



Health and safety in Micro-business – Fishmonger women of Lake Victoria, Kenya

Institution of Occupational Safety & Health

Report by: Duncan Spencer CFIOSH, Head of Advice & Practice, IOSH

Ablly assisted by:

- Nanis Kanana, OSH Compliance & Sustainability professional
- Gladys Nyaga GradIOSH, HSE Practitioner

This assessment took place in November 2023.

Introduction

This report was commissioned in response to the interest shown by the International Labour Organisation and Investment Banks, in attracting economic investment that improves safety, health, and enriches local lives. Workers in Kenya, mostly women, are employed on a piece-meal basis for subsistence pay to buy fish from fisherman, descale and clean the fish, cook it and sell it at market. The conditions of work are hazardous and hard.

In November 2023 the Institution of Occupational Safety and Health (IOSH) commissioned one of its members to visit the industry on location and gather information. The purpose of this report is to highlight the significant risks identified during that visit and offer ideas for investment that will transform the lives of those employed in this industry.

Discussion of issues encountered.

- The operation is described in Appendix A.
- All stages of the process were labour intensive, from picking the fish from the bottom of the boats, the carrying and transportation of the fish, processing to clean and cook the fish and selling portions at market. Lack of knowledge of the hazards and protective controls coupled with long hours without a break causes fatigue and increases exposure to hazards and the likelihood of incidents occurring.
- All the labour observed was conducted by women of all ages.
- The significant hazards at each stage of this process are outlined in Appendix B.

Possible control strategies

To help these women workers the following considerations need to be made:

- a. They live a life earning barely enough to feed themselves and their families. They do not have the means to invest and improve their conditions. External funding from investment or charitable donation will be necessary if change is to be achieved.
- b. In general, the workers have not had a good education. They may well struggle with explanations regarding the biology of the human body and may consequently struggle with understanding appropriate manual handling techniques or adopting neutral postures at workstations to avoid injury.
- c. Expertise will need to visit the locations to carry out any building projects, provide equipment, train, and educate these workers.
- d. Suggested controls could reduce the amount of labour needed. This will provide an opportunity to improve production or release time for the workers to secure additional sources of income.
- e. Any equipment adopted must be able to withstand the rugged environment and be easily fixed using local resources if possible.

Stage 1: Fish Collection

Primarily, investment to reduce risk should focus on building new infrastructure. Engagement with the local authorities will be needed to build better communal facilities that can be used.

The hazards in stage one, when the boats are met, the fish sorted and sold, are mostly associated with it being an uncontrolled and chaotic environment at the edge of the lake. The hazards associated with meeting the boats can be eliminated by segregating the buyers from the sellers, the fishmonger women from the fishermen. The building of additional and longer mooring jetties for the fishing boats would provide more order in the environment and eliminate the need for fishmonger women to wade in the shallows and climb up onto and off the boats. The port would require active daily management to enforce boat use of jetties. Control could be further extended by restricting the use of the jetties to the fishermen alone. The jetties could be situated behind a suitable building where the fishermen can take their catch, sort them, weigh them, and then sell them to the fishmonger women. The building would need room for storage and permanent slabs for displaying the fish. These slabs must be a suitable surface that is capable of withstanding being washed each day to maintain hygiene. This infrastructure construction may well need to be negotiated with the local authorities and arrangements for its maintenance will need to be made.

Segregating the fishmonger women from the direct environment at the edge of the lake will eliminate the likelihood of entrapment, falls, and exposure to some hazards in the mud, and exposure to disease.

Carts or sack borrow provision for the fishermen to bring their catch to the sales area would also assist. The use of plastic fishing trays would mitigate manual handling risk and reduce contamination in the boats and in the wider environment. Plastic trays can

be cleaned more easily. This will reduce the food available to vermin and reduce the bacterial load in the environment.

The gunny sacks and containers used by the fishmonger women are not ergonomically designed. The provision of suitable plastic containers with handles would bring benefits. They can be easily cleaned, and they can be easily grasped during handling. This simple provision will help to mitigate manual handling risk.

The probable ignorance of the way the human musculoskeletal system works hampers the teaching of safe handling techniques. Manual handling risk can be mitigated through the provision of education and instruction in safe handling techniques.

The provision of public hand washing facilities will enable personal hygiene.

Stage 2: Transportation

The market is some distance from the lake. The fishmonger women will wish to go where the customers are. It would be ideal if the market could be moved to be adjacent to the fishing port. If this is impractical, then the fishmonger women will continue to walk, use public transport or motorcycle to get to market. Working with the local authorities to provide good, cheap public transport is essential if we are to reduce the likelihood of injury through road traffic accidents with motorcycles or pedestrians.

Strong containers with handles will help to mitigate manual handling risk.

Stage 3: Processing and Selling Fish

As in stage one, the provision of facilities can greatly mitigate risk. Purpose built workstations for fish cleaning, with polished surfaces to aid cleaning, would be ergonomically safer and more hygienic. Ideally these workstations should be situated in a covered area to keep off the heat of the day and keep workers cooler. They would need running water to clean utensils and hands and surfaces. Such a building could also have welfare facilities in it such as toilets, rest areas and places to wash.

The provision of personal protective equipment would protect those employed to process the fish. Glasses would protect the eyes from fish scales and liquids flicking into the eye. The provision of chef stainless steel gloves would protect the hands.

Workstations must include purpose-built kitchens with cooking facilities and chimneys to ventilate the smoke away overhead height. Purpose-built cooking facilities will mitigate the risk of hot oil spillage and a fire spreading. The provision of stoves will allow fires to be safely contained and would be more fuel efficient. Once built this facility would also need to be structurally maintained.

Workers will need further education to mitigate risk. Fishmonger women must be educated to understand the zoonoses risk and how to avoid getting infected or selling contaminated food. They need to understand why hygiene is important to their lives. If the education were extended to include other fish recipes, with improved facilities they

could develop their menus. This in turn may bring added value and greater income. Investment could also extend to finding new markets for dried fish or diversification by making fish leather products.

Conclusion

With suitable levels of investment, the risks to fishmonger women can be mitigated. The mitigation is focused on two actions which will greatly improve their health, working conditions and prosperity. Firstly, investing in purpose-built facilities at the port and at the market. Careful design can greatly mitigate the risks faced by these women, the fishermen and their customers. The second action would be to improve their knowledge through education and instruction. Understanding the hazards and how to mitigate them will help fishmonger women to work more safely. Learning safer techniques for manual handling and handling raw fish will help to reduce chronic musculoskeletal injury and exposure to zoonoses. Extending education to enable them to diversify will also add value and potentially open new markets for them to sell in.

Appendices

Appendix A: Description of the operation

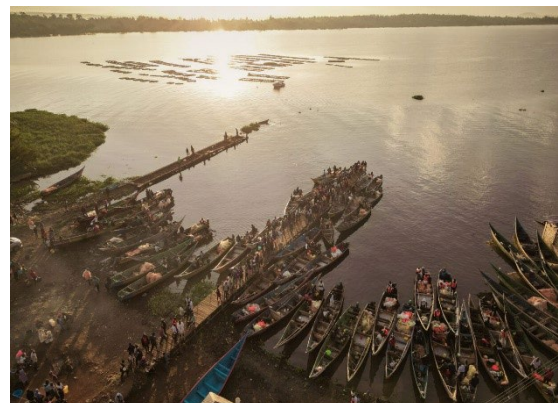
Appendix B: Hazards

Appendix A: Description of the operation

Assessment date: November 2023

Stage 1: Fish Collection

At 4.00am the fishmonger women travel to the lakeshore to meet the fishing boats. The journey is either made on foot, on motorcycles (“bodaboda2”) or by public transport (“matatu”). They arrive at the lakeshore at 6.00am. The women are a range of ages: youth, middle-aged and elderly.



The working scene is chaotic. The fishing boats are beached and it is a free for all as those buying the fish swarm over the sides of the boats to try to get the best of the catch first. The fishermen sort the fish into types, sizes and weights. The main species caught are Tilapia, Nile Perch and Omena (Silver cyprinid).

Once the fish are selected, the fishmonger women and fishermen go to the weighing scales situated on shore. Fish is sold by weight.



The fish is then packed for transport. Gunny bags or containers are used. The fish is covered in woven material to protect it and help keep it fresher. Sacks weigh 50 to 90 kilograms.



Stage 2: Transportation to Market

The fishmonger women must now transport the fish to the market. Some walk carrying their burden on their heads. Others take a motorcycle or public transport.



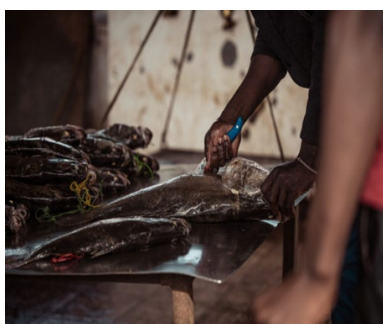
Stage 3: Processing and selling the fish.

At the market the fish is sorted once more according to size and type of fish. The sale prices are determined by these two aspects.

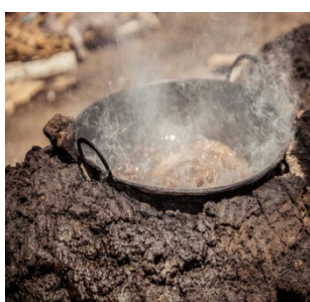
Women informally learn how to do this work from their mothers or peers. Poor habits are therefore perpetuated.



The fish are then cleaned. The inner organs and the scales are removed. They may be filleted. The fish is then either dried in the sun or deep fried and sold.



Cooking arrangements at the market are rudimentary, often using clay to build a cooking workstation. The fish are then sold at market.



Appendix B: Hazards

Stage 1: Fish Collection

Hazard Present	ILO Reference	Existing Controls
Entrapment, slips, trips, and falls The boats are beached by the prow, but it is possible the stern could float around, or the boat could rock from side to side. Anyone climbing onto in moving in the boat could lose their footing and fall. There are trip hazards such as nets, and fish scales and waste can make surfaces slippery. The boats are beached or tethered close to one another so a moving boat could trap people climbing onto them. All scenarios can lead to unexpected falls.	Reference: ILO Code of Practice on Safety and Health in Agriculture: Competence 5.3 Slips, Trips and Falls 14.4	No controls present

Hazard Present	ILO Reference	Existing Controls
A reasonable injury prediction would be broken bones or moderate crush injuries.		
Manual Handling Fish are packed into containers that are manhandled across the boat. People often reach up and over the sides of the boat to take hold of the containers and lift them over the side. This involves holding the weight at arm's length, at head and shoulder height and away from the body. Weights are usually more than 10 kilogrammes. This action has the potential to cause upper limb and lower back muscular strain. If untreated and when the movement sequence is repeated it can develop into chronic and debilitating musculoskeletal conditions. Sorting the fish is often done at ground level with workers stooping to move the fish. This poor posture has the potential to cause lower back and shoulder strain. Similarly, bags are lifted from the ground to hang on weighing scales and then off again. This is usually done with a bent back – poor technique. Sacks may be up to 90 kilogrammes. If untreated and when the movement sequence is repeated muscle strains can develop into chronic and debilitating musculoskeletal conditions. This is made worse by chronic fatigue; the workers are under pressure and do not take breaks.	Reference: ILO Code of Practice on Safety and Health in Agriculture: Competence 5.3 Hygiene 6.8 Ergonomic control 9.3	No controls present

Hazard Present	ILO Reference	Existing Controls
Environment Broken glass and other sharp objects may be hidden in the water at the lake's edge. Most women are bare footed and are therefore vulnerable to cuts to the feet and legs. There may also be trip hazards. When handling the fish sharp fins can cause puncture wounds or cuts to the hands. The women also have a poor understanding of hygiene, often eating before washing their hands. In this environment this has the potential to lead to infections such as dysentery, cholera, typhoid or Weil's disease. There is a possibility of skin infection often called "fish handlers' disease". This is caused by bacteria such as Mycobacterium and Erysipelothrix. There is also a potential for parasitic infection such as schistosomiasis (bilharzia) and vibrio vulnificus. All infections can cause chronic ill health or even death.	Reference: ILO Code of Practice on Safety and Health in Agriculture: Competence 5.3 Hygiene 6.8 Zoonoses 11.4	No controls present

Stage 2: Transportation to Market

Hazard Present	ILO Reference	Existing Controls
Manual Handling Fish are packed into containers that are manhandled on and from the floor. Containers may not have appropriate handles to aid grasping and moving. Container weights are usually more than	Reference: ILO Code of Practice on Safety and Health in Agriculture:	No controls present

Hazard Present	ILO Reference	Existing Controls
10 kilogrammes, sacks can be up to 90 kilogrammes. This exacerbates any manual handling issues. Women may carry the full container on their heads or in their arms. If walking, they must find their way through crowds and weave around trip hazards on the floor. Women taking public transport will have to hold the container in a static position for long periods if they cannot find a seat on the crowded vehicle. Holding awkward postures has the potential to cause lower back and shoulder strain. If untreated and when the movement sequence is repeated this can develop into chronic and debilitating musculoskeletal conditions. This is made worse by chronic fatigue; the workers are under pressure and do not take breaks. Women travelling by motorcycle do not wear crash helmets or protective clothing. If there was a crash, they are vulnerable to broken bones, a fractured skull, or significant skin abrasions (and potential infection).	Competence 5.3 Ergonomic control 9.3 Transport of persons 15.0	

Stage 3: Processing and selling the fish

Hazard Present	ILO Reference	Existing Controls
Fish Handling Fish carry several zoonoses: waterborne bacteria and parasites. These can cause surface skin conditions, or if there is an open wound, perhaps from a puncture	Reference: ILO Code of Practice on Safety and	No controls present

Hazard Present	ILO Reference	Existing Controls
wound from fish spines, infection can find direct access into the body. Hygiene is poor: many women do not wash thoroughly before they eat. Infection can therefore be caused through ingestion.	Health in Agriculture: Competence 5.3 Hygiene 6.8 Zoonoses 11.4	
Fish Cleaning The exposure to possible infection from zoonoses described in the environment section in stage one also applies to this stage of the working process. Cuts and lacerations can also be caused by careless use of sharp knives when cleaning fish scales or when gutting them. This has the potential to cause moderate cuts needing stitches or for those wounds to become chronically infected causing permanent disability or death. Fishmongers report that fish scales and liquids can flick into the eyes. This can cause irritation and infection.	Reference: ILO Code of Practice on Safety and Health in Agriculture: Competence 5.3 Hygiene 6.8 Zoonoses 11.4 Vector-borne diseases and parasitic infections 11.7	No controls present
Fish Frying The cooking stations are built haphazardly out of clay. They are not purpose built. They can be unstable and degrade with the potential for oil pans to fall. The pans of hot oil are consequently often perched in a precarious way, or the clay can break off. Boiling oil can then be spilt. Fires are started with any material that comes to hand including plastics. Smoke is created containing fumes which can irritate the lungs and eyes and cause coughing.	Reference: ILO Code of Practice on Safety and Health in Agriculture: Competence 5.3 Fire safety 14.8	No controls present

Hazard Present	ILO Reference	Existing Controls
The women complain of developing chest disease. Handling the hot oil pans can cause burns. There is evidence of skin burns to the palms and fingers of those cooking the fish. Anecdotal evidence suggested that walking with hot oil in pans in this area was perilous. One chef was reported to have fallen and received third degree burns to head, chest and arms. No temperature control is possible with the open fires. The oil has the potential to get too hot and catch fire. Additionally, when frying water on the surface of the fish causes the oil to spit, flinging hot oil out of the pan. Evidence was gathered showing second and third degree burns from hot oil.		
Environment The ambient temperature is between 28 and 32 degrees Celsius. This is made worse by the proximity to hot oil and the fire. Women can suffer from dehydration, muscle cramps, heat exhaustion and heat stroke. The market environment is disorganised with many slip and trip hazards. Such accidents can result in broken bones.	Reference: ILO Code of Practice on Safety and Health in Agriculture: Competence 5.3 Thermal exposure 17.2	

Recommended control measures:

See the International Labour Organization (ILO)'s Code of Practice on Safety and Health in Agriculture, 2010, found at:

https://www.ilo.org/safework/info/standards-and-instruments/codes/WCMS_161135/lang--en/index.htm#:~:text=This%20code%20of%20practice%20is,governments%2C%20employers%2C%20workers%20and%20other

IOSH is the Chartered body for health and safety professionals. With over 49,000 members in more than 130 countries, we're the world's largest professional health and safety organisation.

We set standards and support, develop and connect our members with resources, guidance, events and training. We're the voice of the profession and campaign on issues that affect millions of working people.

IOSH was founded in 1945 and is a registered charity with international NGO status.

IOSH
The Grange
Highfield Drive
Wigston
Leicestershire
LE18 1NN
UK
+44 (0)116 350 0700

 twitter.com/IOSH_tweets
 facebook.com/IOSHofficial
 tinyurl.com/IOSH-linkedin
 youtube.com/IOSHchannel
 instagram.com/ioshofficial
 tiktok.com/@ioshofficial

Reg Office: IOSH, The Grange, Highfield Drive, Wigston, Leicestershire, LE18 1NN, United Kingdom © 2023
IOSH. Registered charity in England and Wales No. 1096790 and Scotland No. SC043254. VAT registration
number 705 3242 69. IOSH Services Limited company registration number 01816826