SAFETY AND QUALITY IN FISHERIES SUB SECTOR IN UGANDA

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PRESENTATION FLOW

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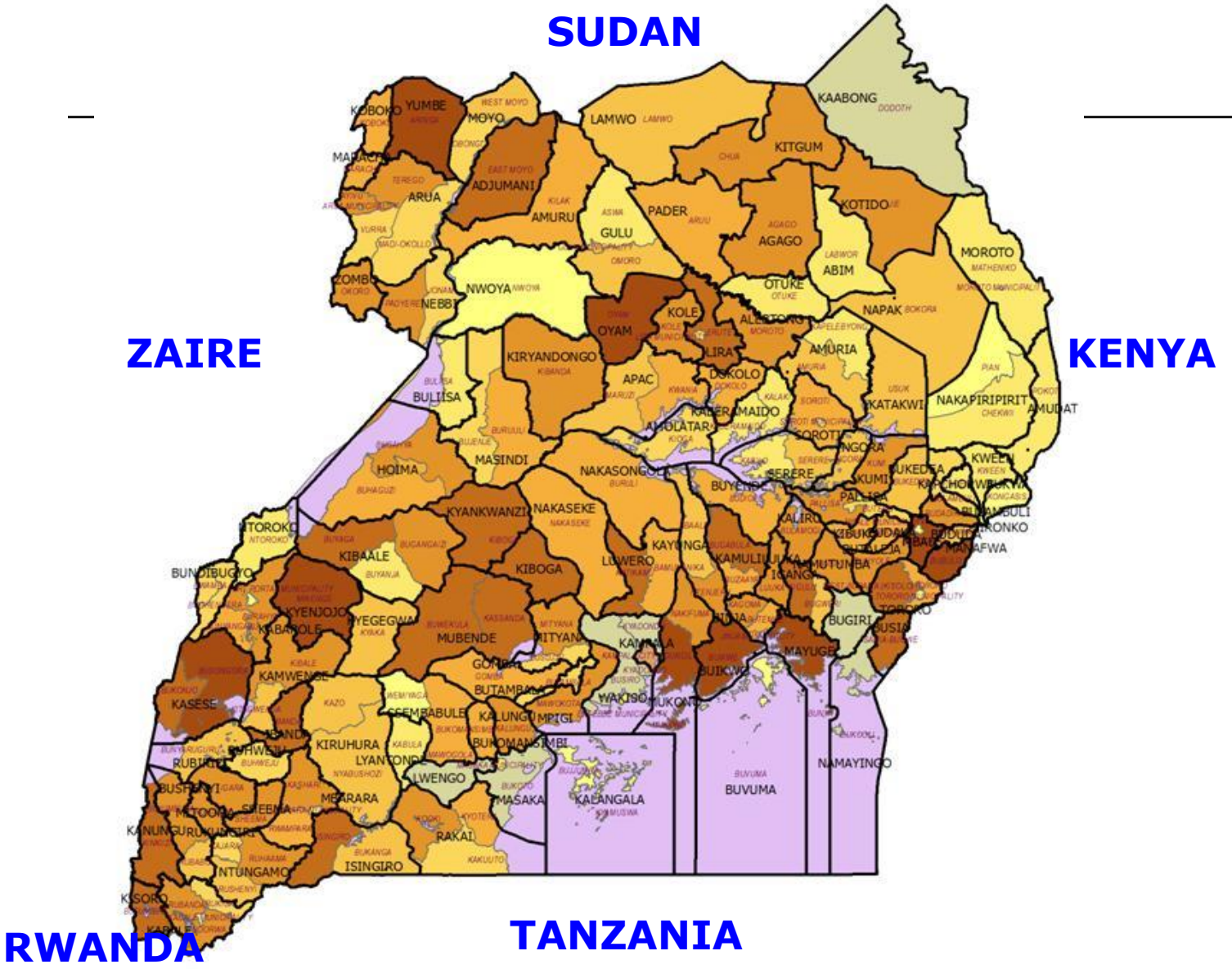
Map of Uganda



Introduction

- The fisheries sector in Uganda is among the key sectors of the economy.
- Contributes approximately 6% of Uganda's GDP.
- The earnings from fish exports increased from US$ 1.4 million in 1990 to $143 million in 2005.
- Commercially exploited species are Nile perch, Nile tilapia and sardine-like *rastreneobola argentae* locally known as *mukene.*

Nile perch exports from Uganda since 1991

Year	Quantity in (tonnes)	Value (,000 US$)
1991	4,751.00	5,308.70
1992	4,831.00	6,450.50
1993	6,037.10	8,806.90
1994	6,563.00	14,768.90
1995	12,970.90	25,902.80
1996	16,396.40	39,780.90
1997	9,839.00	28,800.00
1998	11,604.00	29,732.70
1999	13,342.00	36,608.30
2000	15,876.38	34,363.10
2001	28,153.39	79,039.10

Introduction

- The EU accounts for almost three-quarters of the fish traded to the international premium markets.
- Domestic and regional trade consists mainly of *mukene* and Nile tilapia, although the latter is being traded into Far East markets.
- Traditionally, fish and fishery products are important source of protein

Introduction

- The Uganda fish processing industry, which is composed of private companies in 1988.
- At present, there are 10 registered companies for fish processing and export.
- All the companies are situated on the banks of Lake Victoria
- 700,000 are people involved in various fishing activities including fishermen/women, fishmongers, fish transporters and boat builders.

Introduction

We are going to talk about:

- Sun-drying of Mukene
- Sun drying and salting of Nile perch and Tilapia
- Smoking of Nile perch and Tilapia
- Deep Frying of fish
- Fresh Fish

TILAPIA

NILE PERCH

MUKENE

Fish Food Safety

- To ensuring safe and quality fish and fishery products along the supply chain from capture to marketing the following steps have to be considered.
  - Fishing,
  - Handling,
  - Processing,
  - Packaging,
  - Storage,
  - Transportation and marketing of fish and fish products
    - for human consumption

Fish food safety

- Several risk factors with potential of increasing food safety hazard within the traditional artisanal fisheries production chain. These include:
  - Poor hygiene of fishing boats
  - Dirty fish handling environments
  - Mishandling of cleaning chemicals

- Hazard refers to a biological, chemical, physical or allergy agent or substance in food with potential to cause adverse health effects to consumers, if not controlled

Fish food safety

- Physical contamination of fish with sand and debris at the landing sites.
- This could result into the consumers suffering from a range of food borne illnesses e.g. cholera and physical injury.

Fish Food Quality

Definition:

- Quality is a grade of goodness as rated by the buyer or consumer and may also cover the safety of the fish.

- Different people interpret quality differently

Fish quality is looked at in two-fold

- **Intrinsic quality** means the sum of attributes which are inherent in the harvested raw material fish.

- Active control over or manipulation of intrinsic quality is impossible
  - To control this would mean selection of fishing grounds, fishing seasons, and fishing methods.

Fish quality is looked at in two-fold

- Extrinsic quality defects are quality reductions in the post harvested fish caused by humans deliberately or accidently.

- Extrinsic quality defects is the category of quality where control can be subjected.

Basic scientific facts of fish quality and fish spoilage

- When a fish dies, the biochemical reactions and microbial processes continue to take place in the flesh as long as the enzymes and substrates supporting the processes are still present

- In dead fish, the processes occur through processes known as decomposition, leading to break-down products which are toxic and responsible for loss of flavor and quality of fish when it spoils.

Basic scientific facts of fish quality and fish spoilage

- Freezing or icing of fish does not stop possible quality changes that can occur at low temperatures e.g. oxidative changes
- Exposing fish to higher temperatures and/or sunshine, accelerates spoilage process.
- Fish spoils and lose quality only after death
- The stakeholders involved in the fish production chain should be knowledgeable on how to maintain good fish quality for safety and better prices

Basic scientific facts of fish quality and fish spoilage

Why fish is very perishable and spoils fast,

- Because it contains 70-80% water, 15-24% proteins, 0.2-22% fat and vitamins and minerals in very small amounts.

- A combination of high water content of fish (80%) and warm temperatures promote the growth of bacteria, and this makes fish deteriorate fast in tropical climates

- The bacteria present in the air, water and in the ground are always present in the fresh of fish

Fish spoilage

- Fresh fish mainly undergoes bacterial spoilage
- Salted and dried fish mainly undergoes fungal spoilage
- Salt tolerant bacteria can cause spoilage
- Gill region is the most susceptible to spoilage
- When not eviscerated/gutted quickly after catch the microbes in the Gastro Intestinal Tract can attack the flesh.

Reducing Fish Spoilage

Cooling and freezing the fish,

Preservation by reducing their water contents of fish is through drying, smoking or salting,

- Reducing potential for attack by bacteria through cleaning them or working fast with the fish,
- Proper handling of fish during capture,
- Removing guts immediately after death/capture,
- Avoid stacking them together too high,
- Proper packaging

Fish spoilage

- Even for preserved fish, spoilage can occur as a result of poor fish storage and packaging

- Spoilage is manly from pests, moulds and storage bacteria.

What is important?

- For food safety and quality assurance in the fisheries general guidelines recommended to be followed during
  - **production,**
  - **handling,**
  - **preparation,**
  - **processing and handling fish and fishery products**
- by all operators involved along various stages in the fishery and aquaculture from capture to sale.

Problems of in fish sector

Structure of competent authority

Lack of mandate to control fish quality control by the competent authority. Clear line of command between Uganda National Bureau of Standards under the Ministry of Tourism, Trade and Industry and Fish inspection services in the Department of Fisheries Resources (DFR) under Ministry of Agriculture Animal Industry and Fisheries is needed

Inspection

- There were no clear guidelines and standard operating procedures for fish inspectors regarding fish inspection for fish being landed, hygiene conditions at landing sites, sampling procedure records and documents required for traceability of origin and transportation of fish.

Problems cont'n

Laboratories

- Non-availability of a suitable analytical laboratory for pesticide residue analysis was a key concern. Government Chemists presently is in charge of performing pesticide residue analysis in fish products, however, the performance and capacity still is inadequate

Legislation

- There is need to upgrade Fish Acts to meet present requirements of the fishery industry.

Problems cont'n

Decentralization

- District Fisheries Officers (DFOs) were not answerable to DFR and hence not following the instructions regarding hygiene and handling of fish as required by EU regulations.

Landing Sites

- Most public landing sites had not been upgraded and their facilities did not meet minimum EU requirements.

Fish Handling

- Fish is still generally unhygienically handled throughout the chain.

Why we need to follow guidelines?

- To ensure that the fish and fishery products handled or processed are safe and of the quality required by the local, regional and international markets.
- To make fishing business profitable through good maintenance of quality through better prices
- To promote the use of good practices in handling, processing and preservation activities aiming at slowing down the spoilage

What do we need to do?

- Avoid conditions which might accelerate normal spoilage and/or increase contamination with hazards
- Whenever possible introduce procedures which slow down normal spoilage or reduce the hazards to acceptable limits or eliminate them
- Avoid or minimize contamination of the fish by spoilage agents or hazards
- Move the fish through each stage without delay and control the time each stage takes to avoid attack by spoilage agents or hazards

FISH PROCESSING METHODS AT ARTISANAL LEVEL

Status of artisanal fish processing

- Artisanal fishery's growth was stimulated by the emergency of fish processing industries.
- By-products targeted are raw material for artisanal business:
  - Fish carcass(skeleton)
  - Fish heads,
  - Bladders,
  - Skins
  - Rejected fish
  - Juvenile fish(Tilapia, Nile perch)
  - Spoilt fish (second grade)

Status of artisanal fish processing

The above by-products/raw materials have a greater risk of spoilage because the factories treat them as trash.

- Subjected to:
  - Throwing on ground
  - Heavily bruised
  - Internal bleeding
  - Rupture of internal systems
  - Exposed to high temperature
  - Delayed transportation and in open
  - Large surface are for spoilage

Status of Artisanal fish processing

The main fish processing methods are

- Smoking
- Sun-drying
- Salting
- Deep frying

- Processing area is made of wooden slabs (difficult to clean)
- Drying is done ground on dirt plastic sheets in open air
- Drying is also done on elevated platform

Status of artisanal fish processing

- Lack of clean portable water for fish processing. Lake water is used for cleaning fish
- General lack of toilet facilities at landing sites
- Finished products are stuck on plastic sheets at ground level and in open