Report on Promotion and training of communities on small fish packaging for enhanced human consumption 16th to 19th October 2023 in Mwanza, Tanzania

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Preamble

The Fisheries Education and Training Agency (FETA) in collaboration with Lake Victoria Fisheries Organization (LVFO) planned a training program on improved fish handling, packaging processing and Packaging for communities involved in small fish processing and trading.. The training equipped the mentioned group with knowledge and skills on improved fish handling, processing and packaging techniques.

Learning materials were designed to incorporate both theoretical and practical skills. It was organized to enable participants to relate to the content more easily. Course content contained numerous examples of how to apply the relevant skills in a different environment so that small fish processors and traders use the skills in diverse environment in order to provide alternative non-formal learning opportunities for training on processing and packaging. In the course of delivery, the trainees were given opportunity to practice gained skills.

More specifically, the training focused on the following aspects:

(i) Overview of small fish production including concept of post-harvest loss, Contribution of Dagaa to human nutrition, Challenges and available opportunities in the dagaa industry)

(ii) Small fish handling and processing including fish quality and safety of dagaa, fish spoilage, improved handling, types of fish contaminants, Fish preservation methods, storage and transportation of processed sardine

(iii) Principles of fish packaging (Meaning of fish packaging, Importance of fish package, Requirement of fish package, Parameters to consider during packaging, Methods of fish packaging)

(iv) Fish standard compliance and requirement (Category of standards, importance of standards and Specific requirements for sardine products

(v) Types of packaging materials including types of materials eg plastic bags, paper bags, containers or any biodegradable materials ,film, foil, Characteristics of packaging materials, Advantages and disadvantages of each of the packaging materials, Regulatory aspects of the packaging materials.

(vi) Labelling of fish and fish products including importance of labelling, general rules for product labelling, what must be on the label, date marking in food packaging techniques of labelling, machines, tools and equipment used in fish labelling and estimated prices and sources.

(vii) Fish processing techniques (v) Fish value addition (vi) fish meal production (vii) modern processing methods (viii) Packaging of processed fish products and (ix) Storage of processed fish products. Post training summative evaluation indicated

(viii) Marketing of packaged fish and fish products including Components of Fish Marketing, market segments, types of fish markets and record keeping

Post training summative evaluation indicated that training met objectives by over 96 %. Moreover, all trainees were ready to be Change Agents (CA) when they go back to respective villages and districts.

Acknowledgements

The Fisheries Education and Training Agency in the United Republic of Tanzania (FETA) wishes to thank Lake Victoria Fisheries Organisation for coordinating ground work on preparation of the training and funding upkeep costs and travel arrangements for participants. The Agency is hugely grateful to Kayenze ndogo BMU chair person, Marketing Mangerof Kirumba Market and Chairperson of Charity food products for their collaboration during field visit in their respective areas. In addition, FETA would like to salute all the participants for their active participation during the training. Nevertheless, the agency would like appreciate the commitment of all LVFO staff who facilitated smooth preparation and implementation process.

Acronyms and Abbreviation

BMU	Beach Management Unit
CA	Change Agents
CEO	Chief Executive Officer
DCs	District Councils
DED	District Executive Director
EAC	East African Community
FETA	Fisheries Education and Training Agency
IFAD	International Fund for Agricultural Development
LGAs	Local Government Authorities
LVFO	Lake Victoria Fisheries Organization
MLF	Ministry of Livestock and Fisheries
PHL	Post-harvest loss
URT	United Republic of Tanzania

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1.0 Introduction

Fish and fishery products are among the important sources of food in the World. It provides nutrients and micronutrients that are essential to cognitive and physical development, especially in children, and are an important part of a healthy diet. The population growth coupled with propensity to consume fish have raised the demand and prices of fish in different market. Lake Victoria produces about 1million tons of fish annually and the major commercial types are Nile perch, Tilapia and Dagaa. The harvested Dagaa from Lake Victoria has significantly increased and contributed 55% (509,598 tonnes) of the total annual fish production in 2014. Dagaa is dried using heat from the sun and largely spread on the ground, nets and grass resulting into low quality end product. To a large extent, this is an outcome of inadequate knowledge and skills among small fish processors and traders. Marketing of such low quality sardine products from artisans faces a number of challenges. This has lead into sardine from Lake Victoria being traded within the East African region. In addition, sardine is also sold into Zambia, Zimbabwe and all the way to South Africa.

LVFO organized training of dagaa processors and traders on handling, processing and packaging to reduce post-harvest losses and increase fisher's benefits accrued from fisheries business. Training will enable the selected group to benefit more from market development and take advantage of some of the opportunities offered by domestic, regional and global markets. Furthermore, the training will help to reduce post-harvest losses of dagaa that is occurring to the producers along its value chain to meet the demand of the markets.

A total of 51 dagaa processors and traders from 14 district along Lake Victoria were trained. These district were Sengerema, Bukoba, Muleba, Geita, Chato, Misungwi, Ukerewe, Nyamagana, Ilemela,Simiyu, Bunda, ,Busega, Musoma and Rorya. The training was conducted by senior tutors from Fisheries Education and Training Agency (FETA). The selection of the participant was based on their participation of small fish processing and trading activities as well as their ability to become Change Agent (CA) in their area of operation.

2.0 Planning and administration

This training course was developed to assist small fish processors and traders to internalize on improved fish handling, processing, fish value addition and packaging to become change agent and effectively participate in providing similar training to fish handlers, processors and traders in their village.

2.1 Institutional arrangement for the training program

The training program was organized by Lake Victoria Fisheries Organization (LVFO) in collaboration with the Fisheries Education and Training Agency (FETA). The Ministry of Livestock and Fisheries (MLFs) helped to identify the participants for the course while FETA prepared course description, training modules and delivered actual training.

2.2 Objective of the training program

The general objectives is to promote and train small fish processors and traders on the best practice of packaging for enhanced shelf life, quality, marketing and enhance human consumption of small fish. Specific objectives includes raising awareness on fish handling and processing techniques, provide hands-on training on packaging and labelling of small fish, impart knowledge on fish and fish products standards and fish marketing skills

2.3 Training Participants

This training program involved selected dagaa processors and traders from 14 district along Lake Victoria. These district were Sengerema, Bukoba, Muleba, Geita, Chato, Misungwi, Ukerewe, Nyamagana, Ilemela,Simiyu, Bunda, ,Busega, Musoma and Rorya. A total of 51 fish processors and traders participated in the training. The main consideration during selection was the actual involvement of participant in fish processing and trading as well as the age to be below 35 years. A list of participants is appended to this report (appendix 3).

2.4 Training Materials and Delivery Plan

During the preparatory stage, it was decided that the training program should be linked to the participants' own observations and experiences. It was organized in a way that the trainees would acquire both knowledge practical skills. The main objective was to make the training relevant and build confidence through real demonstrations and experience sharing.

Training materials were therefore carefully selected, and were presented in a specific order to ensure accurate review and create coherence.

Although a combination of lectures, group discussions, group presentations and case studies were used in delivering the training program, particular attention was placed on real work life experience and demonstration particularly in application of traditional and modern processing techniques and packaging. The detailed training program is appended to this report (Appendix 2).

3.0 Teaching modules and methodology

Various teaching and learning methods were applied including lectures aided by audio-visual aids, group discussion and practical demonstration in order to provide basic frames of reference on the subject matter. These were facilitated by the following resource persons (Table 1).

Table 1: Resource Persons

RESOURCE PERSON	MODULE/RESPONSIBILITY	TELEPHONE	E-mail
Mr. Arnold Mbunda	• Reason for fish spoilage • Handling of fish, on vessels, landing site and processing plant • Traditional processing methods • Modern fish processing methods • Storage and transportation of small fish: • Fish contaminants • Principles of fish packaging	+255679 838283 +255755 191833	mbundaarnoldo@gmail.com
Mr. Mukama Ndaro	• Contribution of Dagaa to human nutrition • Concept of posr harvest loss • Challenges in the dagaa industry • Available opportunities	+255622 771 656	mchigula2002@yahoo.co.uk
Dr. Ofred Mhongole	• Fish and fish products standards - Industry standards - National standards – TZS	+255 717 041 676	

	- Regional standards – EAS/SADCSTAN - African Standards (ARS/ARSO) - International standards (ISO) • Regulatory requirements for fish and fish products		
S.S Sonda	• Production of Fish Value added products • Fish packaging practical demonstration • Fish processing practical demonstration	+255769 363 750	selekashilya@gmail.com
Elizaberth Lukindo	• Marketing of packaged fish and fish products: • Labelling of fish and fish products.	+255754 685 361	Beth29april@gmail.com

4.0 Training Program

4.1 Delivery of Training

The delivery of the training was divided into three categories. The first category was was devoted for causes of fish spoilage, different fish contaminants, handling of fish on vessels, at the landing sites and during processing and transportation. A practical on quality assessment using sensory method was also done in the first day of the training. The second day was dedicated for traditional and modern methods of fish processing followed by practical demonstration of different fish processing and preservation technique including icing, drying and salting techniques. The third day of the training was committed for post-harvest loss concepts, improved packaging of fish and practical on fish packaging. The curriculum contained the following course modules;

a) An overview of small fish production

b) Handling of fish, on vessels, landing site and processing area

c) Fish contaminants

d) Traditional processing methods

e) Modern fish processing techniques

f) Concepts of fish Post-harvest loss

g) Principles of fish packaging

h) Requirement for fish storage and transportation

4.2 Presentations

4.2.1 Overview of small fish production and fish spoilage

This topic was designed so that the processors, traders and all fisheries stakeholders will be able to explain the importance of fish as food and as a source of income and know what can make fish go bad or spoil and harm the consumer. In addition trainees learnt on the production trend of small fish its challenges and available opportunity. Trainee also learnt what makes fish go bad quickly and how to prevent this and make sure that fish is as a fresh as possible and safe to eat. In addition, the topic enabled trainees to know how to recognize when fish has gone bad and what a good quality fish. Last, discussion was made on the importance of hygiene and sanitation of the personnel, equipment, facilities and environment to reduce spoilage and contamination.

4.2.2 Handling of fish, on vessels, landing site and processing area

Fresh fish is highly perishable and spoil as soon as it is landed in the boat. Fishers and fish traders have a responsibility to ensure safety and quality of their products. Safety and quality require good handling. It is estimated that a quarter of world food is lost through spoilage due to poor handling. Once quality is lost, it cannot be recovered. Quality and safety should be taken care from harvesting up to consumption.

In this unit trainees learnt some good fish handling that is significant to reduce fish loss. The loss in quantity of fresh fish is a serious problem among fishers and fish processor. Lack of knowledge and inadequate facilities for landing, handling and distribution are among the causes of high loss occurring to fish in Tanzania.

Detailed discussion was made on different facilities required on board fishing boat in order to land fish which are in good quality, numerous amenities such as water supply, ice, fish hold, containers, cleaning and facilities for personal hygiene are vital in bringing best quality fish. Also trainees were provided with basic requirement at the landing site and processing area including the importance of adhering to basic personal and production principles of hygiene

and sanitation. Practicing hygiene and sanitation at the landing site is necessary to reduce the risk of spoilage and contamination.

4.2.3 Fish contaminants

In this topic trainees were told that, fish and fish products may contain harmful substances known as contaminants. The contaminated fish might not look or smell different, but still can be harmful to consumer. In addition, trainees learnt on the types of contaminants, where do they come from, their effects and ways to reduce contaminants in fish. Nevertheless, trainees were told that, the person working in fish processing chain, water used for washing, the environment and equipment are the major sources of contamination leading to spoilage and poor quality fish. These factors may introduce microbes, chemical substances and physical hazards with potential health risk to the consumer.

4.2.4 Fish and fish products standards

In this topic, trainees were taught the meaning of standards and its importance in ensuring producers of the respective product to produce quality and safe products for human consumption as well as it to meet the requirements/demand of a given market. Detailed discussions were made about the categories of standards, importance of standards, examples of standards related to dried, smoked and fried sardine. It is a mandatory requirement that any processed food need to meet specific standard basing on market requirement.

4.2.5 Traditional processing methods

In this unit, detailed discussion was made on the preliminary fish processing techniques such as stunning, sorting, washing, gutting and slicing. Procedures to do them and their importance in relation to final quality of the product. Furthermore, the importance of traditional knowledge and wisdom of the local people in fish preservation were discussed. These methods include drying, frying, salting and smoking. Trainees also studied advantages, disadvantages and precautions to take while preserving fish using these methods.

4.2.6 Modern fish processing techniques

Besides the traditional methods discusses in 4.2.4 above, the trainees were also highlighted on modern fish processing which includes fish freezing, canning, mincing, chemical preservation and production of various value added fish products. This topic aimed at imparting knowledge and skills on the production of a wide array of products to increase their economic value. This

is more important nowadays because of societal changes that have led to the development of outdoor catering, convenience products and food services requiring fish products ready to eat or requiring little preparation before serving.

4.2.7 Concepts of fish Post-harvest loss

When handling fresh fish there is a possibility of physical, quality and market force losses to occur at any point from harvesting to consumption. Causes of post-harvest losses which are usually biochemical and microbiological changes occurring in fish after harvesting were discussed. In addition, other causes of post-harvest fish loss including poor handling practices, high ambient temperatures, inadequate packaging and storage practices, discarding of by-catch, poor processing techniques, insect infestation and fluctuations in demand and supply of fish at the market were also discussed. Trainees were also informed on the negative impacts of Post-harvest losses on income of the fishermen, fish processor and traders as well as its contribution to food insecurity.

4.2.8 Fish Packaging and storage

In this topic, trainees were taught that proper processing without using a suitable packaging material can result in significant losses. Therefore, detailed discussions were made about the function of packaging, requirements of food packaging materials, materials used for fish packaging, bad packaging practices and good packaging practices. Furthermore, learners were told that the effort made during processing and packaging should be accompanied by proper labeling. It is a mandatory requirement that any packed food product should be correctly labeled.

4.2.9 Requirement for fish storage and transportation

In this topic trainees were informed that fish transportation is the process of supplying processed fish in different areas at a particular time. It intends to make the sun dried, smoked, salted fish and other fish product available to consumer. Trainees were informed that the van for carrying processed fish should be shaded to reduce temperature inside and be cool. In addition, never use bare transport to avoid dust and rainfall. Furthermore, learners were told that the effort made during processing and packaging should be complemented by proper storage of the products in order to avoid spoilage. The main causes of spoilage in storage include bacteria, insect infestation, molds, rancidity, discoloration, and texture changes. Lastly trainees were told that in the storage room follow good manufacturing practices to prevent cross-contamination with bacteria and prevent insect infestations. Lastly trainees were

informed that it is recommended that dried fish should be stored in a separate room from other food products.

5.0 Field visit

5.1 Kayenze ndogo landing site

Participants visited Kayenze ndogo landing site for practical demonstration on better fish handling, smoking and frying Appendix 5.

5.2. Field visit to Kirumba market

Participants visited Kirumba market, the largest dagaa market on Lake Victoria. They were shown the receiving area, storage, weighing bridge and processing of Nile perch by-products (Appendix 5).

5.1 Charity Food Products

Participants visited Charity Food products for practical demonstration on better fish handling, drying using solar tent dryer, frying and packaging. Appendix 5.

6.0 Certification

Trainees were awarded a certificate issued by the Fisheries Training and Training Agency signed by the Head of Short courses and Principal Trainer. A copy of issued certificate is appended to this report (Appendix 4).

7.0 End of Training Evaluation

Summative evaluation was conducted at the end of training program. Generally, the result indicates that participants were satisfied with the way training program was organized and managed (see appendix 1). Teaching materials, methodology and tutorage were rated high; with trainees being excited on the use of learner centered training techniques. On the other hand, trainees fulfilled their expectations by 97%. Time allocation for the program and quality of teaching aids were rated high, however, it was suggested that time allocated for the training was generally short for effective internalization of all necessary frames of reference on the subject matter. It was strongly recommended that more time should be allocated for such training in future.

8.0 Remarks

8.1 Closing remarks by Guest of Honour

Hon. Anna Mkilima, Nyamagana District Commissioner pointed out the importance of fish and fishery products as being important sources of food in the East African Community and being traded across our borders. Lake Victoria produces about 1million tons of fish annually and the major commercial types are Nile perch, Tilapia and dagaa. She explained that unlike Lake Victoria which has one type of dagaa, Lake Tanganyika has got two different. He informed participants that the harvested dagaa from Lake Victoria has significantly increased and contributes about 55% of the total annual fish production in the lake. Dagaa has got high post-harvest losses which can be reduced though improved handling, processing, packaging and storage. Dagaa has high crude protein content, and it is rich in essential health minerals such as Iron, zinc and calcium but majority is used for production of animal feeds. The consumption of dagaa can contribute to the reduction in the number of stunted children in EAC. She noted the low annual fish consumption in East Africa being less than 6 kg, while the world average is 20 kg and the recommended amount by World Health Organization is 25 kg.

She appreciated the training which was intended to build the capacity of sardine processors and traders in proper processing and packaging to enable them improve the processing and

packaging skills, to ensure production of safe products required in the market. She pointed out the challenges of sardine processors reading their participation in the productive sectors of the economy which vary according to age, class, education, ethnicity, location and other socio-cultural characteristics and the need to address them.

The Guest of Honour was impressed by the selection of youth processors and traders to be considered for training in the dagaa value chain as they form the majority in artisanal dagaa and fish processing. Generally, youth are marginalized but this trend has been changing quite rapidly all-over East Africa and globally.

She requested participants to make use of the skills gained during the four days training FETA Nyegezi Mwanza and also to share what they learnt with their colleagues when they return home.

She concluded by declaring the training workshop on dagaa fish processing and packaging officially closed and I wish participants a safe journey back home.

8.2 Closing remarks by LVFO Representative

The director of research LVFO Dr. Robert Kayanda, appreciated the training fish handlers and processor on improved fish handling, processing and packaging. He pointed out the importance of fish and fishery products as being important sources of food and income in East Africa. He appreciated the training which was intended to build the capacity of fisheries actors on fish handling, processing and packaging to enable them improve the handling, processing and packaging skills to ensure production of safe products required in the market as well as reduce post-harvest loss. He also insisted on become a Change Agent in their respective area by providing the knowledge and skills obtained to fellow fish processors, traders and other fisheries actors.

8.3 Vote of thanks by Participant

Mr. Antipasi Ananias one of the trainees gave the vote of thanks on behalf of the participants. He thanked the almighty God for the good health during the training and opportunity to attend the training which have enabled sharing of information and gaining information and skills. He thanked LVFO for identifying and recognizing processor and traders to benefit from the training. He further thanked the trainers for the good, clear and interesting presentations which enabled them to understand the different topics trained on. He requested participants to pass on the information learnt to others, to comply with required handling and processing standards.

9.0 Conclusion

In conclusion, both formative and summative evaluation suggested that the teaching-learning process was successful in imparting the intended knowledge and skills. In all training sessions, the training ended with a strong commitment by all participants to apply acquired knowledge and skills obtained through this training program.

Appendix

Appendix 1: Evaluation Form

FOMU YA TATHMINI YA MAFUNZAO

Tafadhali soma kila kipengele na utoe maoni yako kwa lengo la kuboresha wakati mwingine mafunzo yanapotolewa. Weka alama ya vema kwenye kibox kwa kuzingalia maelezo yafuatayo:- **1=Mbaya, 2=Wastani, 3=Nzuri, 4= Nzuri sana**

Eneo la Tathmini	***ALAMA***			
	1	2	3	4
Chakula kilikuwa kizuri na chenye mchanganyiko wa vyakula	☐	☐	☐	☐
Vifaa vya kufundishia ikiwepo chumba, mahali, na vitendea kazi vilitosheleza	☐	☐	☐	☐
Ratiba ilifuatwa na kila kitu kilifundishwa kadri ya ilivyohitajika	☐	☐	☐	☐
Wakufunzi walikuwa wanajali na kutoa majibu kwa maswali mbalimbali yaliyoulizwa	☐	☐	☐	☐

UFUNDISHAJI	***ALAMA***			
	1	2	3	4
Malengo ya mafunzo yalikuwa bayanar	☐	☐	☐	☐
Ratiba ilifuatwa na kukamilishwa	☐	☐	☐	☐
Wakufunzi walikuwa wanaeleweka na wenye taalama na weledi	☐	☐	☐	☐
Wakufunzi walifanikiwa kusimamia mijadala mbalimbali	☐	☐	☐	☐
Malighafi ya kufundishia pamoja na vitendea kazi vingine vilikuwepo	☐	☐	☐	☐
Kulikuwa na mchanganyiko mzuri wa nadharia, mifano, vitendo na mijadala mbalimbali	☐	☐	☐	☐

TATHMINI YA JUMLA	***ALAMA***			
	1	2	3	4
Mafunzo yamekizi matarajio yangu	☐	☐	☐	☐
Mafunzo yanaendana na shughuli zangu	☐	☐	☐	☐
Nimeridhiwa na mafunzo kwa ujula wake	☐	☐	☐	☐

Toa mapendekezo kwenye maeneo yafuatayo:

Unapendekez kitu gani kingeonggezwa kwenye maunzo haya
Unaona kitu gani hakikutakiwa kuwepo kwenye mafunzo haya?
Je nini kitukuwa chenye faifda Zaidi kwako
Je ni kitu gani hakikuwa na faida kwako?

Toa maoni mengine yoyote

Appendix 2: Tentative Program

TENTATIVE PROGRAM FOR THE PROMOTION AND TRAINING OF COMMUNITIES ON SMALL FISH PACKAGING TECHNOLOGY AT FETA - NYEGEZI, MWANZA -TANZANIA FROM 16th - 19th OCTOBER 2023

Day 1: 15th OCTOBER 2023 – TRAVEL TO FETA -NYEGEZI (MWANZA)		
DAY 2: 16Th OCTOBER 2023		
Time	***Activity***	***Responsibility/Facilitator***
8.30 - 9.00 a.m.	Registration	**All participants**
9.00 - 09.30 a.m.	Official Opening Prayer Introductions Welcoming Remarks from FETA Opening Speech	Participant All Participants **Mr. Arnold Mbunda** **Mr. Mukama C.K.Ndaro (Campus Manager)** and **Dr. Robart Kayanda (LVFO Representative)**
09.30 a.m.-10:00 a.m	***TEA BREAK***	**All participants**
10.00 – 10.10 a.m.	**Training rules and expectations:** Setting rules , getting to know trainees expectations and electing training officials such as timekeeper	All the trainees **Arnold Mbunda**
10:10 a.m– 10:50 p.m.	**An overview of small fish production :** This module covers the following topics: 1. Contribution of Dagaa to human nutrition 2. Concept of posr harvest loss 3. Challenges in the dagaa industry 4. Available opportunities	**Mr. Mkama C.K.Ndaro and Mr Arnold Mbunda**
10:50 a.m– 11:30 p.m.	Discussion	**All Paricipants and Tutors**
11:30 a.m– 12:50 p.m.	**Small fish handling and processing :** This module covers the following topics: 1. Fish quality and safety of dagaa 2. Fish spoilage (causes and how to tell a fresh fish) 3. Improved handling (Good and bad practices) 4. Fish preservation methods	**Mr. Arnold Mbunda**
12:50 a.m– 13:30 p.m.	**Discussion**	**All participants and Tutors**
13.30 – 14.30 p.m.	***LUNCH***	**All**
14.30 – 15.10 p.m	**Production of Fish Value added products** This module covers the following topics: 1. Method for fish value addition 2. Advantages and disadvantages of fish value addition	**S.S Sonda and E.V Lukindo**

	3. Production of various fish value added products including fish cutlets, fish powder, fish ball, fish fingers etc	
15:10 a.m– 15:50 p.m.	**Discussion**	**All participants and Tutors**
15:50 a.m– 17:00 p.m.	**Principles of fish packaging:** This module covers the following topics: 1. Meaning of fish packaging 2. Importance of fish package 3. Requirement of fish package 4. Parameters to consider during packaging 5. Methods of fish packaging	**Mr. Arnold Mbunda and S.S Sonda**
17:00 – 17:30	**Discussion**	**All participants and Tutors**
17.30 p.m.	**EVENING TEA**	**All participants and Tutors**
DAY 3 : 17th OCTOBER 2023		
Time	***Activity***	***Responsibility***
08.30 - 09.00 a.m.	Registration	**All participants**
09.00 - 09.20 a.m.	**Recap**: 1. Opening prayer 2. Recap	All participants
09:20-10:20 a.m.	**Fish standard compliance and requirement** This covers the following topics: 1. Category of standards 2. Importance of standards 3. Specific requirements for sardine products	**Dr. Ofred Mhongole**
10:20 a.m– 10:40 p.m.	**Discussion**	**All participants and Tutors**
10.40 - 11.10 a.m.	***TEA BREAK***	
11:10 -12:10 p.m	**Types of packaging materials:** This covers the following topics: 1. Types of materials eg plastic bags, paper bags, containers or any biodegradable materials ,film ,foil etc 2. Characteristics of packaging materials 3. Advantages and disadvantages of each of the packaging materials 4. Regulatory aspects of the packaging materials	**Mr. Arnold Mbunda**
12:10– 12:30 p.m.	**Discussion**	**All participants and Tutors**
12:30-13:30	**Marketing of packaged fish and fish products:** This covers the following topics: 1. Components of Fish Marketing 2. Fish Marketing: Segments of market 3. Types of fish markets 4. Examples of dagaa markets in Tanzania.	**Elizaberth Lukindo**

13.00– 14.30 p.m.	***LUNCH***	
14:30 – 17:00 p.m.	Practical Demonstrations (Sardine Processing and value addition	**Madam E.V.Lukindo and S.S.Sonda**
5.00 p.m.	***EVENING TEA***	**All participants**
	DAY 4 : 18th OCTOBER 2023	
06.30 - 07.00 a.m.	Registration	**All partcipants**
07.00 – 13.00 p.m.	Field visit **Kayenze ndogo dagaa landing site** and **Charity Fish Processing** Practical demonstrations	Chaired by **Mr. A.Mbunda** Rapporteur : **Madam E.V.Lukindo**
13.00 – 14.00 p.m.	***LUNCH***	**All participants**
14:00-14:40 a.m.	**Labelling of fish and fish products**. This covers the following topics: 1. Importance of labelling 2. General rules for product labelling 3. What must be on the label? 4. **Date marking** in food packaging 5. Techniques of labelling 6. Machines, tools and equipments used in fish labelling and estimated prices and sources.	**Mr. A.Mbunda**
14:40 – 15:00	**Discussion**	**All participants and Tutors**
15:00 – 16:30 a.m.	Demonstrations	**S.S Sonda, E. Lukindo and Mr. A.Mbunda**
16.30 p.m.	***EVENING TEA***	**All participants**
5.00 p.m.	***EVENING TEA***	**All**
	DAY 5 : 19th OCTOBER 2023	
Time	***Activity***	***Responsibility***
8.30 - 9.00 a.m.	Registration	**All participants**
9.00 - 9.30 a.m.	**Recap**: 1. Opening prayer 2. Recap	**Participants**
09.30 - 10.10 a.m.	**Storage and transportation of small fish:** This covers the following topics: 1. Methods of fish transport 2. Characteristic and of authenticated fish transporting vehicles 3. Requirement for fish transport 4. Importance of proper storage	**Madam E.V.Lukindo**

	5. Methods of dagaa storage (Good and bad practices)	
10:10 – 10:30 a.m	**Discussion**	**All participants and Tutors**
10.30 - 11.00 a.m.	***TEA BREAK***	**All participants**
10:00 a.m-13:30	Discussion/questions/ Practical Demonstrations	**Madam E.V.Lukindo and S.S.Sonda**
13.30– 14.30	***LUNCH***	**All participants**
14.30– 15.30	**Closing ceremony**	**All participants**
15:30	**Departure**	**All participants**

Appendix 3: Attendance List

MAFUNZO KWA JAMII JUU YA UCHAKATAJI, UHIFADHI NA UFUNGASHAJI WA DAGAA

FETA NYEGEZI, MWANZA – TANZANIA

Tarehe: 16/10/2023

Na	Jina	Shughuli	Kijiji	Wilaya	Namba ya	Sahihi
01.	BEATUS NAMARA	Mchakataji	KASHENO	MULEBA	0766069670	
02.	ANTIPAS M. ANANIAS	Mmiri Mmuni	KASALAZI	SENGEREMA	0655137647	
03.	ANDREA GODFREY	Mmuni	MAKOKO	MS.M.OINI	0765435015	
04.	VUMILIA NZELA	MCHATAJI DAGA	CHIFUNFU LUGONGO	SENGEREMA	0765735015 0762906967	
05	JOSEPHAT A. MOHAMED	Mchakataji	CHIFUNFU	SENGEREMA	0743-617181	
06	NEEMA RICHARD	Mchakataji	CHIFUNFU	SENGEREMA	0763227116	
07.	VESTINA NYARO	Mchakataji	CHIFUNFU	SENGEREMA	0781891122	
08.	LUCAS FITINA LUGOHYA	Mchakataji	CHIFUNFU	SENGEREMA	0768599203	
09	EVERIN C. BISANDA	Mchakataji	KASALAZI	SENGEREMA	0744222910	
10	DAILUS A. ANATORY	Mmuni	MWANZA	CHATO	0715935405	
11	ABIA PHILIPO	MCHAKATAJI	BUKINGA	MSOMA VIJIJINI	0752936114	A. Philipo

16/10/2023

Na	Jina	Shughuli	Kijiji	Wilaya	Namba ya	Sahihi
12	CHOISINA MWAMKEMI	MJIANIKA DAGAA	BLANGONYA	SENGEREMA	0718 79916	
13	Suleiman Adam Zuku	Mchakataji	Chifunfu	Sengerema	0755505303	
14	Pronatus Umendo	Kusafirisha dagaa	Busega	Busega	0742241552	
15	SALIMA SUDIJUMA	MACHINGIA	MAKOKO	MUSOMA	0659769220	S. Sijuma
16	SHARIFA LAMICKI	NAUZA DAGAA	KAYENZO	ILEMELA	0755335443	
17	RAHIFA SALIMA BADA	Nauza Dagaa Nia Kuchuuza	BUHONGA	MWANZA	0759685058	R. S. Bada
18	HAWA ZACHARIA	MCHAKATAJI	CHIFUNFU	SENGEREMA	0746 441719	H. Zacharia
19	NISEIHA CHARLES	MJANILIAMALI	CHIFUNFU	SENGEREMA	0689033250	
20	JULIANA CHARLES	MCHAKATAJI	MGANZA	CHATO	0759109857	J. Charles
21	NAZMA KATELA	MJASILIAMALI	CHIFUNFU	SENGEREMA	0658891363	N. Katela
22	RICHARD LUCAS	MCHAKATAJI	SIRARI	TARIME	0752072146	R. Lucas
23	SAMIRI MICKDAD KHALFAN	MCHAKATAJI NA SAMAKI	MISUNGWI	MISUNGWI	0747619015	
24	ANAKI NUNI ISSA	MCHAKATAJI	MISUNGWI	MISUNGWI	0752957610	

16/10/2023

Na	Jina	Shughuli	Kijiji	Wilaya	Namba ya	Sahihi
25	ELIZABETH BENADO	MKULIMA	KASALAZI	SENGEREMA	0756736473	E. benado
26	SARAH PAINETHO	MCHAKATAJI	KASALAZI	SENGEREMA	0688088254	S. Painetho
27	BIBIN MOHAMED	MKULIMA	KASALAZI	SENGEREMA	0694297154	[illegible]
28	PRIMUS EDWARD	MJASIRIAMALI	SOTA	ROLYA	0756807436	[illegible]
29	JACKSON MARTIN BALEBA	MJASILIAMALI	CHIFUNFU.	SENGEREMA	0744 481919	[illegible]

16/10/2023

Na	Jina	Shughuli	Kijiji	Wilaya	Namba ya	Sahihi
30	RABIA S KABIRITI	MCHAKATAJI	KASALAZI	SENGEREMA	0752760873	R. Kabiriti
31	ABDUL AZIZ IBRAHIM	MCHAKATAJI	CHIFUNFU	SENGEREMA	0710-381017	[illegible]
32	JANE JOHN MWALUKU-RUFI	MCHATAJI	KASALAZI	SENGEREMA	0743059499	J. John
33	SOPHIA KENGOSE ANYUOR	MCHAKATAJI	BUTIMBA	NYAMAGANA	0953963781	[illegible]
34	HEPPNES DANIAELI	MCHAKATAJI	KASALAZ	SENGEREM	0689322800	[illegible]
35	ASTERIA GEORGE	MCHAKATAJ	KASALAZ	SENGEREM	0745635[illegible]	A. george
36	MILAMBO LAMECK MARWA	MCHAKATAJI	KASALAZ	SENGEREMA	0757712572	[illegible]
37	JOHN MARY JOHN	MCHAKATAJI	KASALAZI	SENGEREMA	0767049115	[illegible]

16/10/2023

Na	Jina	Shughuli	Kijiji	Wilaya	Namba ya	Sahihi
38.	DANIEL EDWARD	MFUGAJI SAMAKI	CHIFUNFU	SENGEREMA	0752801422	
39.	HAPPYNESS CLIFOD	MCHAKATAJI	BUSEKERA	MSOMA VIJIJINI	0754564397	
40	PASCHAL GERALD	Mchakataji	Kanyala	Sengerema	0747259	
41	FRANK NWIJARUBI	Mchakataji	Konyala	Sengerema	0782727548	
42	VERENIANA DEOGRATIUS	Mchakataji	CHIFUFU	Sengerema	0621135962	
43	RAPHAEL L. NGOMENI	Mchakataji	CHIFUNFU	SENGEREMA	0755950419	
44	ROSEMARY MARTIN	Mchakataji	CHIFUNFU	SENGEREMA	0744201731	
45	ANITHA RAULIANI	mchakataji	Nansadoo	ukerewe	0766337400	
46	HUSSIAN HASHIMU	mchakataji	BUNDA	MUSOMA	0683346570 0759	
47	CHARLESS HASANI	MCHAKATAJI	KANYALA	SENGEREMA	0688287573	
48	KAPESA KAFARANSA	MCHAKATAJI	KASALAZI	SENGERGMA	0785535981	
49	WITNESS NSIGAZ	MCHAKATAJI WA DAGAA	BUKOBA MUNISPAL	BUKOBA	0684671215	
50	REVOCATUS MGISHA	MFANYA BIASHARA WA MABONDO	KIHOLELE	MULEBA	0753831036	
51	Salala JOSEPHU	MFANYA BIASHA	KILOLA	BUJOGO	0742357181	

Appendix 4: Sample Training Certificate

Certificate of Participation

This is to certify that

Sophia Kagose Awuor

Has successfully completed a short course training program on

BEST PRACTICE OF PACKAGING FOR ENHANCED SHELF LIFE, QUALITY, MARKETING AND IMPROVED HUMAN CONSUMPTION OF SMALL FISH (*Rastrineobola argentea*)

covering the following topics: *Fish Handling, Processing, Value Addition, Quality Control & Standards, Packaging, Labelling, Marketing, Record Keeping, Fish Storage and Transportation*

Held at FETA—Nyegezi, Mwanza—Tanzania from 16th to 19th October, 2023

Executive Secretary
LVFO

SC/FP/FETA 0727/2023

Campus Manager
FETA—Nyegezi, Mwanza

Appendix 5: Training Photos

Group picture during opening session

Group photo during closing session

Fish drying practical

Group presentation after field visit

Label prepared for each product

Samples of label prepared

Packed sardine

Packed sardine

Sardine drying at Kayenze ndogo

Solar dryer at Charity food Products