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Cover Photo

Symposium participants pose for a photo. Image courtesy of Hillary Egna.

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Introduction

Dr. Hillary Egna
Director of the Aquafish CRSP- Oregon State University

In the agri-food sector, a value chain network consists of different processes and activities in order to bring food products and services to the market to satisfy customer demands. A value chain in sectors with perishable products such as fish adds additional dimensions because of the limited shelf life and the importance of food quality and food safety issues. These factors make such value chains complex, especially when other factors like variability in demand and price, and environmental factors are considered.

The improved management of agri-food value chains and networks is considered a method to increase productivity and the performance of the agriculture sector in developing countries. This is based on the presupposition that the flow of goods and services, capital, technology, ideas, and labor offers opportunities for developing nations to enhance economic growth and reduce poverty by increasing productivity and efficiency, providing access to new markets and ideas, and expanding the range of consumer choice. International development organizations are increasingly focusing attention on entrepreneurship and agricultural trade via linkages with better rewarding markets, promoting exports of agricultural products, and fostering competitiveness in the agricultural sector. Value chain analysis therefore provides a reference point for improvements in products and services, and, in the case of value chains of developing country commodities, can suggest interventions for consequent improvements in the economic welfare of the poor by linking small householder farmers and their families with the market.

At present, in most developing nations, there appears to be limited distinction in the marketing of wild-caught fish and farmed fish and the two often share the same marketing chain. The value chain typically follows one of two forms - a short chain that is usually localized and a long chain that extends to distant markets and includes export markets. Internal domestic markets are typically characterized by simple short value chains with little value added. Limited processing or packaging occurs between producers and consumers. In Africa, where on average people use more of their income to purchase food than is the case on other continents, most consumers obtain their food through short, simple, largely local value chains. With increased international trade, value chains become more complex, and longer value chains create challenges of achieving efficiency at each stage of the chain to minimize cost and also meet demand.

Good linkages are needed to improve information flow and learning capacities and also help to reduce transaction costs, increase productivity in terms of value, and increase profitability. Value chain collaboration then becomes very important for smallholder producers in developing countries to ensure access to new and profitable markets. Collaboration also allows participation in network governance to enable timely responses to end-user demands for capacity development and knowledge dissemination. Market access and value chain governance are commonly recognized as the key dimensions for creating opportunities for smallholder producers in developing countries. Addressing value chain issues in international development work involves efforts toward making local producers cost-competitive and also building capacity to enable them to comply with quality requirements, ensure consistent and reliable supply, and meet quality and safety standards. Opportunities for poor smallholder enterprises include cost-efficient market intermediate activities such as product aggregation, storage, processing, and distribution.

Access to market information and the nature of information flow has become a key requirement for maintaining competitiveness. With increasing access to and use of the Internet and mobile communication devices, individuals in developing countries have the opportunity to effectively participate in value chains

to be competitive. Supply chains for agri-food products also being driven by delivery and procurement conditions requiring timeliness, consistency and reliability, and the development of relationships.

Value chains are dynamic and vary in terms of composition, relationships, information flow, market positioning, etc. There is the need for an understanding of market dynamics and a thorough analysis of actual and potential market segments and competition. Transactions costs analysis can be used to assess barriers to market participation by resource-poor smallholders by defining characteristic of smallholders and the factors responsible for market failures. In developing countries, some markets do not exist, and where markets exist, there are high transactions costs associated with accessing those markets. With limited quantities of products and unreliable supply lines, high exchange costs are associated with longer distance to the market, poor infrastructure network and poor access to assets and information. Differences in transactions costs and access to assets and services are possible factors underlying the various levels of market participation among smallholders. While value chain analysis is extremely useful, its weaknesses highlight the fact that many other important considerations are necessary to increase value for the entire chain or some of its participants. This session's focus on markets and value chains is an attempt to better understand the intricate linkages between the chain elements, performance, and value added distribution to allow a determination of optimal institutional arrangements and policy approaches to smallholder participation.

In many of the analyses, the gender of the actors was found to be an important factor in terms of access to investment, trade goods and information. However, gender does not act in isolation from other variables in the human dimension and is embedded in culture and household structures. For the first time, and primarily through the medium of the three sessions highlighted in this Proceedings, IIFET has received the presentation of a substantial body of gender studies. To highlight the insights on gender in aquaculture and fisheries supply chains and in small scale fishing communities more generally, a special report (Overcoming Gender Inequalities in Fish Supply Chains to Inform Policy and Action) is included.

SESSION 01A: MARKETS AND VALUE CHAINS FOR SMALL AQUACULTURE ENTERPRISES (IN FISHERIES, AQUACULTURE AND FOOD SECURITY)

Organizer and Chair: Dr. Hillary Egna

Objective: To discuss the breadth and complexity of value chains for aquaculture products; to identify barriers and constraints to the addition of value to farm-raised products that increase producer incomes and food security; to highlight producer efforts to broaden access and participation in value chains.



VALUE CHAIN DEVELOPMENT FOR TILAPIA AND CATFISH PRODUCTS: OPPORTUNITIES FOR WOMEN'S PARTICIPATION IN KENYA

Dr. Kwamena Quagraine* and Leah Ndanga

Purdue University and Kwame Nkrumah University Of Science and Technology (Ghana)

Abstract

A Benefit-Cost Analysis using ratios of annual costs and benefits was calculated for fish farmers (aquaculture) and fish marketers (including distributors, processors and retailers). Forty five of the 86 respondents had a benefit cost ratio higher than 1. Further analysis investigated effects of selected variables on ratios. Relative to Eldoret, marketers in Nairobi and Kisumu were more likely to have lower margins possibly due to the size of markets, competition and customer base. Experience had a positive effect on ratios probably because of the relationship-based nature of the fish markets. Fish marketers who had been in the business longer had created a strong customer base and stronger ties with their suppliers and customers. The data showed that performing multiple business functions had a negative effect on financial viability suggesting that specialization, and/or focusing a larger portion of the business in either retailing or wholesaling was better. Although gender effect was insignificant, the regression showed that being a female had a positive effect on the business' financial viability. As part of the VCA framework, we used Porter's model for competitive analysis in conjunction with the marketing mix (Ps) and SWOT analysis, performance profiling and the factor evaluation matrix. In terms of Porter's 5 forces framework, the best value chain opportunities exist for fish marketers and the worst exist for input suppliers. Despite the high initial costs, by diversifying and also acting as hatchery and/or breeder, fish farming is viable.

VALUE CHAIN DEVELOPMENT FOR TILAPIA AND CATFISH PRODUCTS: OPPORTUNITIES FOR WOMEN'S PARTICIPATION IN KENYA

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INTRODUCTION

- ◉ Fish -important food source in many Africans' diets
- ◉ Fish supply in Kenya- mainly wild capture fisheries and imported marine fish
- ◉ Aquaculture development in Kenya- identified as a core activity for funding in NEPAD Action Plan in 2000.
- ◉ Growth in aquaculture- cover the fish supply gap.
- ◉ Despite government's efforts (ESP program), access to capital - major constraint

OUTLINE

1. Introduction
2. Tilapia and Catfish value chains
3. Porter's 5 forces industry analysis /
Marketing Mix
4. SWOT analysis
5. Economic Profitability Analysis
6. Key Success Factors
7. Opportunities

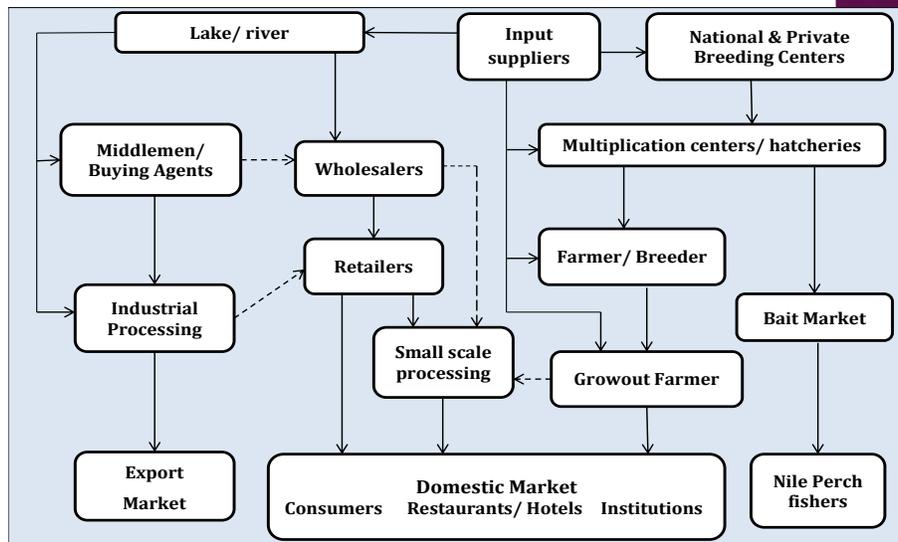
INTRODUCTION

- ◉ Aquaculture development in Kenya identified as a core activity for funding by GOK
- ◉ Aquaculture covers the fish supply gap
- ◉ Access to capital is a major constraint
- ◉ Limited distinction between wild-caught and farmed fish in the marketplace

INTRODUCTION

- Farmed fish usually by direct sales to consumers, traders & establishments
- Culture is mainly Nile tilapia (*Oreochromis niloticus*) and African catfish (*Clarias gariepinus*)
- Fish production is male dominant
- Women traditionally dominant in harvesting, post-harvest handling & marketing

TILAPIA & CATFISH VALUE CHAINS



Adapted from Quagraine et al (2007), Charo-Karisa et al (2007) & survey findings



VALUE CHAIN PARTICIPANTS

1. Input suppliers
 - Aquashops and Agrovets
 - Harvest equipment suppliers
 - Irrigation and Greenhouse equipment suppliers
2. Fish farmer/ Input suppliers
3. Fish farmers
4. Fish marketers
 - Wholesalers
 - Retailer/ Traders
 - Processors

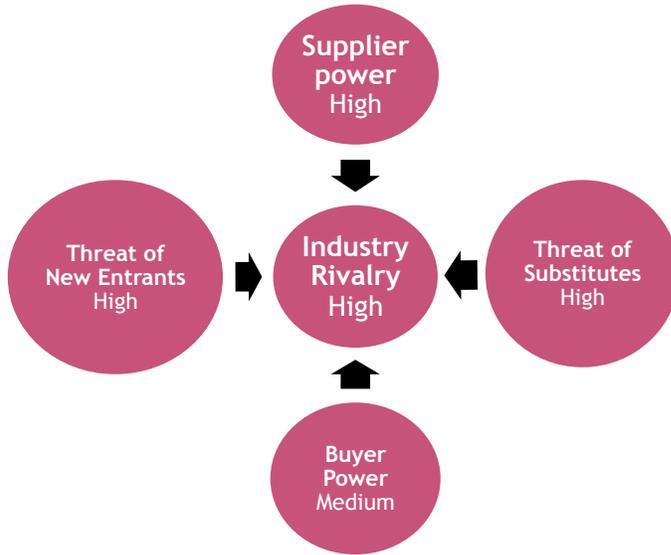


RESULTS

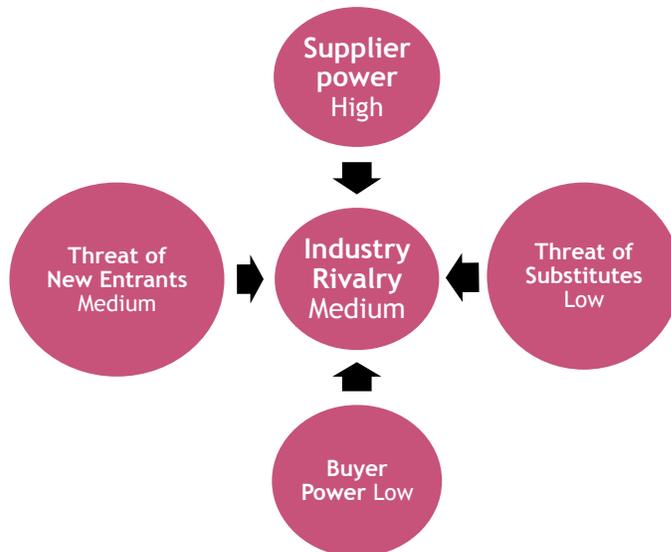
PORTER'S 5 INDUSTRY FORCES

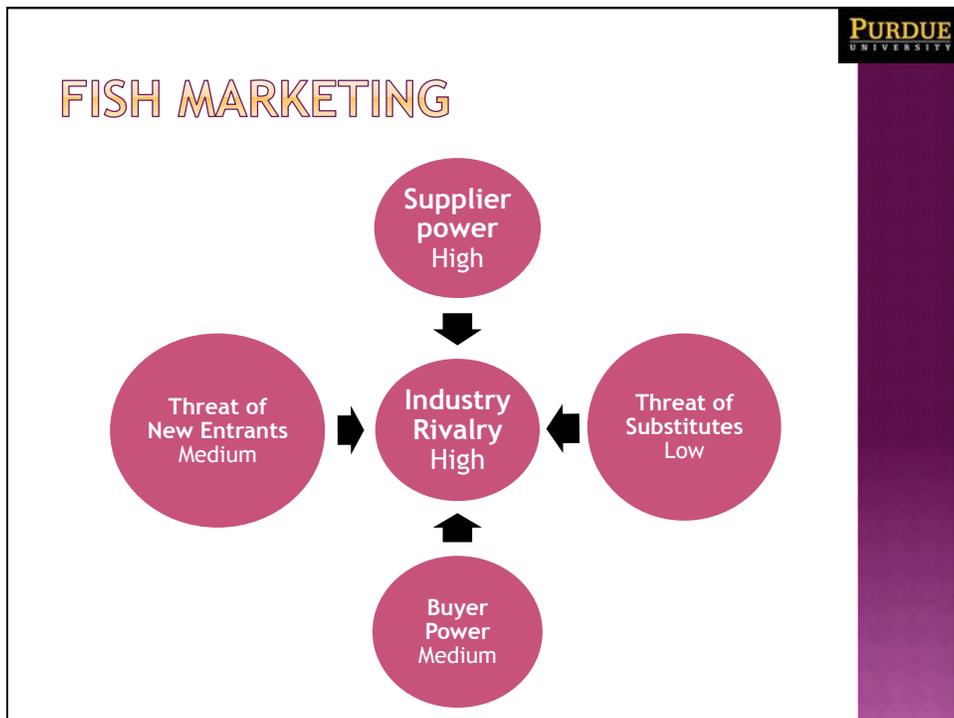
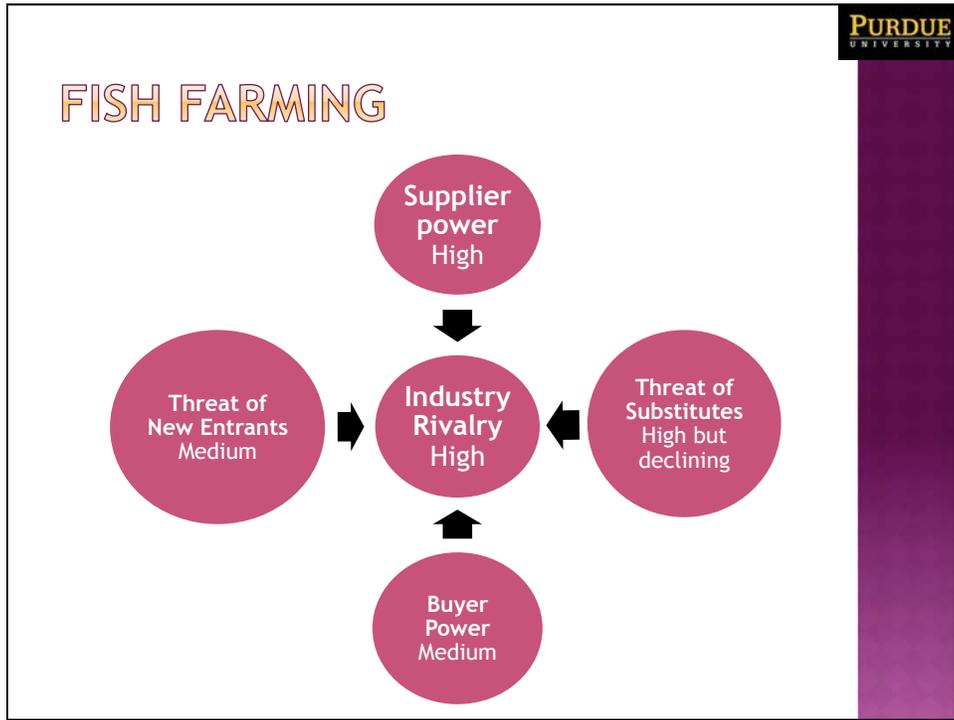
(FORCES DETERMINE COMPETITIVE INTENSITY & PROFITABILITY)

INPUT SUPPLY

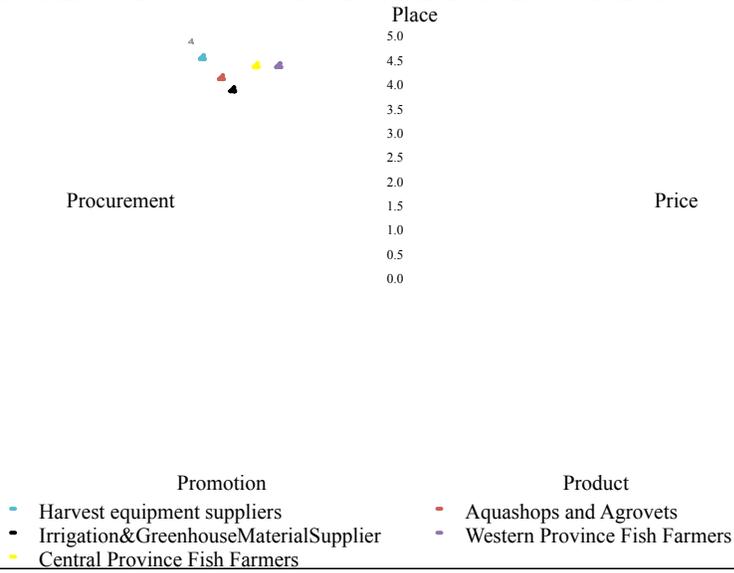


FISH FARMING/ INPUT SUPPLY





RADAR CHART OF PERFORMANCE IN TERMS OF THE MARKETING MIX - INPUT SUPPLIERS & FARMERS



RADAR CHART OF FISH MARKETERS' PERFORMANCE IN TERMS OF THE MARKETING MIX



RESULTS

SWOT ANALYSIS

(EVALUATES THE STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS OF BUSINESSES)

INPUT SUPPLY

Strengths

- Diversified product offering
- Convenient bulk sales
- One stop shop
- Liaisons with government - Department of Fisheries referrals

Opportunities

- Only 6 government accredited aquaculture input suppliers
- Well defined market with access to capital
- Successful 2008 ESP government pond initiative
- Increased local government financial support
- Referrals from government for technical assistance

Weaknesses

- Temperature control
- Expensive transportation
- Customer defaults on payment
- High initial capital investment

Threats

- Crime - thefts and burglaries
- US\$ fluctuations
- Customs and port delays
- Expensive transportation and Transport delays
- High input prices
- Slow delivery of inputs

FISH FARMING / INPUT SUPPLY

Strengths

- Only available option in close proximity
- Good verifiable Quality
- Training & Consultation on aquaculture
- After sale services/free consultation
- Great service-personal touch
- Connects supply chain actors

Opportunities

- Only 6 government accredited aquaculture input suppliers
- Shortage of fingerling/fry to stock ponds
- Successful 2008 ESP government pond initiative
- Referrals from government for technical assistance
- Increased local government financial support

Weaknesses

- High initial capital investment
- Temperature control
- Lack of binding contractual arrangements
- Expensive transportation- no delivery
- Small scale- no chain power

Threats

- Lack of support structure and institutional organization
- US\$ fluctuations
- Lack of quality control in terms of inputs
- Input supply delays and shortages
- Fish culture inputs too costly/not available locally

FISH FARMING

Strengths

- Less labor intensive
- Ready protein source
- Source of water used for irrigation, livestock & household use
- Pond bottom mud used to fertilize gardens/ fields
- Enhanced community relations- farm gate sales

Opportunities

- Successful 2008 ESP government pond initiative
- Increased local government financial support
- Ready market due to government undersize fish ban
- Branching into input supply &/or value addition
- Can diversify into ornamental or bait fish

Weaknesses

- High initial cost for training, pond construction & inputs
- Require training on fish rearing and pond management
- Require expert evaluation of location/site/water and extension services
- Expensive construction and operation costs

Threats

- Constrained access to inputs
- Lack of trained extension officers
- Shortage of fingerling/fry to stock ponds
- Land availability
- Need close proximity to water
- High labor costs



FISH MARKETING

Strengths

- Can engage in wholesaling, trading and processing concurrently
- Low start up and operating costs
- Convenient bulk sales delivered to market
- Can process (dry, smoke or fry) leftover fish
- No construction or training required
- Low switching costs in terms of products of location

Opportunities

- New farmed fish market
- More female traders
- More youth economic participation in market
- Better market conditions from government
- Consolidation into one market facility
- Improved sanitation

Weaknesses

- Short shelf-life
- Low profits
- Crime & Theft by middlemen & employees
- Access to capital/finance
- Transportation for fish supply to market
- High storage and refrigeration costs

Threats

- Less / no government assistance in some markets,
- Poor roads delay delivery & accidents
- Fish shortage
- Poor hygiene in the market
- Crime & corruption
- Increased competition



RESULTS

ECONOMIC PROFITABILITY

ECONOMIC PROFITABILITY ANALYSIS

1. $BCR = \sum_{t=1}^T PVB / PVC$
2. $PVB = \sum_{t=1}^T B_t / (1+r)^t$
3. $PVC = \sum_{t=1}^T C_t / (1+r)^t$

Where

- PVB is the present (discounted) value of benefits
- B_t is the dollar value of future benefits in time t
- r is the discount rate
- t is the year in which B_t is realized
- PVC is the present value of costs
- C_t is the cost in time t
- BCR is the ratio of costs to benefits in discounted terms

FISH MARKETERS

Monthly Averages	Nairobi Markets, Central Province	Kisumu Market, Western Province	Eldoret Markets, Rift Valley Province	Sample Total
Total Annual Costs	244,354	128,825	133,213	198,504
Total Annual net revenue	580,897	218,267	225,455	437,174
Benefit-Cost Ratio	2.3	1.7	1.7	2.2



FISH FARMERS

	Western province	Central province	Rift Valley province
Year one			
Avg Benefit-Cost Ratio	0.328	0.009	0.018
Avg Net Benefits (Ksh)	-104,461	-98,353	-65,223
Year Two			
Avg Benefit-Cost Ratio	1.751	0.107	0.024
% change from Year 1	81.28	92.01	23.67
Avg Net Benefits (%)	-737.09	-18,331.33	-32,660.74
% change from Year 1	-14,072	-436.53	-99.70



KEY SUCCESS FACTORS

◉ *Input supply*

- Stable finances and substantial capital resources
- Large contracts and/or links with NGOs and government department to ensure referrals and large contracts
- Good planning and foresight to circumvent effects of delays
- Access to personal or reliable transportation
- Strategic alliances

KEY SUCCESS FACTORS

◉ *Fish farming/Input supply*

- Strong knowledge base
- Stable finances and substantial capital resources
- Established good fish breeds, i.e. good brood stock
- No accredited fish breeding centers or hatcheries in close proximity
- Strategic alliances
- Alternative electricity source

KEY SUCCESS FACTORS

◉ *Fish farming*

- Stable finances and substantial capital resources
- Reliable accredited input supplier
- Good knowledge base
- Patience and determination
- Integrated aquaculture and agriculture system
- Alternative electricity source



KEY SUCCESS FACTORS

◉ *Fish marketing*

- Versatility and persistence
- Discipline in terms re-investing earnings
- Good inter-personal skills and engaging personality
- Cleanliness
- Ability and equipment to perform light processing



OPPORTUNITIES

1. Fish Marketing

- Provides the most flexibility and liquidity
- Easier to enlist additional assistance

2. Fish farming

- Despite the high capital investments and high entry barriers, some costs can be minimized via integrated system
- Aquaculture is not as labor intensive as other agricultural activities
- Requires a long term commitment, patience and persistence

OPPORTUNITIES

3. Fish farming / Input supply

- Requires large capital outlays
- Only established fish farmers can assume this

4. Input supply

- Require large capital outlays and additional finances in case of emergencies
- Often a full time obligation
- Government & NGO interest reduces transaction costs

CONCLUSIONS

- Fish farming is the driving function of the aquaculture value chain
- Sale of fish enhances community relations and creates a stable source of income and food
- Fish marketing offers female participants more flexibility and liquidity
- Input supply recommended for those seeking long term financial strength & having strong educational and technical backgrounds
- Established fish farmers may consider diversifying into input supply and value addition.



CONCLUSIONS

- ◉ Kenya government initiatives are commendable - incentive schemes and ESP program.
- ◉ Private sector involvement commendable - aquashops (FARM-Africa and the UK funded Research into Use program) and agrovets (CNFA) initiatives.
- ◉ Need for a multi-level collaborative effort to determine a long term strategic plan that benefits and includes all value chain participants

***FUNDING FOR THIS RESEARCH WAS PROVIDED BY
THE***



**COLLABORATIVE RESEARCH
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VALUE CHAINS OF CAPTURED & CULTURED SNAKEHEADS (*CHANNA MICROPELTES* & *CHANNA STRIATUS*) IN THE LOWER MEKONG BASIN OF CAMBODIA & VIETNAM

Dr. Robert Pomeroy* and L. X. Sinh
University of Connecticut and Can Tho University (Vietnam)

Abstract

The rapid development of snakehead aquaculture in Vietnam and Cambodia has led to economically unstable conditions. The farming systems of snakeheads have been spontaneous and mainly uses live feed that cause environmental pollution and the depletion of natural aquatic resources in freshwater. The price of commercial snakeheads is not stable because they are strongly affected by the seasonal supply of wild captured fish as well as seasonality in snakehead farming. They are primarily used for domestic consumption. There has been limited research conducted on snakeheads, especially the marketing of this group of fish species. So far, market channels as well as value chains of giant snakeheads and common snakeheads have not been studied. The current study reports on a value chain analysis covering all of the aspects of the snakehead fish industry in the Lower Mekong Basin. The results of this study are useful for management and development of the snakehead industry, as well as contributing to food security, job creation and marketing of fish products in the Lower Mekong Basin region of Cambodia and Vietnam.



**VALUE CHAINS OF CAPTURED & CULTURED
SNAKEHEADS (*Channa micropeltes* & *Channa
striatus*) IN THE LOWER MEKONG BASIN OF
CAMBODIA & VIETNAM**



R.S. Pomeroy, L.X. Sinh & H. Navy
Dar Es Salaam - Tanzania, 17th July 2012



AquaFish CRSP Project
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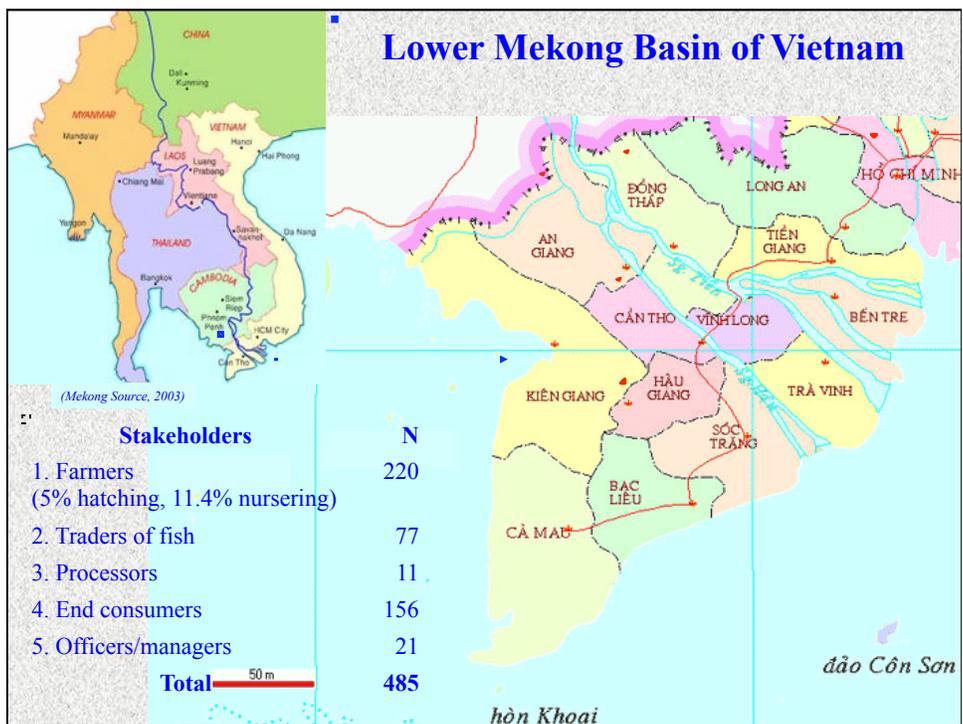
Phase 1 (2007-09) => Marketing of snakehead products is important!

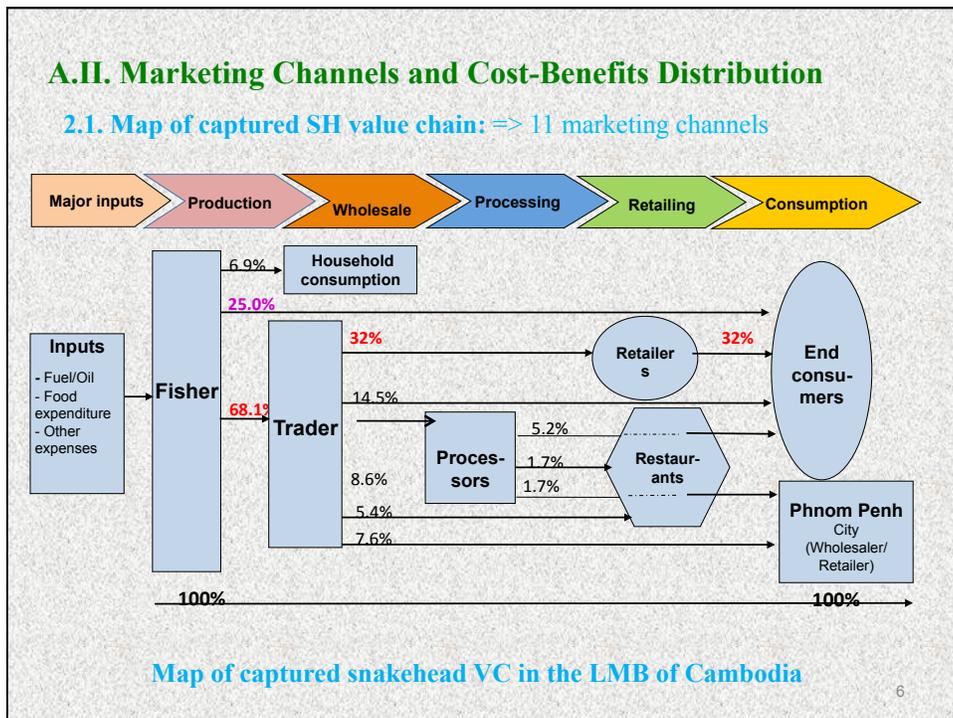
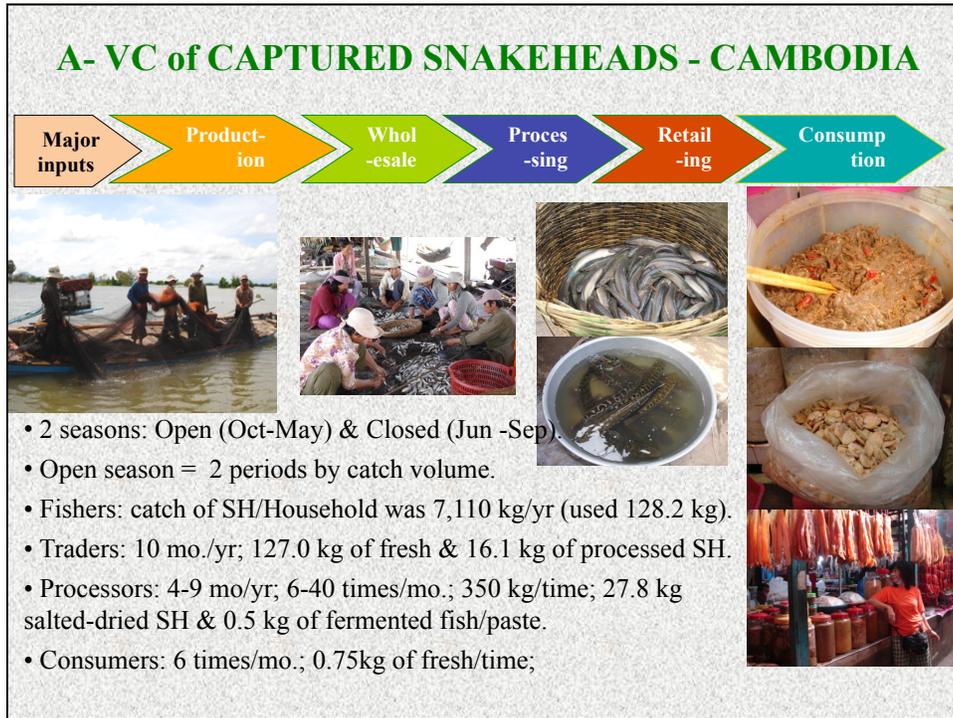


Investigation 5 – Phase 2 (2010-11)
**VALUE CHAIN ANALYSIS OF SNAKEHEAD FISH
IN THE LOWER MEKONG BASIN OF CAMBODIA & VIETNAM**

OBJECTIVES:

- To describe the chain actors and their activities related to SH;
- To analyze the contribution of costs & the distribution of profits;
- To analyze the perception of major groups of chain actors;
- To propose the suggestions for an improvement of SH value chain.





A.II. Marketing Channels and Cost-Benefits Distribution (Cont.)

2.1 Channel 1 – Captured SH:

Channel 1: Fishers -> Wholesalers -> Retailers -> Consumers

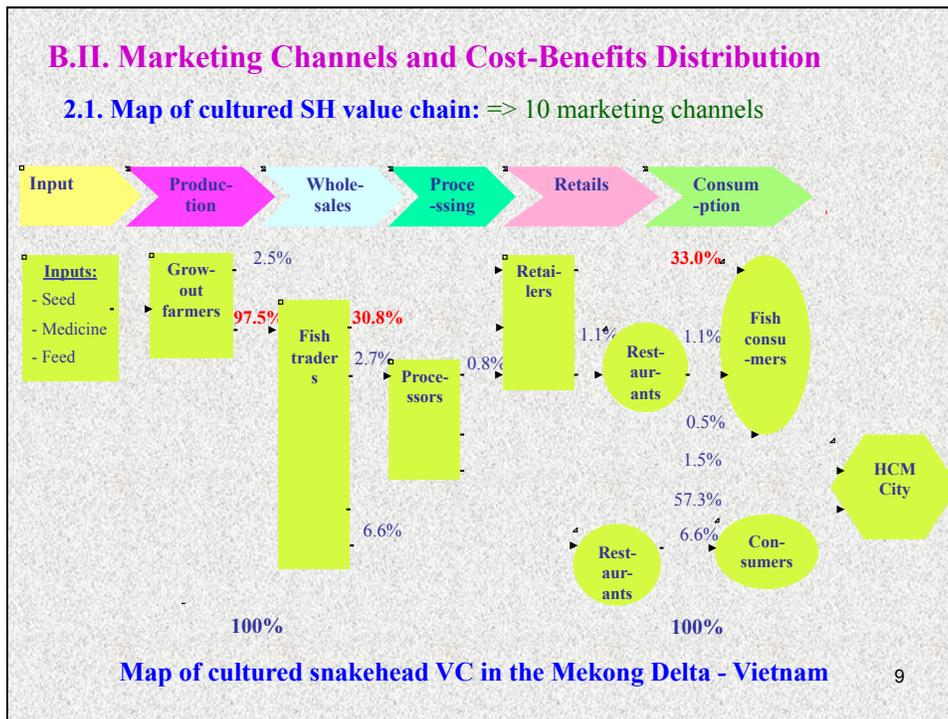
Description	Fishers	Wholesalers	Retailers	Total
Selling price	1.62	2.11	2.93	
Buying costs	0.57	1.62	2.11	
Added costs	-	0.02	0.25	
Net added value	1.05	0.47	0.57	2.09
% of net added value/kg	50.2	22.5	27.3	100.0
Production/HH/year (ton)	1.41	96.36	5.70	
Total profit (USD/year)	1,480.5	45,289.2	3,249.0	50,018.7
% of NAV/actor/year	3.0	90.5	6.5	100.0

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B- VC of CULTURED SNAKEHEADS - VIETNAM



- Hatcheries: Natural breeding, ~30 days/batch; 1,100 fries/kg
- Nursery: 25-35 days/cycle; Size of 314 fingerlings/kg.
- Kept for nursery & grow-out: 69.4% fries and 89.0% fingerlings.
- Farmers: 4.5-8 months/crop; mainly used LVF (FCR: 3.9-4.3)
- Harvest size: 0.55-1.30 kg/fish; Sold to traders: 80.7%.
- Included/Excluded owned captured LVF: 52.3% & 35.8% had (-) profits.
- Traders: Wholesalers & retailers; retailers traded both fresh, dried & fermented SH.
- Fresh SH/day: 2.2 tons & 17 kg; Processed SH/day: 4.4 kg & 6.3 kg (smaller size).
- Processors: 8.2 tons of raw SH /yr (smaller size); 3 forms of products; Export is very limited.
- Consumers: 61% of living expenditures was for food; Buying SH: 1 time/week; 0.75kg/time.



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B.II. Marketing Channels and Cost-Benefits Distribution (Cont.)

2.2. Channel 1 – Cultured SH:

Farmers -> Wholesalers -> Retailers -> Consumers

Description	Farm-ers	Whole-salers	Proces-sors	Retailers	Total
Selling price (USD/kg)	1.65	1.77		2.4	
Buying cost (USD/kg)	1.4	1.65		1.77	
Added cost (USD/kg)	-	0.051		0.08	
Net added value (USD/kg)	0.251	0.069		0.554	0.874
<i>% Net added value/kg</i>	28.8	7.8		63.4	100.0
Output/actor/year (tons)	14.1	728.2		6.0	
Total profit/actor/yr (USD)	3,542.9	49,931.4		3,325.7	
<i>% NAV/actor/year</i>	6.2	87.9		5.9	100.0

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C. UPGRADING of the VCs of SH in the LMB:

- Various guidelines (also known as manuals or handbooks) exist for carrying out VCA => cover 4 broad stages of VCA (Fig.2).
- + Appraisal of VCs and related information, e.g., choosing products, areas to work, and partners; conducting surveys to describe VCs and product sub-sectors; rapid market appraisals, and data analysis.
- + Design of interventions to improve VC performances, including technologies, institutional innovations, and policies.

Figure 2: Stages of value chain analysis (Nang'ole, E.; D. Mithöfer & S. Franzel, 2011)



C. Upgrading the VCs (cont.):

1. To establish clubs or cooperatives of chain actors within the SH industry and to develop the linkages for better production and marketing of SH.
2. To have a good management of fish traders and better provision of market information to all chain actors. It is vital to ensure that each chain actor can possibly obtain the same benefit to sustain VCs.
3. To improve the management of fish quality by providing proper feeding, conservative and processing technologies (death rate, weight loss, value added products), and to increase export opportunities.
4. To have a better planning and supportive policies including wild fish stock management. Better export-oriented policies in association with financial policies are necessary to increase the production of SH as well as to reduce the risks of the chain actors.

Thanks for your attention & comments!

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VALUE CHAIN ANALYSIS (M. Porter, 1985)

- VCA describes the activities the organization performs and links them to the organizations competitive position.
 - VCA describes the activities within and around an organization, and relates them to an analysis of the competitive strength of the organization.
- ⇒ Therefore, it evaluates which value each particular activity adds to the organizations products or services.
- ⇒ Possible to produce something for which customers are WTP a price only if the related things are arranged into systems & systematic activities.

• => **VCA consists of:**

- Selection of the chain;
- Mapping of the chain;
- Analysis of cost and profit;
- SWOT analysis.



• => **Improvement of VCs:**

- Production => New Prod? Quality?
- Cost reduction;
- More investment (esp . outsiders);
- Redistribution (act., cost, profit).

• **???** More considerations:

- Gender ?
- Poverty?
- Linkages (vert, hort, reg.)?
- Governance?

REVIEW OF STATUS AND OPPORTUNITIES IN FARMED FISH MARKETING IN KENYA

Julius Manyala*, Judy Amadiva, Charles Ngugi, and Kwamena Quagrainie
Moi University (Kenya), Ministry of Fisheries Development (Kenya), and Purdue University

Abstract

Review of Status and Opportunities in Farmed Fish using an Innovative Real Time Fish Market Information System

Past Aquaculture CRSP and AquaFish CRSP research studies in Kenya have largely focused on fish production resulting in improved production technology in aquaculture. In 2007, total fish production was estimated to be 4,245mt valued at US\$6.6 million but has since grown exponentially. In Western Kenya, initiatives by cluster fish farmers have realized significant increases in the production of catfish fingerlings (*Clarias gariepinus*) for bait to Lake Victoria long-line fisheries. Some cluster farmers have diversified into fish feed production, extension services on pond construction and training other farmer on artificial propagation of the African catfish at a fee. The biggest challenge to many of these fish farmers is the lack of a marketing information system for farmed fish and fish products. Fortunately, Kenya is now widely covered by mobile phone networks, which offers a potential to map markets and demand with supply. This study assessed the potential for an Aquaculture Fish Marketing Information System (AFMIS) that integrates production and markets based on the existing model developed by Kenya Marine and Fisheries Research Institute (KMFRI). There is a Kenya national fish farming inventory database which was used by KMFRI to develop the Enhanced Fish Marketing Information System (EFMIS) for the commercial capture fisheries. EFMIS emerged from a National Fish Marketing Information System (NAFMIS) to enhance fish trade and incomes through improved access to fish market information. A conceptual framework for the AFMIS technology is envisaged to provide information on fish seeds, brooders, fish feed, prices, quantities and availability.

Review of Status and Opportunities in Farmed Fish Marketing in Kenya

Julius Manyala¹, Cecilia Muthoni¹, Judy Amadiva², Charles Ngugi³ and Kwamena Quagraine⁴

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IIFET Conference
Hyatt Regency Kilimanjaro
Dar-es-Salaam, Tanzania
16th – 20th July 2012



INTRODUCTION-1

- At present aquaculture accounts for 9% of total fish production in Kenya
- The aquaculture production levels currently stand at 12,153 MT (2010)
- There has been an increase in the number of fish farmers from 1,000 in 2007 to over 28,000 in 2010 (Under ESP & EARPAD (Fish Farming Enterprise & Productivity Programme –FFE&PP))
- Issues: Production vs Organized marketing system



STATUS

Facilities	2008	2009	2010	Projected Results
No. of ponds	7530	9116	15529	48,000
No. of Dams	301	331	331	-
No. of Tanks	156	161	161	-
Total	7,987	9,608	16,021	48,000
Pond Area	728 ha	825 ha	1017 ha	1440 ha
Production	4,452 MT	4,895 MT	12,153 MT	12,960 MT



- ## OBJECTIVES
- Identify factors that influence consumer decision-making and purchase of tilapia and catfish product.
 - Examine consumers' preference structure and decision criteria for farmed tilapia and catfish.
 - Possible linkages to Fish Marketing Information System such as EFMIS.
- 

METHOD

Marketing study:

- Major urban centres – high fish demand
- At least 300 questionnaires proposed
- M. Sc Students involvement
 - Preferences
 - Purchasing patterns
 - Preferred products
 - Quantities purchased



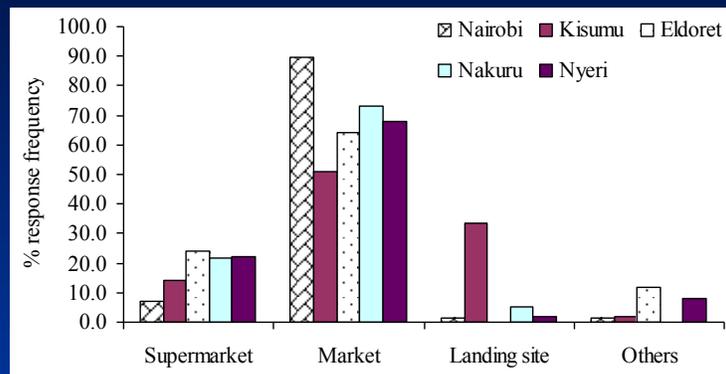
Map of Kenya showing the major study centres:
Nairobi, Nyeri, Nakuru, Eldoret and Kisumu

RESULTS - 1

- Respondents 377
- The most preferred species was tilapia
- Over 72% of the respondents in all the towns
- Consumption Patterns:
 - Kisumu (1.71 ± 0.21 kgs)
 - Nairobi (1.42 ± 0.16 kgs)
 - Nyeri (0.31 ± 0.04 kgs)



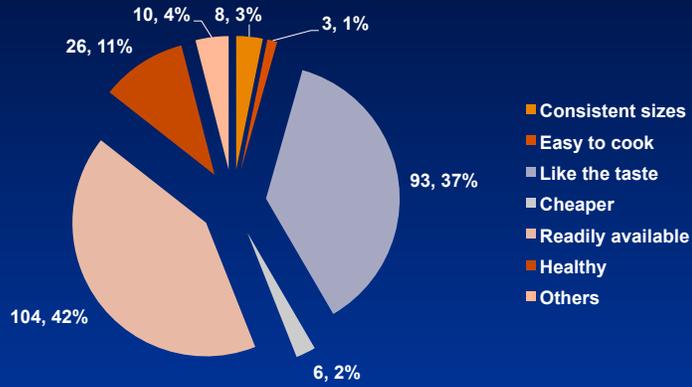
RESULTS-2



Common places where the local people purchase fish

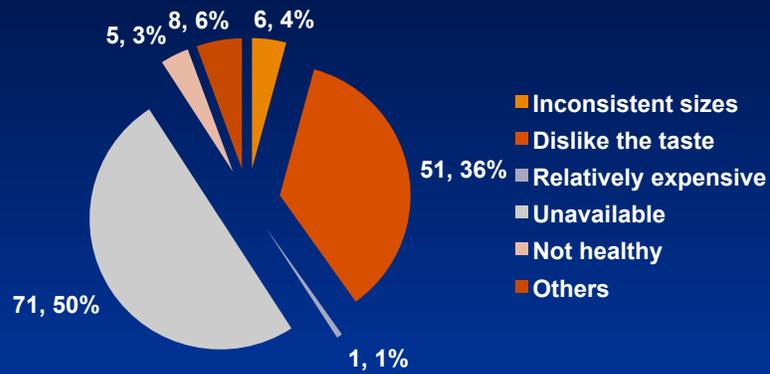


RESULTS-3



Reasons for preference of tilapia regardless of type and source

RESULTS-4



Reasons for non-preference of tilapia regardless of type and source

E-WORKSHOP/EFMIS



CONCLUSIONS

- Market structure is now relatively well understood
- Availability of fish is limited in some urban centres
- Prices are sometimes prohibiting
- Marketing information is relatively available
- Tilapia market is segmented more by price and product types and availability
- Product development seem to be a necessity for socio-economic groupings

RECOMMENDATIONS

- Analysis of the different tilapia value chains
- Tilapia value chain development:
 - Product diversification
 - Value addition
 - Quality assurance and quality control
- Integration of Aquaculture Marketing Information into EFMS
- Development of strong production cluster
- Linkages between production, market research and distribution
- Developing and improving processing capacity
- Access to financial capital for fish cottage industries

RECOMMENDATIONS

- Linking Farmers to the cluster
- Linking clusters to markets
- Linking clusters to cluster (Networking)
- Linking farmers & clusters to marketing information systems
- Linking clusters to Aquashops

THANK YOU

*FUNDING FOR THIS RESEARCH WAS PROVIDED
BY THE*



**COLLABORATIVE RESEARCH SUPPORT
PROGRAM**



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IMPROVING THE SUPPLY CHAIN OF THE TILAPIA INDUSTRY IN THE PHILIPPINES

Dr. Wilfred Jamandre*, Upton Hatch, Remedios Bolivar, and Russell Borski
Central Luzon State University (Philippines) and North Carolina State University
Improving the Supply Chain of Tilapia Industry of the Philippines

Abstract

This study evaluated the Philippine tilapia supply chain including the roles of key actors, logistical issues, external influences, and transaction flows among market levels. It identified improvement areas and provided recommendations for the industry. Key players include hatcheries, nurseries, commercial/small-scale farmers, consumers and institutional buyers. Pampanga, Batangas and Laguna are major tilapia sources while Metro Manila, Angeles and Baguio are the major demand centers. Dagupan is the major tilapia transshipment point for Northern Luzon. Many farmers employ a “circuitous” production technique to meet markets’ preferences. Direct buying and selling at central markets are the common operations of the tilapia industry. Consumers generally prefer whole live fish with size from 250 – 300 grams per fish. The requirements of institutional buyers are more varied. Filleted tilapia requires about 2-3 pieces per kg. High costs of logistics and transactions; lack of cold storage and transport vehicles; and meeting delivery requirements are the major concerns of nurseries, farmers and traders. Irregular supply of desired quality and volume of tilapia, limited capital for expansion, and predatory market practices are the main concerns of processors. Some recommendations to address the issues and concerns, are: encourage the establishment of more nurseries while intensifying technology transfer to farmers; conduct promotions for niche opportunities of tilapia; motivate small farmers to link with supply chains through an incentive mix; institutionalize an accreditation program for feed manufacturers, hatcheries, processors, etc.; and provide capital windows to improve facilities and reduce logistics and transaction costs in the entire supply chain.

IMPROVING THE SUPPLY CHAIN OF TILAPIA INDUSTRY IN THE PHILIPPINES

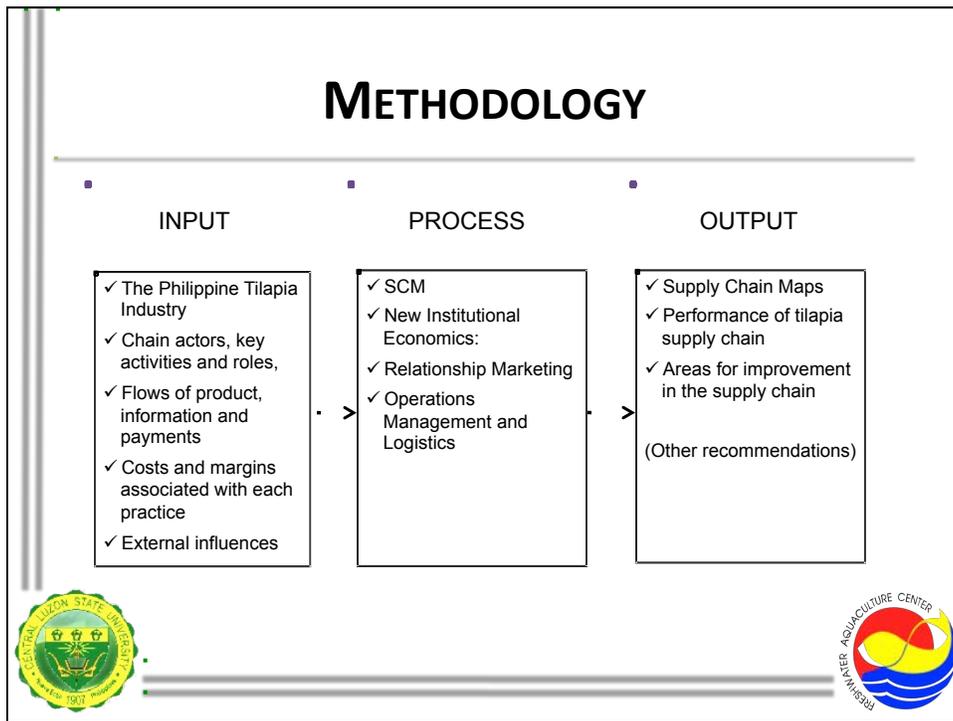
Wilfred E. Jamandre, Central Luzon State University (CLSU)
Upton Hatch, North Carolina State University (NCSU)
Remedios B. Bolivar, Central Luzon State University (CLSU)
Russell Borski, North Carolina State University (NCSU)



OBJECTIVES

1. Develop tilapia supply chain maps
2. Analyze tilapia supply chain performance
3. Identify areas for improvement in supply chain
4. Provide recommendations





STUDY AREAS AND COVERAGE

- Regions I, III, IV, CAR and NCR
- 5 hatchery and nursery operators
- 28 farmers
- 4 processors
- 24 traders/consolidators/shippers
- 11 institutional buyers

Routes of SC mapped	Supply Chain Players	Number of Respondents
Bicol-Laguna-Batangas-Manila-Baguio (Chain 1):	Hatchery and Nursery Operators	3
	Fish farmers	15
	Processors	2
	Traders/consolidators	8
	Institutional buyers	5
Pampanga-Pangasinan-Ilocos and Isabela - Baguio and Manila (Chain 2):	Hatchery and Nursery Operators	2
	Fish farmers	13
	Processors	2
	Traders/consolidators	16
	Institutional buyers	6




DATA GATHERED

- key players, their roles/activities/services
- product grades and standards
- product, information and payment flows
- logistics issues
- production and marketing
- external influences



Results and Findings



HIGHLIGHTS OF THE PHILIPPINE TILAPIA INDUSTRY

- 12% of GDP from aquaculture
- 1.4 million workforce and fish producers
- source of food and animal protein
- 3.81 kgs per capita consumption
- 10% average annual growth rate (2005-2008)
- 14% of the total food expenditure



BAS, (2010) and Rodriguez, et.al. (2009)



HIGHLIGHTS OF THE PHILIPPINE TILAPIA INDUSTRY

- 258,663MT production *(BAS 2010)*.
- 80% from Regions III and IV
- Top 5 provinces:
 - Pampanga (37.68%), Batangas (21.06%), Laguna (4.64%), Rizal (4.06%) and Bulacan (3.58%).
- Culture environments:
 - 57% freshwater fishponds
 - 38% freshwater fish cages
 - 7% brackishwater fishpond
 - 1% freshwater fishpen *(BFAR, 2004)*



HIGHLIGHTS OF THE PHILIPPINE TILAPIA INDUSTRY

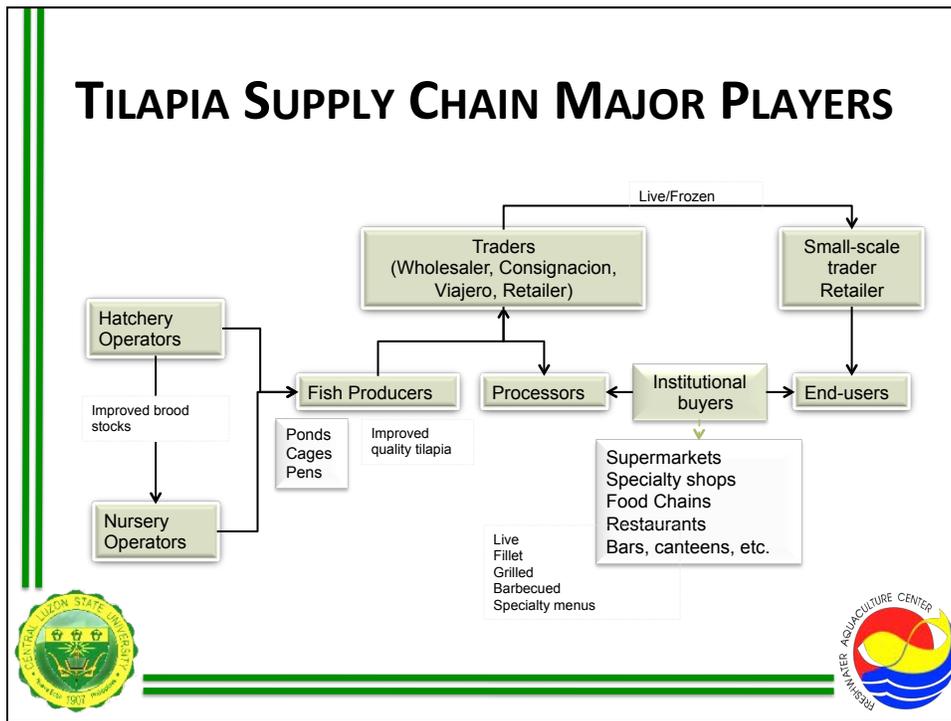
- Types of tilapia:
 - Nile Tilapia
 - 87% to total tilapia production in 2000 (BFAR, 2001)
 - Red Tilapia (Mozambique)
 - BFAR GET Excel
 - Genomar Supreme Tilapia (GST)



HIGHLIGHTS OF THE PHILIPPINE TILAPIA INDUSTRY

- Industry's growth drivers:
 - genetic improvement
 - stock management and cultural practices
- Market niches:
 - product forms - filleted, dried, whole fish
 - outlets - supermarkets, food chains





NURSERY OPERATORS

- Maintain fry up to marketable sizes:
 - 22-20 on-season months (May, June, July, August)
 - 14-12 off-season (September, October, November, December)
- Prefer Nile tilapia




Central Luzon State University (Logo: 1907)

FRESHWATER AQUACULTURE CENTER (Logo)

HATCHERY OPERATORS

- ✓ Supply fry and fingerlings (400 thousand fry every 18 days)
- ✓ Provide techno-guides to fish producer – customers
- ✓ Handle about 3,000 breeders (GIFT -CLSU)
- ✓ Maintain nursery ponds



FISH PRODUCERS

- produce marketable tilapia
- 2.5 – 3 months (4-5 pieces per kg)
- 3.5-4.5 months (2-3 pieces per kg)



WHOLESALE & RETAILERS

- **Wholesalers**
 - shippers or viajeros
- **Retailers**
 - Resellers
 - Handle 100-150 kg of live fish, daily (5-6 pieces per kg)



TRADERS & CONSOLIDATORS

- Traders**
 - buy, sell and distribute
- Consolidators**
 - Supply supermarkets
 - Facilitators
 - Price monitor
 - Small-scale trading
 - Gatekeepers



PROCESSORS

- Fillet, dried, whole, frozen and choice portions or trimmings
- Dressing recovery:
 - 1 kg raw tilapia (2-3 pieces) yields 30-35% fillet, 18% belly, 25% innards, 21% head and 1% skin



INSTITUTIONAL BUYERS & HOUSEHOLD CONSUMERS (KEY CUSTOMERS)

- Institutional Buyers (Supermarkets, Specialty Shops, Food Chains, Restaurants)
- Household consumers



PRODUCT FORMS

- Preferred by household customers
 - live whole tilapia
 - size of 4-5 pieces per kg (200 - 250 g per fish)
 - Northern Luzon markets prefer darker-skinned tilapia
 - The common food recipes are charcoal grilled, fried, boiled and “paksiw”
- Preferred by hypermarkets
 - live whole fish
 - size of 3-4 pieces per kg (250 – 350 g per fish)



PRODUCT FORMS

- Specialty shops and food chains in major urban centers
 - tilapia fillet (350 g per pack)
 - whole frozen fish (2-3 pieces per kg)
 - dried fish (100 g per pack or 30-35 g per fish)
 - by-products of filleting - fish soups, tilapia belly and deep fried tilapia skin



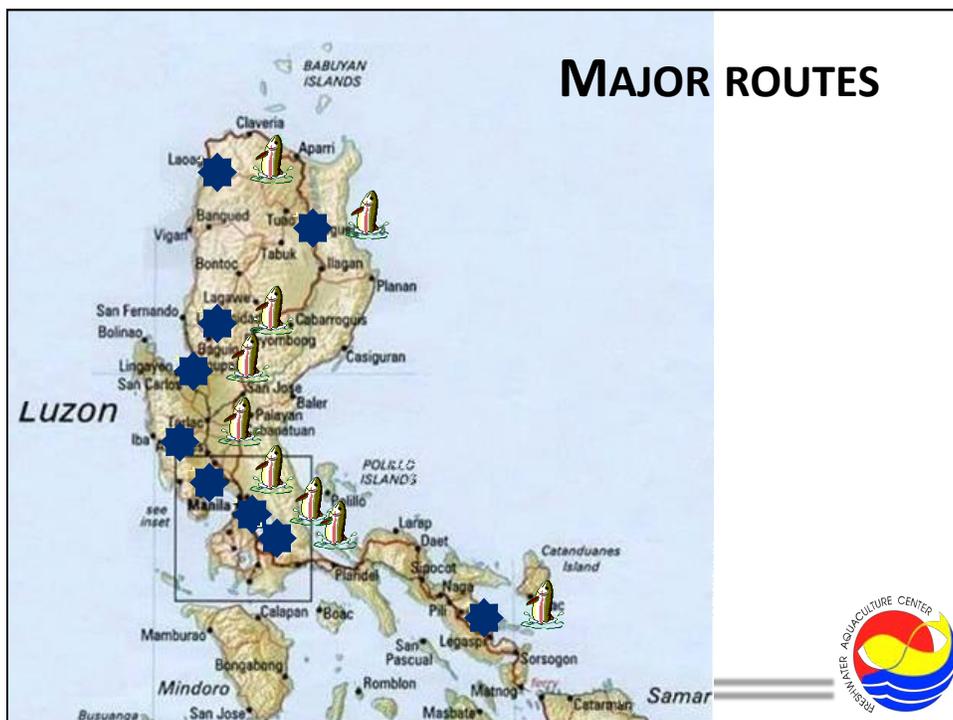
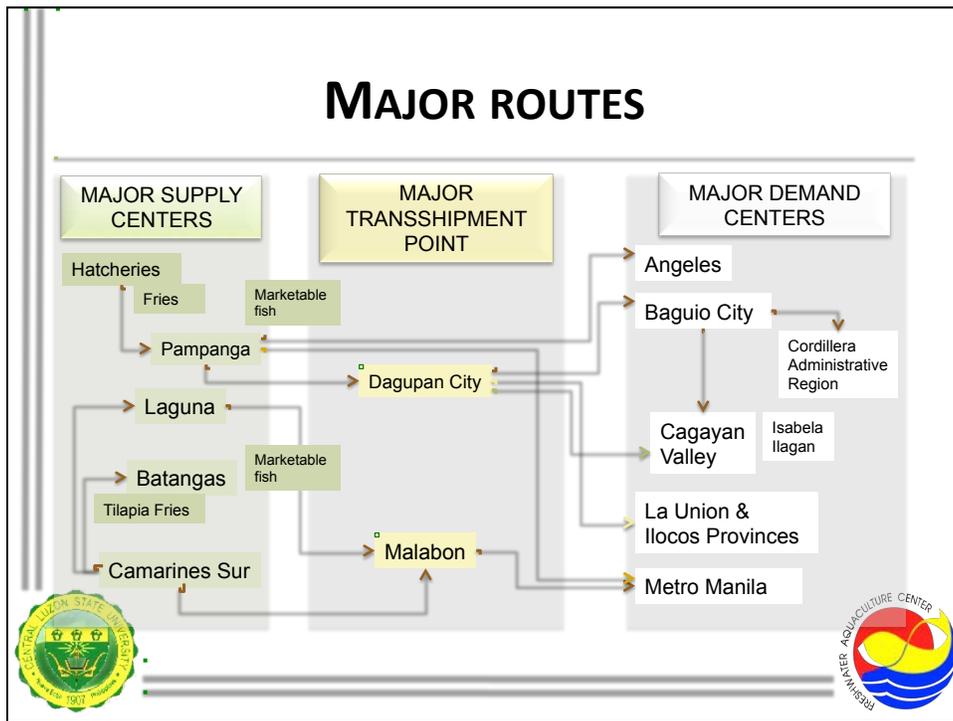
PRODUCT FORMS

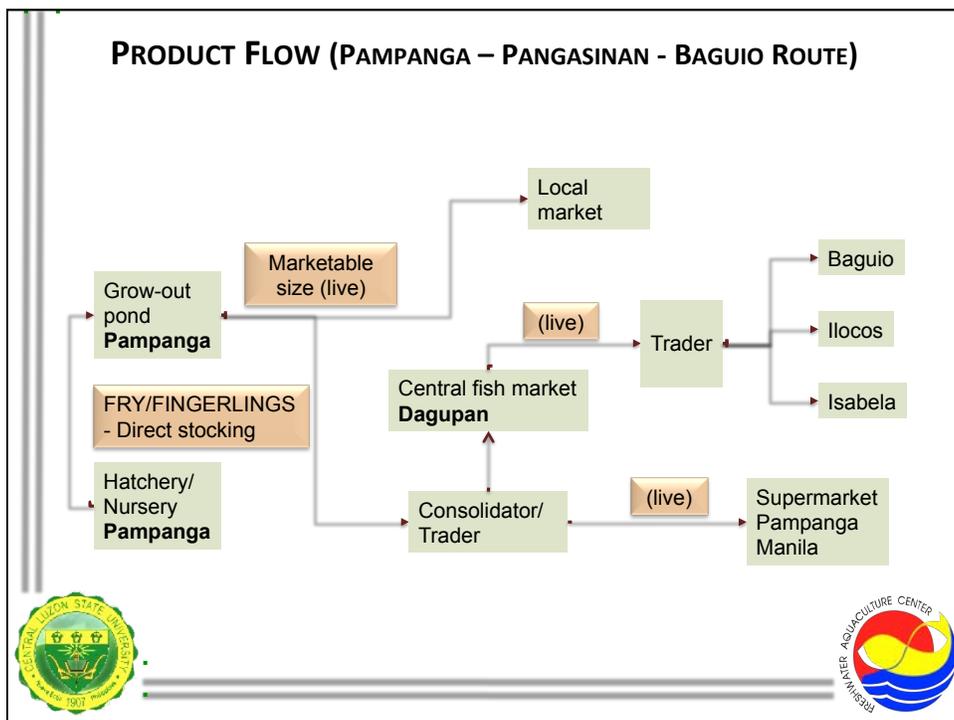
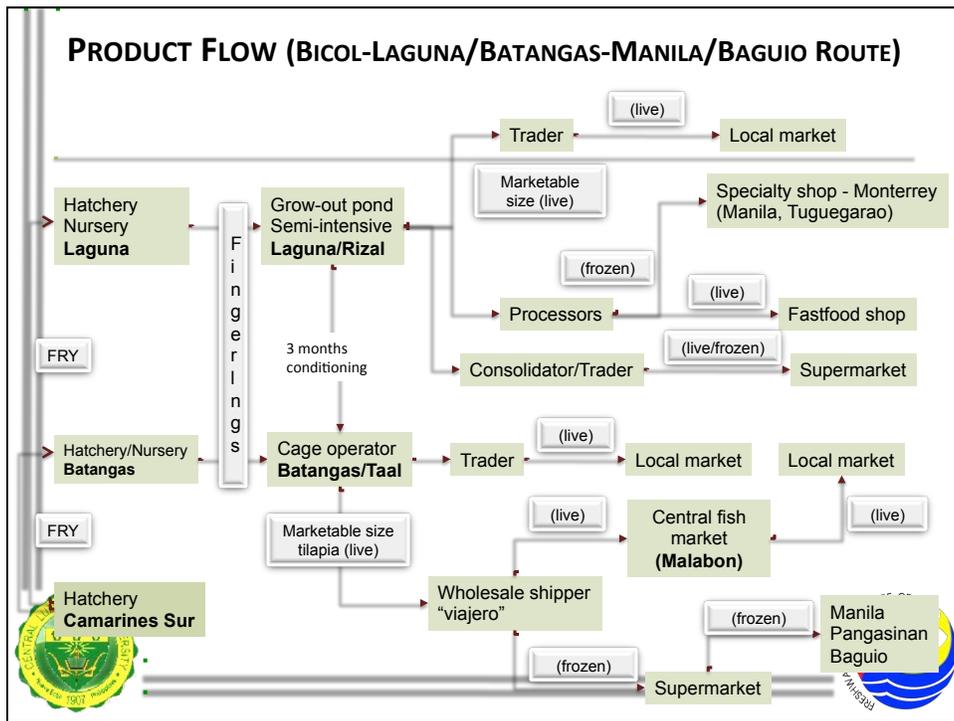


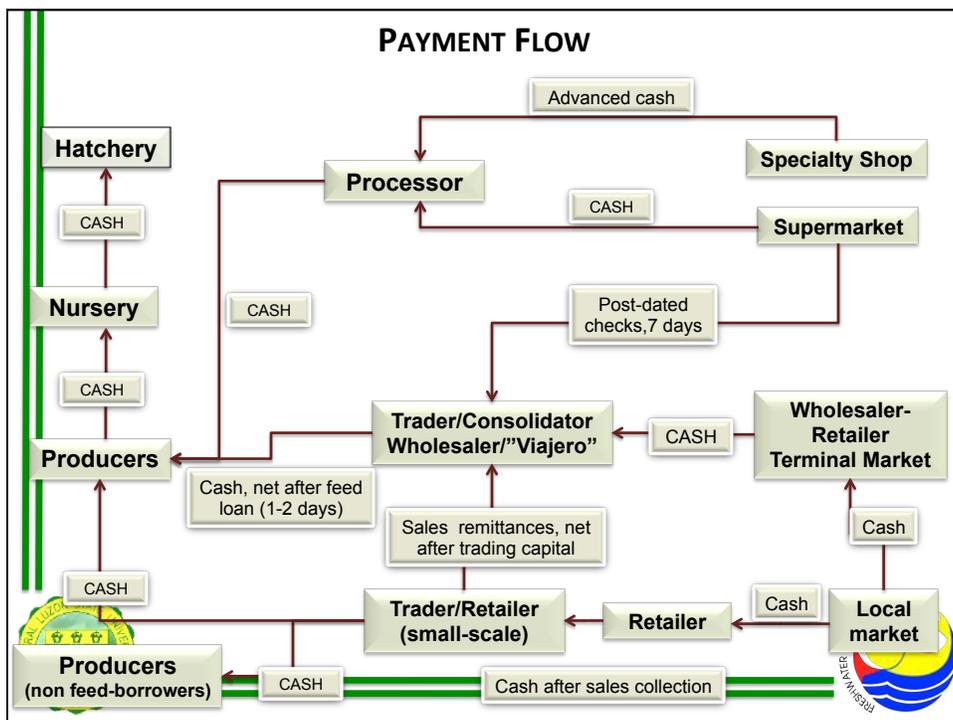
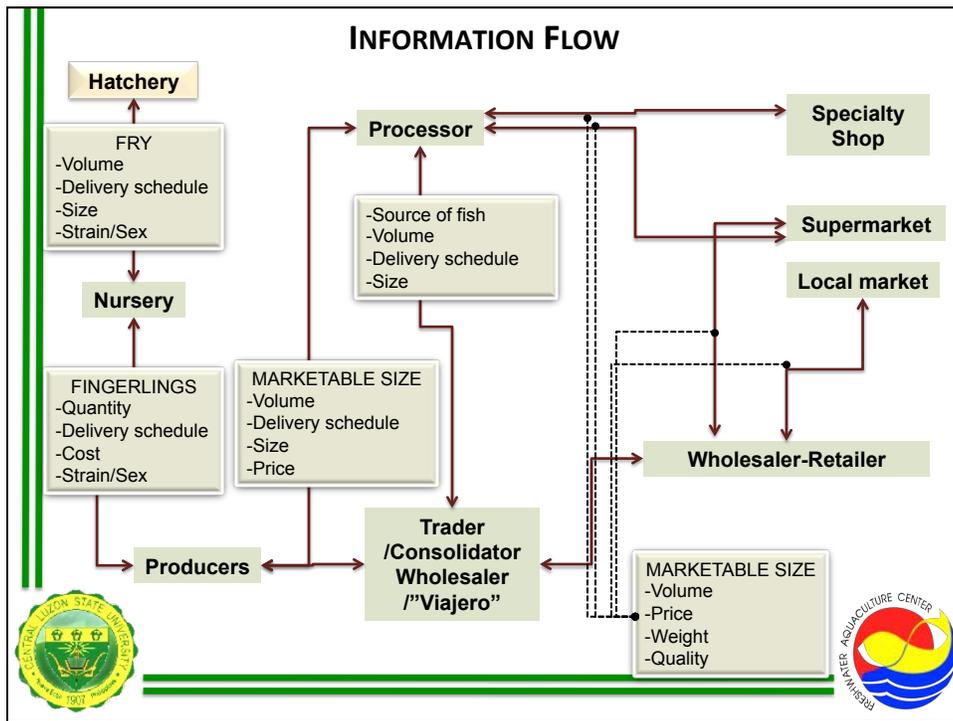
VOLUME REQUIREMENTS

- Major customers in Luzon
5,335 kgs average daily or 1, 947,275 kgs (or ~
1,947.28MT) yearly
- Annual national consumption requirement:
323,850 MT (~ 1%)









MAJOR CONCERNS		TRANSACTION COSTS
<p>HATCHERIES/ NURSERIES</p> <ul style="list-style-type: none"> • High cost of outbound logistics • High competition with mixed sex fingerlings • High mortality rates 	<p>FISH FARMERS</p> <ul style="list-style-type: none"> • Expensive inputs • Mislabeled inputs • Low fish recovery <ul style="list-style-type: none"> - 25% in lakes and cages/ pens - 60% in pond systems • Unpredictable climate patterns • Prolonged grow-out period (8-10 months) • Lack of cold storage facilities 	<p>HATCHERIES/ NURSERIES</p> <ul style="list-style-type: none"> • In-transit mortality losses • Toll fees (“goodwill”) <p>FISH FARMERS</p> <ul style="list-style-type: none"> • 4% shrinkage allowance required by traders • Overstocking • Cost of waiting • Harvest delays • Limited opportunities for value-adding & processing




MAJOR CONCERNS	TRANSACTION COSTS
<p>TRADERS</p> <ul style="list-style-type: none"> • “Uncalibrated” weighing scale of fish farmers • Disrupted delivery schedules due to defaulting “contract growers” • Lag responses to price changes • Absence of product grades and standards 	<p>TRADERS</p> <ul style="list-style-type: none"> • high logistics and transaction costs of <ul style="list-style-type: none"> • Search • Assembly • Distribution




MAJOR CONCERNS		TRANSACTION COSTS	
<p>PROCESSORS</p> <ul style="list-style-type: none">• Insufficient supply of raw materials• Lack of blast freezers and other equipment• Presence of inexpensive substitutes (e.g. pangasius, sea bass and others)		<p>PROCESSORS</p> <ul style="list-style-type: none">• High cost of filleting• Low dressing recovery• High opportunity costs due to untapped markets	



MAJOR CONCERNS		TRANSACTION COSTS	
<p>INSTITUTIONAL BUYERS</p> <ul style="list-style-type: none">• Off-season stock-outs from regular suppliers		<p>INSTITUTIONAL BUYERS</p> <ul style="list-style-type: none">• High cost of product search• High opportunity cost	



RECOMMENDATIONS

- (1) Encourage the establishment of more nursery and hatchery farms
- (2) Conduct market promotion
- (3) Motivate participation of small farmers in supply chains
- (4) Institutionalize an accreditation/certification program for feed manufacturers, hatcheries and processors
- (5) Strengthen farmers' organizations



Thank you.



Funding for this research was provided by the

AQUA FISH

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END



PROSPECTS FOR IMPROVING VALUE CHAIN FOR CULTURED FISH IN UGANDA

Dr. Gertrude Atakunda and Dr. Theodora Hyuha

National Fisheries Resources Research Institute and Makerere University (Uganda) and Makerere University (Uganda)

Abstract

Prospects for improving value Chain of aquaculture fish (Tilapia and African Catfish) in Central Uganda

The paper examines the value chain of cultured fish (Tilapia and African catfish) in central Uganda with an objective of providing information on the topic. Aquaculture has been recognized as a sector to contribute to food security and poverty alleviation in the country. However, there is dearth of information on this sector. Data collected through a structured questionnaire in 2010 was designed to solicit information along the value chain from farmers to the consumer including all the key players. In addition to structured questionnaires, case studies were also undertaken. The results show that the cultured fish value chain is short. Much of the fish grown by farmers is sold at the pond site due to limited volumes produced for sale, the demand for fish is quite high and at the same time the market for large volumes of the product is underdeveloped. Little value addition is undertaken due to limited knowledge. However, two case studies of private sector initiatives on marketing farmed fish undertaken by Kajjansi Aquaculture Research and Development Centre suggest that trading in cultured fish is profitable. Smoking fish, particularly catfish in attempt to improve its taste and hence acceptability by consumers is beneficial. A survey of traders and processors dealing in captured fish cited lack of demand for cultured fish products because of the size and reliability of supply as the major constraints to carrying the products in their stalls. There is need to develop production and value chain capacities to respond to the existing high demand.

Prospects for Improving Value Chain for Cultured Fish in Uganda

Theodora Shuwu Hyuha

Makerere University

Gertrude Atukunda

National Fisheries Resources Research Institute

Joseph Molnar

Auburn University

Introduction

- Aquaculture has been recognized as a sector to contribute to food security and poverty alleviation in the country.
- Aquaculture production is a relatively new activity in Uganda's farming system having been introduced in 1953 at Kanjansi, current research institute in Aquaculture
- Adoption of the new technology has been generally slow

Intro cont'

- Adoption by farmers mainly through donor funding e.g (USAID, DFID, ADB and ICEIDA) implying subsidization of the sector.
- Thus so far it has run as a non profit making venture
- Many of the farmers have joined either to preserve their land or to ensure access to it.

Intro Cont'

- Largely the sector has remained subsistence
- Commercialization is emerging but limited information exist
- Objective of the study: Understand performance and constraints of the subsector in order to be able to improve the system for the benefit of the consumers, traders and producers.

Methodology

- Used both quantitative and qualitative techniques to get the necessary data.
- Structured questionnaires and check lists were used to get production and cost figures.
- Reviewed available records of farmers and small-scale traders/processors.

Methodology cont'

- Analysis of gross margins at different nodes of value chain
- Key Informants
- Focus group discussion
- 2 Case studies

Results

- Uganda's aquaculture value chain is short and not clearly understood.
- Majority of fish on the market is from capture fisheries
- Hence, the margins presented below are for captured fish
- Studies carried out on VCA of captured fish provide lessons for analysis of cultured fish (Table 1)

Market Analysis of captured fish (UGX)*

Item	Tilapia	Nile Perch
Market dues	6000	1054
Storage costs	0	10208
Transport	24000	44833
Labor	0	9000
Total cost	30000	65095
Revenue	60000	192000
Gross margins/day	30000	126905
Gross margins/kg	1500	4230

*1 US \$ = UGX 2450 mean for 2011

Case study 1:
Value Chain for cat fish and tilapia

Making fish sausages

- Chain include:
 - Buying fish from farmers
 - Transporting to processing plant
 - Labor and other inputs for processing

VCA cont'

- Packaging
- Advertising & wholesale trading to restaurants and supermarkets
- Costs and returns at each stage still being compiled (venture started in 2011)

Fig. 1 Fish farmer weighing in fish



Fig 1&2: 1:Loading of fish 2:Fish at Plant



Produced and packaged sausages



Case Study 2. Value Chain for Smoked cat fish

- More than 90 % of consumers prefer African Catfish in processed (smoked) form
- In order to improve its marketability, value addition through smoking was envisaged important
- The chain is similar to that presented in Case # 1
- Smoking is carried out in a chokor kiln

Figure 4: Kiln for smoking catfish



Gross margin for Analysis for African cat fish Smoking

Category	Unit	Price per unit	Number of Units	Total UGX
Sales	kg	5,000/=	150	750,000
Total variable costs*				163,625
Gross margin				586,375
Depreciation on Kiln				140,000
Net Income				446,375
Net Income / Month				892,750

Figure 3: Catfish Products

Catfish fillets are now available in supermarkets



One restaurant supplier is beginning to deal in catfish

"Curry" Corner	
Beef Curry	
Beef - comes with the bones roasted in a curry with onion, tomato, and spices	\$1,000.00
Khanna Mutton	
A large portion of mutton with onion and fresh green peas	\$1,000.00
Beef Fried Curry	
Curry of beef with onion and tomatoes in a rich tomato sauce	\$1,000.00
Chicken Tikka Masala	
Chicken tikka with onion and tomatoes in a rich tomato sauce	\$1,000.00
Butter Chicken	
Chicken tikka with onion and tomatoes in a rich tomato sauce	\$1,000.00
Tikka Tikka Masala	
Chicken tikka with onion and tomatoes in a rich tomato sauce	\$1,000.00
Catfish Tikka Masala	
Curry of catfish with onion and tomatoes in a rich tomato sauce	\$1,000.00
Roast Curry Masala	
Roast chicken with onion and tomatoes in a rich tomato sauce	\$1,000.00

Several small-scale fish vendors are selling various catfish products.



Conclusions

- Production of fish is profitable, but the magnitude of the margin are affected by transport costs.
- Both smoking and processing fish into sausages offer the best avenue to solving perennial marketing issues faced by farmers
- Close monitoring of the fish production would ensure the quality and consistency in supply.

Conclusions cont'

- Using inappropriate transport to move fish leads to high losses to all concerned in the chain (producers, traders and consumers).

Recommendations

- In order to improve movement of fish through the value chain at least cost, there is need for WAFICOS to work with partner to raise money to buy a refrigerated track
- Need to foster strong farmer entrepreneur partnership with WAFICOS
- Well planned production, monitoring of quality and ensuring consistent supply at each segment of the market.

Recommendations cont...

- Comprehensive mapping and analysis of the value chain of the farmed species is needed of :-
 - Fish sold in fresh/live form
 - Processed form

ACKNOWLEDGEMENTS

- AQUAFISH CRSP For funding the research
- Informants and Farmers for allowing us to pry into their business.
- **Thank you for Listening to us.**

DEVELOPING AQUASHOPS IN KENYA

Dr. Sammy Macharia and Ms. Judith Amadiva
Department of Fisheries (Kenya)

Abstract

Commercial aquaculture is gaining momentum in Kenya with farmers looking at it as viable enterprises especially in rural areas. Market for farmed fish in Kenya is quite promising with fish prices in several parts of the country ranging from KES 150 (USD 1.8) per kg. This indicates a real investment opportunity through aquaculture. Almost all major urban centers in Kenya where aquaculture is practiced in the surrounding areas constitute assured markets especially for Tilapia. However one of the major bottlenecks to commercial farming in the country is lack of aquashops where farmers can buy aquaculture inputs with ease and timely access. Farmers have to travel long distances to procure aquaculture inputs especially fish feeds, harvesting nets, predator control nets, pond fertilizers, fingerling transportation bags, pond liners among others. There is need to establish aquashops where farmers can buy a variety of aquaculture inputs under one roof within their area. A feasibility survey conducted in Western Kenya outlined a number of factors that need to be considered while establishing aquashop in any locality. These factors include farmers and ponds distribution, access road network, existence of related businesses such as agro-shops, vet-shops, animal feeds shops and agricultural materials dealers outlets. The key factor however was number of fish farmers within an area as this foretold the number of potential customers for an aquashop hence the viability of the aquashop within an area.

Developing Aqua-shops in Kenya

Sammy K. Macaria and Judy Amadiva
Ministry of Fisheries Development-Kenya

Introduction

- * Commercial aquaculture is gaining momentum in Kenya
- * Farmers are now looking at it as viable enterprises especially in rural areas.

Introduction...

- * With a promising huge domestic market for farmed fish in Kenya, Kenyans are willing to pay KES 150 to KES 300 (USD 1.8 to USD 3.6) for per kg.
- * Almost all major urban centers in Kenya where aquaculture is practiced constitute assured markets especially for Tilapia.
- * This indicates a real investment opportunity through aquaculture.

Challenges

- * Key challenge for fish farmers is in acquiring farm inputs such as fish feeds, harvesting nets, predator control nets, pond fertilizers, fingerling transportation bags, pond liners, oxygen tablets etc, most of which are to be procured from far away or totally lacking.
- * Farmers have to travel for long distances to obtain most of these inputs.

Addressing the challenges

- * The challenges in acquiring inputs can be addressed by availing the inputs.
- * This is by making it easy to acquire the inputs locally and in time.
- * Better still to make all aquaculture inputs, services and information available from one place-the *Aqua-shop*

What are Aqua-shops

- * Aqua Shops are hubs for commercial and small-scale fish farmers to conveniently access aquaculture inputs, links to technical support and to markets.

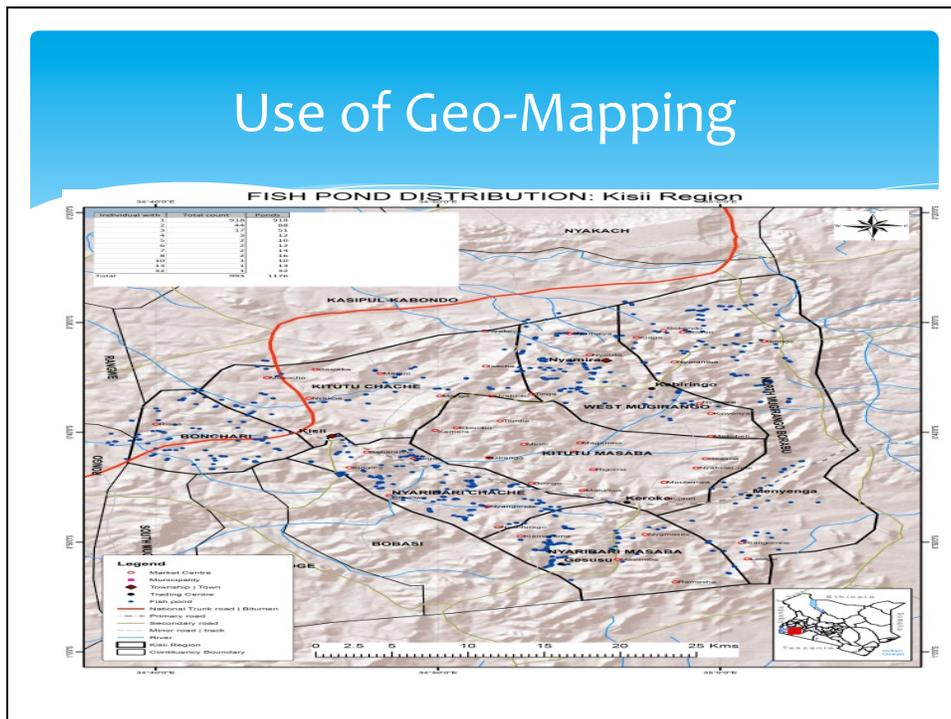
Establishing Aqua-shops

- * A feasibility survey conducted in Western Kenya outlined a number of factors that need to be considered while establishing Aqua-shops.
 - i. Farmers/ponds distribution,
 - ii. Access road network,
 - iii. Existence of related businesses such as agro-shops, vet-shops, animal feeds shops and agricultural materials dealers outlets

Establishing Aqua-shops...

- * The key factors however was *number of fish farmers and the number of their ponds and how they are distributed* within an area as this foretold the number of potential customers for an Aqua-shop.
- * This could indicate the viability of the Aqua-shop within an area.

Use of Geo-Mapping



Identifying Franchisees

- * Franchisees operate the Aqua-shops, these could be personalities familiar in similar business or new entrant.
- * In both cases, there is need for sensitization and basic training in Aqua-shop operations.
- * Where to get inputs and their costs, key inputs suppliers, linkages with service providers, markets and market prices, potential buyers etc.

Ripple effect

- * Once the concept is introduced in area, the laws of demand and supply will drive development of Aqua-shops,
- * Franchisees in areas with many farmers will have higher turn overs, thus generating higher incomes and possibility of competitiveness.
- * Their social impact will be through providing quality services at affordable prices.

Examples of Aqua-Shops

Namboboto Aquashop operator: Faith Buluma



Funyula Aquashop: Aquashop operator Saul Odenyo and Janet Kerubo



Owaka Aquashop: Aquashop Operator Raphael Were.



Conclusions

- * The Aqua-shops concept is working in piloted areas of Western Kenya and therefore it can work in the rest of the country,
- * Aqua-shops play a big role in aquaculture development at both small and large scale operations.

Acknowledgement

- * **Ministry of Fisheries** Development-Kenya-FFE&PP through ESP & EAPARD
- * **DFID RIU**- funded the first Aqua-shops
- * **Farm Africa** -Coordinated
- * **Stirling University**-Did farmers needs assessment
- * **AquaFish CRSP**-Created customers for the Aqua-shops through capacity building programs-pond construction, on farm trials, pond dynamics and now the Best Management Practices (BMPs).

Thank you



MANAGEMENT AND VALUE CHAIN OF NILE TILAPIA CULTURED IN PONDS OF SMALL-SCALE FARMERS IN MOROGORO REGION, TANZANIA

Dr. Sebastian Chenyambuga*, N. A. Madalla, and B. V. Mnembuka
Sokoine University, Tanzania

Abstract

This study was carried out to assess the management practices, production performance and value chain of Nile tilapia grown in ponds of smallholder farmers in Morogoro region, Tanzania. The study was carried out in Morogoro urban, Morogoro rural, Mvomero and Kilombero districts. Information was collected on household characteristics, pond management, source of fingerlings, farming system, feeding, gender issues, marketing, and problems affecting fish farming. The data were collected through individual interviews of household heads. A total of 30 fish farmers were involved in the study. About 76.7% of the farmers were males and 23.3% were females and their most important economic activities were crop production, livestock production and fish farming. Most farmers (50%) ranked fish farming second to crop production. The main reasons for culturing fish were provision of animal protein food for home consumption and generation of income (80.0%). On average fish farming was reported to contribute 10.6% of household annual cash income (TZS 1,200,810.00 \approx USD 750.5). The majority of the farmers were fertilizing their ponds with chicken manure (30.0%), cattle manure (23.3%), pig manure (10.0%) and composite (20.0%). The frequency of manure application was either once per month (46.7%) or twice per month (33.3%) and the amount applied was 0.14 kg per m². The majority of farmers (80.0%) stocked Nile tilapia fingerling in their ponds at a stocking density of 2 fish/m². About 40% of the farmers reported that they got the initial stock from development and research projects and the rest purchased from government hatchery (26.7%) and fellow fish farmers (33.3%). Most farmers (73.3%) cultured pure stand of Nile tilapia and only few farmers (26.7%) practiced polyculture of Nile tilapia and African catfish. All farmers depended on natural food as a source of feed for their fish. In addition, the farmers reported that they feed maize bran (96.7%), vegetables (66.7%), and kitchen leftovers (13.3%). In most households fish farming was done by men. Men were responsible for purchasing and stocking fingerlings (60.0%), feeding (40.0%), pond maintenance (53.3%), harvesting (60.0%) and selling (43.3%). Women were mainly involved in fish processing (76.7%) and feeding (26.7%). The average period from stocking to harvesting was 5.75 \pm 0.18 months and the mean yield of Nile tilapia was estimated at 6,946.2 kg/ha per year. About 22.2% of the harvested fish were consumed at home and the remaining 77.8% were sold. Most farmers sold fresh fish and the fish were sold directly to neighbours (70.0%) and consumers in the local market within the village (30.0%). Price of fish was higher in the local markets (TZS 2440 \pm 577.6/kg) than from the neighbours (TZS 2210 \pm 265.2/kg). The most important problems affecting fish farming in the study areas were lack of capital (56.7%), inadequate knowledge in fish farming (43.3%), stunted growth of fish (43.3%), unavailability of good quality feeds (40.0%), irregular supply of water (36.7%), unavailability of fingerlings (33.3%) and predation (33.3%). It is concluded that small-scale fish farming is done mostly by men, and it is characterized by low productivity due to improper pond fertilization and feeding. Almost all farmers sell fresh fish directly to consumers either at their homes or at the local market in the same village.

Management and value chain of Nile tilapia cultured in ponds of small-scale farmers in Morogoro region, Tanzania

Sebastian W. Chenyambuga , Nazael A. Madalla
and Berno V. Mnembuka

Department of Animal Science,
Sokoine University of Agriculture, Morogoro,
Tanzania.

Introduction

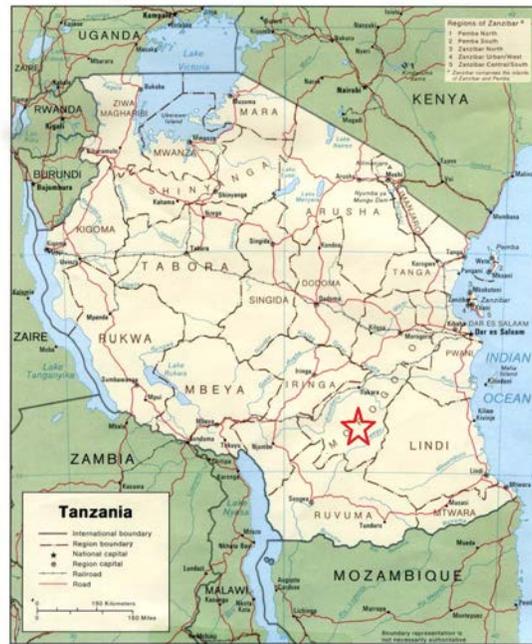
- In Tanzania experimental culture of tilapia started at Korogwe (Tanga) and Malya (Mwanza) in 1949.
- Currently aquaculture is dominated by freshwater fish farming in which small-scale farmers practice both extensive and semi-intensive fish farming.
- Current estimated number of fish ponds is 14 100 distributed mainly in four regions; Ruvuma, Iringa, Mbeya and Arusha

- Nile tilapia (*Oreochromis niloticus*) is the species that dominate aquaculture production in Tanzania, followed by African catfish (*Clarias gariepinus*).
- At the moment aquaculture is still a subsistence activity practiced by small-scale farmers.
- Low productivity and profitability are typical characteristics of the small-scale production of tilapia in Tanzania.

- Given the importance of aquaculture in the country, there is a need to improve fish production to complement the capture fisheries.
- Before embarking on improvement of productivity of fish farming, it is important to assess the current biological and economic productivity of Nile tilapia in ponds of small-scale farmers.
- This study was carried out to determine production yield and market channels of farmed Nile tilapia and identify the constraints facing fish farming in rural areas.
- In addition, the study examined gender issues in fish farming under the smallholder farming system.

Materials and methods

- The study was carried in four districts of Morogoro region (Kilombero, Morogoro Urban, Morogoro Rural and Mvomero).
- In each district two to six villages were randomly selected making the total number of villages to be 12.
- Within a village one to five farmers were randomly selected depending on the number of fish farmers in the village, making the sample size of 30 households.



- Face to face interviews of selected farmers were conducted using structured questionnaires and personal observation was also done.
- Information was collected on households' socio-economic characteristics, pond size, fish management practices, production yield, marketing of Nile tilapia, gender issues and constraints.

Results

Table 1: household characteristics of the farmers

Variable	Factors	Percentage
Sex of household head	Male	76.7
	Females	23.3
Number of ponds	One	73.3
	Two	20.0
	Three	3.3
	Four	3.3
Species cultured	Nile tilapia	80.0
	African catfish	3.3
	Both	16.7

Variable	Factors	Percentage
Water sources	Rivers	63.3
	Springs	10.0
	Underground water	26.7
Water availability	All year round	56.7
	Seasonally	43.3
Water quality	Very good	20
	Fair	50
	Bad	20
Use of pond site before	Crop production	83.3
	Vegetable garden	3.3
	Idle land	13.3

Table 2: Economic activities of fish farmers in the study areas

Enterprise	1 st (%)	Rank			Contribution to income (%)
		2 nd (%)	3 rd (%)	4 th (%)	
Crop production	76.7	10.0	3.3	-	42.7
L i v e s t o c k production	3.3	33.3	20.0	3.3	21.5
C a s u a l employment	6.7	-	-	-	9.6
Small businesses	3.3	-	10.0	-	16.6
Fish farming	6.7	50.0	30.0	6.7	9.6

Table 3: Feeding materials provided to cultured fish

Type of feeds	n	Percentage	Mean \pm s.e.
Maize bran	29	96.7	
Kitchen left over	13	43.3	
Vegetables	20	66.7	
Amount of feed (kg/day)			2.80 \pm 0.327

Table 4: Pond fertilization

Variables	Factors	n	Percentage (%)
Pond fertilization	Yes	29	96.7
	No	1	3.3
Type of fertilizer	Cattle	7	23.3
	Chicken	9	30
	Pigs	3	10
	Chicken & pigs	3	10
	Composites	6	20
	Goats	1	3.3
Frequency of application	Once	14	46.7
	Twice	10	33.3
	Thrice	1	3.3
	Tetra	1	3.3

Table 5: Production (yield) and fish marketing

Variables	Mean
Price from neighbors (TZS)	2210
Local markets (TZS)	2440
Fish vendors (TZS)	2500
Distance to market (km)	1.7
Price of smoked fish	2500
Price of fried fish	2750
Yield for total harvest per year (kg/ha)	6,946.2
Proportion consumed (%)	22.2
Proportion sold (%)	77.8

Most farmers sold fresh fish directly to neighbours (70.0%) and consumers in the local market within the village (30.0%).

Responsibilities of different household members in fish farming

- Men were responsible for:-
 - purchasing and stocking fingerlings (60.0%),
 - feeding (40.0%),
 - pond maintenance (53.3%),
 - harvesting (60.0%) and selling (43.3%).

- Women were mainly involved in fish processing (76.7%).

TABLE 6: Constraints to fish farming

Problems	Most important (%)
Lack of funds	56.7
Stunted growth	43.3
Inadequate knowledge	43.3
Lack of concentrates	40.0
Irregular water supply	36.7
Predation	33.3
Unavailability of fingerlings	33.3

Conclusions

- Aquaculture is important to household food consumption and incomes ranking 2nd or 3rd to crop production.
- Yield of Nile tilapia cultured in ponds of small-scale farmers is low due to small pond size and poor management.
- Almost all fish ponds are owned by men, often the household heads.
- Most farmers sell fresh fish directly to neighbours and consumers in the local market within the village.

Acknowledgement

- We thank AquaFish CRSP for financial support.
- We acknowledge the assistance provided by farmers and extension officers.

SESSION 02A: LOOKING AT FISH SUPPLY CHAINS WITH A GENDER LENS

Organizers and Chairs: Dr. Hillary Egna and Dr. Meryl Williams

Objectives: Gender, as well as other cultural, class, religious and ethnic factors, affects how fish supply chains function and where value is created and captured along the supply chain. Using studies from Africa (Nigeria, Kenya, Tanzania and Uganda) and South Asia (Sri Lanka and India), researchers explore divisions of labour, including especially those due to gender, and the economic and social dimensions of fish supply chains and markets. Relationships between actors in different parts of the chain, especially between fishers and traders are also covered.



APPRAISAL OF FRESH FISH MARKETING IN ONDO STATE, NIGERIA

M. L. Adeleke* and J.A. Afolabi

Department of Fisheries and Aquaculture Technology and the Department of Agricultural Economics and Extension, Federal University of Technology (Nigeria)

Abstract

This study carried out an appraisal of fresh fish marketing in Ondo state, Nigeria. It specifically examined the socio-economic characteristics of fresh fish marketers, determined profitability and examined market structure for fresh fish in the study area. A multi-stage sampling technique was used to select 45 fresh fish marketers and structured questionnaire administered on them. Data collected were analyzed using descriptive statistics, gross margin analysis, Gini-coefficient analysis and marketing function analysis. The study revealed that 95.6% of the respondents belong to the active segment of the population while the remaining 4.4% were aged. Analysis also showed that fresh fish market was dominated by females which accounted for 73.3% of the sellers. The profitability analysis showed that an average marketer incurred a total variable cost of N511,185.78 (\$3,195) per year but earned an average revenue of N618,875.56 (\$3,867) over the same period. This indicates that an average marketer earned N107,689.78 (\$673) as gross margin per year suggesting that fresh fish marketing is a profitable venture in the study area. A Gini-coefficient of 0.5292 obtained in this study indicates a high level of concentration in the fresh fish market. The result of the marketing function showed that the estimated coefficient of multiple determination (R^2) indicates that the postulated regressors i.e. included variables in the model explained 98.7% in the variation of the regressand (i.e. sales revenue).

APPRAISAL OF FRESH FISH MARKETING IN ONDO STATE, NIGERIA

M. L. ADELEKE¹, J.A. AFOLABI²

¹Department of Fisheries and Aquaculture Technology

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Outline

- Introduction
- Objectives
- Research methodology
- Results and discussions
- Summary and recommendations

Introduction

- Marketing is a management process responsible for anticipating, identifying and then satisfying consumer wants and needs with a view of making profit.
- Fish is a diverse group of animal that live and breathe under water by means of gill.
- Therefore, fish marketing is a management process responsible for:
 - anticipating
 - identifying and
 - then satisfying consumer wants and needs
 - with a view of making profit in fish and fish related business(es)

Objectives

This study therefore carried out an appraisal of fresh fish marketing in Ondo State, Nigeria. Specifically, it;

- ❖ Examined the socio-economic characteristics of fresh fish marketers in the study area.
- ❖ Determined the profitability of fresh fish marketing in the study area and
- ❖ Examined the market structure for fresh fish in the study area.

RESEARCH METHODOLOGY

- **Study Area**

- ❖ This study was carried out in Ondo State situated in the South-Western Nigeria.
- ❖ This State lies between longitude $4^{\circ}30''$ and 6° east of the Greenwich Meridian and latitude $5^{\circ} 45'$ and $8^{\circ} 15'$ North of the equator. The state has a population of 3,441,024 (National Population Commission, 2006).



RESEARCH METHODOLOGY

- **Sampling Technique:**

A Multi-stage sampling technique was used for this study.

- Stage I: Akure South Local Government Area was purposively selected because of the prevalence of fresh fish marketers in the area.

Stage II : a random sampling technique was used to select 45 respondents and structured questionnaire administered on them.

- **Analytical Technique:**

Descriptive statistics was to analyze the socio economic characteristics of fresh fish sellers,

- Gross margin analysis was used to estimate the profitability of fresh fish marketing,
- Gini- coefficient was used to examine the concentration of fresh fish market in the study area.

RESULTS AND DISCUSSIONS Table 1a

Socio – Economic Characteristics of Respondents

AGE OF THE RESPONDENTS:

Most of the respondents (85.0%) were between the age of 20-50 years , this implies that the respondents were young and agile to carry out fresh fish marketing activities in the study area.

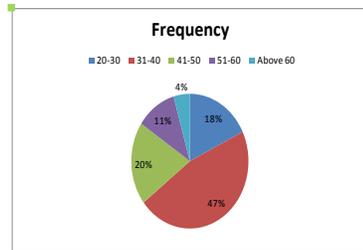


Figure 1 Age distribution

Age (years)	Frequency	Percentage
20-30	8	17.8
31-50	30	66.7
51 and above	7	15.5
Total	45	100.00
Sex	Frequency	Percentage
Male	12	26.7
Female	33	73.3
Total	45	100.00
Status	Frequency	Percentage
Single	6	13.3
Married	38	84.4
Widow	1	2.2
Total	45	100.00
Household Size	Frequency	Percentage
1-5	18	40
6-10	27	60
Total	45	100
Educational status	Frequency	Percentage
Primary education	11	24.4
Secondary education	23	55.6
National diploma	2	4.4
NCE	2	4.4
Modern III	1	2.2
University education	4	8.9
Total	45	100
Years of experience	Frequency	Percentage
1-10	32	71.1
11-20	10	22.9
21-30	3	6.6
Total	45	100.00

RESULTS AND DISCUSSIONS Table 1b

Most of the respondents (73%) were female this was in line with the general belief of the people in the study area that marketing is the business of woman.

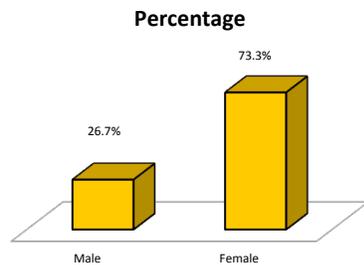


Figure 2 Gender

Age (years)	Frequency	Percentage
20-30	8	17.8
31-50	30	66.7
51 and above	7	15.5
Total	45	100.00
Sex	Frequency	Percentage
Male	12	26.7
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RESULTS AND DISCUSSIONS Table 1c

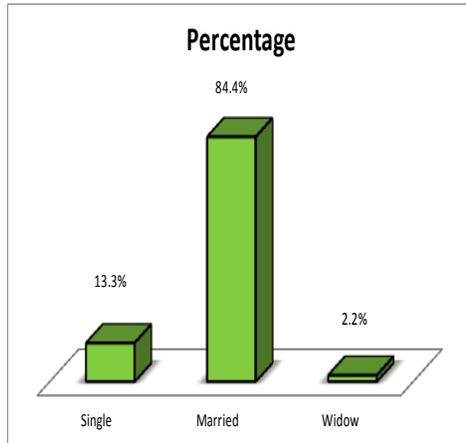


Figure 3 Marital status

Age (years)	Frequency	Percentage
20-30	8	17.8
31-50	30	66.7
51 and above	7	15.5
Total	45	100.00
Sex	Frequency	Percentage
Male	12	26.7
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Distribution Respondents by household size Table 1d

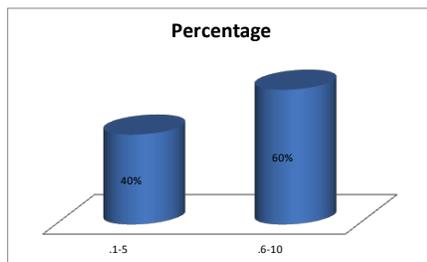


Figure 4

Age (years)	Frequency	Percentage
20-30	8	17.8
31-50	30	66.7
51 and above	7	15.5
Total	45	100.00
Sex	Frequency	Percentage
Male	12	26.7
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Educational Status **Table 1e**

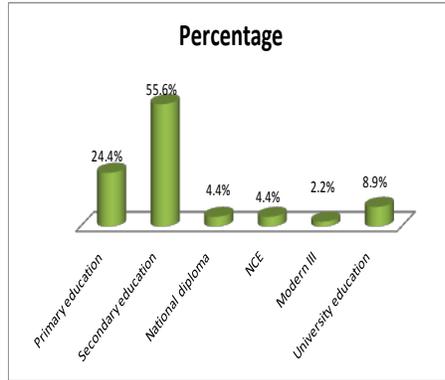


Figure 5

Age (years)	Frequency	Percentage
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Total	45	100.00

Years of experience **Table 1f**

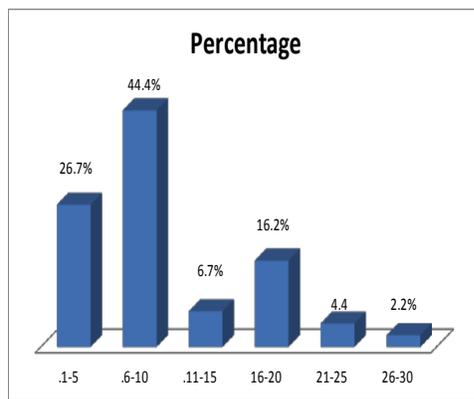


Figure 6

Age (years)	Frequency	Percentage
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31-50	30	66.7
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Total	45	100.00
Sex	Frequency	Percentage
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Total	45	100.00

GROSS MARGIN ANALYSIS **Table 2**

Table 2

Items	Cost (₦)/(USD)
Cost of storage	11300/75.33
Cost of equipment	269940/1799.60
Cost of purchase	21588000/143920.00
Cost of labour	440000/2933.33
Cost of transportation	694120/4627.50
Total variable cost	23003360/153355.73
Total revenue (TR)	27849400/185662.70
Gross margin (GM = TR-TVC)	4846040/32306.93
Average total variable cost (TVC/n)	511185.78/3407.91
Average total revenue (TR/n)	618875.56/4125.81
Average gross margin (GM/n)	107689.78/717.91

Source: field survey, 2011

Where n = Number of sellers at the market (Respondents)

RESULT OF THE GROSS MARGIN ANALYSIS (Table 2)

- The total revenue over the same period was N27849400 (185662.70USD) while
- the gross margin was N4,846,040(32306.93USD).
- This implies that on the average a fresh fish marketer incurred N511,185.78 (3407.91USD) as variable cost
- and earned N618,875.56(4125.81USD) as monthly revenue.
- This result indicates that a fresh fish marketer earns an average of N107, 689.78(717.91USD) monthly as gross margin.
- **This reveals that fresh fish marketing is averagely profitable in the study area.**

Computation of Gini Coefficient for fresh fish marketing in the study Area **Table 3**

sales (N)	Number of sellers	Proportion of sellers (X)	Cumulative proportion of sellers	Total sales (N)	Proportion of sales	Cumulative proportion of total sales (Y)	XY
0	4	0.09	0.09	420,000	0.015	0.02	0.0018
250000	6	0.13	0.22	1178400	0.04	0.06	0.0078
350000	7	0.16	0.38	1970000	0.07	0.13	0.0208
450000	8	0.18	0.56	3090000	0.11	0.24	0.0432
550000	1	0.02	0.58	480000	0.017	0.26	0.052
650000	2	0.04	0.62	1200000	0.04	0.30	0.0120
1	17	0.38	1.00	19269000	0.70	1.00	0.3800
	45	1.00		27629400	1.00		0.4708

Result of GINI coefficient analysis

- Gini co-efficient = $1 - \sum XY$
 $= 1 - 0.4708$
 $= 0.5292$
- This indicates:
- high level of concentration and
- This is in-line with the fact that Gini coefficient close to 1.00 indicates inequitable distribution of sales/ income in the market place.

MARKET CONDUCT OF FRESH FISH

- Price determination: (cost of purchase plus margin 86.7%)
- Method of creating awareness/ attraction
 - :open display
 - :persuasive method
 - :advertisement

Constraints of fresh fish Marketing in the study area

- Transportation
- Seasonal increase in price of fresh fish
- High cost of fresh fish
- Seasonal variation in price and fluctuation in demand
- Lack of market space

Summary and Conclusion

- Analysis showed that fresh fish market was dominated females which accounted for 73.3% of the sellers.
- The study revealed that 95.6% of the respondents belong to the active segment of the population while the remaining 4.4% were aged.
- The profitability analysis showed that fresh fish marketing was averagely profitable in the study area.
- Gini-coefficient of 0.5292 obtained in this study indicates a high level of concentration and inequality in the fresh fish market.

Recommendations

- Government intervention
- Conducive market location
- Improved fish farming/ Aquaculture
- Cooperative societies that are gender sensitive

ACKNOWLEDGEMENT

Professor Dapo Fagbenro

Federal University of Technology, Akure, Nigeria

**• THANK YOU ALL FOR
LISTENING**

CONTRIBUTION OF LAKE VICTORIA DAGAA FISHERY IN EAST AND CENTRAL AFRICAN FISH TRADE

Salehe, M.A*., Mlaponi, E., Onyango, P.O., and Mrosso, H.D.J.

Tanzania Fisheries Research Institute (Tanzania) and University of Dar es Salaam (Tanzania)

Abstract

While the focus of Lake Victoria Nile-perch fishery is to serve the global market and tilapia is mainly for domestic market in Tanzania; Dagaa has a great potential for small scale trade in regional markets. In 2006 a survey was conducted to assess the regional fish marketing channel for the major commercial fish species in Lake Victoria. It was revealed that Dagaa accounts significantly in terms of volume traded in regional markets compared to Nile perch fish products. However, the latter fetches higher royalty. The present paper discusses the potential of Dagaa in regional fish trade, distribution system of Dagaa and other fish products in regional markets, and challenges faced by small-scale traders in regional fish trade and make recommendations on how to address the challenges.

CONTRIBUTION OF LAKE VICTORIA DAGAA FISHERY IN EAST AND CENTRAL AFRICAN FISH TRADE

BY
Salehe, M.A.; Mlaponi, E.; Onyango, P.O.;
and Mrosso, H.D.J.

INTRODUCTION

Dagaa
(*Rastronebola argentea*)



- Native sardines
- Its maximum length sizes 40-60 mm
- Spawn all over the Lake Victoria
- Accounts as second commercial specie in Tanzania

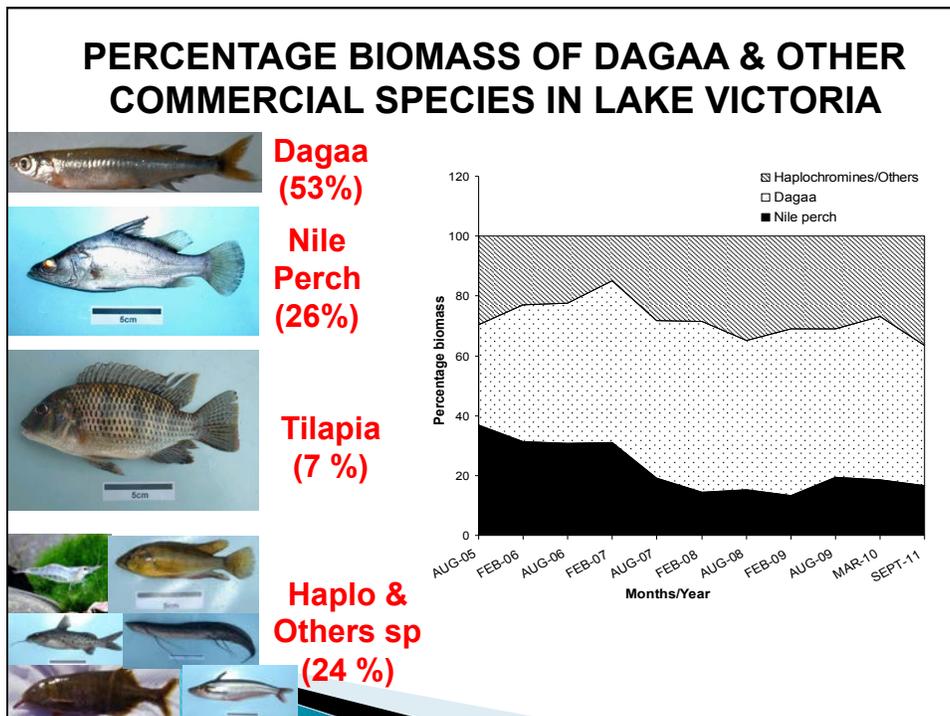
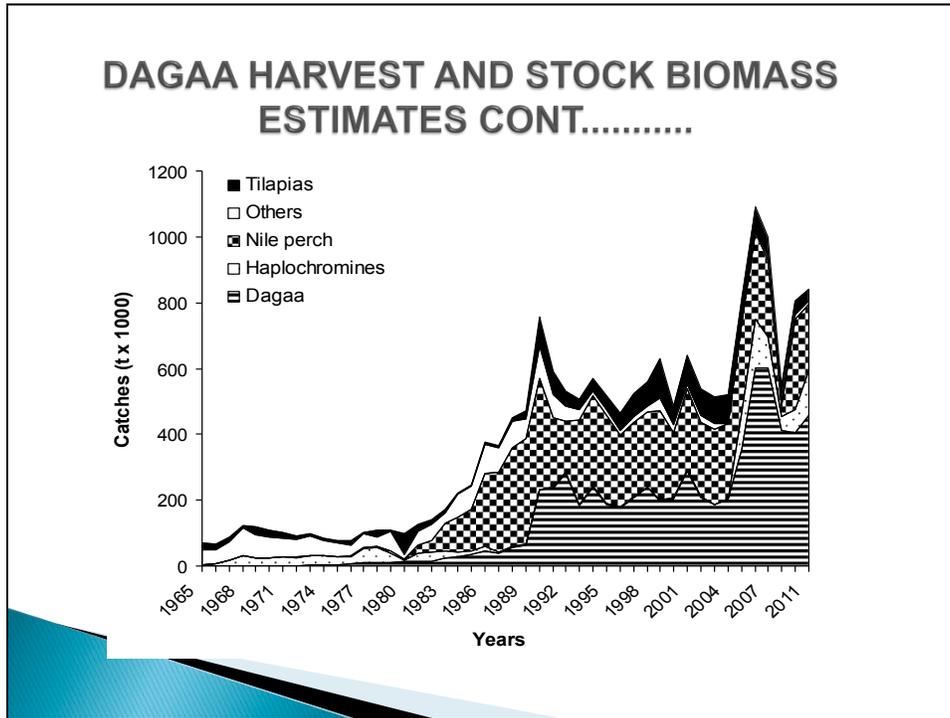
INTRODUCTION CONT.....

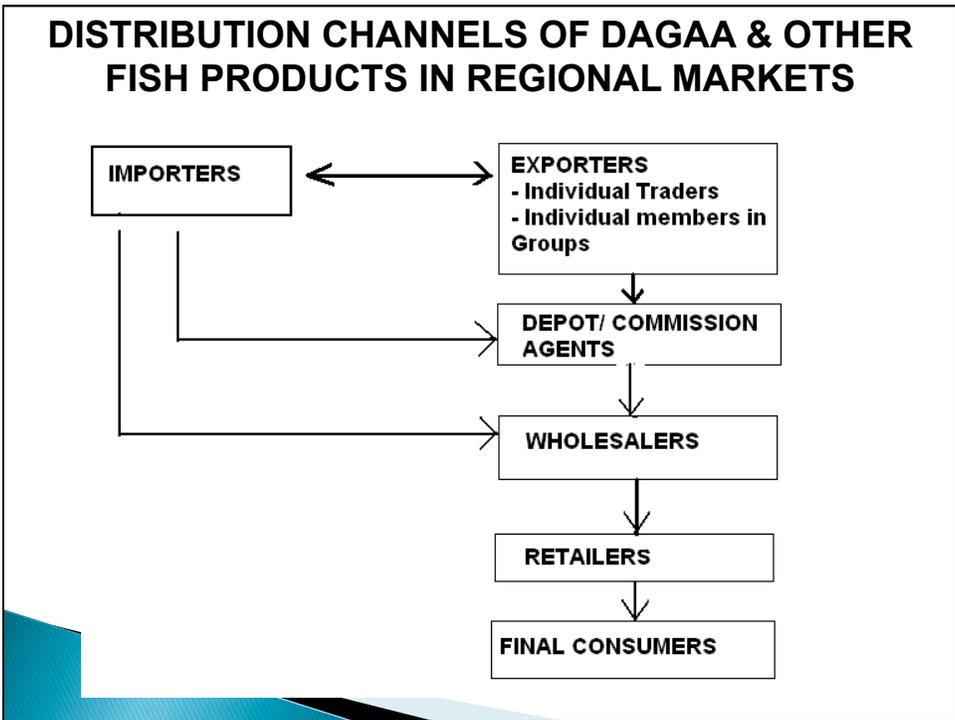
- ▶ Dagua is potential for small scale trade in domestic and regional markets
- ▶ Major source of cheap protein
- ▶ Dagua has high nutritional value rich in protein and lysine
- ▶ Dagua contains the medicinal component for treating measles and kwashiorkor

DAGAA HARVEST AND STOCK BIOMASS ESTIMATES

- ▶ Harvest undertaken by small scale fishers using Sesse boats with paddles & small seines or lift nets carried by paired boats (Catamarans)
- ▶ There about 23,493 fishers with 7,831 boats targeting dagaa
- ▶ The fishery undertaken on lunar month







Licensed individual exporters

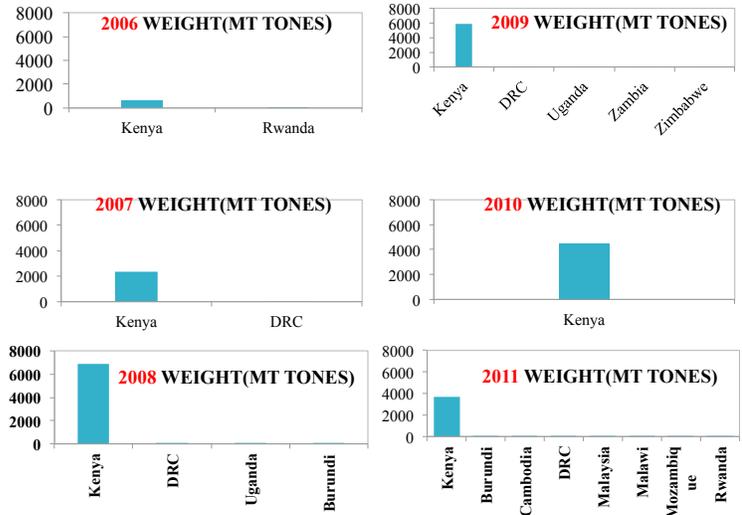
Year	Males	Females	Total
2005 - 2006	25	7	32
2008 - 2009	9	-	9
2010 - 2011	11	1	12

Source: Fisheries Division

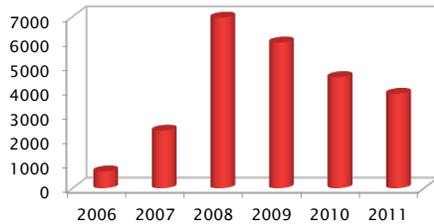
Licensed groups Exporters

Market	Group name	Membership	
		Male	Female
Kirumba	Ushirika wa Wauza Samaki	145	10
Muganza	Uaminifu	56	4
	Jikomboe	79	12
	Tumaini	6	14
	Upendo	5	1
Total		291	41

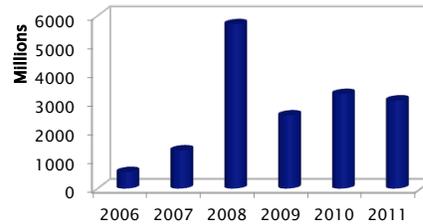
Dagaa Regional Markets



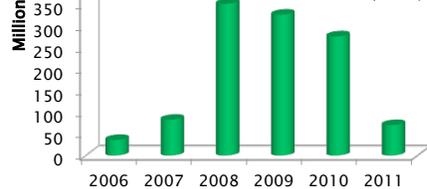
WEIGHT (MT TONES)

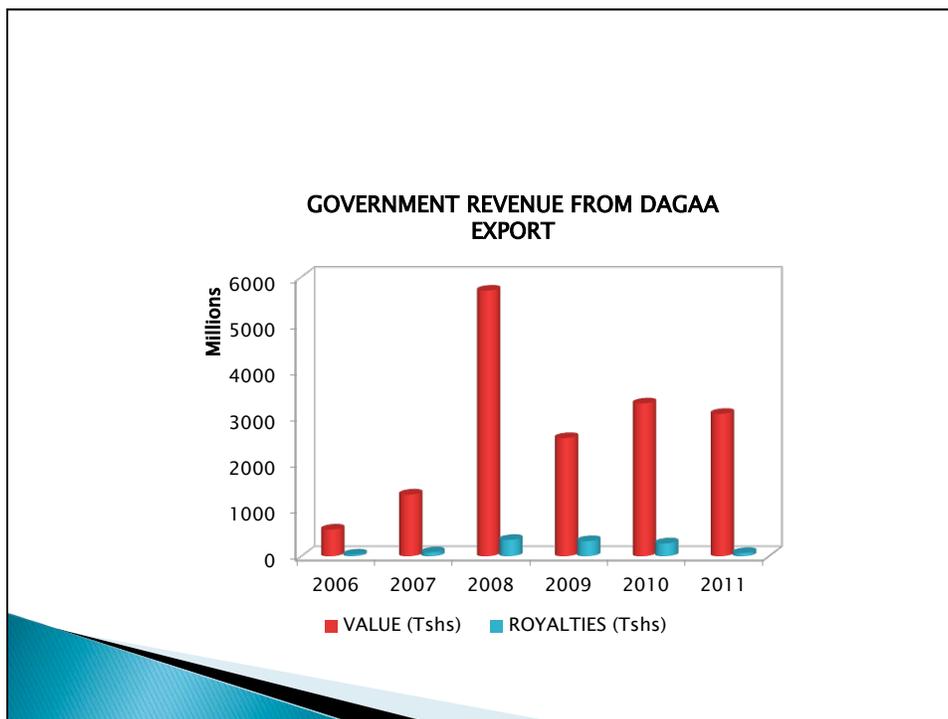


VALUE (Tshs)



ROYALTIES (Tshs)





VALUES OF NILE PERCH BY-PRODUCTS

Year	Weight(mt tones)	Value (tshs)	Royalties (tshs)
2006	578	192722341	20069213
2007	724	257675746	21601919
2008	1300	7301161830	35421691
2009	1643	472006451	85830275
2010	1829	834004192	82283971
2011	1531	614919862	59392017
Total	7604	9672490421	304599086

MAJOR CHALLENGES FACING DAGAA REGIONAL TRADE

- Poor processing techniques and high post-harvest losses
- Low capital to most traders
- Lack of business knowledge

RECOMMENDATIONS AND THE WAY FORWARD

- Encourage investment in dagaa processing
- Capacity building on financial and business management
- Regional traders should be encouraged to establish or join the available micro finance institute

ROLE OF GENDER IN GLOBAL FISHERY VALUE CHAINS: A FEMINIST PERSPECTIVE ON ACTIVITY, ACCESS AND CONTROL PROFILE

Achini De Silva*, Trond Bjorndal, and Audun Lem

Sabaragamuwa University of Sri Lanka (Sri Lanka), Centre for the Economics and Management of Aquatic Resources (United Kingdom), and Food and Agriculture Organization (Italy)

Abstract

Women in fishing communities play multidimensional roles. Women pervade fisheries and their roles were identified as workers in both fisheries, markets, processing plants and non-fishery, mothers who give birth to successors, as caregivers of the family, as connecting agents of social networks, as representatives of local culture, as community workers and governors. The main aim of this study is to identify and measure women's involvement in global fishery value chains and investigating their activity, access and control profiles in fishery value chains in selected destinations in Asia, Africa and Latin America. Primary data were obtained from fisheries and aquaculture operations in Thailand, Vietnam, Bangladesh, Cambodia, Sri Lanka, Ghana, Zimbabwe and Honduras. . Participant observation with experienced investigators, focus group discussion and gender resources maps were the principal data collection tools. Women play non-significant roles in capture fishery production and totally depend on religion and culture while their contribution in aquaculture production is great. Female roles were centred on household activities which take them away from direct income generation and access to the capital assets. Less educated, resource poor women are concentrated in the low value end of the value chains while the high value end of the value chains is mainly handled by the resource rich males and limited number of educated, resourced owned females. Women's engagement is less in modern value chains with few nodes than the traditional complex and lengthier value chains.

Role of gender in global fishery value chains: A feminist perspective on activity, access and control profile



Achini De Silva, Trond Bjorndal and Audun Lem

Sabaragamuwa University of Sri Lanka, Centre for the Economics and Management of Aquatic Resources (CEMARE) and Food and Agriculture Organization (FAO)

Background

- Women pervade fisheries and their roles were identified as **workers** in both fisheries, markets, processing plants and non-fishery, **mothers** who give birth to successors, as **caregivers** of the family, as **connecting agents** of social networks, as **representatives** of local culture, as **community workers** and **governors**

Objectives

- To **identify** and **measure** women's involvement in global fishery value chains and **investigating their activity, access and control profiles** in fishery value chains in selected destinations in Asia, Africa and Latin America.

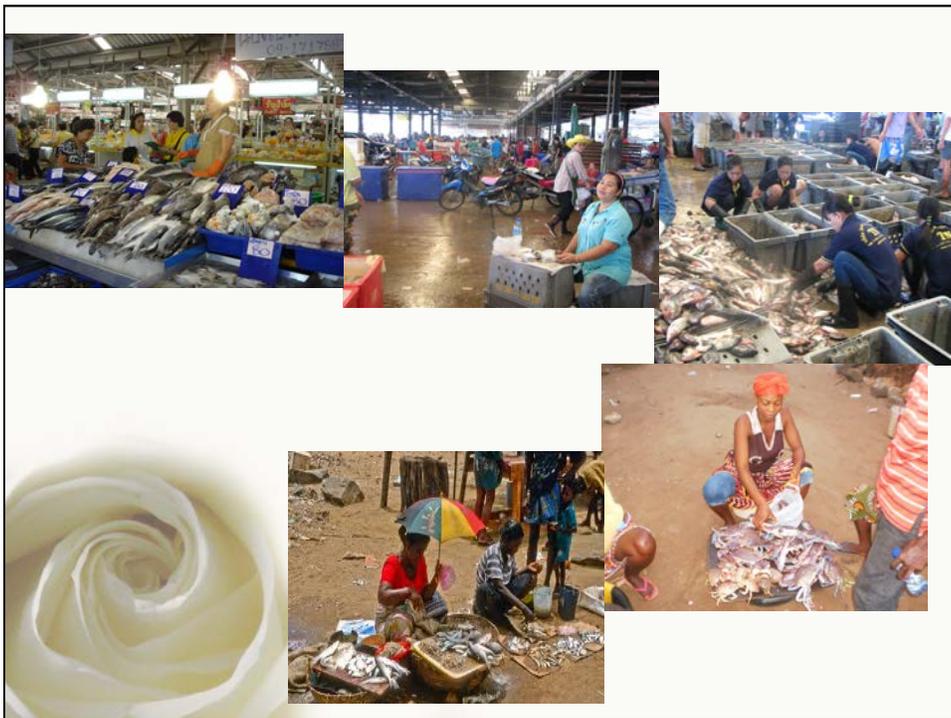


Method

- Case study approach & research locations were based on FAO: NORAD value chain project
- Both developed & developing nations
- Participant observations with experienced investigators,
- Focus group discussions and
- Gender resources maps were the principal data collection tools.



Faces of women in global fishery value chains





Data

- **Primary data:** fisheries and aquaculture operations in Thailand, Vietnam, Bangladesh, Cambodia, Sri Lanka, Ghana, Zimbabwe and Honduras.

Thailand : Sea bass, Venamie shrimp, Tuna, Indo- Pacific mackerel

Vietnam: Pangasias, Shrimp

Bangladesh: Shrimp

Cambodia: Snake head, Reddish Pangasias

Sri Lanka: Shrimp, Tuna

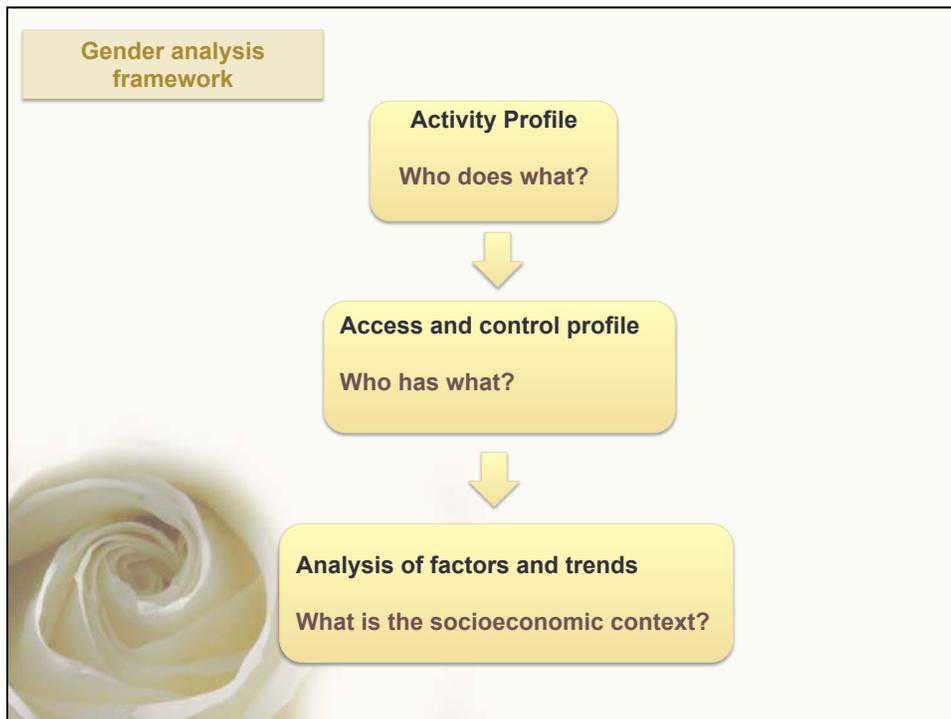
Ghana: Tilapia

Zimbabwe: Tilapia

Honduras: Shrimp, Tilapia, Spiny Lobster

Peru: Anchovy, Trout

Uganda: African cat fish, Tilapia, Nile perch



Findings

- Women play **non-significant** roles in capture fishery production
- Depends on religion and culture
- Contribution in aquaculture is great
- Women's role in fish marketing: handling, grading, packing and retailing is very important for timely distribution of the catch locally
- Female roles were centred on household activities which take them away from direct income generation and access to the capital assets.

- Less educated, resource poor women are concentrated in the low value end of the value chains
- High end of the value chains is mainly handled by the resource rich males and limited number of educated, resourced owned females.
- Women’s engagement is less in modern value chains with few nodes than the traditional complex and lengthier value chains
- The departure of women from fisheries will adversely interfere with existence of the local fishing culture and industry

Table 1: Gender Analysis

Location & Fishery	Activity profile	Access & Control profile	Factors & Trends
Thailand: Sea Bass	<ol style="list-style-type: none"> 1. Investment , pond construction, preparation & seeding – male 2. Feeding - 60% female 3. Care taking – 80% male 4. Harvesting – 90% male 5. Handling & Grading – 90% female 6. Distribution – 60% male & 40% female 7. Wholesaling 60% male 8. Retailing – 80% female 	<ul style="list-style-type: none"> • Both genders have equal access rights to resources & involve in decision making • Female intervention is common in marketing • Similar wages for both • Males play key roles in special activities that require male hands 	<ul style="list-style-type: none"> • Increasing trend in female involvement in value chains • Female roles centred in processing & marketing than production • Less concern or less respect for tradition, beliefs, values & norms which hinders female participation in fishery • Improved access to education & resources make more female participation in high ends of value chains

Location & Fishery	Activity profile	Access & Control profile	Factors & Trends
Vietnam: Pangasius	<ol style="list-style-type: none"> 1. Investment , pond construction, preparation – male 2. Seeding – 40-50% female 3. Feeding & caretaking – small scale 75% female engaged; large scale hired male labor 4. Harvesting – 100% male; females as collectors 5. Wholesaling – 90% males; handling & grading mainly females 6. Retailing – 65% females; transportation & delivery mainly males 	<ul style="list-style-type: none"> • Female play important roles as fishing partners with males • Males associated with more visible, commercially-oriented, large or medium scale activities • female involvement is high in small-scale, subsistence and non-commercial sectors 	<ul style="list-style-type: none"> • Increasing trend in female participation in value chain activities • Cultural beliefs make females away from harvesting & large scale fishing • Female roles are prominent in marketing & educated, wealthier females placed at higher ends of the value chain

Location & Fishery	Activity profile	Access & Control profile	Factors & Trends
Cambodia: Snakehead (pond/ cage culture)	<ol style="list-style-type: none"> 1. Pond preparation, fingerling collection & seeding: 75% males 2. Fish stocking: both males & females 3. Feeding: 60% female 4. Fertilizing: 55% males involve 5. Care taking: 100% females 6. Harvesting: 80% males considered as men's responsibility 7. Distribution: both males & females 8. Trading, processing, maintaining fishing gear & equipment 	<ul style="list-style-type: none"> • Males have more access & control over resources • Less female participation in decision making & management • Marketing function is leading by females • Most of the female jobs are under paid • Unequal access to resources but micro credit schemes are more focus on females 	<ul style="list-style-type: none"> • Cultural beliefs make females away from fishing • participation of teenage children is common

Location & Fishery	Activity profile	Access & Control profile	Factors & Trends
Honduras :Shrimp	<ol style="list-style-type: none"> 1. Pond preparing, seeding –mainly males 2. Feeding & care taking – commercial scale mainly males and small scale females 3. Harvesting – mainly males with female help on handling & grading 4. Distribution – commercial scale mainly males & small scale female involvement is high 5. Wholesaling – mainly males handled in large scale 6. Retailing – principally females 	<ul style="list-style-type: none"> • Both have similar access and control rights • Male roles are dominant in commercial scale while female play great participation in small scale 	<ul style="list-style-type: none"> • Both play significant roles in value chains • Increasing trend of educated & wealthier females own & manage fishery business

Location & Fishery	Activity profile	Access & Control profile	Factors & Trends
Peru: Anchovy	<ol style="list-style-type: none"> 1. Production – 100% males 2. Processing – large scale & mainly males involved 3. Wholesale & retail – small scale & in local markets mainly operate by females 	<ul style="list-style-type: none"> • Gender division is unequally distributed through value chains • High degree of female participation in wholesaling & retailing • females have poor access to resources and low involvement in decision making 	<ul style="list-style-type: none"> • Female involvement in value chains are poor & concentrate on low value ends • Female participation in distribution & marketing is high • Traditional beliefs & attitudes brings secondary social role for females



Location & Fishery	Activity profile	Access & Control profile	Factors & Trends
Kenya: Nile perch	<ol style="list-style-type: none"> 1. Production – males invest in fishing boats & gear, & harvesting 2. Processing – females do small scale processing while males engage in commercial processing 3. Quality control – both males and females involve 4. Marketing – mainly females 	<ul style="list-style-type: none"> • Poor access to resources is common for females due to social pressure • Less female participation in decision making & management 	<ul style="list-style-type: none"> • Female participation in decision making, access to resources and engage in value chain activities poor and females concentrated at low value ends are most vulnerable



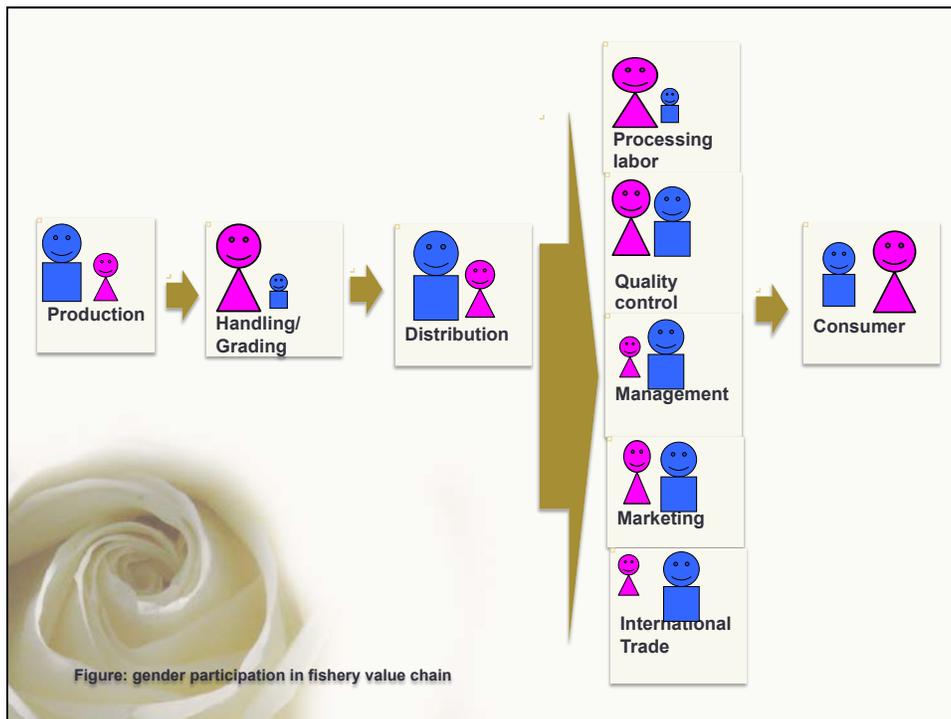
Location & Fishery	Activity profile	Access & Control profile	Factors & Trends
Uganda: Tilapia	<ol style="list-style-type: none"> 1. Pond/ cage construction, pond preparation & stocking – mainly by males 2. Feeding & sampling – both but female involvement is high 3. Harvesting – mainly males 4. Marketing – mainly males 	<ul style="list-style-type: none"> • Males have access to resources & education • Female roles are concentrated in marketing • Educated females play significant roles in high ends of value chains 	<ul style="list-style-type: none"> • Female access to resources, decision making & management are poor • Female roles changing slowly



Table 2: Gender participation in value chain activities

	Asia	Africa	Latin America
Small-scale capture 1. Production	Male dominance; Female play supportive roles, shell fish collection	Rich & old fishers & female invest in boats & fishing gear, males as crew & female collect shell fish	Both males & females invest in boats, fishing gear, refrigeration & logistics, both engage in fishing, female collect shell fish
2. Supply & Trading	Males invest and dominate; Female participation high in South East Asia	Men invest in logistics, both engage	Both engage and manage, female manage businesses are common
3. Processing	Female engagement is high in local smoke, dry & salted fish processing; Female labour in processing plants	Female invest & engage in local processing of smoke & dry fish	Female invest in local processing & processing of smoke & dry fish for local markets
4. Retailing	Female dominant in local retailing	Female retailers common in local markets & as individual retailers	Both males & females operate retail shops or act as individual retailers
5. Wholesaling	Male dominate & manage wholesale markets; High female participation in South East Asia	Males manage & both engage in functioning	Males manage wholesale markets; but female participation is high
6. Admin, HRM, Finance	Both genders; more	No separate designated	Both engage in record

	Asia	Africa	Latin America
Small-scale Aquaculture 1. Production	Investment, ownership belongs to males; pond construction & initial preparations handled by men while females responsible for caretaking & feeding; harvesting mainly men & women presence is common in South East Asia; handling, grading & other supportive roles done females	Both males & females invest in fish farms, pond construction, initial work; harvesting mainly males & feeding, caretaking, handling & grading mainly done by females	Investment born by both wealthier males & females; pond construction, stocking, harvesting are mainly male roles & feed preparation, feeding & caretaking are female roles
2. Supply & trading	Same as small scale capture fishery	Same as small scale capture fishery	
3. Processing	Same as small scale capture fishery	Same as small scale capture fishery	
4. Retailing	Same as small scale capture fishery	Same as small scale capture fishery	
5. Wholesaling	Same as small scale capture fishery	Same as small scale capture fishery	
6. Admin, HRM, Finance	Same as small scale capture fishery	Same as small scale capture fishery	



Conclusions

- Gender roles differ – culture, values, attitudes & norms concerning resource access & control, mobility, type of technology involved, extent of commercialization & product
- Overview of the fisheries & aquaculture value chains & gender involvement – asset access & control is vital
- Female roles concerned more on lower levels of value chains having less access to resources & decision making
- Educated resource rich females concentrated on higher levels of value chains and enjoying better returns

- Deprived members have weak bargaining power, little control over resources & prices ..more vulnerable
- Males invest in production, distribution, logistics, commercial processing & control markets
- Females invest on local processing & retailing
- female engagement is less in modern value chains with few nodes than the traditional complex and lengthier value chains
- Departure of women from fisheries will adversely interfere with existence of the local fishing culture and industry

Acknowledgements

- **All national consultants of the FAO-NORAD value chain project for their valuable contribution**

SUN-DRIED MUKENE (*RASTRINEOBOLA ARGENTEA*) VALUE-CHAIN ANALYSIS IN UGANDA

Margaret Masette*

Food Biosciences Research Centre (Uganda)

Marketing of Mukene (*Rastrineobola argentea*) has become a lucrative business in Uganda after decades of underutilization but its value-chain from capture to market remains unknown. Consequently, a study was undertaken at two selected landing sites located along L. Victoria and several Kampala markets. Using a structured questionnaire a total of 200 fisher-folk were interviewed to identify key-stakeholders, linkages and economic variables along the value-chain. Results indicated that boat-owners incurred the highest input per 100kg-bag of dried Mukene at a cost of UGX 60,000/= followed by regional traders and local traders at UGX 10,000/=. However, the profit margins increased from the boat-owners to the regional traders who earned 2 and 4 times the cost of input respectively. This was expected because some traders were known to offer advance payment to fishers cum processors which trapped the latter in perpetual indebtedness and compromised the final product quality. Although fishers and processors influenced Mukene quality which ultimately determined the price of the final product, they benefited least from their efforts with profit margins 10% and 12% respectively. The profit margin for the boat-owners cum traders selling Mukene for human consumption, varied between UGX 180,000 and UGX 240,000 per 100kg-bag depending on market. Similar weight of Mukene designated for animal feed earned the manufacturer between 44% to 52% profit depending on the mixing ratio with other feed ingredients. The market retailers in the local as well as Supermarkets earned substantial profit.

Sun-dried Mukene (*Rastrineobola argentea*) value-chain analysis in Uganda

Margaret Masette
Food Biosciences Research Centre
(FBRC) P. O. 7852
Kampala-Uganda

IIFET conference 16-23 July 2012 Dares Salaam 1

INTRODUCTION



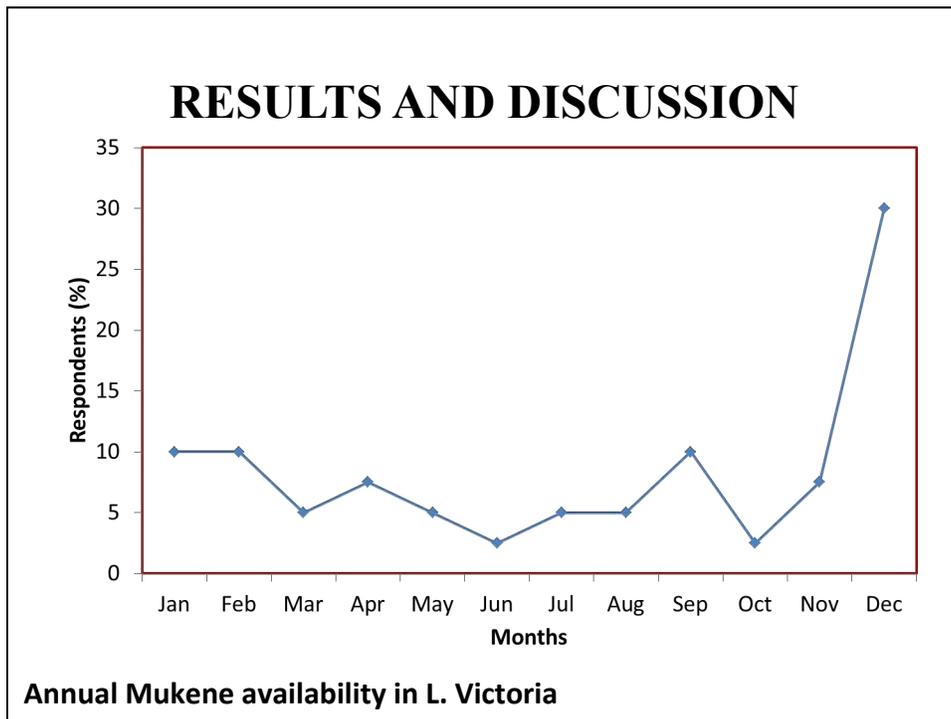
- Mukene (*Rastrineobola argentea*) is tiny bony fish - average length 5cm and weight 15g.
- 80% used for animal feed while 20% enters chain for human consumption
- Post-harvest losses vary between 40-90%
- Contributed US\$ 2 million to Uganda's economy 2010
- V-C consists of several key actors
- Relationships between different key actors is dictated by gender roles, capital and type of market

SPECIFIC OBJECTIVES

- To identify key-players in the Mukene fishery
- To determine linkages between key-players
- To establish inputs and profits at various segments along the Mukene value-chain.
- To generate data for policy formulation – facilitate streamlining of the Mukene sector

METHODOLOGY

- ✘ A structured questionnaire was used to collect information from Kasekulo and Kiyindi landing sites and market outlets in Kampala.
- ✘ About 213 randomly selected boat owners, processors and traders.
- ✘ Responses were coded and analysed using SPSS package.
- ✘ Input costs at each segment of the chain were determined and used to compute the final input cost per 100kg-bag of sun-dried mukene.
- ✘ Profit margin was calculated from the selling price of the bag at the respective chain segment.



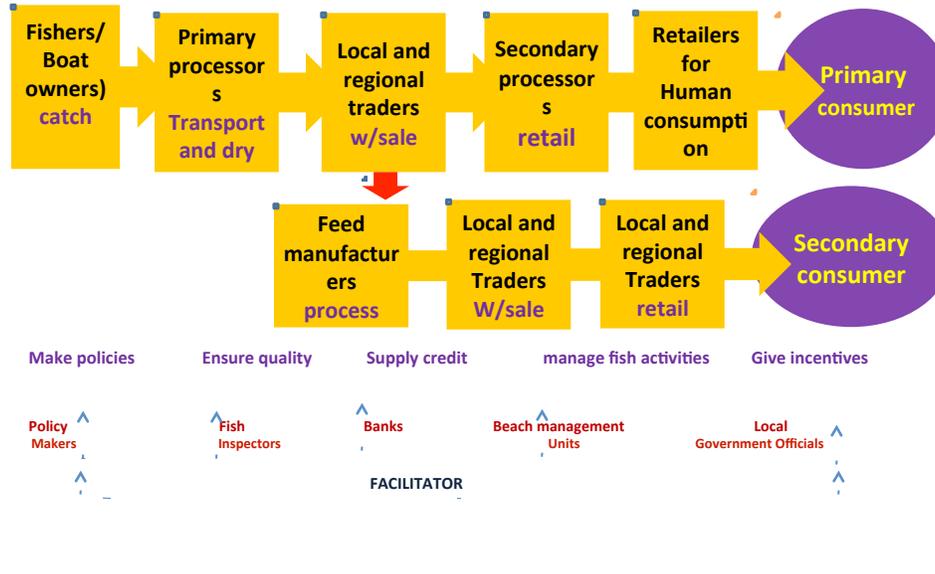
KEY PLAYERS IN MUKENE FISHERY

At principal segments: -

✘ Landing site – include Boat owners, fishers, processors, (BMUs), traders (local & regional), and Local authorities

✘ Market outlets – include traders (local & regional), Supermarkets, Feed manufacturers, consumers (primary & secondary)

Interactions between key actors



LANDING SITE ACTORS

(a) Boat owners



Artisanal:

- Varies with landing sites but on average 60% women and 40 men
- Average investment –UGX 12.5 million per boat (Equivalent to US\$ 5000)
- Profit margin on 100Kg dry product = 30%

Medium scale

- Principally menfolk
- Average investment UGX 150 million (Equivalent: US\$ 60,000)
- Profit margin on 100Kg dry product= 45%

(b) Fishers



Artisanal:

- Mainly hired adult and youthful males
- Trip investment in terms of food and site charges UGX 10-15K (Equiv US\$ 4-6)
- Profit margin 37.5-46.9%

Medium scale

- Mainly salaried adult males i.e. workers
- No investment

(c) Processors



- Usually women carry Mukene from fishing boats
- No monetary investment except time and food to ensure good health
- If 30 basins are ferried to drying ground, they get 1 basin or UGX 5,000 (US\$ 2)
- Considering standing of living at landing site, profit margin = UGX2,500 (US\$ 1) per day
- 1 basin dried Mukene = UGX 15,000 (US\$ 6)

Processors cont'



Artisanal:

- Mixed gender at drying ground
- Share chores of scarring off birds and domestic animals
- Paid in kind or US\$ 1 per batch



Medium scale:

- Mixed gender
- Paid UGX 150,000 (US\$ 60) per month

Inputs & Investments for other actors

Value-chain actor	Basic Required Inputs	Production costs (UGX'000)	Average Investment (UGX'000)	Profit margin on 100Kg
Local trader	Transport + Muk	100 per trip 120-150 per bag	2,000-1000	40-50%
Regional trader	Transport + Muk	600 per trip 120-150 per bag	20,000	70-83%
2 nd processor	H/Q Muk+ composite flour)+ mill +labour	120 per bag 25,000 300-600 per mo	100,000-150,000	30-40%
Retailer for human	H/Q Muk, mkt dues + Monthly rentals	135 per 100kg-bag 1-15 per month	200-250	30-37%
Supermarkets	Packaged Muk + rent	150,000	500	35-50%
Feed manufacturer	mukene + maize or rice bran/husks) + mill + labour	100-120 per bag 7,000 250-500 per month	10,000	44-52%

Value Share

Chain actor	Variable costs	Revenue (Selling price)	Gross income (profit)	Gross margin	Added value	Value share
	A	B	C = (B-A)	D=(C/B*100	E	F=E/B*100
Boat owner (Process, transport, fishing)	60,000	210,000	150,000	71%	120,000	57%
W/salers	135,000	300,000	165,000	55%	90,000	30%
Retailers	260,000	336,000	76,000	22.6%	36,000	10%

SWOT Analysis

Chain segment	Constraints	Opportunities	Recommendations	Responsible party
Fishing	<ul style="list-style-type: none"> Seasonality High cost of inputs Inappropriate handling facil's 	<ul style="list-style-type: none"> Advance payment Abundant Mukene stocks 	<ul style="list-style-type: none"> Group formation and strengthening Sanitation and hygiene sensitization 	<ul style="list-style-type: none"> Boat owners Fishers BMU
Financial Institution	<ul style="list-style-type: none"> Poor saving culture 	<ul style="list-style-type: none"> Govt policy on poverty eradication 	<ul style="list-style-type: none"> Lower credit rates Create awareness on saving 	<ul style="list-style-type: none"> Banks SACCOS
Economic sustainability of the fishery	<ul style="list-style-type: none"> Use of illegal gear High by-catch 	<ul style="list-style-type: none"> 10mm mesh size, catamaran, boat registration 	<ul style="list-style-type: none"> Sensitization Standardize measurement tool 	<ul style="list-style-type: none"> DFR LVFO BMU & Ext
Relation between actors	<ul style="list-style-type: none"> Unfair and unequal bargaining power Lack of information sharing 	<ul style="list-style-type: none"> Relations exist Willingness 	<ul style="list-style-type: none"> Establish platforms Fisher grps 	<ul style="list-style-type: none"> NGOs Dev partners DFR BMUs
Business environ.	<ul style="list-style-type: none"> Poor infrastruc. Corruption 	<ul style="list-style-type: none"> Draft policy Decentrali. 	<ul style="list-style-type: none"> Exposure visits Train actors 	<ul style="list-style-type: none"> DFR BMU

CONCLUSION

- ✘ Mukene value-chain in Uganda is multifaceted with different nationalities and gender participation at different chain segments.
- ✘ Gender disparity at the respective chain segment was influenced by socio-economic factors like labour intensity of task and capital investment.
- ✘ Lack of policies or inability to enforce them, has led to mismanagement of the resource.
- ✘ As a result some actors took advantage of the status quo to make huge profits
- ✘ Profit margins varied across the value-chain : regional traders had lion's share while fishers and processors earned least.

RECOMMENDATIONS

- ✘ Formulate and harmonize a Mukene quality policy for the ECA region to curb malpractices
- ✘ Forge regional co-operation among respective inspection services and border post agencies to promote trade in high Q mukene products
- ✘ Conduct a detailed study within the ECA region for better understanding of the Mukene value-chain dynamics
- ✘ Create market platforms for chain actors to share challenges, risks and other relevant information about the mukene fishery



ROLE OF GENDER IN VALUE CHAIN FROM PRODUCTION TO MARKETING OF FISH

Dr. Debabrata Lahiri*

Rural Development Centre, Indian Institute Technology (India)

Abstract

In production and marketing of fish the women has a leading role as evident from their involvement in various stages. Involvement of women has in putting fish seed in pond or tank, nurturing these by providing food and adequate care. After catching, fish out of the pond or tank involvement of women has been observed in retail trade of fish in the markets. Even in processing of fish, such fish drying on sea beach women are involved. In other words, the women mainly consider fish production as household enterprise. Wherever, they have been involved in retail trade it has been to supplement the family income. The main objective of the paper has been to (a) To highlight the involvement of women in various stages starting from production, processing and marketing; (b) To estimate the change in value of fish at various stages from production to marketing; (c) To assess the reasons for involvement of women in the value chain. The study has been conducted for both inland and marine fisheries. In both the cases, the areas where women have been mainly involved in the value chain from production, processing and marketing of fish would be first assessed. The comparative advantage of involvement of women versus men would also be assessed. In both inland and marine fisheries adequate number women involved in various stages has been sampled out for detailed study by means of a schedule.

**ROLE OF GENDER IN VALUE CHAIN FROM PRODUCTION TO
MARKETING OF FISH**

**Paper presented at the International Institute of Fisheries Economics and
Trade 2012 at Dar Es Salam, Tanzania**

**Dr. Debabrata Lahiri
Associate Professor
Rural Development Centre
Indian Institute Technology
Kharagpur
India**

Introduction:

Value chain as a concept describes the full range of activities that firms, farms and workers do to bring a product from its conception to its end use and beyond.

This includes activities such as design, production, marketing distribution and support to the final consumer.

Value chain approach focuses on **'vertical'** relationships between buyers and suppliers and the movement of a good or service from producer to consumer.

As an **analytical tool**, value chain analysis has become a key approach in both research and policy fields, with an increasing number of bilateral and multilateral aid organizations adopting to guide several of their development interventions.

Supply chain refers to the set of processes and activities required to produce a product then deliver it to a target market is considered as supply chain.

The term "produce" encompasses growing, transforming, or manufacturing. The entire chain goes from oceans or farms to hands, chopsticks and forks.

Among various products in agriculture and allied sectors fish has been a important item. Central and local governments, donor agencies, non-governmental organizations are concerned with a subset of links within the value chain of fish and fishery products.

Smooth functioning of value chain requires not only the factors of production and technology but also the efficient transport, market information systems and management.

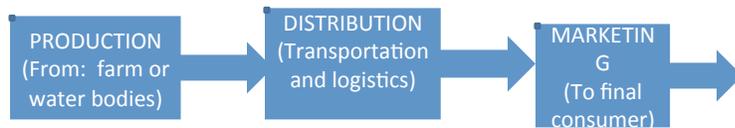


Fig 1: Creation of value chain for fish and fishery products

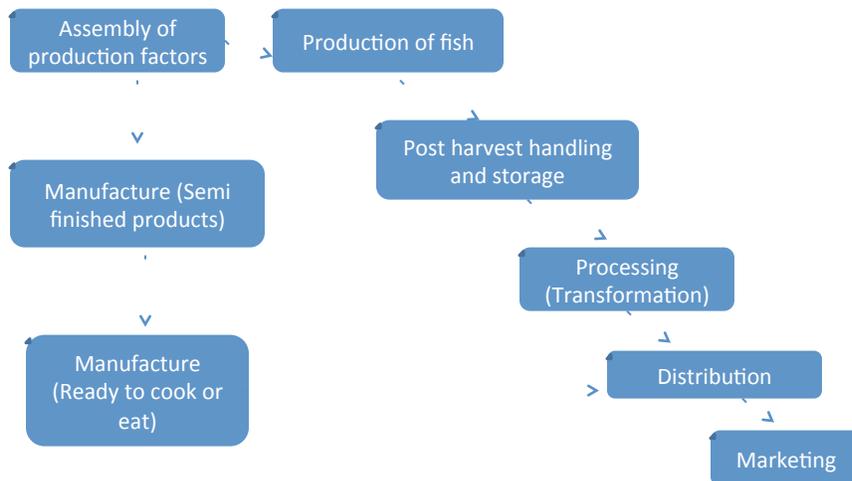


Fig. 2: Key links of fish and fishery products supply chain

Gender in value chain

Gender is conceptualized as the socially constructed difference between women and men (Kabeer, 1999).

Thus gender is about how society gives meaning to differences in femininity and masculinity, and the power relation and dynamics that come about as a result of this (Laven et al. 2009).

Women are always more disadvantaged than men in the context of value chain operations.

Understanding women's position in a value chain, how changes in a value chain might affect gender inequality, and the main constraints for women in terms of gaining from value chain participation, requires one to place gender in the context of intra-household bargaining and of broader social process dimensions (Wyred, 2008); Parpart et.al 2002); Laven et al. 2009)

Objectives

i) To highlight the involvement of women in various stages starting from production, processing and marketing;

ii) To estimate the change in the value of fish at various stages from processing to marketing;

iii) To assess the reasons for involvement of women in the value chain.

Methodology

Data collection

Data had been collected from both primary and secondary sources. Primary data had been collected by employing the following techniques:

(a) Participatory rural appraisal (PRA): For collecting socio-economic information of the fishermen household including women. The information included the following:

(i) Identification of local resources and opportunities for improving the existing income generating activities and identification of the potential alternative ones;

(ii) Ranking of the identified opportunities for women;

(iii) Assessment of the contribution of fish to the livelihood earnings of the people.

- (iv) Assessment of the production and marketing fish at local markets.
- (b) **Focus Group Discussion (FGD):** Specific aim of those discussions were to collect information on mechanism of raw-fish collection, pricing and value addition on raw fish at different levels,
- (c) **Stakeholders:** The following stakeholders had been identified in the supply and marketing chain of marine dried fishery products:
 - (i) Fishers;
 - (ii) wholesalers (*Aratdar*);
 - (iii) Commission agents (*Paikers/Phores*);
 - (iv) Whole sellers/Super market operators.

Main considering factors

- (a) **Identification of trading partners** Value chain analysis has been a comprehensive look at the activities of different trading partners, e.g. Raw fish suppliers, middle men/aratdars, wholesalers, retailers, consumers etc..

Understanding the interaction of these trading partners as well as their roles within the supply chain it is **important to understand the product and information flow.**

Production and distribution channel: The value chain analysis more importantly examines the channels. The distribution channels recognize that product flow is identical at the front and back ends of the supply chain, although between the producers and the retailer's store shelves the flows are very different .

Considering factors at production level: Production and distribution channel as well as the value addition and the profitability of dried fish business are strongly influenced by the following external factors, which need to be considered and examined properly; the considering factors for domestic markets had been:

- i) Sources of finance, NGO/ public financial institutions/local *Mahajans*;
- ii) Inbound transportation cost;
- iii) Quality of fresh raw fish;
- (iv) Contractual production system.
- v) Illegal toll by the local extortionists

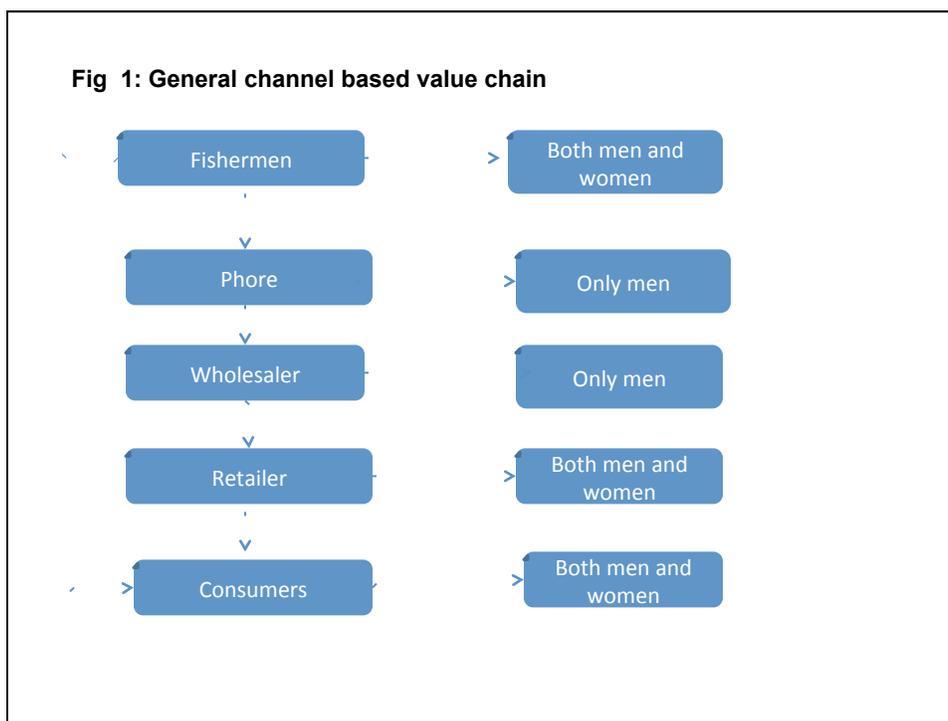


Table 1: Average value addition scenario

Sl. no.	Steps in the channel	Overall value addition (%)	Value addition for women (%)
1	Fishermen to middlemen (Phore)	50	40
2.	Middlemen (Phore) to wholesaler	25	-
3.	Wholesaler to retailer	40	27
4.	Retailer to consumer	26	20

Table 2 :Value addition for of different fish types at different steps

Sl. no.	Fish species	Fisher men to Phore	Fisher men to Phore	Phore to whole saler	Phore to whole saler	Whole saler to retaile r	Whole saler to retaile r	Retail er to consu mer	Retail er to consu mer
		Men	Wome n	Men	Wome n	Men	Wome n	Men	Wome n
1.	Indian major carps	50.00	45.00	25.00	-	40.00	35.00	25.00	20.00
2.	Talapia	40.00	30.00	20.00	-	30.00	20.00	20.00	10.00
3.	Hilsa	50.00	45.00	25.00	-	40.00	35.00	25.00	20.00
4.	Shrimp	60.00	50.00	30.00	-	50.00	40.00	40.00	30.00

Note: Women are not involved where data is not given

Conclusions:

The paper reveals the following aspects:

- i) In developing countries like India women does not perform all the functions (from production to marketing) along the value chain;
- ii) Along the value chain, wherever women takes part, value addition in comparison to the male counterparts has always been lower;
- iii) This has been due to less amount of produce with them to sell and market

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WOMEN IN FISH VALUE-CHAIN IN NIGERIA

Abiodun O Cheke (Ms)*

Federal Department of Fisheries (Nigeria)

Abstract

Women in Nigeria play a key and vital role in the Fisheries value chain in Nigeria especially when we look at their involvement in the marine, artisanal and Aquaculture Subsector of the Fisheries Sector. The women who constitute the greater percentage of the fish mongers processors represent the first segment of the fish market chain; buying fresh fish directly from the fishermen. The fish is either sold fresh by the women, or processed by smoking. In the aquaculture sector the women also play key roles in buying and processing. The women in the fisheries value chain are often grouped into Cooperatives though we have a very, very few that go solo. However, the women's activities in the value chain are characterized by low capital and technology input. Women's work in fish value chain has not been optimized linked to value chain finance in Nigeria thus they are limited to various financial services being put up by the commercial banks for the Agricultural Sector in the Country. This lack of Corporate finance has in essence debar the women from upgrading their fisheries activities and businesses in the various steps along the fisheries value chain and they have thus not been able to build sustainable and viable fish trade especially when it comes to the export of their fish and other fishery products.

Introduction

Fish Provides high quality, easily absorbable protein and a wide variety of vitamins and minerals, even a small amount of fish is an important dietary protein supplement for poor people who cannot easily afford animal protein and who rely mainly on starch diets. "Fish is an important part of daily diet in many countries and provide nearly one quarter of world's supply of animal protein and in many countries fisheries are important sources of employments, income and foreign exchange" (FAO, 1984).

Fish Trade like any traded commodities enhances living standards and sustainable development as well as contributes to the food Security of a country. International fish trade (imports) has a positive impact on Nigeria's food security since Nigeria's fish demand cannot meet supplies; currently from the Federal Department of Fisheries 2007 statistical data collation:- Total Fish Demand for the country is 2.5 million metric tones per annum whilst Total Fish Supply (Domestic and Imports) is 1.34 metric tones per annum . overall assessment of both the export and import aspects of Nigeria's Fish Trade has shown a very positive outlook on outcomes related to national impact of fisher folks, fish workers, fish consumers, fish sellers as well as the fisheries resources.

Nigerian Fisheries Sector:-

Nigeria is located on the West Coast of Africa (West Africa); it is amongst the countries in the Gulf of Guinea and a key member of the Economic Community of West Africa (ECOWAS).

Nigeria has a continental shelf Area of 37,934 km²; a coastline length of 853 km. Aside from its marine waters the country is also endowed with large numbers of bodies of waters – lakes and lagoons, dams etc; Nigeria fisheries sector is thus made up of the following: Artisanal fisheries- consisting of Coastal and Brackish waters; Inland Rivers and lakes.

1. Aquaculture (Fish Farm)
2. Industrial (Commercial Trawlers) – this involves inshore fishing and shrimping i.e. fishing between 5-20 nautical miles of our territorial waters. We also have an EEZ of 200 nautical miles where fishing also takes place, and
3. Distant Waters – this involves Reefer vessels bringing in fish into Nigeria from other countries; termed imports.

Women in Nigerian Fisheries Sector/Value-Chain

Nigerian women play very important role in the various Sector of Nigerian fisheries; they are engaged in a wide range of activities (especially in processing and marketing)-like other women in fisheries all over the World; the Nigerian women in fisheries are no exception; they are the backbone of fresh and dry fish marketing from very early times by vending in rudimentary fish markets as well as carrying fish on head load sales, door to door.

Fish Value Chain Processes

Women in Nigerian fisheries sector play a key and vital role in the fisheries value chain in Nigeria especially when we look at their involvement in the Marine, Artisanal and Aquaculture sub-sector of the fisheries sector. The women who constitute the greater percentage of the fish mangers/processors represent the first segment of the fish market chain; buying fresh fish directly from the producers/fishermen as they land the fish at shores. In the case of Aquaculture production the women often buy the fish directly at the farm gate. There are also a few women in Aquaculture production in Nigeria.

The fish bought by the women are either sold in the fresh form; or as chilled packed in ice; and as live fish as in Aquaculture production often the fish undergoes further processing by smoking before it is sold. In Aquaculture the women play key roles in buying, processing and marketing.

On the whole the women are involved from when the fish is landed at shore; farm gate in Aquaculture; thereafter the fish undergoes some basic or extensive processing, after which the first set of wholesaler women sell to other women/men retailers who in turn sell to consumers. The women wholesalers have more funds for the business than the retailers; however their challenges are similar only in various degrees.

Generally the women have little capital or net worth to put up as collateral for financial institutions; and the financial institutions thus sees them as too high a risk to be given loan even at high interest rates.

Organization

Over the years the Nigerian women in the fisheries value-chain have been organized into fisheries cooperative society though we have a very, very few that do not belong to any union but operate solo (alone) with their operation.

Being members of cooperative societies has enabled the women to upgrade their status (to an extent), as members are able to get government and private sector assistance in terms of loans (though often this fund are not enough): subsidized inputs, capacity building etc.

Also, these cooperative societies are often used to protect the interest of the members as well as to facilitate equitable dealings with their fish suppliers (especially in the industrial and Aquaculture Sector); for often the members of the cooperative societies are able to argue and stick to a certain price regime with the supplier rather than the other way round (for example, if their leaders insist that no members should buy the fish at a price above a certain margin, you can be sure none of their members will) – this in essence shows their power as being part of a cooperative society.

CHALLENGES:-

The women's activities in the value chain are characterized by low capital and technology input. Most of their fish handling operations are without appropriate capacity to meet national and international standards and hence possess low substantial benefit in fish trade.

Women's work in fish value chain has not been optimized or linked to value chain finance in Nigeria – thus they are limited to various financial services being put up by the commercial banks for the Agricultural Sector in the country. This lack of Cooperate finance has in essence debar the women from

upgrading their fisheries activities and businesses in the various steps along the fisheries value chain, they have therefore not been able to build sustainable and viable fish trade especially when it comes to the export of fish and other fishery products.

Recommendation and Conclusions

Considering the above challenges of the women in fish value chain in Nigeria; there is the need to assist these women to rise up and overcome their challenges in order to benefit and reap the reward of fish trade such as wealth creation, employment generation, better nutrition and education processes for their children and all household members.

It is opined that if formal financial institutions can make loans (especially at single digit interest rate) available to the women along their various involvement in the fish value chain to meet their capital requirements, the women will be able to invest in modern technologies like Cold Rooms Smoked fish warehouses, Refrigerated trucks (transportation of fish), as well as modern smoking kilns situated in sheltered locations.

A financial organization should also be put in place to bear the various risks these women encounter along the various fish value-chains, for example most of these women transport fish and fish products using public transportation; this increases risk due to irregular services and increased expenses; which sometimes make these women to sell below cost.

The Federal Government of Nigeria's proposal through the Federal Ministry of Agriculture and Rural Development and Central Bank of Nigeria (CBN) to introduce the Nigeria Incentive – Based Risk sharing for Agricultural Lending (NIRSAL) to farmers should also be extended to the women in the various fish value-chain activities in Nigeria.

Provision of the requisite formal financial assistance as well as provision of modern marketing infrastructures to model markets, Cold Room, Refrigerated trucks, smoked fish warehouses etc to these women will lead to reduction in post harvest loses; it will also provide and strengthen the sale of fish and other fisheries product in their various locations; increase wealth, employment generation, as well prevention of rural –urban migration etc.

Overall; increase in the financial status of the women will lead to the increase in the fisheries marketing activities of the women in the fisheries value chain, in Nigeria it will also boost the growth of the fisheries subsector in Nigeria as well as make substantial impact on the Aquaculture value chain of the Federal Governments' Agricultural Transformation Agenda.

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FISH TRADERS AS KEY ACTORS IN FISHERIES: THE FORGOTTEN DIMENSION OF GENDER

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(Sweden), Department of Political Science (Sweden), Institute of Marine Science

Abstract

Invisible actors on a male dominated arena: female fish mongers' roles, strategies and needs in the fisheries sector in Zanzibar, an increasing number of women have entered fish markets acting as a link between fishers and consumers, i.e. "middleman". However, since fisheries are traditionally male dominated, women receive little recognition. Thus, gender analysis in the fisheries sector potentially can enhance management and development policies as well as environmental issues. In this study 23 women and 23 men from 12 fish markets in Zanzibar were interviewed to examine 1) women's and men's different strategies to succeed on the market, 2) how finance and social networks determine the access to different fish species, 3) knowledge about fish demand and markets, and 4) needs and challenges related to fish trade. Results show that even when women manage to penetrate typical male jobs, the execution of the activity differs greatly between the sexes. Men tend to dominate commercial channels and revenues of large valuable species such as tuna, kingfish and swordfish while women mainly have access to species of low economic value such as anchovies and small mackerels directed to local markets and consumption. The main reason for this was reported to be lack of access to economic and social resources. This, in combination with scarce knowledge about fish demand, market connections and limited mobility, exclude women from more profitable markets. The study suggests that a nuanced understanding of gender dynamics in fishing communities is needed and its relation to wider social, economic, cultural and political processes.

Fish traders as key actors in fisheries:

The forgotten dimension of gender



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Objectives



- i) *Economic resources*
- ii) *Markets and customers*
- iii) *Traded species*
- iv) *Contacts and organizations*
- v) *Knowledge*
- vi) *Perceptions and experiences*



Study area



Stockholm University

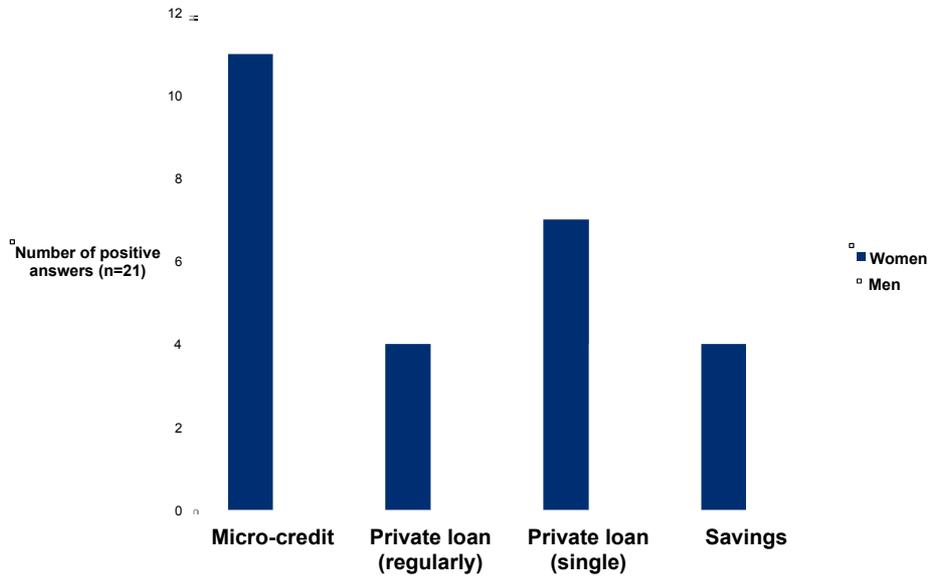
- Interviews (21 men & 21 women)
- Markets of different character:
 - i) No of men/women*
 - ii) Size of fish*
 - iii) Tourism influences*

Economic resources

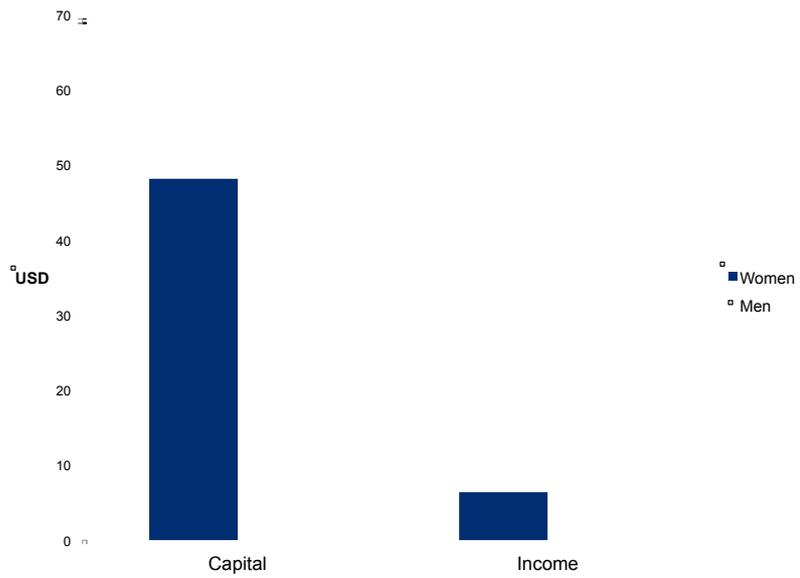


Stockholm University

Initial sources of funding



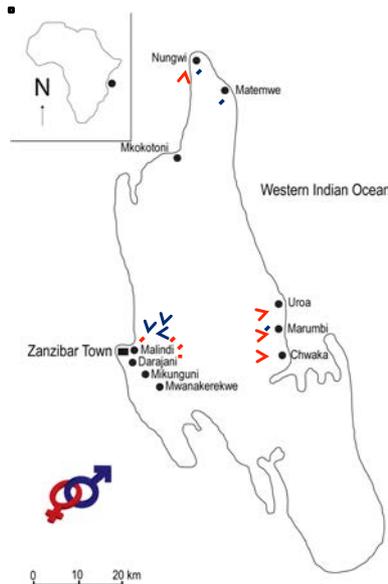
Daily capital used and income (median USD)



Markets



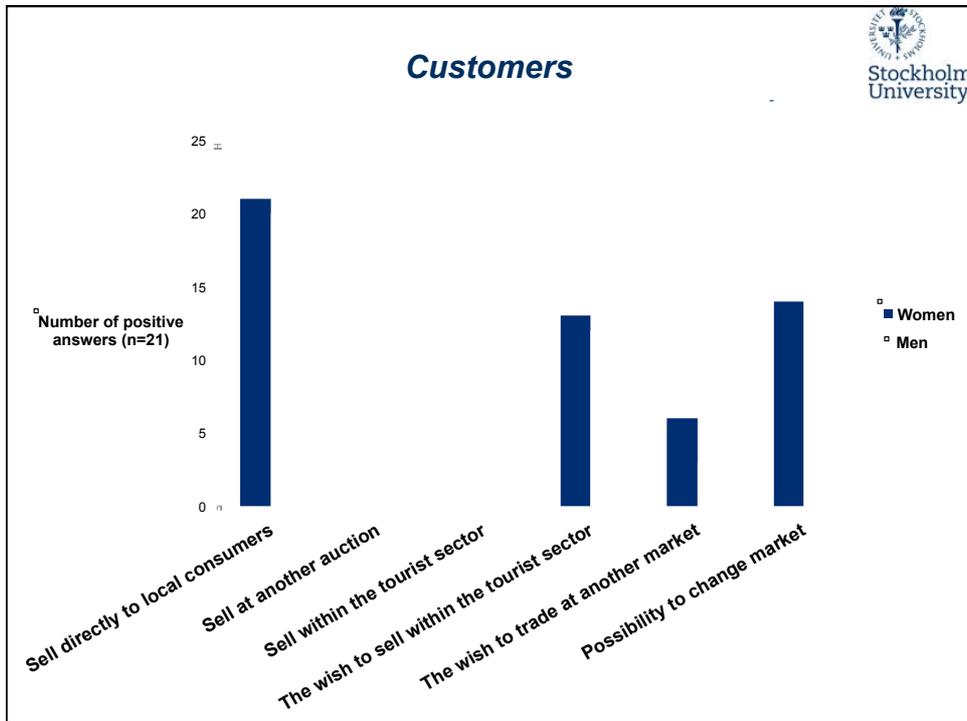
Distance to market

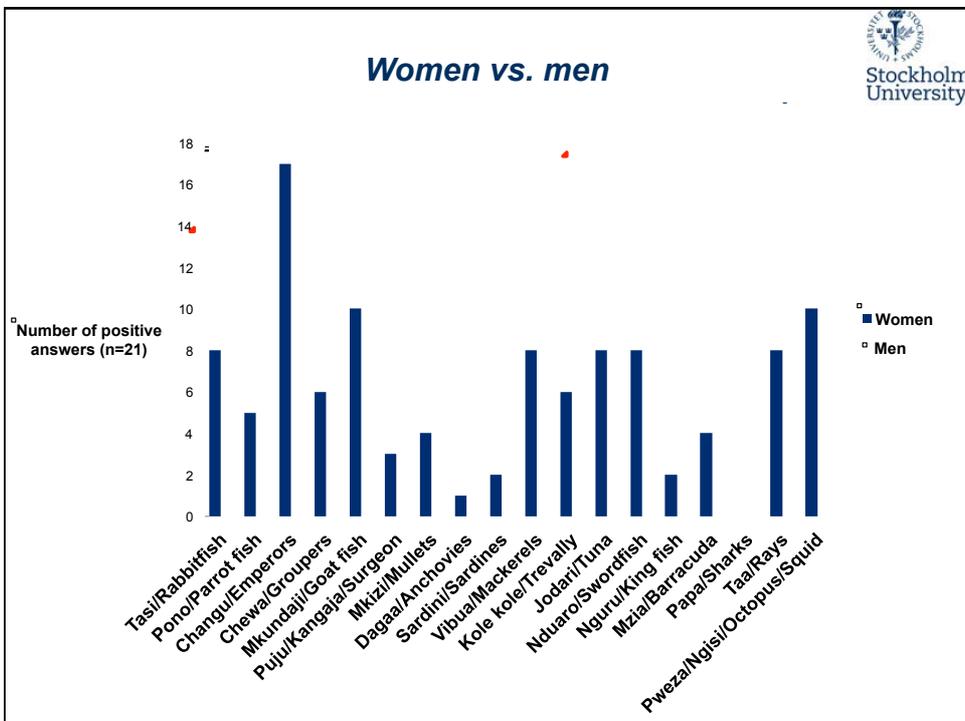


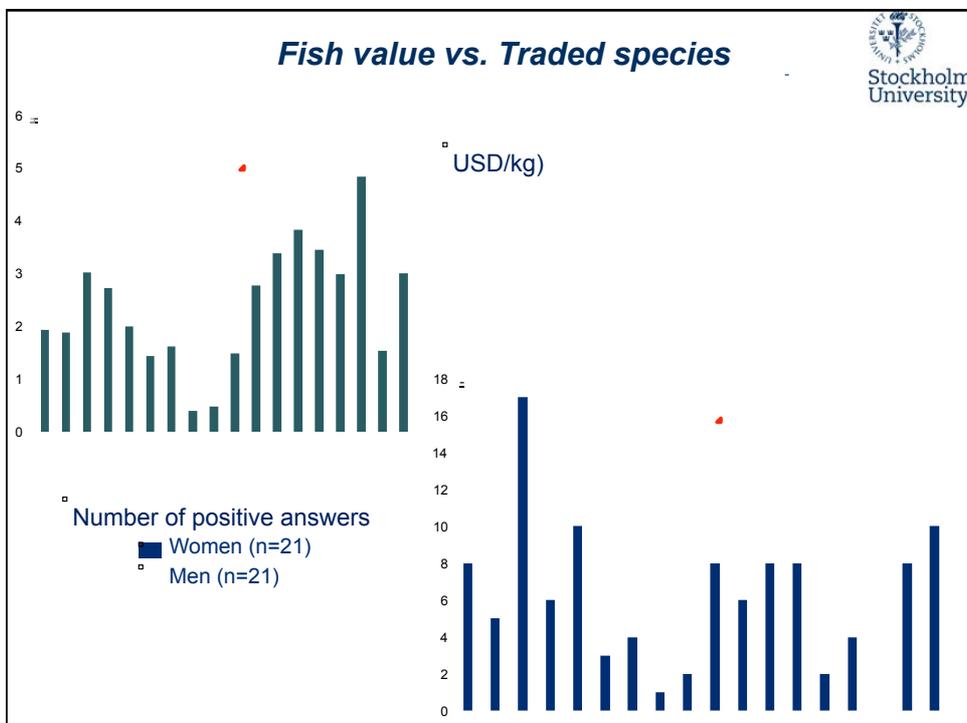
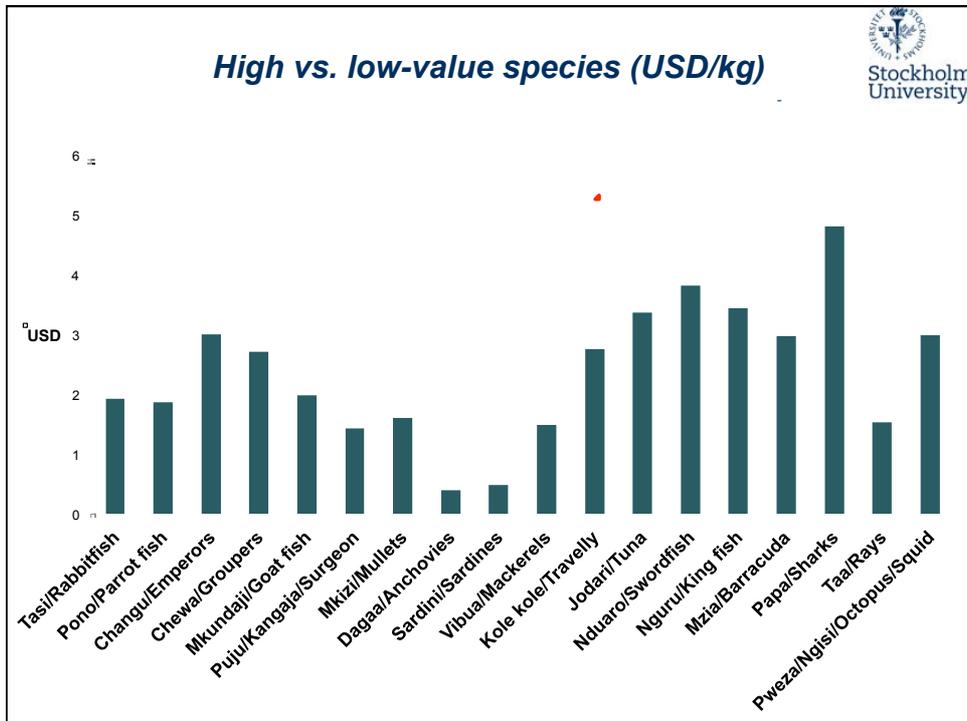
- Women travel long distances **to buy** fish, and mainly sell it sundried or fried in their own village

- Men usually buy fish close to home but travel longer distances **to sell** fresh fish to a high price in Town

- Average 8 h/day in fish trade, but women's main responsibility for household duties result in women having little free time compared to men



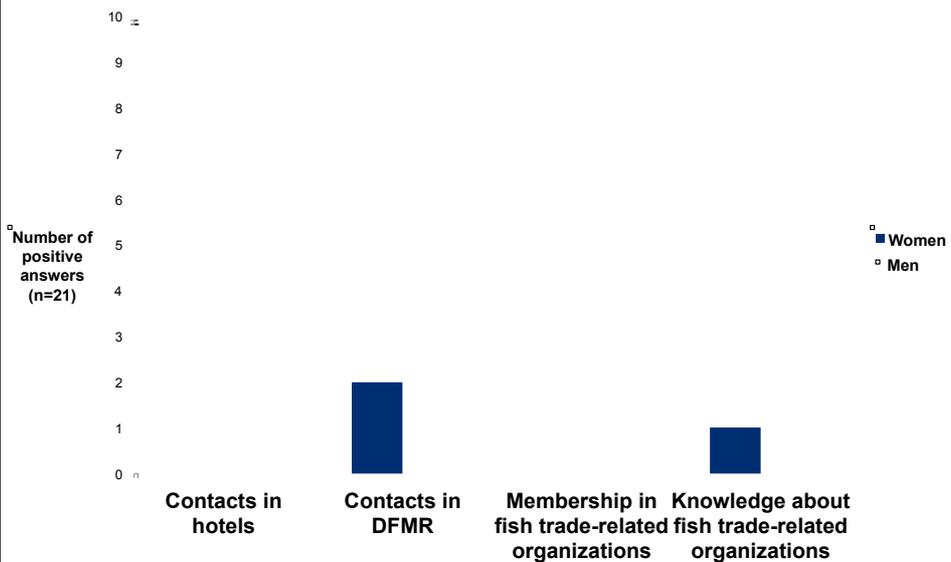




Contacts and organizations



Fish trade-related org/contacts



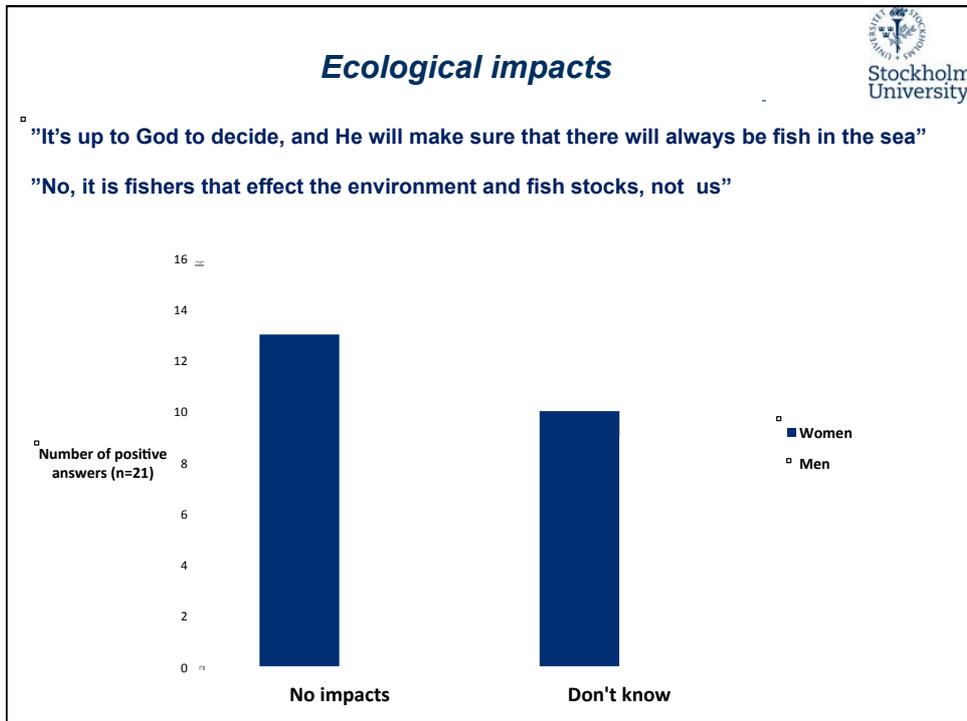
Knowledge



Markets, customers and species

- All female and male traders reported to have good knowledge in market characteristics, demand and high vs. low valuable species
- Most women lacked knowledge in marketing and networking and requested knowledge in how to approach more diverse customers, e.g. hotels and restaurants
- Thus, despite overall good knowledge in markets they trade with fish:
 - i) According to their capital and existing customers*
 - ii) That resists the heat better due to long transport*
 - iii) According to other traders so as to minimize competition*

Familiarity with fish market was very important!



Life improvements and equality

- All traders reported that fish trade has improved their, and their respective community's, living standards

- Direct (fish traders)

- i) Increased income (money for school fees, new houses)
- ii) Protein

- Indirect (community level)

- iii) Economic contributions to e.g. weddings and funerals
- iv) Loans
- v) Free fish to people in the village

- Most traders said that men and women are treated equally and what matters is the capital. Still, female traders experienced little decision-making power, in the household and in the community

Conclusion

- i)* Differences in economic resources such as initial funding, capital and income, men earn more than twice as much/day
- ii)* Differences in sales points, customers and contacts within the tourist sector
- iii)* Unequal opportunities to trade with high valuable fish species
- iv)* Women have little free time to organize and discuss fish trade related issues. No women were involved in any fish trade-related organization
- v)* Overall little knowledge in ecological impacts
- vi)* Improved living standards but most women still found it hard to compete with male traders and no changes in household structure

Acknowledgement



- The Swedish International Development Agency (SIDA) for funding
- Co-authors (de la Torre Castro, M., Lindström, L. and N.S Jiddawi)
- Interpreter (Muumin Abdullaziz)
- All the wonderful respondents and "Bwana Dikos"

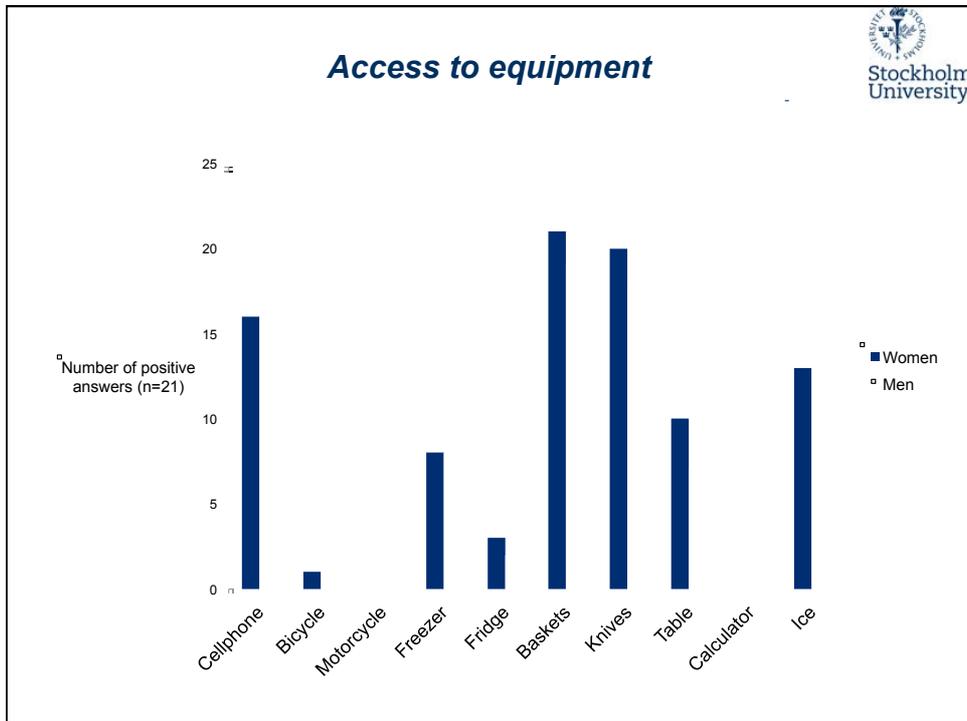


Preliminary data analysis (generalized linear model)



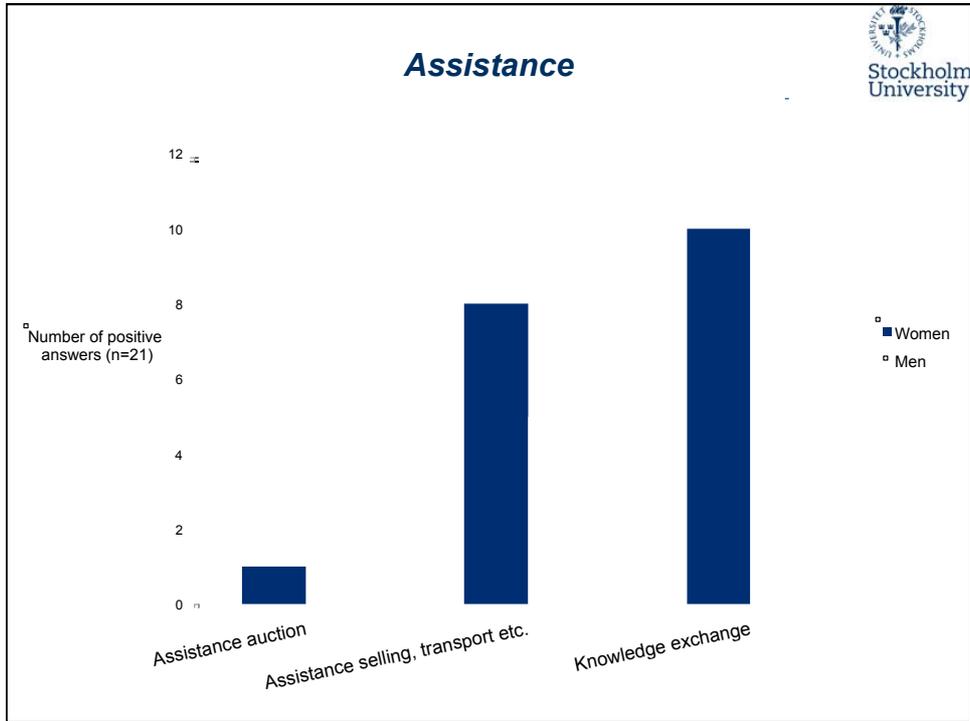
- Income was positively correlated ($p < 0,05$) with
 - Capital
 - Number of years active
- and negatively with
- Age
- No correlation between income and gender, mobility, organization, or distance

To be a "successful" trader you should be young, have great experience and high capital



Characteristics of fish traders

- Time active in fish trade was 9 years for women & 19 years for men
- About 8 hours/day was spent on fish trade
- 33 % of the women & 19 % of the men had additional income bringing activities
- Traditional division of labour. Women reported to have little or no free time!



SESSION 03A: OVERCOMING GENDER INEQUALITIES IN FISH SUPPLY CHAINS TO INFORM POLICY AND ACTION

Organizers and Chairs: Dr. Hillary Egna and Dr. Meryl Williams

Objectives: This panel discussion draws on the wealth of information presented in Sessions 1A (Markets and Value Chains for Small Aquaculture Enterprises) and 2A (Looking at Fish Supply Chains with a Gender Lens) and challenges the panelists to present their views on how gender inequalities in fish supply chains can be overcome. A wealth of information is building to inform action to improve gender equity in supply chains, especially from studies on gender divisions of labour, economic relations and women's empowerment. In addition to research-based knowledge, innovative art-science coalitions are also being tested to stimulate change to greater equity. The output of the Session will be a synthesis of suggestions for policy making and action.



Panelist

Gifty Anane-Taabeah (Ghana)

Virginia Polytechnic Institute & State University

Theodora Hyuha (Uganda)

National Fisheries Resources Research Institute and Makerere University

Nancy Gitonga (Kenya)

FishAfrica

Sara Fröcklin (Sweden)

Department of Systems Ecology, Stockholm University

Shyam. S . Salim (India)

Central Marine Fisheries Research Institute

Agbebi Funmilola Omolara (Nigeria)

Ekiti State University

Stella B Williams (Belgium)

Mundus maris: Sciences and Arts for Sustainability

GENDER MAINSTREAMING AND WOMEN EMPOWERMENT – REFLECTIONS AND UPSHOTS FROM FISHING INDUSTRY OF KERALA, INDIA

Shyam. S . Salim*

Central Marine Fisheries Research Institute (India)

Abstract

Mainstreaming aims at incorporating gender concerns as an integral element in the implementation, monitoring and evaluation of policies and programmes so that benefits are shared equally and inequality isn't perpetuated. UNDP (2008) opined that investing in women competencies and empowering them to exercise their choice is the surest way to sustain economic growth and development. In India, fisheries sector provides a livelihood for women as a source of supplementing fisher household income by their engagement in pre and post-harvest activities including marketing. The fisherwomen in Kerala assume significance due to their involvement in fish related activities leading to distribution, availability and value addition. The study focused the economic, social, political and legal empowerment of fisherwomen involved in processing and marketing across four occupational groups viz. fish retailer, fish vendor, dry fish makers, and value added fish producers and was based on primary data collected from fisherwomen households. The study analyzed empowerment levels using scoring indices and composite empowerment index for fisherwomen categories were estimated. The social and economic empowerment level was high with freedom in decision making and household expenditure. Handling, transporting and storage operations exhibited highest level of discrimination's. SHG's and co-operatives were major networking institutions which augmented empowerment levels. Market intelligence and news were concerns of continuing discrimination's. The results indicated that the fisherwomen in Kerala possessed healthier composite fisherwomen empowerment index. Nevertheless appropriate institutional arrangements ensuring equal opportunities in fish marketing and processing and priority for institutional credit access will mend.



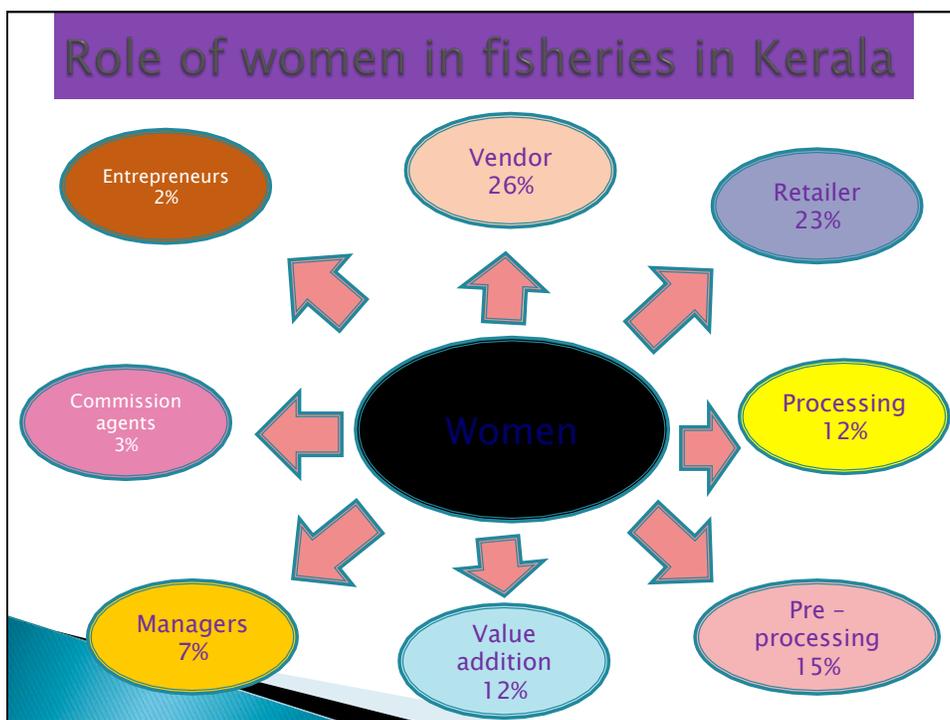
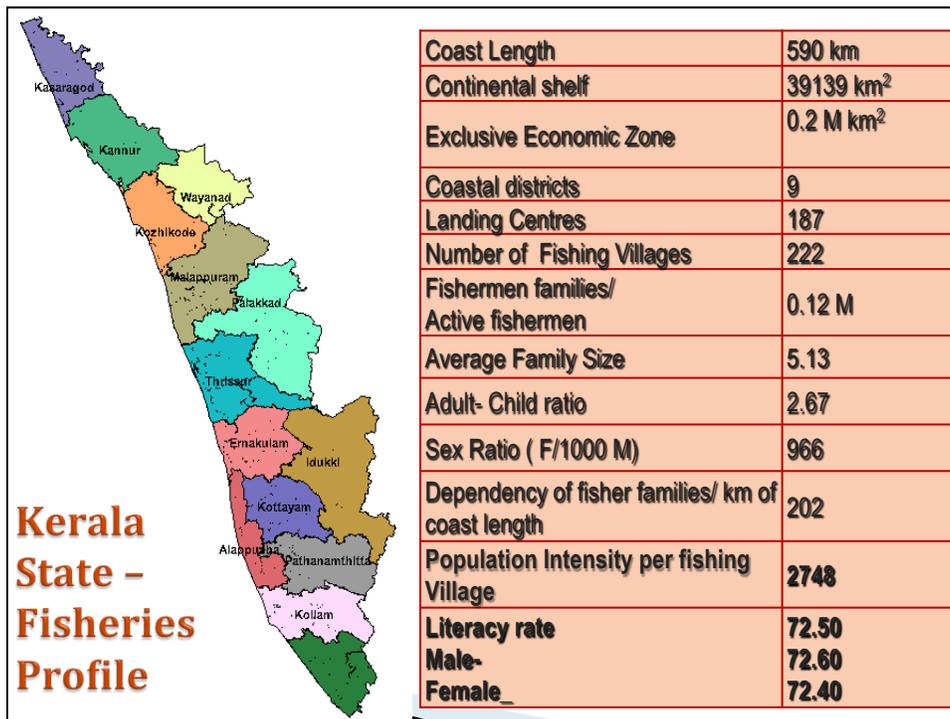
Gender Mainstreaming and Women Empowerment – Reflections and Upshots from Fishing Industry of Kerala, India

Shyam. S . Salim
Central Marine Fisheries Research Institute
Kochi – 682018 Kerala, India



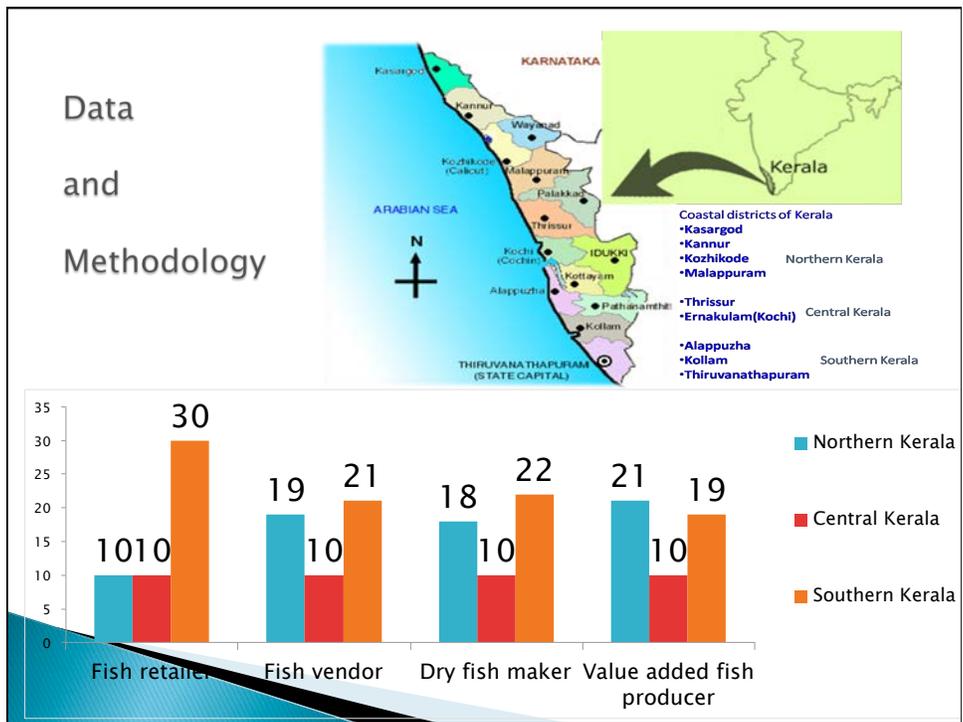
Settings...

- ▶ UNDP (2008) opined that investing in women capabilities and empowering them to exercise their choice is not only valuable itself but also the surest way to contribute to the economic growth and development.



Objectives

- ▶ to analyze the economic, social, political and legal empowerment of fisherwomen of fish processor and marketers
- ▶ To estimate the composite women empowerment index of fisherwomen In Kerala



Data and Methodology(Contd)

▶ Scoring method

Rank order correlation co-efficient

$$(r_s = 1 - 6 \sum d^2 / n^3 - n)$$

where,

d = difference in ranks assigned to a particular parameter among four different categories of fishewomen,
and n = number of parameters under consideration or the highest rank.

Fisherwomen empowerment index

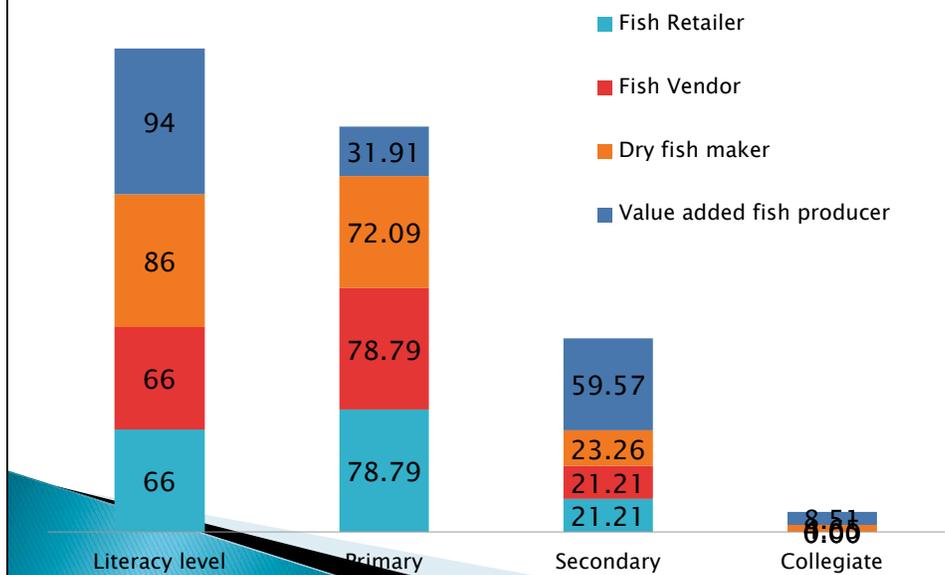
- ▶ Mean Per cent Scores (MPS_i) = \sum Scores actually obtained for each fisherwomen / Maximum possible score to be obtained * 100 where I parameter considered in a particular empowerment category
- ▶ Fisherwomen Empowerment Index = \sum Scores actually obtained for each empowerment indicators / Maximum possible score for each parameter * 100
- ▶ Composite Fisherwomen Empowerment Index (FEI_i) = \sum Scores actually obtained for each empowerment indicators / Maximum possible score for each parameter * 100

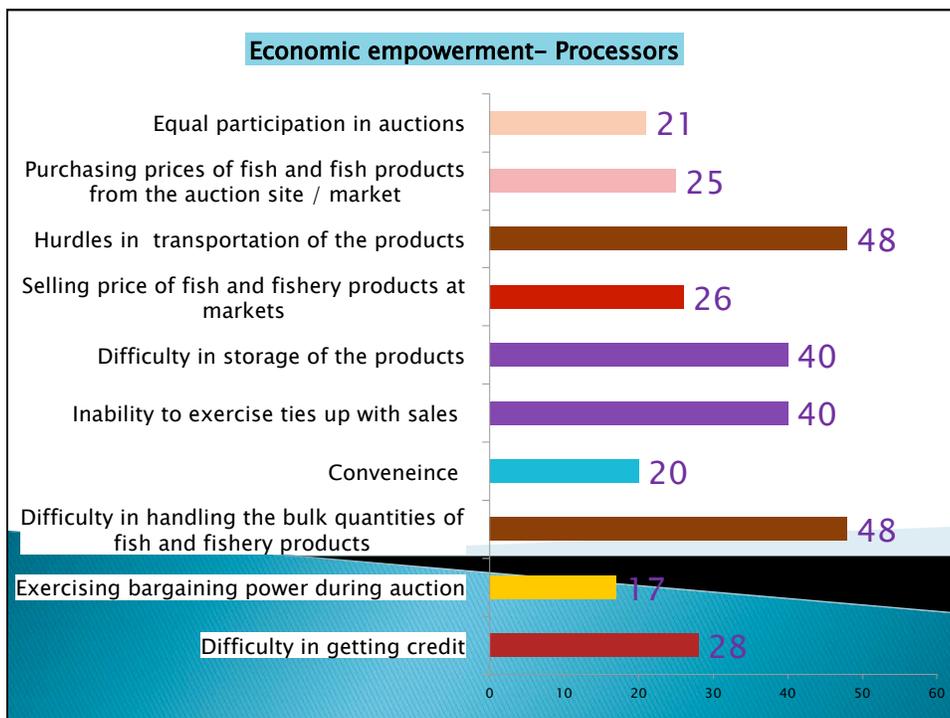
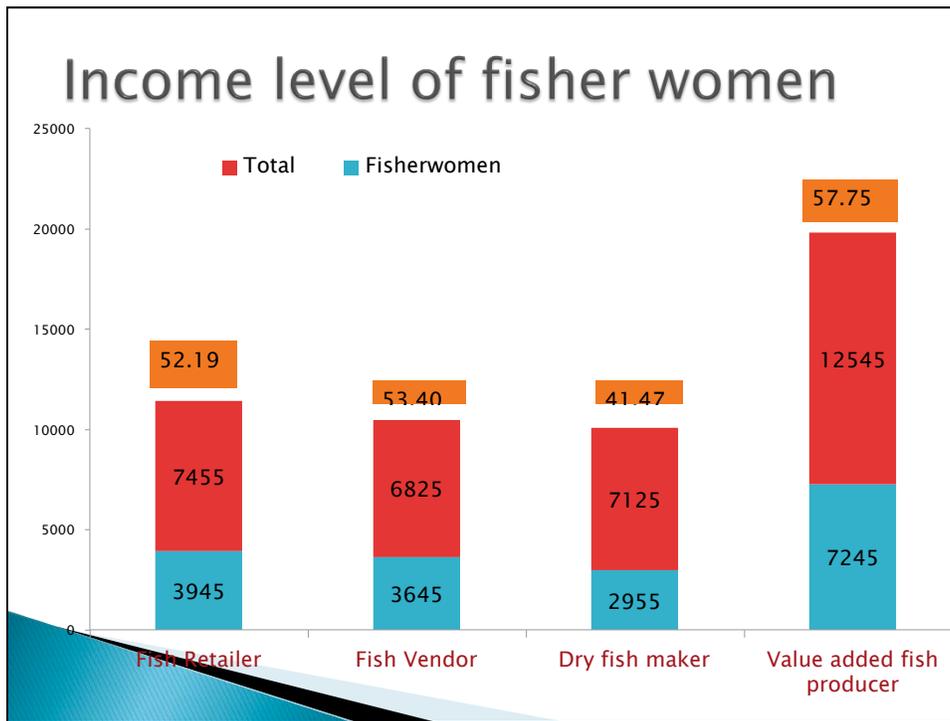
where, i denotes the four categories of empowerment indicators, viz. economic, social, political and legal.

Salient findings

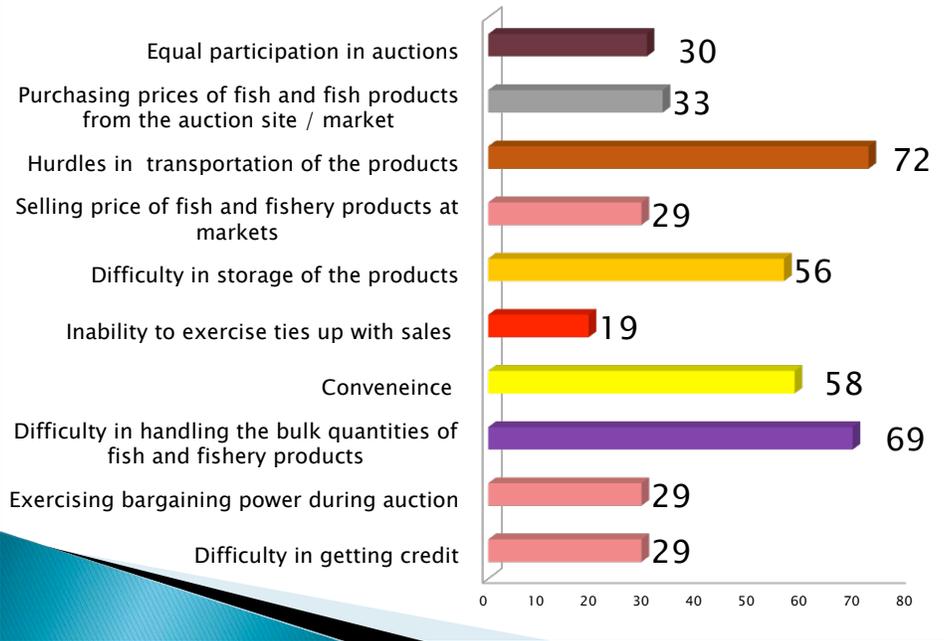
- ▶ General Details
- ▶ **Economic Empowerment** – Gender Discrimination in the Economic Activities of Fisherwomen
- ▶ **Social Empowerment** – Decision making ability of fisherwomen
- ▶ **Legal empowerment** – Access to legal process and systems
- ▶ **Political empowerment** – Access to political systems and citizens power
- ▶ **Empowerment indices across groups**

Educational status of the fisher women

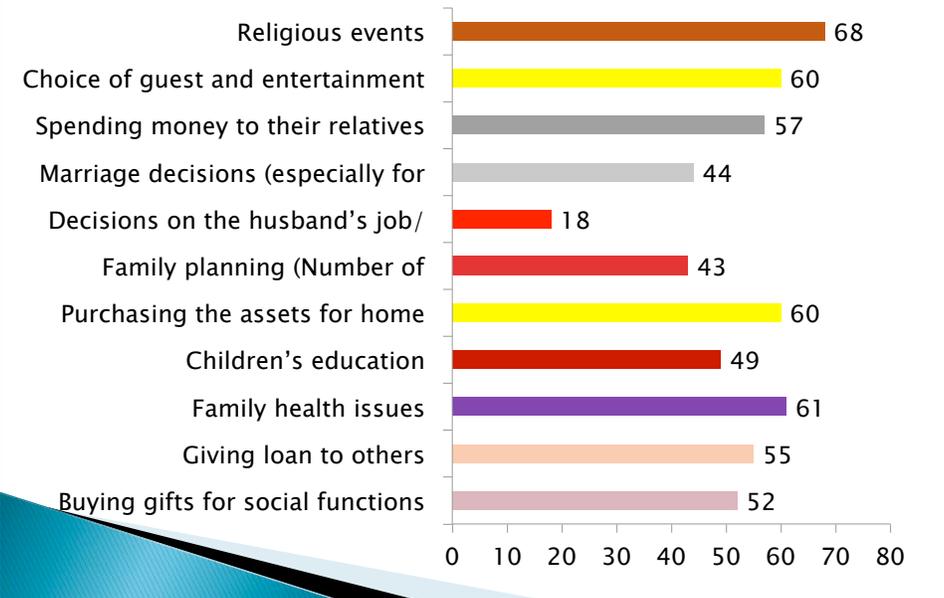


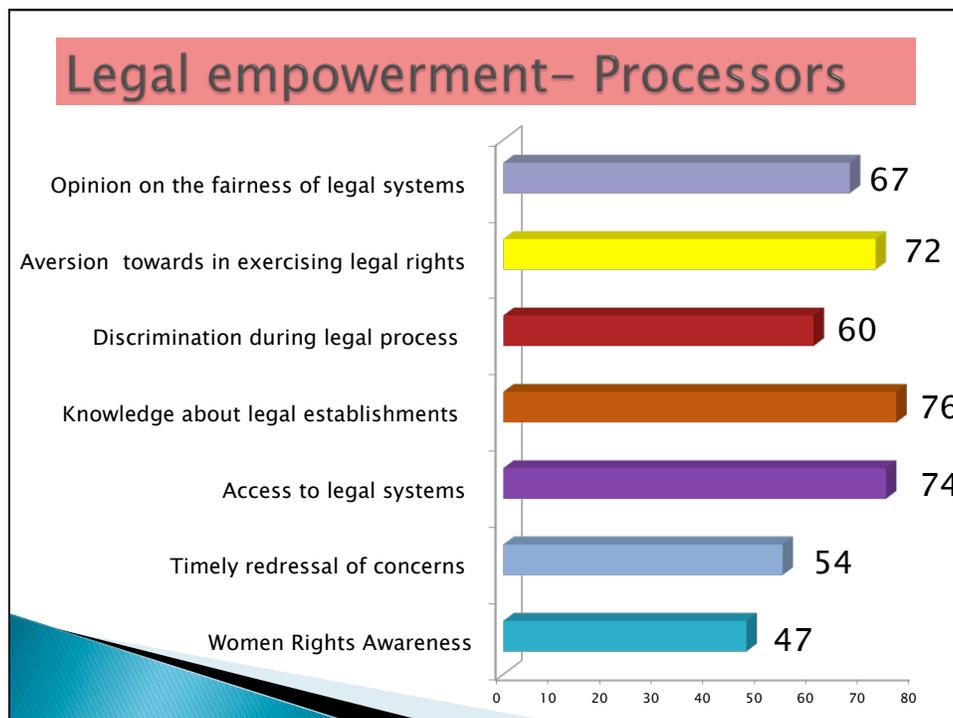
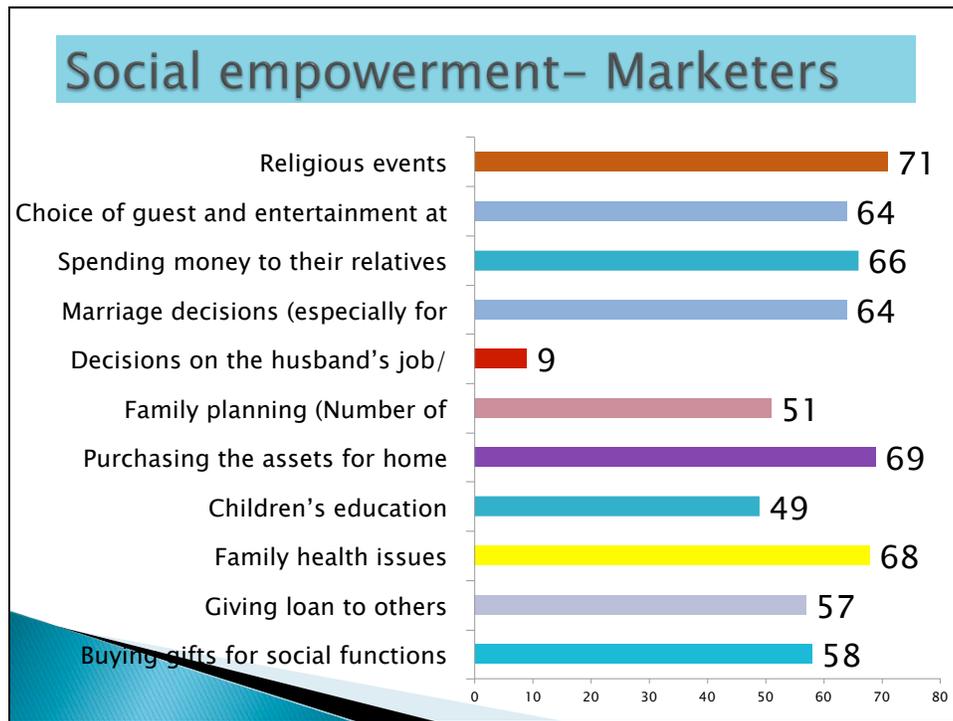


Economic Empowerment- Marketers

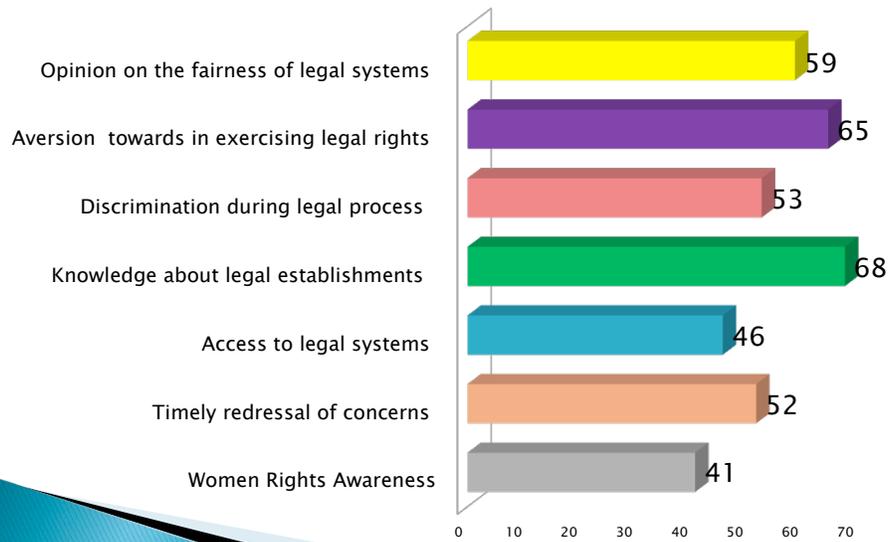


Social empowerment- Processors

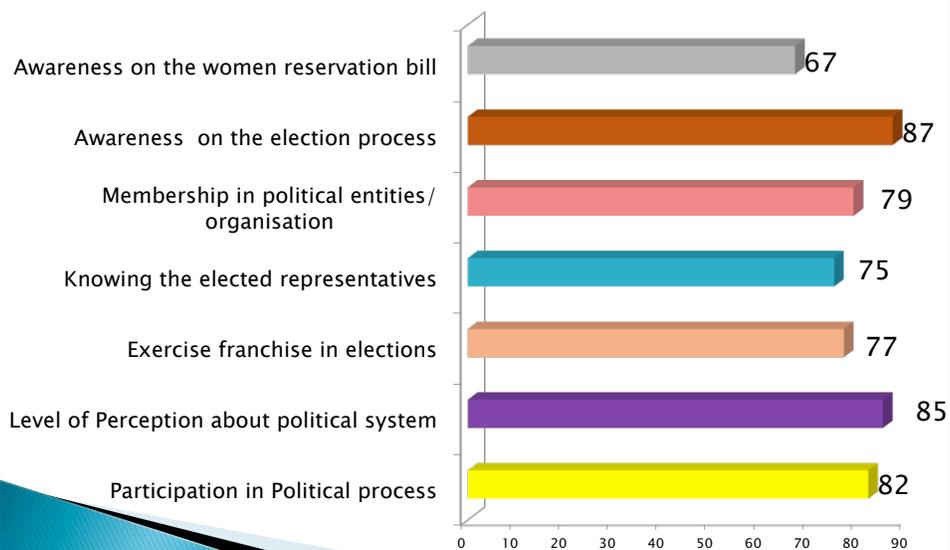


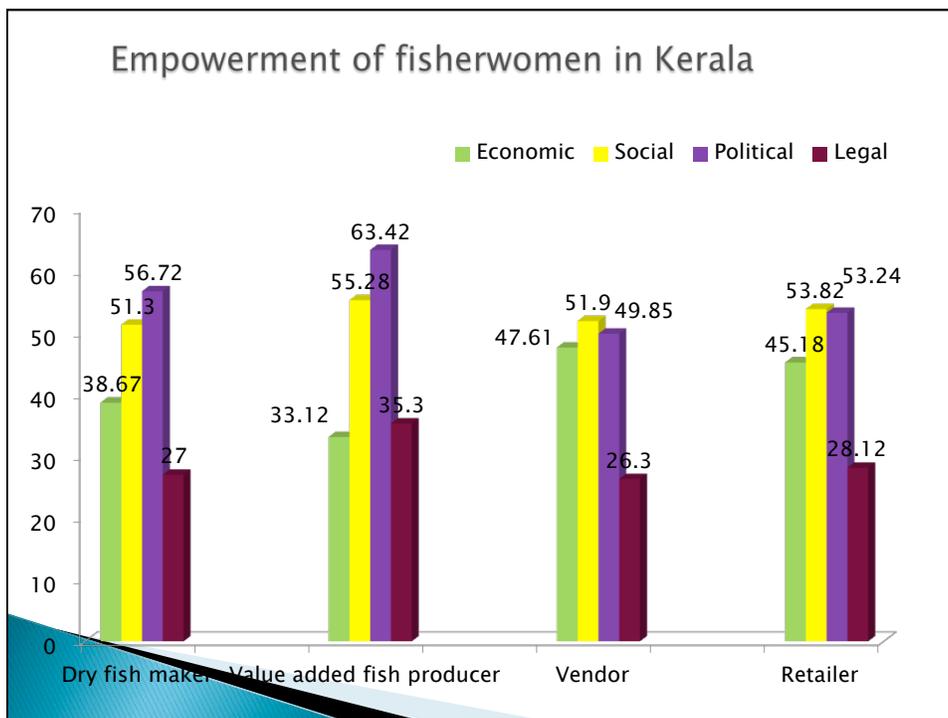
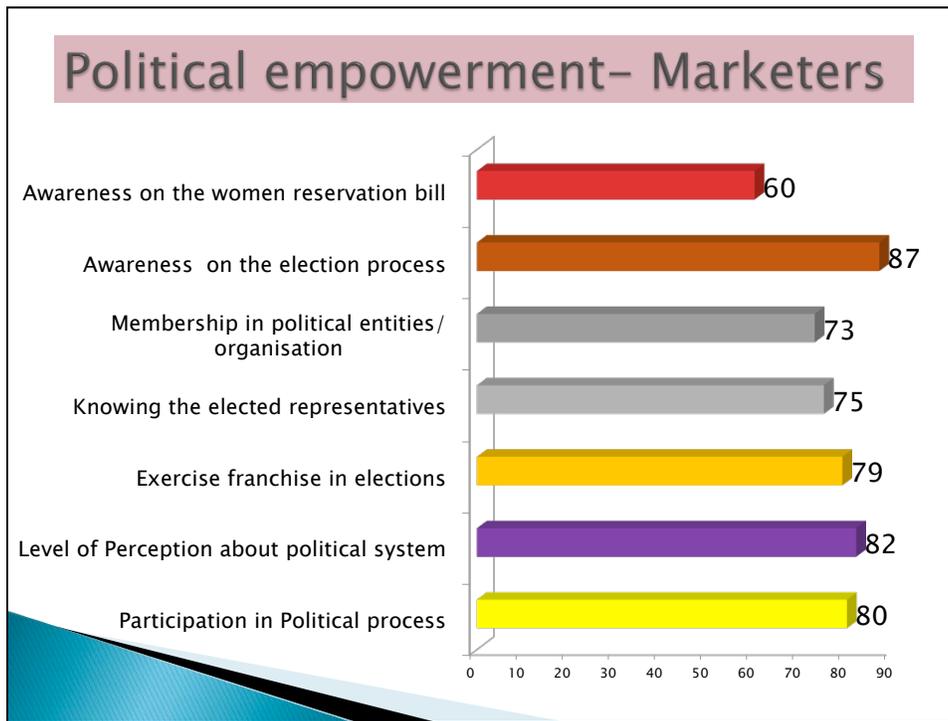


Legal empowerment- Marketers

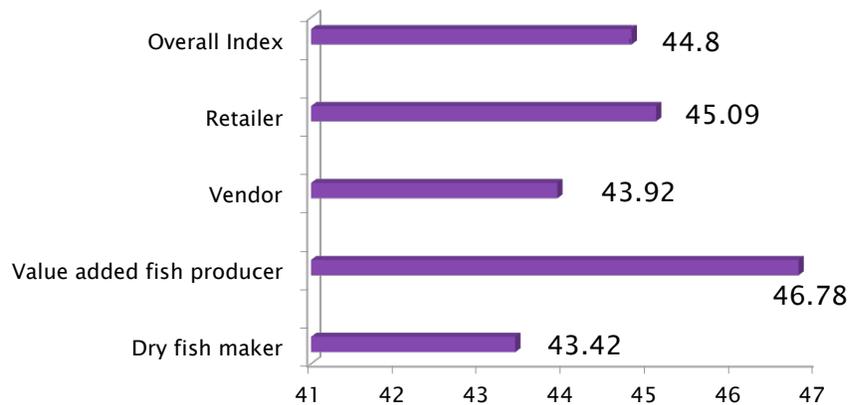


Political empowerment- Processors





Fisherwomen empowerment index



Conclusion

- ▶ Among the different categories of fisherwomen the empowerment of value added producers were highest and lowest for dry fish makers
- ▶ The fisherwomen were more politically empowered in Kerala and least empowered legally
- ▶ The results revealed that the composite fisherwomen empowerment index was high on comparison with agrl sector
- ▶ Th economic empowerment were limited for the women on account of were found to be handling of bulk quantities of fish and fishery products, transportation, storage,
- ▶ The social empowerment were high for attending the religious events, caring about family health issues, purchasing the assets for home,
- ▶ Fisherwomen had very less freedom to decide on their husband's personal habits and business.
- ▶ The legal empowerment is limited by the awareness on the women rights and its access

The way forward.....

- ▶ Appropriate institutional arrangements by way of bringing out guidelines for equal participation of fisherwomen women in auction, fixing of minimum quantities (quota) of fish for women
- ▶ Priority for fisherwomen to institutional credit access by the government agencies may lessen the gender discrimination of fisherwomen.
- ▶ Strengthening awareness and the access to the legal system is important









Auction yard: waiting for the deal



▶ Retailers : Waiting for the buyers



Vendors in search of potential customers



▶ Retailers waiting for the landing centre prices to follow



GENDER ROLES, RURAL HOUSEHOLD FOOD SECURITY AND ENTREPRENEURSHIP AMONG WOMEN IN SELECTED FISHING COMMUNITIES IN SOUTH WESTERN NIGERIA

Agbebi Funmilola Omolara*
Ekiti State University (Nigeria)

Abstract

Nigerian women in fishing sector remain a potent force in the economic growth of fishing communities. The basic objective of involving women in fisheries Development is to make them equal partners to men. That will enable them to participate productively and self-reliantly to improve their family's nutritional and living standards. To create and maintain food and income security in the household, the activities are directed to economic, social and communal organizational and population related aspects. However, many socio-economic factors influences their entrepreneurial skills. This study examines some objectives, such as the roles women play in planning and fisheries management, describing the socio-economic factors, affecting fishing households. Allocation of labour time, determining the effects of some simulated policies on entrepreneurship among the women in the study area. 100 respondents were interviewed in all. A participatory action research approach was employed in addition to the use of primary and secondary data. Purposive sampling method was used in order to cover various aspects of women's economic roles in the fishing communities. Special effort was made to include all economic ventures; attention was given to the scale of operation and method of fishing activities by men and women who supply the primary products. formal and informal and group discussions were carried out for the qualitative method. For the analysis, simple counts, tables of frequencies were used. With respect to estimates of income. The study also highlighted the problems encountered by the women in the study area and proffer solution.

**GENDER ROLES, RURAL HOUSEHOLD FOOD
SECURITY AND ENTREPRENEURSHIP AMONG
WOMEN IN SELECTED FISHING
COMMUNITIES IN SOUTH WESTERN NIGERIA**

BY

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INTRODUCTION

- Since the declaration of the "Decade of the Women" in 1975,
- efforts have been made to improve the living conditions of women and to correct the disequilibrium between men and women.
- This initiative was picked up by FAO and several governments in the developing world.
- Researchers and policy makers are becoming aware that women are actively engaged in many productive activities:
 - which provide added income and needed services to the household,
 - only few references exist describing the role of women in the fishing activity and in fishing communities

INTRODUCTION (CONTD.)/2

- Several factors seem to contribute to the inferior position and suppressed rights and privileges of women in the society:
 - Tradition and culture,
 - social and religious norms and values;
 - political and economic factors
- all contribute to the lowering of the status of women in the society and
- contribute to the form of dominance to which women are subjected to.

INTRODUCTION (CONTD.)/3

- Gender issues and participation in the fisheries sector can be viewed from the perspective of:
- ***gender roles and involvement in development activities of the sector.***
- In the coastal areas and in many villages along the river banks, women are deeply involved in artisanal fisheries activities.
- Despite their involvement in activities of the sector,
- women's operations are often **small-scale** and their **incomes small** as compared to their men counterparts (Agbebi, 2009).
- Women play significant roles in all aspects of fisheries:
 - both in the artisanal,
small-scale sector and
in the commercial sector.
- Roles that remains unarticulated and unrecognized.
(Polnac view)

INTRODUCTION (CONTD.)/4

- *Polnac (1991) made an assertion that coastal fisheries in the developing World is the occupation of last resort and that fisher-folks are the 'poorest of the poor' but this has been contested by several authors.*
- This study reveals how entrepreneurial women operating at different levels in the artisanal fisheries in Ilaje and Ese-Odo fishing communities of South Western Nigeria,
- used the fisheries, not just as an opportunity to earn **regular income**, but as a **strategic economic activity** which enabled them sustain the livelihoods of their families.

INTRODUCTION (CONTD.)/5

- According to Lewis (1977) an entrepreneur is one *who assumes all the risks and makes all the **decisions concerning the operation of an enterprise in order to achieve some economic and social goal.***
- The fish traders in the study area do the same in their small, medium and large scale enterprises.
- In their attempt to sustain their livelihoods,
- they took several risks,
- working under several institutional constraints, and
- succeeded in achieving both economic and social goals, using **entrepreneurial strategies.**

OBJECTIVES

- The study analysed in detail the role of women in the fishing communities,
- identified their problems,
- their entrepreneurial skills, and
- suggested realistic and practical actions to improve their socio-economic conditions
- thereby contributing effectively to food security in the study area.

METHODOLOGY

- The study areas are Ilaje and Ese-Odo Local Government areas of Ondo State, South Western Nigeria.
- The study area falls within the oil producing states in Nigeria called the (Niger Delta region)
- which is often referred to as the richest part of Nigeria, in terms of natural resources endowment.

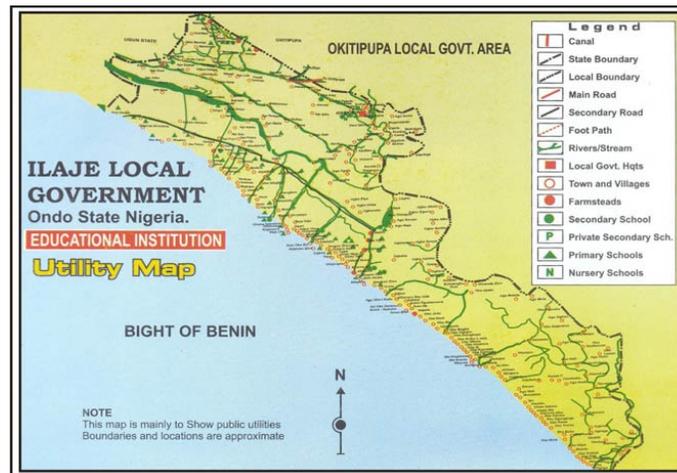
Methodology/2

- Five (5) major fishing communities, **Ori-Oke-Iwamimo, Ilepete, Obe-Ogbaro, Idogun-Nla, Zion-Pepe** were selected in the study area.
- The site selection was based on the population/aggregation of fishing families,
- geographic distribution,
- catch volume and
- species diversities of the catches in the area.

Map of Nigeria showing the study area(South Western part)



MAP OF THE STUDY AREA



RESULTS AND DISCUSSION

Table 1

- At least, 80% of the fisher folks in each of the fishing communities are educated.
- 66% of the fisher folks aged between 21 and 40 years were married and operated the nuclear family.
- This implies that they are permanent settlers in the area and their economic activities revolve around the area. (*so migration is not a factor to be considered here*).

LIST OF TABLES AND FIGURES

- Table 1: Demographic Factors of respondents
- Table 2: Sources of Employment
- Figure 1 : Percentage of respondents involved in various aspect of fisheries
- Figure 2: Uses of Income
- Figure 3: Sources of capital
- Figure 4: Daily income of respondents
- Figure 5: Average daily income from each major occupation

TABLE 1: DEMOGRAPHIC FACTORS OF RESPONDENTS

Parameter	Range	% Demographic factors of respondents in the study area				
		Orioke - iwamimo	Idogun-Nla	Obe-Ogbaro	Zion-Pepe	Ilepete
Age	< 20 yrs	2	0	0	0	0
	21-40yrs	90	94	98	100	90
	41-60yrs	8	6	2	0	10
Marital Status	Single	13	10	20	10	20
	Married	65	80	50	70	65
	Divorced	20	8	15	15	10
	Widowed	2	2	5	5	5
Household Size	Nuclear	90	96	100	92	100
	Extended	10	4	0	8	0
Experience	6-10yrs	30	40	32	35	37
	11-15yrs	50	56	50	42	52
	>15yrs	20	4	18	23	11
Educational Qualification	None	0	0	0	0	0
	Voc. Study	5	6	0	10	4
	Secondary (Jn. & Snr)	80	90	95	85	90
	Tertiary	15	4	5	5	6

- From Table 2, the women engaged in both primary and secondary employment to improve the standard of living of the whole family and to make more money available to the whole family.
- In Table 3, Fish handling forms the primary economic activity for the majority of respondents.
- On the use of income as shown in Table 4,
- **45% of this income is spent on family subsistence.**
- **30 % is spent on children's schooling,**
- **15 % is spent on the purchase of domestic items and clothing.**
- **10% of this income is used to repay debts and loans**

TABLE 2: SOURCES OF EMPLOYMENT

Employment	Primary Activity	Secondary Activity	Frequency	Percentage
Fishing and fishing related				
Fish production	10	2	12	12
Fish processing	9	2	11	11
Fish Marketing	18	1	19	19
Production & processing	11	1	12	12
Processing & marketing	15	0	15	15
Commerce and trade				
Petty trading	3	2	5	7
Drinks	4	1	5	5
Clothing	2	0	2	2
Street food vending	2	2	4	2
Service industries				
Fashion designers	3	0	3	3
Hair dresser	5	0	5	5
Agricultural produce				
Basket weaving	5	2	7	7
Mat weaving	4	3	7	7
Palm oil extraction	3	3	6	6
Cane chairs and stools	2	2	4	4
Arable Farming	4	2	6	6
Total	100			

Fig. 1 Percentage of respondents involved in various aspect of fisheries

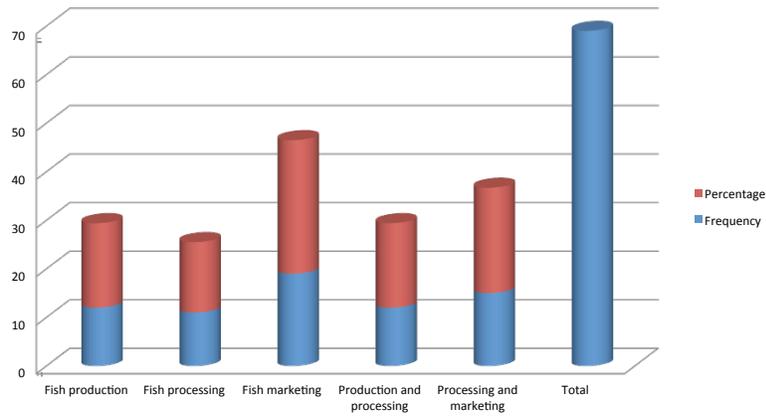


Fig. 2 Uses of income

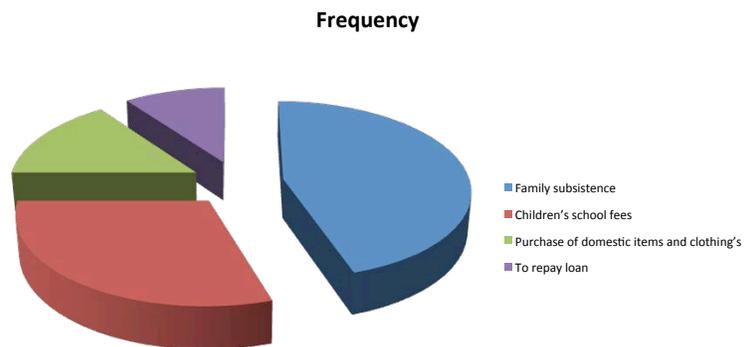


Fig. 3 Sources of capital

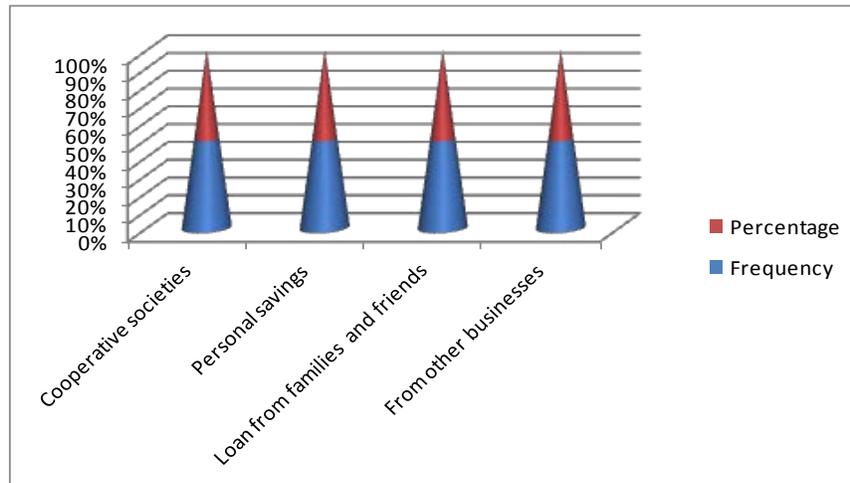


Fig. 4 Daily income of respondents

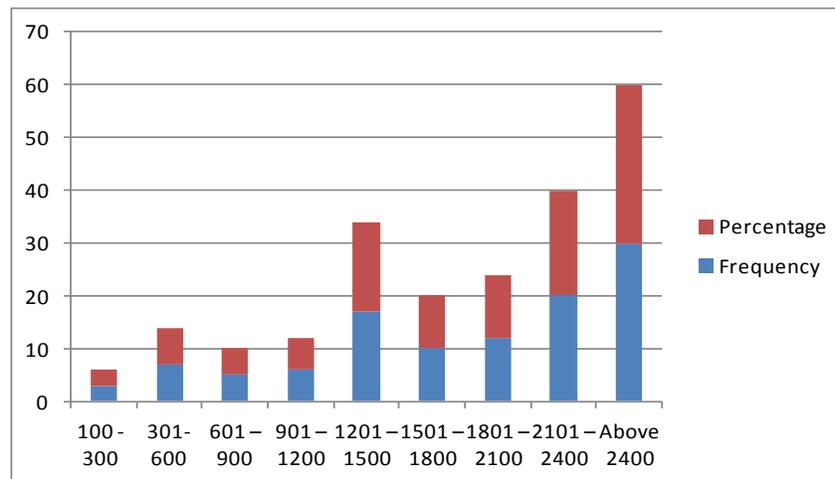
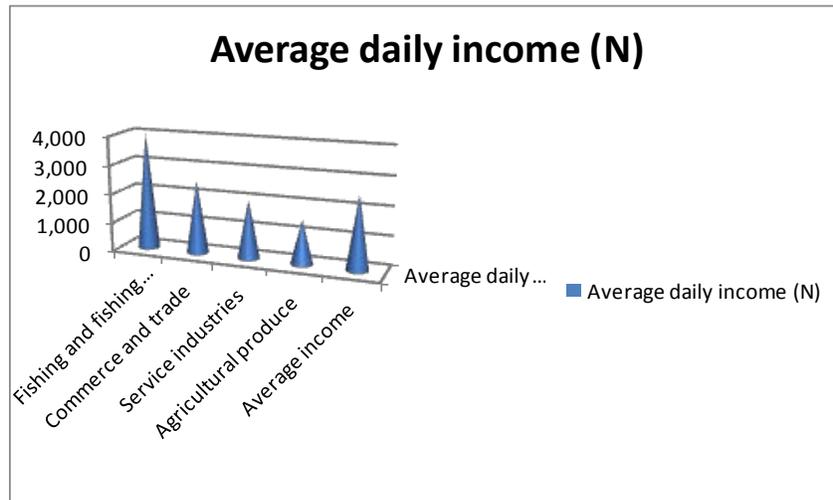


Fig. 5 Average daily income from each major occupation (1US \$= ₦ 160)



PROBLEMS ENCOUNTERED

- Lack of credit facilities
- Transportation problem
- Insufficient fish supply
- Product quality does not guaranty the competitiveness of the women's work
- High market taxes
- Difficulties in processing during rainy season
- Tools and equipments need improvement
- Their working condition is injurious to their health

PROBLEMS ENCONTERED/2

- Their training in elementary book keeping is insufficient
- Inadequate women's group or cooperative societies
- No access to distant market.
- Acute ecological problems (pollution).
- Loss of income from fish spoilage (due to poor handling, lack of storage facilities, poor processing technology).

Policy Recommendations

- Education and training
- Cooperatives societies
- Provision of capital
- Insulated ice boxes training
- Fish handling techniques
- Saving culture
- More capital injection in the study area/
Complimentary activities.

• THANK YOU FOR LISTENING

NEW SOCIO-ECONOMIC ROLE MODELS FOR WOMEN IN FISHERIES AND AQUACULTURE

Stella B Williams*, Cornelia E Nauen, and Adaba T. Ibim
Mundus maris: Sciences and Arts for Sustainability (Belgium)

Abstract

New socio-economic role models for women in fisheries and aquaculture Stella Williams and Cornelia E. Nauen The global scale of aquatic ecosystem degradation raises the question on how women in fisheries and aquaculture can reverse their resulting loss of social status and income by becoming major actors in the transition towards restoration of lost productivity. Influx of external capital into once traditional fisheries e.g. in West Africa, has eroded the control of family enterprises and the role of women who were important in maintaining rules of restraint. While these rules have often taken the form of the sacred in traditional communities, they worked de facto as access limitations to the resource and thus had conservation effects. New socio-economic role models for women could be instrumental in allowing them to regain lost economic influence. Where social recognition is achieved, particularly through enforcement of modern equal opportunity legislation and especially so, when combined with enhanced access to formal education, training, asset titles and credit, women regain capabilities for enhanced social organisation and leadership. A participatory method is proposed to render women's role visible and enable development of socio-economic organisation supportive of social justice and ecosystem restoration.

New socio-economic role models for women in fisheries and aquaculture



Stella B Williams,
Cornelia E
Adaba T.

Mundus maris Sciences and Arts
for Sustainability

IIFET Conference, Dar es Salaam, Tanzania, 16-18 July, 2012

Role of women in traditional fishing communities

- Women had important roles in traditional fishing communities, recognising their productive and reproductive roles;
- In a number of cases, women's roles were strongly connected to resource conservation, often mediated through belief systems and expressed through special ceremonies and taboos;
- Examples: several societies in Africa, Latin America, Asia, the Pacific, Inuits in what is now Canada, traditional societies in Southern Italy (Octopus fishery, sword fish fishery), ...

2

Role of women in traditional fishing communities cont.

- At the 2012 IIFET Conference, I am gladdened to see so many Africa women participate in various presentations as listed in the program. These are the women who I am privileged to recognize as the 'New socio-economic role models.' Their researches and involvement in their own countries will matter in the food security empowerment. These women are playing important roles in traditional fishing communities and they can easily recognise women's productive and reproductive roles.

3

What can be pointed to as evidence for the decline of women's roles in the Fishing industry?

- Technological change and overfishing have tended to erode women's social role in a vicious circle;
- Case studies and material from four continents shows a pattern of unrecognised, unpaid female labour that shows similar marginalisation trends as the artisanal fisheries changes in the face of industrialisation;
- Reconstruction of true catches beyond official underreporting to FAO of 'marginal' activities, e.g. by Sea Around Us Project, illustrate the scale of resulting misrepresentation.

4

Examples of New Role Models in the 21st Century

- The IIFET 2012 have real life examples at this meeting from - Fisheries and aquaculture research;
- Government and public administration at different levels;
- Company managers in fisheries, more so in aquaculture;
- Fish processing industry, canneries, shrimp peeling;
- Managing family businesses in artisanal fisheries;
- Leaders in corporate organisations, community.

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Some Examples of Female Scientists and Social Scientists at IIFET 2012

- Meryl Williams of Australia, Asian Fishery Association etc. etc;
- Diana Templeton, FAO Representative;
- Rebecca Metzner, President of IIFET and FAO etc;
- Nancy Gitonga of Kenya – Fish Africa etc;
- Hilary Eгна of USA - AQUAFISH
- Aina Uulenga of Namibia and IIFET Board etc;
- Maria Rebecca Campos of the Philippines and IIFET;
- Late Jane Bolaji & Margaret Onabanjo of Nigeria – Federal Dept. fo Fisheries etc. etc...

More Examples - Academia



- **Adaba T. Ibim** is a lecturer in aquaculture of the Agriculture Dept. of Port Harcourt University, Nigeria, and a leader in the NGO “Agricultural Support Foundation”
- Women in Science Competition – FARA/CTA promoting agricultural innovation⁷

Another Example: Government and public administration



- **Dr Jane Lubchenco**, Head of the National Oceanographic and Atmospheric Administration (NOAA) of the US is a trained marine ecologist and a committed leader in ocean protection and ecosystem restoration.

Pioneer Female DG of a CGIAR Center



- Dr. Meryl Williams at 42 took up a challenging position as DG of ICLARM then based in Makati, Philippines. In 1992, ICLARM became a member of the World Bank; and in April, Meryl distinguished her profession by becoming the first female DG in the CGIAR system of 19 international research centers.
- True to her character, she attended to her work as an opportunity to contribute to the goal of ecologically sustainable development in world fisheries and aquaculture. In her watch, the center's name was appropriately re-named the WorldFish Center!

.Meryl Williams cont.

- Meryl like most of the females who have scaled the challenge of forging a career in a male dominated world of science said that her success is due to her sense of 'intellectual challenge.' Additionally she insist that 'there is a serious side to her approach professionally. Let me quote her – 'I've found that all the positions I've been in
- all the changes in career, have broadened my intellectual challenge.' She goes on to point out a very interesting aspect: There are 'drawbacks to a successful career, particularly in the enjoyment of her discipline, as pure scientific work increasingly plays a secondary role to the management of people and the organization.

Another Example - Company Managers

- **Elvira A. Baluyut** from the Philippines, successful aquaculture company manager, consultant, and author of several FAO technical reports on aquaculture topics, inland water management and planning
- **Dr. Ursula Warnke**, Director of the German Maritime Museum in Bremerhaven, Germany



11

Another Example - Community Leader



- **Awa Seye**, leader of the women in the fishing community of Guet N'Dar in Saint Louis, Senegal and member of the Executive of the National Collective of Artisanal Fishers in Senegal (CNPS)

12

Can women regain their pre-eminence in nature conservation and restoration?

We looked at the report of Pitcher *et al.*, (2006) On compliance with the Code of Conduct for responsible fisheries: 53 countries responsible for 96% of global nominal catches according to FAO.

We looked at the gender balance in senior positions from minister down and compared that with the scores in Pitcher *et al.*

At a very crude level, the generally poor performance coincided with low number of women, but the result is only indicative and should not be over-interpreted.

13

Tentative Conclusions

- Gender alone is not sufficient in explaining differences between management outcomes in different countries – none of which abides by the Code of Conduct they have voted;
- Nevertheless, we found evidence that women are not only victims of technological and global change, but do seize opportunities to stand their ground and bounce back;
- Access to education and training is key;
- Satisfactory societal and conservation outcomes depend critically on greater equity and improved institutions.

14

Recommendations for policy

- Access to education and technical training for girls and women, e.g in Africa, Asia and the Caribbean in particular;
- Credit schemes adapted to women's investment and management needs, not only at micro-scale and strategies for negotiation by the women for what is needed;
- Adaptation of legislation to allow women to inherit and hold assets (land, capital, ...);
- Adaptation of bylaws of professional organisations to allow women to hold office;
- Study & communication of effects of interventions;
- Implementation of existing conservation commitments and enforcement of rules.

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.Thank You for Listening and also
for your support which is most
appreciated.



SESSION SUMMARY:

OVERCOMING GENDER INEQUALITIES IN FISH SUPPLY CHAINS TO INFORM POLICY AND ACTION

Prepared by Meryl Williams and all presenters named

“Gender equality thinking should not focus just on the numbers of women and men in fish supply chains”, said **Gifty Anane-Taabeah** (Ghana), the final panelist on *Overcoming Gender Equalities in Fish Supply Chains*. The panel and two presentation sessions (*Markets and Value Chains for Small Aquaculture Enterprises* and *Looking at Fish Supply Chains with a Gender Lens*) were held on the first day of the 2012 conference of the International Institute of Fisheries Economics and Trade (IIFET) in Dar Es Salaam, Tanzania. Rather, Gifty contended, “the overall aim should be how to empower women and men in supply chains to boost overall productivity.”

This report draws on insights from a rich set of papers, panelists remarks and audience contributions from the three IIFET conference sessions, plus others from the session called *Too Big to Ignore: Enhancing Visibility and Possibilities in Small-Scale Fisheries*. The three fish supply chain sessions were convened and supported by the AquaFish Collaborative Research Support Program (CRSP), under the leadership of **Hillary Egna** who co-chaired the sessions with Meryl Williams.

The 2012 conference, the first IIFET conference held in Africa, was also the first to highlight gender in such a substantive way, although occasional gender/women’s studies were presented in past conferences. “When I think back to when I joined IIFET in 1985, and now I look out at so many African women as new socio-economic role models here at IIFET 2012, I really feel that IIFET has come a long way on addressing gender,” said **Stella Williams** (Nigeria). Yet, she cautioned, much more is needed as technology and economic changes in traditional fisheries have eroded women’s role and contributions which continue to be under represented in statistics, studies and society. “But,” she emphasised, “we should never lose sight of what women can do. Although gender alone is not sufficient in explaining differences between management outcomes in different countries – none of which abides by the Code of Conduct for Responsible Fisheries they have all voted for – we have evidence that women are not only victims of technological and global change, but do seize opportunities to stand their ground and bounce back. Satisfactory societal and conservation outcomes depend critically on greater equity and improved institutions.”

The IIFET 2012 gender papers covered global studies and work in West and East Africa and Asia. The contributions came from government policy makers, academics and government researchers. They also drew on many different streams of scholarship, focusing economic and social analysis of value chains on development in aquaculture and fisheries and on poverty in small scale fisheries. Gender differences in resource access rights, divisions of labour, access to capital and credit, measures of empowerment that affect power relations in the value chain and the concentration of power in the hands of certain actors and parts of the value chain were examined for fish products from tilapia and dagaa to groupers and tuna.

GENDER AND FISH VALUE CHAINS

“Women pervade fisheries in their roles as workers in fisheries, markets and processing plants and in non-fishery activities such as mothers who give birth to successors, as caregivers of the family, as connecting agents of social networks, among others and agents who share fisheries culture among the generations”, **Achini De Silva** of Sri Lanka reminded us. She reported on work done alongside the FAO-NORAD global small scale fisheries value chain project. The study’s gender framework analyzed 10 country/fishery/aquaculture cases for gender disaggregated activity profiles, access and control profiles,

and analyses of factors and trends. Common patterns emerged in the intersection of gender and income/education. Less educated, resource poor women were concentrated in the low value end of the value chains; resource rich males and a limited number of educated, resourced rich females occupied the upper end. Access to resources was key to design the women's role in fishery value chain. Women are less engaged in modern value chains which have fewer nodes than the traditional complex and lengthier value chains. When women depart from fisheries to go to money earning positions elsewhere, the existence of local fishing cultures and industries are diminished.

Africa

West Africa

“Nigerian women are, and have been from very early times, the backbone of fresh and dry fish marketing. They do vending in rudimentary fish markets as well as carry fish on head load sales, door to door,” said **Abiodun Oritsejemin Cheke**, the Deputy Director in charge of Fish Trade, Federal Department of Fisheries, Nigeria Ministry of Agriculture and Rural Development. Recognizing the importance of women's efforts, the Government has helped organize nearly all women vendors into cooperative societies, but a major ongoing constraint is lack of affordable finances for the cooperatives. To overcome this bottleneck, she announced that, through the Federal Ministry of Agriculture and Rural Development and the Central Bank of Nigeria, the Government announced it would extend the Nigeria Incentive-Based Risk sharing system (NIRSAL), presently used for agricultural lending, to the women in the various fish value-chain activities.

Funmilola Agbebi presented the results of a study of people in five fishing communities in Ilaje and Ese-Odo Local Government areas of Ondo State, South Western Nigeria. The study area falls within the oil producing states and all those interviewed were permanent settlers, not new immigrants. Fish value chain activities were the primary or secondary money earning occupations of most of the women. The activities, however, were beset by many problems, from supply, price and infrastructure difficulties, and the families existed at barely above the poverty level in this area, often referred to as the richest part of Nigeria.

In Ondo State, Nigeria, fresh fish marketing is predominately (73%) women's business, **Lydia Adeleke** found in a study of 45 marketers. They marketers were mainly young and although fresh fish marketing is profitable, it is concentrated and inequitable. The market suffers from several constraints, especially the high cost and variable supply of products and would benefit from creation of gender-sensitive cooperatives.

East Africa

The Kenyan Government has given national priority to aquaculture development and the sector is starting to develop strongly. Some of the reasons were presented in papers on two studies. In one, Kwamena Quagraine applied business guru Michael Porter's five forces industry analysis (threat of new competition, threat of substitute products or services, bargaining power of customers or buyers, bargaining power of suppliers and intensity of competitive rivalry) to the tilapia (chiefly *Oreochromis niloticus*) and catfish (*Clarias gariepinus*) aquaculture value chains in Kenya and concluded that women stood to gain most by the opportunities in the fish marketing segment of the value chain. The sale of fish enhances community relations and creates a stable source of income and food and female participants had greater flexibility and liquidity for their operations. Women had less competitive advantage as input suppliers, fish farmers, or combined input suppliers and farmers.

In Kenya, women are also given opportunities in the public-private partnerships called Aquashops – conveniently located one-stop input supply and extension shops in farming areas. According to studies reported by **Sammy Macharia**, women only and women and men partnerships have developed a variety of models and approaches to deliver essential services including linking clearly labeled inputs and products to markets and information technology services.

As a panelist, **Nancy Gitonga** provided a broad, gendered overview of the Kenyan fish supply chain, noting that production is dominated by men and, although women are not permitted to go fishing due to cultural taboos, they can own fishing vessels. Kenyan women's strengths are in processing and marketing. Women are considered good fund managers, yet, in the fish sector, women's activities are often viewed through a welfare lens whereas men's are projected as businesses. Policies are needed to elevate the decision making roles of women and to remove discrimination.

Sebastian Chenyambuga reported that in Morogoro Region, Tanzania, low aquaculture production of Nile tilapia (*O. niloticus*) is done in ponds owned by small-scale farmers. The ponds, which have been used at subsistence scale from at least 1949 are all owned by men, but women work to some extent in all the production phases and dominate the processing of the product (about 70% of the production) for local sale.

In 10 fish markets scattered around Zanzibar Island, **Sara Fröcklin and co-workers** found that gender was a key dimension in fish trade. First, there was a major gap in terms of economic resources. Many of the male traders have been able to start up their enterprise with savings, while a majority of the women used micro-credits and loans as the initial source of funding. Gender inequalities were also found in terms of capital used and income generated from fish trading activities; male traders earned almost twice as much per day compared to their female counterparts. Second, women travelled long distances to buy and sell fresh and sundried fish, often in the villages, whereas men tended to buy closer to home and sell at higher prices in the main markets, or occasionally within the tourist sector. Third, as a result of low capital, lack of cold storing facilities and limited number of customers, women traded mainly in lower value fish species. Men on the other hand dominated the trade with high-value species such as tuna, king fish, barracuda and sharks. Fourth, none of the female traders were members of any kind of fish trade related association, nor had knowledge about such a thing, whereas about one third of the men were involved. There was an overall wish for a committee, similar to a fisheries committee, targeting fish traders specifically. In conclusion, all traders reported that fish trade has improved their living standards and also benefitted the community. However, most of the female respondents still shared little decision-making power and a majority found it hard to compete with male traders at market spots, particularly in times of declining fish catches and increasing prices.

In Lake Victoria, the small sardine-like cyprinid *Rastrinebola argentea* and other related species (variously called dagaa in most countries, mukene in Uganda, and omena or the Lake Victoria sardine in Kenya) are now the second most important commercial species, after Nile Perch (*Lates niloticus*). With the growth of aquaculture and other demands for affordable fish, the value chains for this species are undergoing rapid transformation. Much dagaa is now lost by poor handling and post harvest problems.

The east and central African trade in dagaa, reported **Mwanahamis Salehe** of Tanzania, has increased since the 2006 and grown from trade to two countries (Kenya and Rwanda) to eight countries in 2011, including Cambodia and Malaysia. The majority of exporters are men, but women are 12% of the exporters in Tanzania. Much better processing, business and management skills are required to avoid the nutritional and economic wastage currently undermining the trade.

In Uganda, sun-dried mukene (or dagaa, *R. argentea*) is predominately (80%) used for animal feed, according to **Margaret Masette**. Boat owners, fishers, processors and traders each operate at a number of scales and different gender disparities were found in the different stages of the value chain, largely related to the labour and capital intensity of the stage. Thus, for example, women dominated in carrying fish from fishers to processors because no capital was required, but workers of both genders operated in the artisanal and the industrial processing stages where more capital was required. Fishers and processors

earned the least profit from the value chain, whereas regional traders captured the highest profit rates (70-83%) and the lion's share of the total profit, from making the highest investments.

Asia

Gendered fish value chain analysis, according to **Debabrata Lahiri**, requires “understanding women's position in a value chain and what constraints women face means that not only looking at the value chain but also at women's intra-household bargaining position and broader social processes.” In a study of Indian value chains for Indian major carps, tilapia, hilsha and shrimps, Lahiri found that women do not perform all the functions along the value chain, and where they do take part, their value addition is less than that of their male counterparts due to the lesser amounts of product they handle.

In three coastal regions of Kerala state, India, **Shyam Salim** studied women's economic, social, political and legal empowerment to create an overall Fisherwomen's Empowerment Index and applied it to women fish retailers, fish vendors, dried fish marketers and value-added fish producers. In overall empowerment, the value added producers were highest and dry fish makers the lowest. The fisherwomen were more empowered than women in the agricultural sector. In empowerment dimensions, political empowerment was highest and legal empowerment lowest.

GENDER AND CLIMATE CHANGE IN COMMUNITIES DEPENDENT ON SMALL SCALE FISHERIES

In the IIFET session on small scale fisheries (Too Big To Ignore), **Lasse Lindström and co-workers** from Stockholm University presented new studies in East Africa, focusing on adaptation and climate change research relevant for helping coastal communities achieve social justice . He echoed the observation by Archbishop Desmond Tutu in the Human Development Report 2008 that “adaptation” is a euphemism for “social injustice.” The poor are exposed to the harsh realities of climate change in their everyday lives. Gender issues are usually ignored in both coastal fisheries and climate change. The research presented stressed the need for empirical analyses which are well anchored in the situation on the ground and which consider social and ecological aspects; and address gender issues at the individual level. Additionally, different strategies such as resilience, reworking, and resistance were highlighted as important to analyze and to link to transformative agency or agency requiring collective responsibility for change. The research is taking place in Zanzibar, Tanzania and in Inhaca Island in Mozambique to allow for comparison.

Paul Onyango turned the IIFET 2012 conference theme (Visible Possibilities) on its head and examined poverty in Lake Victoria fishing communities through the lenses of “invisible possibilities,” which he decomposed into visible absences and invisible presences. Visible - absences – what we perceive is missing in peoples' lives that may make them seem poor - often overshadow the view of invisible presences – the characteristics of people that are their values and strengths. Self respect such as the way women fish traders dress proudly when conducting their businesses, voluntary pooling of assets such as fishing boats by fishermen, sorting out conflicts at the beach level, and many other negotiations are the base of social capital that is never noticed. The challenge for the fishing communities is how to combine and use the invisible assets to create wealth in the community?

REFLECTIONS ON THE GENDER AND VALUE CHAIN PRESENTATIONS

In the IIFET 2012 panel discussion on “Overcoming Inequalities in Fish Supply Chains to Inform Policy and Action, panelist **Theodora Hyuha** of Uganda highlighted four points. In the first, new technologies, she stressed that “women fish farmers have to learn the new technologies. Yet, when extensionists approach farmers, they usually go to men first and so women are left to learn from second hand information.” The second point that emerged from several presentations was that the aquaculture sector in Africa is still often just for subsistence. To develop, finance is needed but women are often restricted to micro-finance options as they have limited collateral, although they are good creditors. In Uganda over

90% of women honour their obligation to pay back the loans, as opposed to men who often evade paying back the big loans they secure. Third, we have tended to treat women as a homogeneous group whereas we need to distinguish those doing well and those needing a hand. Finally, the education system in most countries is gender neutral, implying that both boys and girls will have equal access. However, the reality is different. Girls face more constraints than boys such as a family preference to pay school fees for a boy in the family whenever the financial resources are scarce. Further, girls are brought up to believe that science subjects are hard and meant for boys.

Sara Frocklin also pointed out that a strong theme coming out of the sessions were that organizations for women in the fish value chain were often weak or lacking. To help strengthen their positions and capacity, women fish traders need formal places to meet, opportunities for training and getting to know each other and their collective needs.

Sebastian Mathew of the International Collective in Support of Fishworkers recommended that we consider a human rights based approach to unleash the power of women to fulfill the multiple social, health, reproductive and business roles expected of them in today's coastal communities. **Stella Williams** pointed out that in Africa, women are being used more and more in peace-making efforts. In India, **Shaym Salim** highlighted the superior performance of women in funds management and in delivery of outcomes in Self Help Groups. **Lasse Linstrom** pointed out that we had talked quite a lot about women and men but children and youth in fisheries should also be recognized as they play large roles in many households. **Mundis Maris**, who **Stella Williams** was representing, does target the youth in its work, and it is finding that parents do not want their children to go into fisheries, but to become professionals if possible. Mundis Maris also reaches people through art and creativity.

INFORMATION

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The **International Institute for Fisheries Economics and Trade (IIFET)**, <http://oregonstate.edu/dept/iifet/> is an international group of economists, government managers, private industry members, and others interested in the exchange of research and information on marine resource issues. IIFET organizes biennial conferences and, in 2012, IIFET 2012 was held in Dar es Salaam, Tanzania, with the theme *Visible Possibilities: The Economics of Sustainable Fisheries, Aquaculture and Seafood Trade*. IIFET 2012 was co-organized by the University of Dar es Salaam (www.udsm.ac.tz) and IIFET.

The mission of the **Aquafish Collaborative Research Support Program (CRSP)**, <http://aquafishcrsp.oregonstate.edu/> is to enrich livelihoods and promote health by cultivating international multidisciplinary partnerships that advance science, research, education, and outreach in aquatic resources. Bringing together resources from United States of America and host country institutions, the AquaFish CRSP strives to strengthen the capacities of its participating institutions, to increase the efficiency of aquaculture and improve fisheries management in environmentally and socially acceptable ways, and to disseminate research results to a broad audience.

This report was prepared by **Meryl Williams** with the assistance of all presenters, panelists and other contributors.

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