

TRAINING REPORT

Training of Trainers (ToT) for Fish Post-harvest Loss Handling, Quality Control and Marketing



**April 3 - 6, 2023, Sebeta National Fisheries
Research Center**

Ethiopia

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Introduction

Fish is one of the most valuable sources of high-grade protein available especially because of its high content of essential amino acids. In spite of a low lipid content, fish fats are dominated by unsaturated fatty acids. Fish is also rich in vitamins and minerals. However, even if fish is rich in nutrients, it is a highly perishable product that deteriorates very fast because of its high nutritional value and high-water content. Indeed, after the fish dies, enzymes and bacteria present in the digestive system remain very active. This is the main reason why it is important to handle fish with a high degree of hygiene and to keep its freshness just after capture in order to inactivate enzymes and bacteria. This can be done by using cold chain (ice, refrigeration or deep freezing) or by proceeding rapidly through salting, drying or smoking in order to substantially reduce the amount of free water inside the fish. In Sub-Saharan Africa, poor processing and management of fish products result in losses 30 – 40% and worth up to US\$5 billion annually. In order to improve the fishers' income, training on fish hygiene, value addition and marketing are fundamental.

The Intergovernmental Authority on Development (IGAD) is one of the implementing Regional Economic Communities for the EU funded ECOFISH programme. Moreover, IGAD also applied on the call for proposals programme of ECOFISH and granted a 3-year project on Support to Sustainable Utilization, Development and Management of Two Transboundary Basins Fisheries of Baro-Akobo-Sobat River Basin (BASRB) between Ethiopia and South Sudan, and Lake Turkana Basin (LTB) shared between Ethiopia and Kenya.

The overall objective of the project is to develop gender-responsive and climate-smart sustainable utilization of fisheries resources, and foster use of fisheries for building of resilience and bolstering of food and nutrition security and local economies especially for the fishing and “Arid and Semi-Arid Lands (ASALs)” communities in the two basins. This will include provision of support to the fishing communities and fisheries managers in each of two basins to facilitate their active participation and engagement in fisheries management.

Rationale of the Training of Trainers

Lake Turkana is one of the Great Lakes in Africa that is also world's largest permanent desert lake located the East African Rift Valley. Similarly, Baro-Akobo-Sobat River Basin is located in the Arid and Semi-Arid Lands. Thus, in both basins the fish post-harvest loss is high (>40%) due to the high temperature in the areas and poor infrastructure development. This IGAD-Ecofish project conducted capacity need assessment studies in both basins last year (2022) and one of the key capacity gap identified during the study was fish post-harvest management. Therefore, this regional ToT is targeting to improve fish hygiene, value addition and marketing in both basins.

- 1, OPENING SESSION OF THE WORKSHOP

1.1 Opening Remark by IGAD Secretariat

Dr. Eshete Dejen, Programme Manager of Environment Protection Unit of IGAD Secretariat, made some welcoming remarks for the workshop participants. He recognized the government officials from both Ethiopia, Kenya and South Sudan who were present in the workshop. He highlighted the importance of the training and expressed

1.2 Remarks by the Deputy Director of Fisheries, Kenya

1.3 Remarks by the Director of Fisheries, South Sudan

1.4 Official Opening

The official opening was made by Dr. Fasil Dawit, the Head of Fisheries and Aquatic Development Desk at the Ministry of Agriculture in Ethiopia. In his opening remarks, welcomed all participants to Ethiopia are as follows:

2. WORKSHOP OBJECTIVES AND EXPECTED OUTPUTS AND PROGRESSES OF IGAD ECOFISH PROJECT

Dr. Wassie Anteneh, Blue Economy and Fisheries Expert (IGAD Secretariat) presented the workshop objectives and expected outputs of the workshop. He highlighted them as follows:

Objectives:

- To provide hands on training on fish hygiene and handling
- To introduce traditional fish preservation techniques (fish salting and drying)
- To introduce fish chilling and deep freezing
- To introduce simple fish value addition techniques such as packing and branding

Expected Outputs:

- Trained experts and fishing community on hygiene and fish handling in the three project implementation countries (Ethiopia, Kenya and South Sudan)
- The application of traditional fish preservation techniques (fish salting and drying) and modern methods such as chilling and freezing introduced for the trainees
- Some simple and effective methods of value addition and branding introduced
- Awareness created to expand market access by fishers.

3. Training on Fish Post-harvest Loss Handling, Quality Control and Marketing

The regional training of trainers was done by a consultant/ facilitator who covered the following Modules:

Module 1: Fish Hygiene and fish handling

This module focused on hygiene and fish handling practices that may prevail along fish value chain, i.e. from the boat to the consumer, provides answers to the following questions: a) Is fish a food with high nutritional value? b) Is fish meat more nutritional than cow meat, goat meat, etc.? c) Why is fish a highly perishable product? d) Is spoiled fish a dangerous product? e) What are the main criteria to determine if fish is fresh or spoiled? f) What are the best hygiene practices to avoid fish spoilage? h) How to handle fish?

The module looked at the main reason why it is important to handle fish with a high degree of hygiene and to keep its freshness just after capture in order to inactivate enzymes and bacteria. This can be done by controlling the two key factors that can limit or stop bacterial growth /multiplication namely time and temperature by using cold chain (ice, refrigeration or deep freezing) or by proceeding rapidly through salting, drying or smoking in order to substantially reduce the amount of free water inside the fish.

Module 2: Fish salting and drying

This module presented the improved techniques of wet salting fish followed by drying in the sun on raised racks. Salting and drying are simple techniques commonly used in tropical zone to preserve fish and facilitate transportation. Salting and drying are suitable for regions where there are neither electricity, nor ice facilities.

It was observed that when salting and drying are conducted in a good way, it is possible to increase fish lifespan up to 3 months, even more. It also allows to keep fish nutritional value as well as organoleptic quality, reduces fish post-harvest losses and the final product is much appreciated by consumers.

A practical exercise on fish hygiene and handling, as well as on traditional fish preservation techniques was undertaken during the training.



Module 3: Fish chilling and deep freezing

If fish is exposed to direct sunlight, it may spoil within one day. But, in places where there are electricity facilities, fish can be kept at low temperature and remain fresh a couple of days or months. The best way to avoid fish spoiling is to apply the principle of time/ temperature control to avoid bacterial growth and also to handle it with care and hygiene.

There are different ways that can be used to keep fish freshness: using ice, refrigeration, deep freezing. Preservation time depends on the temperature to which fish is kept. In a fridge for example, fish can be kept for about 7 days, 6 to 12 months in a deep freezer. Ice can also be used to keep fish freshness.

This module covered some advantages of cold chain and different ways that can be used to keep fish freshness at low temperature.

Module 4: Fish marketing

In order to help fishing cooperatives and traders to ensure a good marketing of their product, we have prepared a training module on marketing techniques for fish products. This module was introduced two main components, namely the market study and the calculation of the cost of production and the selling price.

The module indicated that different steps need to be followed in a market study: collection of information on the product to be marketed and its main advantages, methods of packaging, preservation, processing and transport for ability to retain most of its nutritional and organoleptic qualities, - potential customers and their requirements, potential competitors.

The different elements that come into play in the calculation of the cost of production and the selling price are: purchase price of the product, cost of transport, advertising costs, fees paid to



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the different commissionaires who assist you in market research and fish marketing, depreciation costs for equipment and equipment and profit margin.

9. ANNEXES

Annex 1: Training Agenda

Date/Time	Activity	Responsibility
Day 1: 03 April 2023		
09:00 – 9:30	Registration of Participants	IGAD
9:30 – 9:45	Welcoming Remark	AED Director
9:45 – 10:00	Opening Remark	Fisheries Director, MoA/Ethiopia
10:00 – 10:15	Introduction of participants	IGAD
10:15 – 10:30	Workshop Objective	Dr. Wassie
10:30 – 11:00	Health Break and Group Photo	
10: 30 -12:00	Fish Hygiene and fish handling (Module 1)	Facilitator and PMU
12:00 – 13:00	Discussion	
	Lunch Break	
14:00 – 17:00	Practical Exercise on fish hygiene and handling	Facilitator and PMU
Day 2: 4 April 2023		
09:00 – 10:30	Traditional fish preservation techniques	Facilitator and PMU
10:30 – 11:00	Health Break	
11:00 – 13:00	Discussion	
13:00 – 14:00	Lunch Break	
14:00-17:00	Practical Exercise on traditional fish preservation methods	Facilitator and PMU
Day 3: 5 April 2023		
09:00 – 10:30	Modern fish preservation techniques	Facilitator and PMU

10:30 – 11:00	Health Break	
11:00 – 13:00	Discussion	
13:00 – 14:00	Lunch Break	
14:00-17:00	Practical Exercise on traditional fish preservation methods	Facilitator and PMU
Day 4: 6 April 2023		
09:00 – 10:30	Value Addition and marketing	Facilitator and PMU
10:30 – 11:00	Health Break	
11:00 – 13:00	Discussion and closing remarks	
13:00 – 14:00	Lunch Break	
14:00-16:00	Travelling to Addis Ababa	

Annex 2: List of Participants

ETHIOPIA

No.	Names	Name/ Organization	Email
1.	Dr Fasil Dawit Moges	Head Fisheries & Aquaculture Development Desk, Ministry of Agriculture, Addis Ababa	fasild016@yahoo.com
2.	Dr Gatluak Gatkduoth	Researcher, Community Service & Industry Linkages Vice President Gambella University, Gambella	grolkier@gmail.com
3.	Dr Elias Alemu Bedasso	Vice President, Research & Community Service Jinka University, Jinka	Eliasalemu95@gmail.com
4.	Mr Chieng Goaner Jock	Regional Senior Livestock and Fishery Expert Livestock and Fishery Resource Development Bureau, (LFRDB) Gambella Region	chienggoanor2020@gmail.com
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8.	Mr Kassahun Habtegiorgis Telefa	Fisheries Expert Agriculture Office, Southern Nations, Nationalities, and People's Region (SNNP)	NA
9.	Mr Yosef Mesfin Emiru	Fisheries Expert Omo Zone, Agriculture Office, SNNP	yosefmesfin19@gmail.com
10	Mrs Nyapuot Koang Gile	Fish Processor/Transporter Nuer Zone, Larea Woreda Gambella Region	NA
11	Mrs Lebua Maneko Lechama	Fish Processor/Transporter South Omo Zone, Dasenech Woreda Gambella Region	NA
12	Mrs Ara Meri	Fish Processor/Transporter South Omo Zone, Dasenech Woreda Gambella Region	NA
13	Mr Temesgen Arker Mersiya	Leader, Fish Cooperative Fish Trader South Omo Zone, Dasenech Woreda Gambella Region	NA

KENYA

No.	Names	Organization	Email
14	Mr AKWEE PETER EDOME	Senior Lecturer/ Researcher Turkana University College in Lodwar, Turkana County	pedome@tuc.ac.ke akweepeter@gmail.com
15	Mr. Michael Wambua	Director Fisheries Ag Deputy Director Fisheries & Blue Economy State Department for Blue Economy & Fisheries, Nairobi	wambuamk@gmail.com
16	Mr. Omar Boru Jillo Aga	County Fishery Expert County Director of Fisheries Marsabit County	boruaga@gmail.com
17	Mr Lotabo Loongori	Beach Management Unit BMU Chairman, Loiyangalani Landing Site Marsabit County	vesuron@gmail.com
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19	Mr. David Namwaya Wanjala	County Fishery Expert Ag County Director of Fisheries Turkana County	namwayadavid@gmail.com
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21	Mr. Maurice Obiero	Fisheries Researcher Researcher Fish Post-harvest losses Kenya Marine & Fisheries Research Institute, Turkana County	mobiero69@gmail.com

SOUTH SUDAN

No.	Names	Organization	Email:
22	Mr. Jackson Elisoma Muso	Ministry of Livestock and Fisheries Juba	mogga.jackson@yahoo.com
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26	Mr Jilo Gilo Nasir	Deputy Director Jonglei State , MAR&F	

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TRAINERS/ FACILITATORS

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IGAD SECRETARIAT

No.	Location	Name	Email
32.	Djibouti	Dr Eshete Dejen	Eshete.dejen@igad.int
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