000	88.3	350,000-500,000	93.6-133.7
Large	200-399	400,000	106.9	430,000	115.0	450,000-650,000	120.4-173.9
Extra large	400-699	500,000	133.7	-		550,000-800,000	147.1-213.9
Kilo	700- 1000	600,000	160.5	-		900,000-1,000,000	240.7-267.5

Source: Interviews with different value chain actors

Similarly in Tanzania, there is increase in prices and profit margins of maw as you move from one stage of the value chain to another as indicated in **table 9** below;

Table 9: Prices and profits margins along the fresh maw value chain in Tanzania

Category	**Weight (g)**	*Extractors and collectors*		*Traders who buy from extractors and collectors*		*Middlemen of factory agents and regional exporter*		*Factory agents or regional maw exporters*	
		Price/Kg (Tsh)	**Price/Kg (USD)**	**Price/Kg (Tsh)**	**Price/Kg (USD)**	**Price/Kg (Tsh)**	**Price/ kg (USD**	**Price/Kg (Tsh)**	**Price/ Kg (USD)**
Sale prices for maw as reported by different respondents per Kg of maw									
Small	35-49	40,000-70,000	17.45-30.6	60,000-80,000	26.2-34.9	-	-	275,000	120.3
Medium	50-99	120,000-160,000	52.5-69.9	100,000-150,000	43.7-65.6	110,000	48.1	312,500	136.8
Medium-large	100-199	200,000-250,000	87.5-109.4	120,000-200,000	52.5-87.5	160,000	69.9	400,000	174.9
Large	200-1000	250,000 - 300,000	109.4-131.2	180,000-300,000	78.7-131.2	200,000	87.5	462,500	202.3

Purchase prices as reported by different respondents per kg of maw*									
Small	35-49	40, 000-100,000	17.4-43.7	40,000-100,000	17.5-43.7	-	-	-	
Medium	50-99	150,000	65.6	150,000	65.6	-	-	-	-
Medium-large	100-199	-	-	150,000	65.6	-	-	-	-
Profits* margin		8000-20,000	3.5-8.7	2000-30,000	0.9-13.1	10,000	4.4	15,000	6.6

Source: Averaged Values as reported by respondents

Note: Profits not calculated as difference between sale prices and purchase prices shown in the table but as profits earned per Kg reported by the different respondents.*

The maw prices in Kenya are given in Table 10. The categorization (grading) of maws in Kenya is different from that in Uganda and Tanzania. However, when price of maw of same weight are compared, it is clear that the maws are cheaper in Kenya than Tanzania and Uganda in that order. For instance a maw of weight 100-199g in Uganda (table 7a); 100-199 in Tanzania (Table 9) and that of 100-200 in Kenya (Table 10) costs USD 66.9-106, USD 69.9 and USD 39.7 to the middlemen in Uganda, Tanzania and Kenya respectively.

Table 10: Prices of maw in Kenya

Category	**Weight(g)**	***Extractors and collectors***	
		Price/Kg	**Price/kg (USD)**
Small	100-200	4000	39.7
Medium	201-400	6000	59.5
Large	401-600	9000	89.3
Extra large	601-999	16000	158.7
1 kg	1000	27000	267.9
2kg	2000	45000	446.4

Source: Interviews and key informants

3.5.3 Costs incurred by the business actors in maw value chain

The expenses incurred by the maw business operators in descending order of items are: raw materials, infrastructure and equipment, labour, transport, licenses and taxes, rent, energy for lighting and chilling, ice for maintaining cold chain, water, packaging and marketing. The total costs incurred, quantity of maw handled and turnover for maw businesses of selected maw traders and processors in Tanzania are shown in **Table 11**. Overall the ratio of costs to turnover is higher as one moves from upstream to downstream from extractors and collectors to factory operators. This implies that the upstream actors have low profit as compared to their counterparts in the downstream stages of the maw value chain

Table 11: Costs incurred, quantity of maw handled and turnover for maw traders and processors in Tanzania*

Category of maw actors in value chain	**Amount of maw handled per day (kg)	**Business Turn over per month		**Total costs of production per month (Tsh)	
		(Tsh)	(USD)	(Tsh)	(USD)
Maw extractor	0.5-14	955,000-1,000,000-	437.6	16,200-163,000	7.1-71.3
Collectors	0.5-4	50,000-450,000	21.9- 196.8	30,000-450,000	13.1-196.8
Maw traders who buy from maw extractors and collectors	10-60	300,000-10,000,000	131.2 -4373.8	124,200-14,320,001	54.3-6262.9
Middlemen of the factory agents and regional traders	100	5,000,000-60,000,000	2186.9-26,241.8	261, 000-3,023,333	114.2-1322.3
Factory agents or regional maw exporters	100	30,000,000	13,120.9	4,030,000	1,762.6
Fish factory processor	200-240	27,000,000-32,400,000	11,808.7-14,170.4	20,100,000 mainly incurred on fish fillet with the cost incurred on maw reported to be far less than 10%	8,790.9

*Source: Respondents interviewed; Note: *Data only obtained from Tanzania; Note: **Figures reported as ranges of the actual values (lowest –highest) as obtained from respondents*

Few traders and processors (10%) incur expenses on marketing. Routinely, expenses are incurred mainly on transport when looking for buyers of maw, and when seeking partnerships and information relating to maw businesses. However the costs on marketing are far lower compared to costs incurred on other items. Most maw business actors (70%) incur cost on transportation of maw, hence making transport a common cost item among maw chain actors. Many actors (60%) operating legally, also incur costs on paying taxes (collection license, local tax, income and cooperate taxes and export royalty and others). Some actors (55%) allocate resources to comply with quality and regulatory requirements such as registration, inspection and certification fees.

In Kenya, they have not yet put into place requirements to trade in maw; all one has to do is to obtain a fish and fishery products handling license. Likewise in Uganda, maw traders are

required to obtain either an artisanal or factory license depending on the scale of operation. In Tanzania actors are required to obtain local collection license, trading license, permits for handling fish and export licenses. In addition they will need to obtain other permits such as occupational and health certificates. An overview of required documents, legal requirements and licenses and cost imposed to maw operators in the three countries is presented in table 12 below.

3.5.4 Financing and funding opportunities for maw businesses

Most of the maw business operators are linked to a hierarchy of chain actors that have access to the Chinese cash advanced to the maw factory agents. They are advanced money by maw factory operators who seek assurance from the agents to keep the factories running with adequate raw material. The factory agents finance operations of middlemen and this extends to the buyers of maw; from maw collectors and extractors. For these categories of actors funding maw businesses is not of major concern. However, there are independent maw collectors, extractors and artisanal processors who are financially constrained. Therefore, these may seek financing opportunities from sources such as banks and Savings and Credit Cooperative Organizations (SACCOs) which are not convenient to maw business due to high interest rates and short pay-back periods. They also indicate that the maw businesses are considered to be volatile by credit organizations, hence limited access to funding. By working in groups these operators can access other friendly sources of finance; or increase their financial base to be able to obtain loans from credit giving institutions.

The situation for some of the maw traders is aggravated by lack of regional export license which is cumbersome to obtain; with several approvals and permits required from different authorities. These require resources and time that most operators cannot afford and hence end up operating illegally and underground. These operators would need awareness on the process for obtaining the license and training on the requirements for different approvals and permits required to obtain a license. Lack of legal basis for their businesses undermines their capacity to access financing from formal lenders such as banks and therefore addressing the above would increase their access to financing.

The level of financial resources required to operate small maw businesses such as for extractors, collectors, artisanal maw processors and small traders is not so high. Therefore most actors in this category finance their own businesses. Based on information obtained from Tanzania, a maw extractor and collector require 30,000Tshs ($13) to set up the maw business covering procurement of maw and associated items such as knife and extraction stamp. Traders who buy from collectors and extractors require 2,000,000 Tshs ($875) to pay license, buy maw and associated items such as rent, ice, packaging materials and transport. In Uganda it is estimated at 70,000-100,000 UGX ($18.7 -26.7) for maw extractor and collector, and Traders who buy from collectors and extractors 5,000,000 -10,000,000UGX ($1336 – 2674); while in

Kenya maw extractors and collectors require 7000-12000Ks ($69-$119). The maw business does not require large capital; therefore they are estimated 1,114 extractors and collectors distributed at various landing sites in Uganda, Kenya and Tanzania which has created competition. The relatively low capital investment has continued to attract more traders who buy from extractors and collectors; as opposed to middle men and maw factory agents.

There are also opportunities to innovatively manufacture some of the inputs, equipment and facilities used in processing of maw such as drying sticks, preservatives, drying racks and packaging materials. This creates backward linkages for maw industry that are important for job creation and promoting use of locally available materials.

3.5.5 Gender perspectives of the maw business

Men and women play different roles in the maw businesses. Women are preferred to work in maw processing companies as they are considered to be trustworthy, patient, good at cleaning and more reliable by most maw business operators.

Women are not competitive as maw traders/collectors where they need to keep their collection centers open till late hours. Some have indicated they cannot withstand the smell associated with maw. As for access to financing opportunities, both men and women have equal chances. Likewise women and men have same level of education. Positions and wages for personnel employed in businesses at all stages in the chain for women and men do not differ.

3.5.6 Quality and safety aspects of maw businesses

The major market requirement is the weight of the maws which must fall in the legal grades starting from small size of 14g to extra-large (over 1kg). Small maws are not preferred and fetch low profit. The major non-compliance experienced by businesses is dealing in maw of low weight which is purported to come from undersized fish; and lack of operating licenses. Quality of maw is affected when maw bursts inside the fish before removal or damages during extraction. The maw quality is also affected if cleaning is not done adequately to remove excess fat on the outside and underside of the maw, and by holding of the maw outside of the cold chain for longer periods before sale which accelerate spoilage. Spoilage of maw due to microbial attacks affects the texture and color of the maw. Therefore inadequate icing or freezing affects maw quality and acceptability. Maw is also affected by moisture content. Better quality dry maws are those containing water content up to 20% weight by weight (w/w). The practice of holding maws in water as preservation method could affect maw quality, especially if water is not properly squeezed out during cleaning or if drying time is not adjusted to ensure water content is reduced to the required level. The East African market for maw demands for fresh maws with minimal damages/tears. Non-compliance normally results into reduced price offered by the maw buyers or rejection. Maws of low weight are normally

confiscated by the fisheries enforcement since they are considered to have been obtained from fish of illegal sizes.

The common quality challenges along the maw value chains include:

- Damaging of maw during extraction if care is not taken to properly remove it from fish. This is common when the extractors are not skilled
- Throwing around the fish from which maw is to be extracted which may result into bursting of maw
- Deterioration of the fish due to delays in fishing processes which affects the quality of maws.
- Holding fresh maw for longer period without refrigeration or icing.
- Keeping maw in unhygienic polythene bags by itinerant maw collectors and placing maw in direct contact with soiled and unclean surfaces while weighing which affects safety and quality.
- Lack of appropriate facilities for proper extraction and handling of maw at landing site which accelerates spoilage
- Lack appropriate equipment and facilities for maw handling and processing by artisanal maw processors
- Intermittent power cut offs during storage in the freezers or cold rooms and insufficient use of ice which results in spoilage of the maw
- The Chinese market require undamaged maw, of certain weight grades, of golden yellow color, 20% water content, and in good texture. To obtain maw products of such characteristics require implementation of good hygiene practices (GHPs) good manufacturing practices (GMPs), and Sanitation Standard Operating Procedures as well process specification standards which are currently missing.

3.6 Existing regulatory and enforcement mechanisms for Nile perch maw production and trade

3.6.1 Relevant laws and existing regulatory frameworks for maw trade in Tanzania

The main law used to control maw extraction and trade is the Fisheries Regulation No. 13 of 2009 issued under the Fisheries Act of 2003. This gives powers to the Fisheries Enforcement Officials to regulate production and sell of Fish and Fishery Products. It does not specify the production and sell of maw. It provides for export fees and royalties for different fish and fishery products. It also provides for the different movement permits for fish and fishery products. It requires that only Nile perch of sizes between 50 and 85cm is allowed for fishing, but does not specify sizes for maw.

Maw business operators acknowledge the need to comply with the law which requires them to possess fishing, processing or fish and fishery products trade or export license. They also understand the need to comply with requirement to catch Nile perch of right sizes (50cm-85cm length); and trading in maw of acceptable sizes ranging from 15 to 26 cm length. However, there is already a contentious issue regarding the determination of maw obtained from the right sized fish. Most traders argue that weight of maw, as opposed to length, is the appropriate measure to determine whether maw has come from the fish of right size. They argue that in practice some small fish may have larger maw and vice-versa. This issue has been researched by Tanzania Fisheries Research Institute and findings indicated a better correlation between length of maw and fish. They indicate in their report higher level of variances between the weight of maw and length of fish. Based on this research finding, enforcement guideline that recognized maw of size 15-26cm as the accepted maw for trade that corresponds with the legal size of fish (50-85cm) allowed for under Regulation 45 (3) of the Fisheries Regulations of 2009 has been issued and in effect. The guideline is legal given that the Director for Fisheries is empowered to issue them under Article 4 (3) of The Fish Act 2003.

Tanzania has heightened operation to enforce the above requirements through operation code named "Operation Save Sangara (Nile perch)" The Maw traders or processors found operating without licenses and/or in possession of maws of the unacceptable sizes are heavily penalized.

Also maw trading businesses who were supplying regional traders from Uganda were closed because they did not have export licenses. This also affected the maw extractors and collectors who were linked to middlemen that supplied those regional traders. The enforcement of the maw size requirement has created a challenge to artisanal maw traders and processors; because they have to prove to enforcement that the fish from which maw was removed is of appropriate sizes, yet enforcement officials believe that all small maws come from illegal sized fish. This prompted most maw businesses especially those who are linked to regional market to operate underground. Although the impacts on economy of pushing these businesses to operate underground are not well established, they might be significant given the loss in government revenue through license, permits and taxes avoided.

Compliance with the regulation on license is a challenge too for small maw traders in Tanzania. The extractors and collectors complain about the heavy charges for the license which are issued under the Article 22 of the Fisheries Act of 2003. The article prohibits any collection, gathering, processing, manufacturing, selling, marketing, importing or exporting fish and fishery products without a license in respect of such activity. The middlemen, factory agents and fish processing factories complain of heavy charges for licenses ranging between Tsh. 200,000 – 1,000,000 (USD 88-438), different categories of taxes charged by Tanzania Revenue Authority, and the tedious procedures for accessing export licenses. The following are some of the licenses required;

i. Business License from local government
ii. Trading License from Ministry of Industry and Trade (export certificate)
iii. License for fishing or dealing in fish or fish products (fish maws) issued by local government fisheries office
iv. Fish and Fishery Product Export License issued by Ministry of Livestock and Fisheries (required under the Regulation 12 of the Fisheries Regulation of 2009)

To start a fish and fishery products business, an application form to the trade officer at the district endorsed by the district executive officer, health officer and town planning officer is submitted. The applicant is required to obtain TIN and tax clearance from TRA. Then the applicant must obtain a fish/maw collection license from the local fisheries office. To acquire an export license, one must have already obtained a general trading license. To export fish or fishery products, one has to request the fisheries officer for a fish/fishery products export license. Each product has its own specific export license. The application form for the fishery export license has to be brought to Zonal Fish Control Laboratory (in Mwanza) for ascertaining the minimum requirements for handling of fish and fishery products. Then the application is sent to Dodoma for consideration of license by the Ministry of Livestock and Fisheries. All exporters have to pay export royalties for the different products in accordance with the fisheries regulations. This is in addition to the taxes that are already paid at the district where maw is collected.

3.6.2 Relevant laws and existing regulatory frameworks for maw trade in Uganda

The Fish (Fisheries and Aquaculture) Quality Assurance Rules, 2017 is the law used to control maw extraction and trade. The rules stipulate the handling and processing condition for fish and fishery products including maw. The new rules provide for approval of fish maw processors and exporters and determine the cost of licenses for the different maw operators. The license fees for factory maw processors were revised this year (2018) to 3 million Uganda shillings per annum. The artisanal maw processors pay 500,000/=. There seems not to be a clear policy to govern how the license fees for other categories of maw value chain actors. For instance a fish trader who is at the same time a maw extractor pays 50,000/= Boat owners who is maw trader pay 150,000/= and it is not clear whether the license is issued in respect of maw or fish business.

The rules also provide for control of movement, export and import of fish and fishery products including the maw. The maw processors were given a one year grace period to set up proper system and comply with requirements of the law. The competent authority is undertaking regular inspection of the maw factories. They are also certifying all exports of maw. UPDF Fisheries Protection Team searches every boat which comes to the mainland for both undersized fish and small maw suspected to have been removed from undersized fish.

The Directorate of Fisheries Resources (DiFR) inspects all fish and fishery products including the maw at all cross-border points. There are fisheries border point inspectors at Entebbe, Busia, Katuna, Mutukula, Elegu, and Malaba who inspect all fish products including maws.

There is a levy charged on each kg of fish maw exported from Uganda. Imported maws declared as in transit are not taxed, but those imported to be processed in Uganda pay an import duty of 0.06% of the value declared. Factories which import maws across the border for processing in Uganda are granted authority per consignment. For instance one of the fish factories imports frozen Nile perch maws from Kisumu, Kenya; and has an MoU with a Chinese maw processing factory to process the maw and the fish factory exports them.

There is a lot of maw smuggling from Tanzania using luggage bags in passenger buses and through Kasensero landing site in Kyotera District due to the porous nature of the border. The Ugandan traders have Tanzanian partners who aid in the movement of fresh maws transported smuggled from Tanzania. Cross-border trade of maw from Tanzania to Uganda is dominated by fresh maw. This is attributed to enforcement policies in Tanzania that make this it difficult for Ugandan traders to undertake artisanal processing; hence dry maw is not commonly traded.

Maw traders in Tanzania complain of unclear enforcement modalities of maw related regulations in Uganda. There are incidences where traders' maws are impounded regardless of paying taxes at the points of entry. The revenue and enforcement system at the border has been infiltrated by imposters making them to pay taxes sometimes to conmen. Traders complain that the Fisheries licenses are not recognized by the UPDF enforcement teams. Even when maw is extracted from the right sized fish and the trader has trading license, the maws are confiscated. There is fear among the maw traders regarding the role of UPDF in fisheries related enforcement, and hence do not report these cases directly to UPDF. Such information is passed on to DiFR but operators do not have trust that DiFR can rein on UPDF.

3.6.3 Relevant laws and existing regulatory frameworks for maw trade in Kenya

Kenya is revising the fisheries laws to include the control of maw trade because the existing regulations do not cover specifically, the maw. The regulations once developed will among others set standards to control the processing, quality and safety of fish maws. The government intends to legalize the trading of maws extracted from fish of right size in order to improve the business atmosphere. Currently, maw is covered under the existing fish and fishery product regulations; hence there is not any licensing mechanism specific to maw. There is also no enforcement system for maw. People are free to come in and buy and export maw to the region without any interferences.

3.6.4 Overview of Enforcement activities related to maw trade in Uganda, Kenya and Tanzania

There are no uniform regulatory requirements, procedures and enforcement mechanisms for maw trade in Uganda, Kenya and Tanzania (Table 12). For example, anyone dealing in maw of 600grams and above in Tanzania is prosecuted by law and yet in Uganda and Kenya one can trade in whatever maw size is available. Licensing requirements; license fees; royalties and duties; procedures for trading in maw; and procedures for enforcement of maw trade requirements among others, vary in the three countries. Table 12 gives the overview of the regulatory mechanisms for maw trade in the three countries

Table 12: Overview of the regulatory mechanisms for maw trade in the Uganda, Tanzania and Kenya

Regulatory Requirements	**Uganda**	**Tanzania**	**Kenya**
License	Only specific license for maw factory processors and artisanal processors stipulated. Other operators can obtain single license for handling all fish and fishery products (maw, fish trade, fishing etc.)	Specific maw collection, trade or processing license required for all actors in chain (dry, fresh and frozen maw considered different products hence requiring separate licenses) Export license required even for regional exporters	A general license for fish and fishery products handling required
License fees	Maw factory processor 3,000,000Ush. (USD 800) Artisanal maw processor 500,000 Ush. (USD 133) Other categories range from 50,000 Ush. (USD 13) – 150,000 Ush. (USD 40)	License fees ranging from 200,000 Tsh (USD 88) for extractors and collectors to 1,000, 000 Tsh (USD 438) for agents, middlemen, and regional traders	Not obtained
Royalties	Import duty of 0.06% of value of the maw charged (4000-5000UGX.) per kg of maw imports to be	Royalties of up to 1,600 Tsh per Kg resulting in 6,000,000 Tsh (USD 2626) per annum for Regional exporter and	Not obtained

	processed in Uganda. Processed or frozen maw for export (not processed in Uganda) exempted this duty	far more for exporters to Far East charged as 0.05% on value of exported batches	
Procedures for trading in fish maw	General fish and fishery trading license for small scale maw traders (but not keenly enforced); permit and export license for large maw processors and exporters	Business License from local authorities; Trading License from district trade office, license for trading in fish from district fisheries office, Maw export license issued by Ministry of Fisheries. keenly enforced and all must comply	General fish and fishery trading license for small scale maw traders (but not keenly enforced); permit and export license for large maw processors and exporters
Enforcement procedures	UPDF inspects all boats landing for presence of small maw purported to have been removed from undersized fish. Any violation results in confiscation of the product	Operation Save Sangara, ongoing, any violation is fined according to the penalties stipulated under the section 46 and 47 of the Fisheries Act of 2003. Factories are charged over 200Million Tsh. (USD87,660) Middle men (15Million Tsh (USD 6574) and Extractors and Collectors 1 Million Tsh. (USD 438)	No enforcement activities are going on regarding the maw trade
Clarity of laws relating to maw trade	The Fish (Quality Assurance) Rules cover the maw processing and trade but address mainly artisanal large scale processors and factory processors. It establishes different license fees paid by different actors in the chain. Maw size is used	Although the Fisheries Act of 2003 and Fisheries Regulations of 2009 recognize maw among fish and fishery products and there is not specific regulation for maw trade, the provisions in the law are clear regarding what actors need to do, for	The Fisheries (Safety of fish, Fishery Product and Fish Feed) Regulation, 2007 and Fisheries Regulation 15 (1) of 1991 issued under the Fisheries Act of 1989 as amended 1991 requires

	to enforce fishing laws yet this is not covered in the relevant law. There is ambiguity regarding what size is acceptable for trade and as such UPDF confiscates products when actors feel they are acting legally	which they understand. The maw products accepted for trade, licenses requirements and fines charged when there is a violation; are all clear in law	traders of fish to obtain the permit from competent authority to place fishery products on market; and trading license for fish trade. This is being revised to cater for maw. At the moment maw are treated among fish and fishery products; and it is not clear by law whether maw traders require trading license given that the law talks about fish trade
Other enforcement related issues	Fresh maw importers complain of impostors who pose as Uganda Revenue Officials at Borders who fleece them when paying for import duties. Regional importers complain of corruption by fisheries enforcement	Tanzania outlawed regional traders and maw processors. The regional traders are arrested. They also complain of cheating by counterparts in Tanzania who connive with the Tanzania law enforcement to corruptly impound their consignments	The regional maw traders have no enforcement activities related to maw and regional traders work freely in Kenya

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Maw trade is a growing business in the East African countries. The high demand for maw in China and other Far East countries such as Japan holds promise for future growth of income for fish dependent communities, national revenues from fishery products, and employment opportunities. The maw business in East Africa, which is centered mainly on the Chinese Export companies based in Uganda and Tanzania, has increased prospects for operators of fish factories. The fish processing companies have experienced growth in profitability of their businesses due to added revenue from maw emanating from ever increasing international demand and prices of maw. This is in addition to normal profits accrued from fishery products such as fish fillets. The maw business has also increased the prospects for maw traders, middlemen linked to/and few trusted agents of Chinese operated maw processing and export companies. In the process of searching for maw to supply to Chinese companies, the agents have created a lucrative artisanal maw trade sector. This has established business linkages cascading from the middlemen based in towns to the small extractors and itinerant maw collectors based at the landing sites and villages.

However, the benefits accruing from increased international and regional demand for maw, as well as the related price surges have not trickled to the traditional mainstream actors in the fish supply chain including fishing crew, boat owners, fish suppliers and agents of the fish factories. This is because of the requirements by the factories in Tanzania and Kenya, and recent directive in Uganda; that all fish have to be supplied with their maw to the fish factories. Most fish suppliers still complain of stagnating or ever reducing prices offered by fish factories despite the ever increasing prices of maw in the artisanal maw supply chain. This has led to suspicion among operators in the upstream side of fish chain of existence of conspiracy and curtail among fish factory processors and relevant government officials to reap from their (fisheries chain actors) effort.

Considering the growing maw trade in East Africa, the existing physical and quality infrastructure in the entire maw chain is too weak to support and sustain production of world quality maw export products. From the maw extraction stamps/tables/slabs at the landing sites, to the maw collection room/bench, artisanal and factory processors; great investments are needed to improve facilities and quality management practices in order to produce quality maw. This should include promoting use of appropriate techniques, equipment and practices in production of maw. Development and implementation of necessary policies, regulations and standards are required to support production of maw of world export quality.

The lack of maw standards regarding good hygiene practices (GHPs), good manufacturing practices (GMPs), sanitation standard operating procedures (SSOPs) as well as processes specifications for production of better quality maw, impacts local traders and processors who lose financial value due to quality loss.

The preference to employ women in cleaning, stitching, drying and packing of maw by large scale maw traders and processors provides opportunities for women employment since they are trusted to handle highly valued and priced products. Although there are no gender disparities in the wages offered by maw operators to women and men employees (ranging USD 2.2 - 4.4 for unskilled labor; and USD 4.4-8.8 for skilled labor) in Tanzania and USD 1.3-2.7 for unskilled and USD 2.7-3 in Uganda; seem not to match with the good revenues obtained from maw. Also apart from a few youth involved in extraction and collection of maw at landing sites and homes, which are considered menial tasks with little returns, most maw businesses are run or employ mature individuals. This may taint the contribution made by the growing maw business to the growing challenge of youth unemployment in the region. The youth need to be encouraged to explore business and employment opportunities in the maw processing and trade.

The maw businesses are profitable across board. However, some specific roles such as being agents of Chinese-run maw factories are considered to offer far better opportunities for business growth to traders. This is because of the heavy capitalization that agents receive from Chinese in form of advance loans that are not secured by any security, mortgage or guarantees. Artisanal processing of maw is more viable and profitable if the right equipment and techniques and skills are used to produce a product that approximates the quality of those produced by Chinese run factories. Some of the maw businesses especially those operated by the artisanal maw processors and traders that supply the middlemen, who are not linked to funding provided by Chinese maw processors, lack friendly sources of finance to capitalize their businesses. By working in groups these operators can access other friendly sources of finance; or increase their financial base to be able to obtain loans from credit giving institutions.

The fishing regulations and those related to licensing of handling, processing, export and importation of fish and fishery products (including maw) are the main requirements enforced by the relevant authorities in the region. However, the manner in which these are enforced impacts the maw trading business negatively and may lead to loss of government revenue as well. The operations of many chain actors are considered by authorities as illegal or illegitimate. These businesses have resorted to operate underground. Some have ended up engaging in smuggling of maw across borders to tap into increasing prices in the region. Trading of maw should be streamlined by harmonizing trade regulations to enable regional traders to source maw in all countries without any hindrance, maw licenses should be affordable to small scale operators such as maw extractors, collectors and traders.

4.2 Recommendations

In order to optimize benefits from the maw trade and processing businesses in the region

1. A mechanism should be devised to rationalize the benefits accruing from increasing prices of maw so that benefits can trickle down to all maw and fish chain actors instead of benefiting only Indian and Chinese nationals. Such mechanisms include: recognizing maw as a tradable product separate from fish; developing a maw trade regulation requiring fish factories to return maw to fish suppliers if they cannot pay for it; streamlining the licensing of maw trade to include the lower actors in the value chain; increasing awareness among lower chain actors such as fishing crew, boat owners, fish suppliers and agents regarding the value of maw; and imparting skills to the lower chain actors on proper handling of maw. To achieve these, the Governments should work with relevant partners and stakeholders to undertake these measures:
    - Conduct study to understand the requirements for maw trade in the Far East Asia and the East African region
    - Governments working through LVFO to urgently develop a maw trade regulation requiring fish factories to return maw to fish suppliers if they cannot pay for it
    - Work with the National Export Promotion Bodies to support locals in the EAC to Export Maw Directly to the Far East
    - Encourage regulators, researchers, fish factories and actors in fish and maw chains to segregate maw data from other products
    - Specify and strengthen maw licensing and maw trading procedures to ensure that all players in the value chains get their fair share through a maw trade regulation
    - Develop the capacity of maw chain actors by providing them with training in business skills and maw handling, processing, storage and marketing skills
    - Sensitize regulators regarding conduct of maw businesses at all stages in the value chains and provide them with training on effective regulatory activities rated to maws trade.
2. There is need to exploit employment opportunities, especially for the youth and women, available in maw processing and trade by Fisheries related associations, organizations dealing with quality, leading maw processing companies, donors, relevant government ministries, departments and agencies (MDAs) and training institutions:

- Encouraging the youth to get involved in maw businesses such as extraction, collection and trade which do not require larger capital yet profitable
- Training the youth to establish and run legal and registered maw businesses
- Encouraging small scale maw traders and artisanal processors who do not have access to finance capital from the Chinese maw exporters to form groups; provide them with skills for financing and credit access; and guide them on the sources of finance required to expand and sustain their maw businesses
- Providing support to existing businesses to access proper equipment including setting up initiatives to assist them in developing some of the equipment and infrastructure themselves

3. Investments are required to establish the quality infrastructure for maw extraction, handling, processing and trade by developing and implementing the necessary policies, regulations and standards to produce and trade maw of world export quality. This can be achieved by:
    - Regional governments working through LVFO developing policy and legal framework that stipulate players, their roles and linkages along the maw value chain
    - Governments working with partners undertaking a survey to determine the numbers of maw businesses and their status along the value chain to inform regulatory activities
    - Governments urgently developing specific maw regulations and harmonizing them in the region to properly guide the extraction, processing and trade of maw
    - Fisheries related associations, organizations dealing with quality, leading maw processing companies, donors, relevant government ministries, departments and agencies (MDAs) food safety and quality experts and training institutions training the actors in the supply chain on the quality standards and how to implement requirements of the regulations
    - Government requiring the private sector to install facilities and implement practices that comply with minimum standards as set out in the relevant government regulations.
    - Government working with partners and food safety and quality experts through LVFO developing guidelines to promote food safety practices in the extraction, handling, processing, packaging and transportation of maw by:
        ✓ Urgently developing guidelines to guide maw traders on the legal sizes, areas allowed for extraction and conditions for extraction, handling and processing of maw in the chain
        ✓ Developing and harmonizing products and process standards for maw in the EAC
        ✓ Developing harmonized good hygiene practices, good handling practices and sanitary standard operating procedures for maw during extraction, processing, transportation and marketing of maw for the region
    - Government working with development partners, NGOs, and associations sensitizing operators and policy makers on food safety management at all stage in the maw value chain
    - Implementing food safety and quality controls in maw value chain by the private sector and competent authorities
4. There is need for governments, development partners and stakeholders to encourage, promote and support the use of appropriate techniques, equipment and practices in extraction, processing, transportation, storage and marketing of maw by all value chain actors. This will be achieved by:
    - Sensitizing the maw operators to ensure cold chain throughout the chain for maw by use of ice during handling and transportation of fresh maw by maw extractors, collectors and traders; and refrigeration to store fresh maw by traders, middlemen and agents
    - Promote establishment of the necessary physical infrastructure in the maw value chain by encouraging extractors, collectors, and artisanal processors to use appropriate facilities, equipment and materials such as use of potable water, cleanable tables for extraction, and

ice cool boxes for transporting maw, better drying racks by artisanal processors, observance of hygiene and use of protective gears. Some of the small operators could be guided and supported by development partners to install the basic infrastructure to enable them to produce and handle safe and quality maw

- Governments should require all the maw factories to install appropriate facilities and equipment required for production of safe and quality maw

5. As the maw trade continues to increase in the region; there is a danger for overfishing of Nile perch to satisfy the demand for maw. If nothing is done to control the level of fishing, this could result in collapse of Nile perch Fishery and hence reduced maw supply from the region. Responsible regional bodies such as LVFO should therefore work with governments and development partners to undertake measures to ensure sustainability of Nile perch resource and maw supply. More importantly there is need for responsible government departments and agencies working through the LVFO to continuously monitor to determine and mitigate the likely impacts that the maw trade may have on the sustainability of fisheries resource. These objectives are to be achieved using the following measures:

    - Undertake studies on relationship between fish maw size and fish size in relation to acceptable slot sizes for fish net
    - Conducting a socio-economic impact studies on fish maw trade
    - Strengthening and enforcing slot size regulation to ensure fishing of legal sized fish
    - Determining the upper allowable inches for gillnets that catch legal sized fish
    - Strengthening acquisition and management of data by the Nile Perch value chain actors
    - Exploring the possibility of using other fish sources apart from Nile perch from capture fishery by conducting research on reproductive biology of Nile perch and the necessary conditions for growth in aquaculture culture conditions; and use of fish maw from other fish species
    - Conduct research on different types of maw obtained from different ecological environments
    - Promote investments in the manufacture of maw value added products
    - Conduct research to produce inputs for maw value chain operations using locally available materials such as drying sticks, drying racks, preservatives and packaging materials

ANNEXES

ANNEX A: Major Traders of Maw in Uganda

S/NO.	COMPANY	PHONE/E-MAIL CONTACT
1.	Bisoboka Enterprise Ltd	Tel +256 775372087 Tel +256 753915556
2.	Allied Fish And Fish maw Traders	Tel +256 702486817
3.	Graben Holdings Limited	Tel +256 772600625 ekasumba@yahoo.com
4.	Entebbe Soccer Academy (EsaFushing)	Tel +256 750332227 mimiph84@gmail.com
5.	Nasariki Investments Ltd	Tel +256 752454700
6.	Nabukeera Gertrude	Tel +256 759456451
7.	Yiga Joseph	
8.	Barise Fishers Limited	Tel +256 751611913
9.	Kairugavu Siraji	
10.	Byakatonda Charles	Tel +256 754221922
11.	Faith Ventures And General Investments Ltd	Tel +256 753977788 Tel +256 772599880
12	Daniel Namulanda	Tel +256 794869417
13	Mugerwa Fred	Tel +256 776046973 Tel +256 753406973
14	Excellent Venture Company Limited	Tel +256 774595132
15	Kingdom Fighters General Investments Ltd	Tel +256 753790774
16	Ask International Limited	Tel +256 753343055 askinternational2013@gmail.com
17	*Mulinzi Freedom	Tel +256 753912577

ANNEX B1: Exporters of Maw from Uganda

S/NO.	COMPANY	ADDRESS
1.	Karmic Foods Limited	Tel +256 393261046
2.	Ngege Limited	
3.	Lake Bounty Limited	Tel +256 756631903
4.	Byansi Fisheries Ltd	
5.	*Iftra Uganda Limited	
6.	Mpongo Limited	
7.	Peng Lida International Limited	
8.	Fresh Perch Uganda Limited	
9.	Green Fields Uganda Limited	
10.	Mingda International Import and Export LTD	
11.	*Yong Qiang Sea Food Trade LTD	Tel +256 755666688
12	Lusango Real	Tel +256 794869417
13	Kitebi Enterprizes (U) Ltd	Tel +256 772629998 Tel +256 752629998
14	Xuri	
15	Hongli Zhonghua Company Limited	Tel +256 793868722
16	*Rong Zhang (U) Ltd	Tel +256 794078323
17	Aqua Perch Limited	
18	OSI International Company Limited	Tel +256 756138168
19	E.A Bladder	Tel +256 777094188
20	Run Fa Company Limited	Tel +256 701507666
21	*Wiest Ast (U) Ltd	Tel +256 756282688

ANNEX B2: Exporters of Maw from Tanzania

S/NO.	COMPANY	ADDRESS	LOCATION
1.	Zhen-hua Company Ltd	P.O. Box 1623 Mwanza +255 758 885 777	Nyakato Buzuruga street – Nyamagana Municipal, Mwanza, Tanzania
2.	Nata Fishing Maws	P.O. Box Mwanza +255 788 999 909	Mlango mmoja street– Nyamagana Municipal, Mwanza, Tanzania
3.	Win Ink Home Co. Ltd	P.O. Box 1800 Mwanza johnson666lee@gmail.com +255 713 369098/ +255 752 332213	Plot No. 1486; *Block* Rumara Street- Ilemela Municipal, Mwanza, Tanzania
4.	Sunshine Sea Food Ltd	P.O. Box 639 Mwanza +255 785 422898/752 847412	Nyakato Ind. Area street – Nyamagana Municipal, Mwanza, Tanzania
5.	Weish A.S.T. (T) Ltd (Hang Fung Co. Ltd)	P.O. Box 2011 Mwanza Weishoust.leo@gmail.com +255 764 772112/745 178816	Sabasaba Street- Pasiansi, Ilemela Municipal, Mwanza, Tanzania
6.	Dayaxu (T) Ltd	P.O. Box 6175 Mwanza tzmy257925@163.com +255 756 775 888/764 257 925	Plot No. 25; Block E. Kiseke Street, Ilemela Municipal, Mwanza, Tanzania
7.	Honglin International Trade Development Company Ltd	P.O. Box 6222 Mwanza linfang.chao@163.com +255 684 131 978/ 627 845 606	Plot No. 005/036; Iloganzala, Pasiansi Ilemela Municipal, Mwanza, Tanzania
8.	Rong Zheng (T) Ltd	P.O. Box 720 Mwanza rongzhengtz@gmail.com +255 786 222 212/ 754 476590	Plot No. 41; Block A Bwiru Area - Ilemela Municipal, Mwanza, Tanzania
9.	Tongfu Trading Ltd	P.O. Box 2592 Mwanza tongfutrading@gmail.com +255 745 686999/745 688 668	Plot No. 19; Block .M. Sabasaba Street- Pasiansi, Ilemela Municipal, Mwanza, Tanzania
10.	Dong Brothers Co. Ltd	P.O. Box 1623 Mwanza sosli88@yahoo.com +255 768 843 934/766 797 653	Plot No. 12; Block .A. Nyasaka, Ilemela Municipal, Mwanza, Tanzania
11.	F & F Group Co. Ltd	P.O. Box 14112 DAR ES SALAAM ffgroup04@gmail.com +255 715 707514/713 296665/763 976001	PPF House Plot No. 507; Block .A. Kiseke B Street, Ilemela Municipal, Mwanza, Tanzania

ANNEX C1: List of people met or contacted in Uganda during the Maw Value Chain Study

S.N	Institution/Location	Names	Position/Role	Contacts
1	Federation of Fisheries Organizations Uganda (FFOU)	Ezra Kanyana	President	0701-158174/0744-158174 kanyanaezra@gmail.com
2	Uganda Fish Maw Association – UFTA	Matovu Richard	Chairman	0752-646161
3	Uganda Fisheries and Fish Conservation Association (UFFCA)	Kamuturaki Seremos	Executive Director	0414-573317 0772-474228/0703-936612 kamuturakiseremos@ufca-ug.org kamuturakiseremos@gmail.com
4	Directorate of Fisheries Resources (Entebbe)	Edward Rukunya	Acting Director	0772-413279 0700-148275 edwardrukunya@yahoo.com
5	Directorate of Fisheries (Entebbe)	Jimmy Atyang	Principal Fisheries Inspector	0773-922204 jimmyatyang@yahoo.com
6	Directorate of Fisheries (Entebbe	Julius Ogwal	Principal Fisheries Inspector	0779-311230
7	Directorate of Fisheries (Entebbe)	Alfred Akwankwasa	Head Fisheries Inspection Unit	0772-335225 alkalfredie@gmail.com
8	Kigungu Fish Landing Site-Wakiso District	Bakaaki Robert.	Former BMU Chairman	0752-946978/ 0779-071184
9	Mutukula Border	*Simon Imongit* *Isa Yalu*	Border Fisheries Inspector Trainee Fisheries Inspector	0786-376755/0700-827500 0771-632366/ 0704-328934
10	Karmic Foods Limited	Satish	Factory Manager	-
11	Kiyindi Fish Landing Site – Buikwe District	James Katali James Kafuba	District Fisheries Officer Fisheries	0772-587760 0772-668001

			Inspector	
12	Kasensero Fish Landing Site – Kyotera District	Joseph Bwanika Jonah Rusoke	District Fisheries Officer Fisheries Inspector	0778-814263 0772-896155/ 0701-895154
13	IFTRA Uganda Limited	P.Raveendran	G.M Finance Quality Manager	0782-154456
14	Ddimo Fish Landing Site-Masaka District	Gesa Zam Namusoke Raffik	District Fisheries Inspector Fisheries Inspector Landing site Assistant	0701-663896 0701-994067 0775-848133
15	Association of Fishers and Lake Users of Uganda (AFALU)	Godfrey Seyonga	Chairman	0752-943582
16	Uganda Fish Processors And Exporters Association (UFPEA)	Ovia Katiti William Tibyasa	Executive Director Officer	0704-631058 0701-520077
17	Kalangala District Local Gorvernment Fisheries Department	Jack W. Mbareeba	Senior Fisheries Officer	0772-641356 0752-641356
18	Nakataba Landing Site, Kalangala District	Mike	Fish Supplier operating from Nakataba Landing Site in Kalangala	-
19	Kananansi Landing Site, Kalangala District	Bosco Nansera	Fish supplier operating at Kananansi landing site	-
20	Kyagalanyi Landing Site, Kalangala District	Bernard Banadda	Fish supplier operating at Kyagalanyi landing site	-
21	Fisheries office based at Nakataba Landing Site in Kalangala District	Fred Ntale	Fish inspector at Nakataba Landing Site	0750-619558

ANNEX C2: List of people met in Tanzania during the Value Chain Study

S. N	Institution/Location	Names	Position/Role	Contacts
1	Department of Fisheries in Kagera Zone	Gabriel Mageni	Officer in Charge, Fisheries Resource Protection	+255 75 4248375 +255 713 248 375 magenigabriel@yahoo.co.uk
2	Department of Aquaculture in Kagera Region	Mercedes Kaigalura	Officer in Charge Aquaculture, Kagera Zone	+255 763 364 433
3	Kagera Fisheries Limited (Bukoba)/Omega Fish Ltd (Mwanza)	Amin Hassanali	Propriator Kagera Fisheries Ltd/Omega Fish Ltd and Chair Tanzania Fish Processors and Exporters Association	+255 754 44 33 22
4	National Fish Quality Control Laboratory (NFQCL) Nyegezi, Ministry of Livestock and Fisheries	Emmanuel M. Mondoka	Principle Fish Quality Inspector	+255 28 2550025 + 255 754 830 827 +255 786 830 827 mondoka@yahoo.com
5	National Fish Quality Control Laboratory (NFQCL) Nyegezi, Ministry of Livestock and Fisheries	Stephen Lukanga	Head of NFQCL and Officer in Charge of Fisheries in Lake Victoria Zone	+255 754 437 234 +255 715 437 234 salukanga@gmail.com/salukanga@gmail.com
6	National Fish Quality Control Laboratory (NFQCL) Nyegezi	Frank Fijelu	Fisheries Inspector	+255 753 327 919 frankfijelu@gmail.com
7	Mwanza City Council Fisheries Office	Kenedy Michael Kilimisa	Mwanza City Council Fisheries Officer (Nyamagana	+255 784 366 155 +255 655 819 217 kennytz@yahoo.co.uk

			Division)	
8	Tanzania Fisheries Research Institute (TAFIRI) Centre, Mwanza	Magreth Musiba	Ag. Centre Director	+255 754 363 314 musibam@yahoo.com
9	Mwanza City Council Fisheries Office	*Makuke Makuke*	Mwanza City Council Fisheries Officer (Illemela Division) in Charge Igombe and kayenze Landing Sites	-
10	Nile Perch Fisheries Limited, Mwanza	Rupesh Mohan	General Manager	+255 28 2570327 +255 784 887 487 rupesh@nileperchfisheries.com
11	Fisheries Department in Mara Region (Musoma)	Alli Mzee Said	Officer in Charge – Fisheries Resource Protection – Mara region	+255 758 845 870 +255 784 205 557 Allimzeesaid91@yahoo.com
12	Fisheries Department in Mara Region (Musoma)	Hamad Stima	Officer in Charge – Fish Quality Control, Standards and Marketing – Mara Region	+255 784 499 059 +255 769 735 022 stimahj@yahoo.com
13	Musoma Fish Processors Ltd	George Y. Fernandez	General Manager	+255 684 319 373
14	Fisheries Department in Mara Region (Musoma)	Yamungu Ngendu	Fish Inspector/Fisheries Officer	+255 764 481 232 Ngenda.jean@gmail.com

ANNEX C3: List of people met in Kenya during the Maw Value Chain Study

S.N	Institution/Location	Names	Position/Role	Contacts
1	Department of Fisheries in Kisumu	Dr. Christine Akoth	Assistant Director Kisumu Fisheries Departments	-
2	Department of Fisheries in Kisumu	Dr. Stanley Tonui	Fish inspector	+254 724 266 857 stanleykipdawn@gmail.com
3	Wiclum BMU management committee, Kisumu	Peter Were Ojuru	Member	-
4	Wiclum BMU management committee, Kisumu	Samson Otieno Onsier	Member	-
5	Wiclum BMU management committee, Kisumu	Samora Machel Abibi	Member	-
6	Wiclum BMU management committee, Kisumu	Mariko Otumbo Onyango	Member	-

ANNEX D: Terms of Reference

Background of the assignment

GIZ is implementing the Global Program on Sustainable Fishery and Aquaculture in four countries (Mauritania, Malawi, Madagascar, and Uganda). The overall objective of the program is to ensure food security and to reduce poverty by increasing fish supply and income. The Global Program is part of the special initiative "One World-No Hunger" (SEWOH) of the German Federal Ministry for Economic Cooperation and Development (BMZ). It concentrates on three main areas of activity: Improvement of the artisanal fisheries leading to better access to fisheries products and employment opportunities, promotion of sustainable fisheries and reduction of illegal, unreported and unregulated (IUU) fishing. Target groups are vulnerable households and communities, artisanal fishers and small- and medium sized enterprises in the fishery sector. Additional stakeholders are ministries responsible for fisheries management, fishing organizations, associations and training institutions.

The Ugandan part, called the Responsible Fisheries Business Chain Project (RFBCP) is concentrating on sustainable fisheries management of Nile perch at Lake Victoria. The political

partner of the project is the Lake Victoria Fisheries Organization (LVFO) and project activities contribute to the implementation of the Nile Perch Fishery Management Plan-II and Fisheries Management Plan-III of Lake Victoria. The implementing partners of this project are the LVFO, the Uganda Fish Processors and Exporters Association (UFPEA) and Kenya Fish Processors and Exporters Association (AFIPEK). The project includes implementation and outreach in Kenya and Tanzania, as these are two additional riparian states at Lake Victoria.

The project is designed to achieve an increased food security and secured income for an increasing population based on a strengthened fisheries co-management approach. In this regard the Nile Perch maw value chain is to be explored as a potential source of income for local fishing communities as well as revenue for the country.

The increased predominantly Asian demand for fish maw as a luxury good has led to an increased relevance of the maw value chain in the Nile perch fishery, which is until today relatively unexplored. Fish maws are dried or frozen and exported to Asia where they are a delicacy in making soup stocks or to Europe for use in filtering beer. Fish maws are purchased not only from factories but also directly from fishermen bypassing official channels. About 16 exporters are registered within Uganda to export the maws. Relatively high profit margins make the international trade in Nile perch maws attractive.

However, little is known about quantities, prices and the ways of processing swim-bladder obtained from Lake Victoria. The influence of maw harvesting on Nile Perch stock and the availability of Nile Perch on local markets that results from this, will also need to be looked at. Trade of maw stemming from undersized Nile Perch was prohibited in 2015 however little has been done in terms of enforcement. An additional challenge is the absence of the upper slot size in the Ugandan fisheries law, resulting in the hunt down of the big spawners for their swim-bladder. This consultancy will offer supplementary support to RFBC implementation, by exploring, quantifying and qualifying the local and regional Nile perch maw production, processing and marketing. Additionally to that, it will study the influence of the maw trade on the Nile perch availability on the local and international market. The consultancy will conclude with recommendations for regulations on the value chain.

Issues to be addressed

The specific task is to: Prepare a value-chain analysis report for the Nile perch maw trade in East Africa that investigates/defines all harvest, processing and trade aspects as well as quality and legislative issues.

Activities of the consultant

The expert shall perform following tasks:

- Carry out a short desk study of recent, relevant literature and legislation.
- Convene a meeting with known representatives of the fish maw traders, fish processors &traders, fishermen associations and Ministries responsible for fisheries and trade to identify current challenges within the maw value chain.
- Investigate/define the structure of the distribution channels for maw from harvest to the export markets, using one or two examples per country to describe the distribution channel per country (in case they differ).
- Identify and quantify the different actors and describe their interaction, including
  - producers and harvesters,
  - handlers and/or buyers
  - processors
  - exporters
  - or any others
  - Ministry responsible for fisheries management and trade
- Investigate /define the role of women within this value chain (processing and trading) and identify gender specific challenges/opportunities.
- Identify the major players (individuals/companies) amongst the processors and traders including a data based estimate of their annual trade volume.
- Create an actor's map of the whole value chain according to *Capacity WORKS* standards as annex to the assignment report.
- Describe the processing of the maw including the used techniques, the ratio between dry/wet weights, impact of technique on quality and price, etc.
- Assess possibilities to improve current processing techniques regarding cost, efficiency, hygiene, etc.
- Describe the value chain for the fish (Nile perch) of which the maw has been removed, including amounts, type of products obtained, consumers of the different products, markets, prices and margin, etc.
- Identify potential market entry points for local traders and processors
- Investigate/define prices for Nile perch maw depending on size, quality characteristics and dry/wet weight throughout the distribution channel.
- Investigate costs and margins associated to the different levels of the distribution channel. "Who profits, how and how much?"
- Estimate the overall value of the maw trade per country.
- Investigate required investment in the maw trade for market entry, as well as to secure current/future markets and assess the requirement of investment including access to funds and financing opportunities. (E.g. micro-credit) for such investment.
- Assess staff status in processing and trading considering aspects such as numbers, educational level, permanent or temporary employment, average wages, position of women etc.

- Identify regulatory needs and recommendations on regulations for the Nile Perch maw value chain.
- Prepare and present the key findings of the study to the stakeholders at a feedback workshop (1 day). The views of the stakeholders should be included in the final report.
- Produce a final report from the study activities.
- Produce a final report from the workshop upon receiving stakeholders' comments.

Expected outputs

The Expert will present a consolidated report demonstrating the work done, namely:

- Technical report for the project.
- Layman's summary (one or two page non-technical summary as well as non-technical paragraphs within the report)
- Workshop outputs/reports.
- One to two page non-technical summary of the report to be used as a briefing paper for key stakeholders as an annex to the assignment report.
- Actor's map of the whole value chain according to Capacity WORKS standards as annex to the assignment report.
- Systematic graphical display of the value chain as optical summary of the report in annex to the assignment report. Graphic must also be submitted as high resolution PDF for further use in GIZ publications.
- Provision of picture material of the value chain: at least 20 photographs displaying different stages of the value chain to be used in publications by GIZ and in line with the respective requirements.
- Present the final report at an LVFO one-day workshop

Format of report

The Final report should follow the structure indicated below:

- Title page
- Table of content to three levels
- List of annexes as appropriate
- Table of tables, figures and pictures
- Abbreviations and acronyms
- Executive summary (1 to 2 pages)
- Introduction
- Main body divided into different sections as appropriate, normally Context, Methodology, Performance in relation to TOR, and discussion (up to 30 pages)
- Conclusions and recommendations (each recommendation must be preceded by a conclusion, that refers to a discussion in the main body of the report)
- Annexes as required including Terms of Reference, Schedule and People met, etc.

The report will be produced using MS Word and will be available in hard and electronic form, both in Word copy and all the elements together in a single file pdf format.
Pictures must be taken in accordance with GIZ rules and guidelines and copy- as well as user-rights must be assigned to GIZ. Pictures must be submitted as electronic copies and should have a suitable resolution to be printed on A0 format.
Report to be reviewed by RFBCP

Duration		**Working days UG**	**Working days TZ**	**Working days KE**
	The overall requirement is as follows:			
	Preparatory work	2	2	2
	Field work such as visiting Landing sites, markets, processing sites, stakeholder meetings, etc. for purpose of data collection.	12	12	8
	Stakeholder Workshop	1	1	1
	LVFO Workshop delivery (1 day)		1	
	Final report writing		2	
	Consolidating regional report	4	1	1
	Total	22	16	12
	Total input day: **50** working days			
Start Date	Latest 01.05.2018	Completion: 15 July 2018		

Experience and qualifications
Qualifications and skills:
1) Fisheries scientist / Economist
2) Agro – or socio economist
3) Food scientist

Experience
1) Proven experience in the Nile perch fishery in the great lakes region
2) Understanding of the fisheries economics, fish & maw marketing, fish quality and processing for Nile perch fishery at the artisanal level
3) Experience in Value chain analysis

The consultant is expected (but not obliged) to subcontract local consultants either for work in Kenya, Tanzania or Uganda within the agreed man-days.

ANNEX E: Tools (1-7) Used in the Study

TOOL 1: Nile perch fisheries supply chain players

Name of the landing site……

Chain player	**Tick if present**	**Description of roles by gender**	**Number (#) of Women**	**Number (#)of Men**
Boat- and fishing gear owners				
Fishing crew (Baria)				
Factory Fish processor(*large scale establishment approved as a factory)*				
Artisanal fish processors (*Other small processing establishments including cottages)*				
Fish smokers				
Fish salters				
Fish dryers Other (specify)……				
Fish supplier • Trader to the factory, • Collector from the island • Local fish trader(who buys from landing site and transports by truck to sell in the markets • Fish monger (using bicycles, bodas etc. to hawk fish in the villages)				
Ice Suppliers				

Cold room operators				
Fish guards				
Fish Inspectors (local Gov.)				
Other (Specify)				

TOOL 2: Maw value chain actors

Name of the landing site……....

Maw value chain actors	**Tick if present**	**Description of roles by gender**	**# of women**	**# of men**	**Location (whether the actor is found at LS or off LS**
Boat- and Fishing Gear owners					
Fishing Crew (baria)					
Fish supplier (from which maw is removed) • Trader to the factory, • Collector from the island • Local fish trader(who buys from landing site and transports by truck to sell in the markets • Fish monger (use bicycles, bodas etc. to hawk fish in the villages					
Maw Extractors					
Artisanal Maw Processors *(limited volumes in establishments not approved as factories including cottages)*					

Factory Maw Processors*(Volumes in approved establishments)*					
Maw Traders who buy from fishers					
Maw traders who buy from fish suppliers and/or collectors					
Maw Traders (Involved in other activities e.g. buy from fishers, or fish suppliers or collectors) and or packing.					
Maw Packers					
Fish Inspectors (Local Government)					
Fish guards					
Maw Transporters					
Other (Specify)					

TOOL 3: Techniques for handling maw in the value chain

Stage in Supply and Processing Chain: Landing Site or Processing site or Factory (*Tick as appropriate*)
Product Handled: Fresh or dry maw *(Tick as appropriate)*

Stage in the maw value-chain	**Description of the technique used**	**Challenges associated with the technique**	**Other challenges**
Handling of Nile perch from which maw is to be removed			
Extraction			
Processing and Preservation (details of the methods used)			
Packaging			
Storage			
Transportation			

Marketing at local			
Marketing at regional level			
Marketing at international level			

a) Explain how each of the challenges identified along the Value Chain are being addressed

……..
……..
……
……..

Suggest ways you would wish to see the technology used in processing the product improved

……
……
……..

Tool 4: QUESTIONNAIRE FOR STUDYING THE VALUE-CHAIN AND TRADE OF THE NILE PERCH MAW IN EAST AFRICA

SECTION 1: GENERAL AND DEMOGRAPHIC INFORMATION (all actors)

1.0 Please indicate your role in Nile perch or Maw value chain (check box as appropriate)

a) Fishing Crew ☐
b) Boat- and fishing gear owner☐
c) Factory fish processor ☐
d) Artisanal fish processor (Fish smokers, Fish salters, Fish dryers) ☐
e) Fish Suppliers (Trader to the factory, Collector from the island , Local fish trader(who buys from landing site and transports by truck to sell in the markets, Fish monger (use bicycles, boda bodas etc. to hawk fish in the villages☐
f) Ice Suppliers ☐
g) Maw extractor ☐
h) Maw Trader who buys from fishers ☐
i) Maw trader who buys from fish suppliers/collectors ☐
j) Maw Traders (Involved in other activities e.g. buy from fishers, or fish suppliers or collectors) and or packing. ☐
k) Artisanal Maw Processor)☐
l) Factory Maw Processor ☐
m) Maw Packer ☐
n) Cold chain service provider ☐
o) Maw Exporter ☐
p) Other (please specify)……

1.1 Describe your roles in the value-chain

……
……
……

1.1.1 Are you working as an individual or are you employed?

……

1.1.2 If employed, what is your position in the business?

……

1.2 Age: (record the actual age in the boxes) (a) <14 ☐ (b) 14-20 ☐ (c) 21-30 ☐

(d) 31-40 ☐ (e) 41-50 ☐ (f) 51-60 ☐ (g) >60 ☐

1.3 Gender: (a) Male (b) Female

1.4 Level of education:

a) None ☐ b) Primary ☐ c) ordinary level ☐ d) Advanced level ☐
e) Diploma holder ☐ f) Degree holder☐ g) post graduate☐
h) Others (please specify) ☐……

SECTION 2: QUESTIONS RELATING TO NILE PERCH MAW (subsections for specific categories)

SECTION 2A: ALL CATEGORIES OF ACTORS IN MAW CHAIN – (extractors, traders, processors and exporters of maw)

2.1 i) Do you do business related to Maw? a) Yes ☐ b) No ☐

ii) Indicate what type of maw business that you do? a) Harvesting raw material (b) Owner of raw material (c) Collector/trader of raw material (d) Artisanal processor of raw material (e) Supplier to Nile perch to export factory (f) Supplier to Maw export companies (g) Cold chain service provider (f) Exporter of maw
(f) Other, describe……..
……

iii) Why are you involved in this particular business?
…….....
……
iii) Do you have an operator's license for supplying/extracting/processing/trading/exporting the maw?
a) Yes ☐ b) No ☐
(Ask to see the license and note willingness to show or not)

2.1.1 How much maw do you extract/sale/process/export in; (please tick as appropriate both question and answer)
a) Day ……..Kg /number/ other units
(b)Week...……..……Kg/number/other units
(c) Month…….…… Kg/number/other units
(d) Year……..Kg/Number/other units

2.1.2 What is your total turnover of fish maw produced/processed/traded/exported per month……
…….....?

2.1.3 Would you please provide the costs incurred on your fish maw business in the last three months as indicted below

a) Raw material (Maw, Nile perch) ……..

b) Labor costs…….
c) Other inputs (preservatives, packaging materials, labels, cleaning materials and equipment, other)……
…….....
d) Energy costs…….
e) Transport costs……
f) Water costs……
c) Infrastructure (buildings, rent, equipment, maintenance etc.) ……
……
e) Taxes…….
f) Marketing……
h) Quality and regulatory compliance (license, quality audits and inspections, etc)…….
……
(i) Other costs (Please specify) ……..

2.2 Give information on the education level, employment positions and wage categories of your workers as indicated below

Education level of workers of Maw Business by gender							
Gender	**Number of workers per Education level**						**Totals**
	Post Graduate	Graduate	A-level	O-level	Primary	None	
Men							
Women							
Youth							
Totals							
Women (%)							

Number of workers in different employment positions categories				
Gender	**Employment Positions** ***Levels (L*)***			**Totals**
	Lower position Category	Middle Position Category	Top Position Category	
Men				
Women				
Youth				

Totals				
Women (%)				

Number of workers in different wage categories				
Gender	**Wages (L*) per level)**			**Totals**
	Low wage Category	Middle wage category	Upper wage category	
Men				
Women				
Youth				
Totals				
Women (%)				

2.3. Are there any regulations and standards related to maw business you are expected to comply with? a) Yes b) No

2.3.1 If yes, mention them……
……...

2.3.2 Are the regulations and standards being enforced a) Yes b) No

2.3.3 If Yes, by whom……

2.4 Do you weigh/ measure/count the fish maw before/during selling? A) Yes☐ b) No ☐

2.4.1 If yes, how do you weigh/measure/count? a) Weight in Kilograms ☐
b) Count number of pieces of maws ☐ c) Estimate weight of Maw ☐
d) Others Specify)……..

2.4.2 Do you categorize the maw size during selling? a) Yes☐ b) No ☐

2.4.3 If Yes, give the categories…….
……

2.5 Where do you sell the maw that you extract/process/trade?
(a) Processing factory (Please mention factory)
.……

(b) Middle men (explain)

……

(c) Exporters of maw (Explain)

……

(d) Export directly to outside countries (please mention countries)

……

(e) Others (specify)……

2.5.1 (i) If you sale fresh maw, who are your customers for the fresh maw?

(a) Maw Extractors ☐, b) Artisanal Maw Processors ☐, c) Factory Maw Processors ☐ d) Maw Traders who buy from fishers ☐ e) Maw traders who buy from fish suppliers and/or collectors ☐ (f) Regional traders☐ (g) Maw Exporters ☐

(h) Other (Specify)……

2.5.2 (ii) If you sale dried maw, who are your customers?

a) Maw processors ☐ b) Maw packers' ☐ c) Maw exporters ☐ d) Consumers ☐ e) Maw importers in other countries) ☐ f) Regional traders ☐ g) Other (Specify) ☐……..

2.5.3 (iii) Among your customers, who are the main buyers (companies) of Nile perch maw

a) Locally……

b) Regionally ……..……

c) Internationally……

2.6 In your opinion, is the maw business worthwhile?

(a) Yes ☐ *(b)* No☐

2.6.1 If yes, give reasons for your answer**.....**

.....?

2.6.2 If No, what are the challenges in the business……

……

……

2.7. Are there financing and funding opportunities available for maw (handling/processing/preservation/trade) business that you can apply for?

(a) Yes ☐ *(b)* No ☐

2.7.1 If yes, give details…….

2.7.2 If no, give reasons…….

2.7.3 If there are financing and funding opportunities for maw business; are they accessible to you? *a)* Yes ☐ *b)* No☐

2.7.4 If no, please indicate why ……

SECTION 2B: FISHING CREW

2.1. Do you own the fishing boat and fishing gear that you operate or it is owned by another person? a) Own fishing boat and gear b) Boat and nets owned by another person c) Own one of the two

2.1.1 If the boat or gear that you operate are owned by another person; who sells the fish that you land a) fishing crew ☐ a) Boat and gear owner☐

2.1.2 If you sale the fish, do you also sell the maw? a) Yes ☐ b) No☐

2.1.3 If No, explain why……
……

2.1.4 If yes, how much of the landed Nile perch do you have their maws extracted?
.....

2.1.5 Please explain to whom the maw is sold……..
……

2.1.6 Explain how the maw is extracted and sold……..
……

2.1.7 What challenges are you facing in relation to selling of maw……
……
……**.....**

2.1.8 Can you suggest any solutions to the challenges…….....
……...……
……

2.2 Where do you sale the fish from which the maw has been extracted?

a) Factory b) middle men c) local processors d) fish mongers e) fish traders f) individual consumers e) others (specify)……

SECTION 2C: BOAT AND FISHING GEAR OWNERS

2.1 Do you sale the fish that is landed by your boat? (a) Yes ☐ (b) No ☐

2.1.1 If yes, do you extract maw from the Nile perch which is landed a) Yes ☐ b) No ☐

2.1.2 If yes, how much of the landed Nile perch do you have their maws extracted?

2.1.3 Explain how the maw is extracted and sold…….**.....**
……
……....

2.1.4 Explain to whom the maw is sold……
……
……

2.1.5 What challenges are you facing relating to selling of maw?

……
……
2.1.6 Can you suggest any solutions to the challenges……..
……
……
2.2 Where do you sale the fish from which the maw has been extracted?
a) Factory b) middle men c) local processors *d*) fish mongers *e)* fish traders
f) Individual consumers *e)* others (specify)……

SECTION 2D: COLD CHAIN SERVICE PROVIDERS

2.1 What kind of cold chain services do you offer to the Maw business operators

- *a)* Cold room facilities for freezing of maw ☐
- *b)* Ice for chilling the maw ☐
- *c)* Cold room facilities for fish from which maw is removed ☐
- *d)* Ice for chilling fish from which maw is removed ☐

2.2 Which maw value chain actors utilize your cold chain facilities?
(a) Maw Extractors ☐ *b)* Artisanal Maw Processors ☐ *c)* Factory Maw Processors ☐
d) Maw Traders who buy from fishers ☐ *e)* Maw traders who buy from fish suppliers and/or collectors ☐ *(f)* Regional traders☐ *(g)* Maw Exporters ☐
(h) Other (Specify) ☐……
2.3 If the maw stored at the cold room, how do you charge your customers for the cold chain services?
……
……
2.4 How much maw is brought for storage in your cold room per month ……
…… (Kg/pieces/other)
If you sale ice to the maw value chain actors, how much do you charge per Kg. of Ice
……
2.5 How much quantity of Ice do you sell to maw business operators per month……
2.6 What challenges related to cold chain do your customers in maw business face……
……
……

SECTION 2E: TRADERS AND PROCESSORS

2.1 How do you transport the maw to the processing/preservation/market location?

(a) By foot ☐ *(b)* bicycle ☐ *(c)* vehicle ☐ *(d)* boat ☐ *(e)* rail ☐ *(f)* air ☐
(g) Motorcycle (Boda boda) ☐
*(h)*Others (specify) ☐……

2.2 Give the quantities of maw that you sell to the different markets as listed below
(a) Major buyer in Uganda who exports to China
……..……..……
(b) Regional market in; a. Kenya☐ b. Tanzania ☐
……..……..……
(c) Other countries within the region…….
……
(d) Exporters based in Uganda who export to other regions**.....**
……
(e) Exporters within the region who export to China……
……**.**
f) Others (Please specify) ……..…….
……
2.3 Which is the most important maw market for you and why?
……
……
……
2.4 Do you grade the maw for sale? *a)* Yes ☐ *b)* No☐
2.4.1 If yes, mention the different grades
……
……**.....**
2.4.2 In what form do you sell the maw? *a)* Fresh☐ *b*) fresh frozen ☐ *c)* sundried☐
d) solar dried ☐ *e)* other (Specify) ……
2.4.3 What is the unit cost (kilogram /piece/other) for each grade of the maw products you sell?
……
……
2.4.4 Do you sell maw depending on size? a) Yes ☐ b) No ☐
2.4.5 If yes, what are the different sizes?
*(a)*Small……
……

*(b)*Medium…….....
.....
(c) Normal-Large……...
(d) Extra Large……...
2.4.6 How do you determine the size of the maw (weight/length/other)……
……
……
2.4.7 What are the prices of the different maw sizes that you sell in different markets?

Maw Sizes	**Prices in different Markets (Kg/piece/other)** (Ug/Ke/Tz shillings)					
	Buyer in Uganda who exports to China	Buyer in Kenya or Tanzania (Tick as appropriate)	Buyers in other countries within the region	Exporters based in Uganda who export to other regions	Exporters within the region who export to China	Others (Please specify)
Small						
Medium						
Normal large						
Extra large						
Others						

2.5 Do you get damaged or defective maws? *a)* Yes ☐ *b)* No ☐
2.5.1 If yes, at what stage of the value chain do you get damaged or defective maws?
a) Extraction ☐ *b)* freezing ☐ *c)* drying ☐ *d)* packaging☐
e) Transport ☐ *f)* other (specify) ☐……
2.5.2 (i) What are the damages or defects that you experience in the stage(s) mentioned above?
……
……
2.5.2 (ii) Do you have markets for any damaged/defective maws? a) Yes ☐ b) No☐
2.5.2 (iii) If Yes, mention the markets……
……
2.5.2 (iv) If you sell damaged /defective maws; do you categorize /grade the maws?
a) Yes ☐ *b)* No ☐
2.5.2 (v) If Yes, What are the categories/grades……
……

2.5.2 (vi) What are the prices per category/grades of maw that you sell?

……

……

2.6 What determines the price of your maw or maw products?

(a) Size☐ *b)* dry or wet☐ *c)* Humidity ☐ *d)* Existence of moulds ☐ *e)* Shape☐

f) Color☐ *g)* Cost of production ☐ *i)* Demand for the product

j) Other (Specify)……

2.7 (i) Do you have any ideas of what the exported Nile perch maw is used for**?**

(a) Yes ☐ *(b)* No☐

2.7 (ii) If Yes, Please explain……

……

2.8 Do you make profit on the dry maw sold? *a)* Yes *b)* No

2.8.1 If yes, how much do you make per unit (kg/pieces/other) of dry maws sold?

……

……

2.8.2 Do you make profit on the fresh maw sold? *a)* Yes *b)* No

7.3 If yes, how much do you make per unit (kg/pieces/other) of fresh sold?

……

2.9 Which areas in the maw business of processing and trade offer opportunities for investment and why? ……

2.10 Have you ever experienced a situation of non-compliance with the standards or any other requirements demanded by the market? *a)* Yes *b)* No

2.10.1 If Yes, which are those standards/requirements……..……..

……

……....

2.10.2 What were the effects of non-compliance to the standards/requirements demanded by the markets on your business?

(a) Loss of market access to certain markets *(b)* Rejection of maw by buyers (*c)* Reduced orders *(d)* Reduced prices *(e)* Trade/export ban

(f) Others (Please specify) ……

2.11 Have you experienced quality and safety challenges during handling/processing/preservation/trade of maw? *a)* Yes *b)* No

2.11.1 If Yes, mention the challenges

……

……

2.12 What are the roles of women and men in processing and trading of maw?

a) Processing

Men……
……
Women……
……

b) Trading

Men……
……....
Women……
……

16. What opportunities are available for men and women in processing and trading of maw?

a) Processing

Men……
……
Women……
……....

b) Trading

Men……
……
Women……
……

17. What challenges are experienced by men and women in processing and trading of maw?

a) Processing
Men……
…….....
Women……
……

b) Trading

Men……

……

Women……

……....

SECTION 2F: MAW EXPORTERS

2.1 Other than cleaning and drying, is there any further processing done on your maw before export?

a) Yes *b)* No

2.1.1 If yes, Please describe the processes

……

……

……

2.2 To which markets or countries do you export maw?

(a) Regional market: 1. Kenya ☐ 2. Uganda ☐ 3. Tanzania ☐

4. Others (specify)……..

(b) China through Hong Kong ☐

(c) Other destinations 1. Europe ☐ 2. Africa ☐ 3. America ☐

4. Other Asian countries☐

(d) Others (specify)……

2.3 Indicate the quantities of maw that you export to different markets

a) Regional markets ……..……(Kg)

b) China……..……(Kg)

c) Other destinations (Africa) ……...(Kg)

d) Europe, US and other Asian countries ……..(Kg)

e) Other (specify)……(Kg)

SECTION 3: QUESTIONS RELATING TO NILE PERCH FROM WHICH MAW IS REMOVED?

SECTION 3A: FACTORY FISH PROCESSORS

3.1 Do you extract maw from the Nile perch which purchased? a) Yes b) No

3.1.1 If yes, how much of the purchased Nile perch do you have their maws extracted?

……

……

3.1.2 Out of the Nile perch brought to the factory how much is received with or without maw per day (Please state quantity as per day and per week)

a) With the maw……..Kg/tonnes

b) Without the maw……..Kg/tonnes

TOOL 5: Handling practices for maw at different stages of the Value Chain

Stage in Chain where observation is carried out: Landing Site/ Artisanal Processing facility/Factory/Packing facility/Transportation facilities (Tick as appropriate)

Observable Parameters	**Document observed practices**
Extraction of the maw	
Use of clean and sharp knives	
Use of clean and portable water	
Use of clean slabs	
Use of Personal Protective Equipment	
Practice of good personal hygiene	
2. Processing of the maw	
Use of clean utensils and equipment	
Use of clean drying surfaces	
Use of recommended preservatives (if any)	

Use of proper packaging materials and methods	
Use of Personal Protective Equipment (PPE)	
Practice of good personal hygiene	
Availability of the necessary documents (e.g HACCP)	
Well-designed processing facility	
Existence of qualified staff	
Transportation and marketing	
Use of clean containers/equipment for transportation	
Use of proper transportation and marketing channels	
Ability to meet market and regulatory requirements for both local, regional and international markets	

TOOL 6: Schedules for the different Focus Group Discussions

This schedule highlights the topics to be discussed with members of different FGDs planned for different actors in the value chain. The discussions will aid to confirm and verify information obtained from observation checklists and questionnaires

1. **Boat and fishing gear owners; and Fishing Crew**

- Proportion of Nile Perch from which Maw is removed
- Scenarios for fish maw extraction by the fishers, factories or others
- Cost of doing business, Prices, Markets, Viability and profitability of fish maw business
- Current regulations on maw extraction
- Opportunities for Investments and credit access and business funding sources for maw

- Associations/ collective / group memberships and benefits through the association for those involved in maw business
- Gender distribution which gender is involved and why? Gender numbers, positions, benefits etc
- General business challenges and their solutions

2. Maw Traders-including middle men who trade in both dry and fresh maw, and exporters

- Source of maws, the quantities, handling and transportation techniques and infrastructure, market channels and destinations
- Cost of doing business, Prices, Markets, Viability and profitability of fish maw business
- Costs and Profit margins
- Quality and safety requirements for the different markets
- Investment opportunities, credit access and funding sources
- Standards and regulatory compliance issues (quality and physical infrastructure, and required investments)
- Policies, Laws, regulations, directives and related regulatory issues
- Enforcement mechanisms and their effects on maw business
- Gender distribution (where is which gender involved and why? Gender number, responsibilities, positions, decision making and benefits
- General challenges associated with Maw Trade Business and their solutions

3. Maw processors (artisanal and factory)

- Source, quantities, handling and transportation techniques and infrastructure, market channels and destinations
- Cost of doing business, Prices, Markets, Viability and profitability of fish maw business
- Costs and Profit margins
- quality and safety requirements for the different markets
- Investment opportunities, credit access and funding sources
- Standards and regulatory compliance issues (quality and physical infrastructure, and required investments)
- Policies, Laws, regulations, directives and related regulatory issues
- Enforcement mechanisms and their effects on maw business
- Gender distribution (where is which gender involved and why? Gender interplay)), number, responsibilities, positions, decision making and benefits
- General challenges associated with Maw Processing Business and their solutions

TOOL 7: Schedules for discussions with Key Informants

The key informants will be visited at their offices to obtain their views on global picture regarding nature of maw business, their contribution to the economy, policy and regulatory issues, strategies for addressing infrastructure (quality and physical) that facilitate maw businesses, how to address challenges in the maw value chain among others

1. NGOs with stakes in fisheries

- challenges in the value chains and what is being/or can be/ done to address challenges
- Gender distribution
- Policies and laws
- Rights and available alternatives

2. Women groups

- Roles
- Benefits for members, strengthening mechanisms
- Challenges
- Opportunities

3. Inspectors/Fish Guards/ Fisheries officers

- Existing laws, policies and regulations
- Enforcement mechanism
- Effects of some enforcement mechanisms on maw processing and trade
- Regulatory challenges in the fish maw business sector

4. Ministry of officials (Directorate of Fisheries Resources)

- Main players in the maw and Nile perch business
- Different types of licenses related to maw trading
- Number of licenses for each type
- Overall quantity of maw, Nile perch and their products produced in 2017. If not available then in 2016
- Overall Revenue from fish Maw export
- Overall Contribution of Maw to GDP, incomes and livelihoods
- Existing markets and marketing channels
- Available support and opportunities for fish maw enterprises
- Existing laws, policies and regulations
- Regulatory issues associated with the maw and Nile perch business
- Enforcement mechanisms

5. Ministry of Trade/Export promotions Board

- Maw fish exports statistics
- Number of Maw Export Licenses
- Major exporters
- Major export destinations
- Other potential export market

6. Fish Exporters and Processors Association / Maw Traders Associations

- Number of active Maw traders
- Quantity of Maw produced and exported,
- Proportional of Nile perch from which Maw is removed
- Regulatory issues, challenges and solutions
- Quality, safety and other Market requirements
- Major markets
- Main players/actors in the maw business
- Investment challenges, available opportunities, availability of credit and funding sources
- Cost and Profitability of the maw business
- Employment in the fish maw (Number of employees (M/F), wages and other salary issues)
- Gender issues (women involvement)- Numbers, Positions, roles, and benefits of women