Assessment of Market Opportunities for Small-Scale Fishers and Farmers in Central Uganda

Study/Marketing, Economic Risk Assessment, and Trade/Study/13MER05AU

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ABSTRACT

This study was designed to generate information to support the development of marketing strategies for fishers and aquaculturalists producing product for the reseller markets in Uganda. The specific objectives were to: 1) identify the appropriate market segments and pricing mechanisms used by small-scale fish farmers in central Uganda; 2) analyze the commodity flows and price formation in the different fish reseller market channels; 3) evaluate the performance of the marketing system by calculating gross and net margins for selected fish species; and 4) assess the critical factors affecting market performance and propose policy recommendations for enhancing market performance. The study area was defined to include selected districts in central and eastern Uganda including: Buyende, Jinja, Nakasongola, Mukono, Kampala, Wakiso, Buikwe, and Luweero. With both metric and non-metric data collected, the analysis included descriptive as well as inferential statistics. The results revealed that: (1) mark-up pricing, competitors prices and price haggling were the most used pricing strategies by fish farmers; (2) the direction of causal relationships was observed from the retail to the wholesale and ex-vessel markets, indicating that retailers are the price leaders in the Uganda catfish supply chain; (3) by using gross margin and marketing margin to examine market performance, it was revealed that participants in the wholesale market channel realized higher absolute margins compared to participants in the retail market channel; and (4) the most pressing concerns were common to both retailers and wholesalers, including high fish supply cost, low sales price, low fish supplies, and arrests for selling immature fish. In brief, study findings can be used by relevant authorities to harmonize marketing strategies and to develop guidelines through which price distortions can be removed to promote free market practices.

INTRODUCTION

There is need to place special emphasis on market research derives from the strategic challenges that the aquaculture industry faces in Sub-Saharan Africa. In Uganda, one of the constraints to the growth of the aquaculture industry is lack of organized effort to assist small- and medium-scale producers in developing marketing strategies and programs designed to serve existing and newly emerging markets.

Experience has shown that markets can fail the poor, especially poorest and marginalized groups, including women. Many of the recent initiatives to link small-scale farmers to markets have largely focused on export markets as these are seen as important sources of economic growth (Johnson 2005, Hellin and Higman 2002, GoU 2003). However, many of these approaches tend to be top down and lack an effective process of community learning and empowerment. The decisions on what products and enterprises to develop, what markets to target are often prescribed by government agencies, private companies or development organizations. These organizations then conduct a commodity market chain analysis and organize production to meet identified market demand, often external export markets. These approaches have produced mixed results.

While many studies have documented impressive results of linking farmers to export markets, it has been argued that small-scale farmers have rarely benefited from these initiatives, as niche markets tend to be highly competitive and specialized, with rigorous quality standards which can be challenging for many small-scale farmers (Diao and Hezel 2004). There are real risks that such market opportunities may be seized by a few large-scale commercial farmers to the expanse of small-scale farmers.

With much emphasis on exports, the study of the domestic market for fish and fishery products has not received the attention it deserves. Particularly, domestic markets still represent a large and growing market that ought to offer real opportunities to small-scale farmers. Also, domestic marketing affect the performance of the fish-exporting sector given that all fish products, before being exported, have to pass through some stages in the domestic market. Efforts to ameliorate information on domestic fish marketing and on identifying constraints and opportunities for the improvement of production and marketing arrangements are thus paramount.

OBJECTIONS

The main driver for this study was to generate background information for the development of marketing strategies for fishers and aquaculturalists producing product for the reseller market. The project had four overriding objectives:

- Identify the appropriate market segments and pricing mechanisms used by small-scale fish farmers in central Uganda;
- Analyze the commodity flows and price formation in the different fish reseller market channels;
- Evaluate the performance of the marketing system by calculating gross and net margins for selected fish species; and
- Assess the critical factors affecting market performance and to propose policy recommendations for enhancing market performance.

METHODS

The study was conducted in selected districts in central and eastern Uganda: Buyende, Jinja, Nakasongola, Mukono, Kampala, Wakiso, Buikwe, and Luweero. Both secondary and primary data were used to develop a detailed understanding of the price phenomenon in the fisheries reseller markets. For the primary data, three distinct, complementary, questionnaires were designed for researching the fish food processing reseller market (see instruments in the appendix). The first questionnaire was designed for wholesalers, the second for retail buyers, while the third was designed for food service providers. The data were collected from both capture and aquaculture establishments.

Wholesalers were identified and selected from the respective district fisheries office records and where possible by referral. Restaurants and retail samples were also determined by visiting major fish markets in the selected districts. The questionnaires were designed to ascertain the respondents' interest in purchasing aquaculture products as well as potential for value-added opportunities. The questions required respondents to identify marketing issues and features that are important to meeting their product needs and market demand. Questions on volume and value of aquaculture products currently used by the respondents were included.

The data were analyzed to determine the potential demand for aquaculture products, buyer requirements, and organizational buyer preferences for products and service. This was done for all three reseller markets (wholesalers, retail buyers and food service) with comparisons made where appropriate. With both metric and nonmetric data collected, the analysis includes descriptive as well as inferential statistics.

Examined market segments and pricing mechanisms used by small-scale fish farmers. The first study objective was to generate background information for addressing marketing strategies and pricing mechanisms for farmed fish in the study area. A market strategy combines the farm's set of marketing mix variables and the arrangements for their application and identifies the firm's marketing goals and explains how they will be achieved, ideally within a stated timeframe. The strategy determines the choice of target market segments, market positioning, and the allocation of resources along each marketing mix factor. The lack of appropriate marketing strategies, skills and knowledge in marketing has further complicated the situation leaving many fish farmers in the study region struggling to grow market share. Thus this study was designed to accomplish two related activities: (a) to determine the market segment of farmed fish in central Uganda, and (b) to determine the marketing strategies of farmed fish in central Uganda.

Three districts (Mukono, Wakiso and Mpigi) from central Uganda were purposely selected, and a snow ball sampling technique was used to select a sample of 126 fish farmers that had harvest fish in the last fish cycle. Data were collected using a structured questionnaire on farmers' socio economic and socio demographic characteristics, production practices, marketing aspects, and constraints. A summary of the survey results is presented below (Please refer to the appendix for the detailed results).

Socio-economic characteristics of fish farmers in selected districts. Fish farmers were generally middle aged (42.7 years), literate, with 2 ponds per farm on average, and an experience of 7 years (Table 1).

Table 1. Showing socio-economic characteristics of fish farmers in Mukono, Mpigi and Wakiso districts.

Characteristic	Mukono % (n = 61)	Mpigi % (n = 21)	Wakiso % (n = 40)	Total % (n = 122)
	Mean	Mean	Mean	Mean
Age (years)	49.4	50.4	46.9	48. 7
Household size	4.7	6.2	5.8	5.36
Education (years)	11.3	13.2	13.1	12.2
Number of ponds	3.0	4.3	3.5	3.39
Number of ponds harvested in the last cycle	1.7	2.2	2.3	1.95
Experience in fish farming (years)	7.1	7.4	6.5	6.93

Fish marketing. The majority, 93.4%, reported selling fish while 6.6% did not, mainly because of low production (62.5%), home consumption (12.5%) and lacked market (25%).

Selling context. More than half of the respondents (56.90%) reported selling fish products as individuals, not as a group (Table 2).

Table 2. Context for selling fish.

Context	Mukono % (n = 61)	Mpigi % (n = 21)	Wakiso % (n = 40)	Total % (n = 122)
Individual	56.90	73.68	71.43	64.29
Group	39.66	21.05	22.86	31.25
Both	3.45	5.26	5.71	4.46

Fish farmers expressed different reasons why they used individual/group approaches in selling fish. Reasons why group method was preferred are given in Table 3.

Table 3. Reasons for preferring group marketing for selling fish.

Reason for preference	Mukono % (n = 61)	Mpigi % (n = 21)	Wakiso % (n = 40)	Total % (n = 122)
Good payment	43.48	0	0	28.57
Buyers come to the farm	4.35	75	37.5	20
No competition	13.04	0	12.5	11.42
Convenient	13.04	25	12.5	14.29
Pay in cash	21.74	0	37.5	22.86
Group project	4.35	0	0	2.86

However, some farmers used individual marketing system as shown in Table 4.

Table 4. Reasons for preferring individual marketing for selling fish.

Reason for preference	Mukono % (n = 61)	Mpigi % (n = 21)	Wakiso % (n = 40)	Total % (n = 122)
Good payment	6.25	0	21.74	10.29
Buyers come at the farm	15.63	15.38	26.09	19.12
No competition	50	0	13.04	27.94
Convenient	9.38	15.38	17.39	13.23
Lack of farmer group	12.5	61.54	13.04	27.94
Pay in cash	6.25	0	4.35	4.41
Difficulty in marketing	0	7.69	4.35	2.94

To market fish farmers seek pricing strategies that enable them to earn high profit margins. These are summarized in Table 5.

Table 5. Pricing strategy used by fish farmers in Mukono, Mpigi and Wakiso districts.

Pricing strategy	Mukono % (n = 61)	Mpigi % (n = 21)	Wakiso % (n = 40)	Total % (n = 122)
Price penetration	11.48	42.86	37.5	25.41
Price skimming	4.93	19.05	15	10.66
Lead pricing	3.28	19.05	5	4.10
Break even pricing	13.11	4.76	2.50	8.20
Geographical pricing	3.28	4.76	2.50	3.28
Perceived pricing	6.56	14.29	22.50	13.11
Volume pricing	11.48	38.10	20	18.85
Single pricing	54.10	52.38	35	47.54
Loss leader pricing	0	19.5	7.5	5.7
Discounts offer	1.64	38.10	20	13.93

Source of market information. Lack of market information results in limited capacity for fish farmers to respond to market signals and leads to weak bargaining power. Respondents mentioned various sources of market information utilized in selling fish (Table 6).

Table 6. Sources of market information.

Source of market information	Mukono % (n = 61)	Mpigi % (n = 21)	Wakiso % (n = 40)	Total % (n = 122)
Fellow farmers	40.4	31.6	32.3	36.4
Fisheries (Entebbe)	8.8	31.6	6.5	12.1
Pond constructors	5.3	26.3	29.0	15.9
Market traders	29.8	5.3	22.6	23.4
No source	5.3	5.3	3.2	4.7
Radio	8.8	0.0	6.5	6.5
Television	8.8	1.8	0.0	0.9

Niche markets. Respondents indicated selling most of the fish at farm gates or at the fish ponds. About 37% of the farmers were aware of better market outlets: 40% in Mukono, 36.4% Mpigi and 30% in Wakiso.

Reasons why they were not able to access better market outlets. Low fish production was sited mostly at 60% followed by no BMU permit 20% and high transport costs 6.7% and lack of proper market information at 13.3%. Marketing strategies on how to improve fish marketing are outlined in Table 7. Promotion of awareness of better markets (21%) and production of required size featured as the most important marketing strategies for fish marketing in central Uganda.

Table 7. Strategies for improving fish marketing in the study area*.

Suggestions	Mukono % (n = 61)	Mpigi % (n = 21)	Wakiso % (n = 40)	Total % (n = 122)
Invest in iced vehicles	11.1	0.0	0.0	5.6
Provision of enough capital	5.6	0.0	0.0	2.5
Form strong fish farming groups	5.6	0.0	11.5	6.2
Promote awareness of better markets	25.0	26.3	11.5	21.0
Ease of access of permits	11.1	25.0	0.0	16.7
Production of required fish size	11.1	21.1	30.8	19.8

* % do not add up to 100% because of multiple responses

Commodity flow and price formation in catfish reseller markets. The widening gap between farm, wholesale and retail prices in various agricultural markets has motivated many empirical analyses of price transmission (Meyer and Cramon-Taubadel 2004; Pozo, Schroeder and Bachmeier 2013; Simioni et al. 2013). The concern in many of the studies is whether prices adjust symmetrically or asymmetrically. This is not surprising given that asymmetric price responses are of concern to producers of agricultural commodities who often claim that retail prices rise faster and fuller than farm price increases, but that retail price declines are not likely to be either as full or transmitted as fast as declines in farm prices (Gauthier and Zapata 2006).

The implication is that retailers possess and exercise greater market power as evidenced by asymmetric price responses. Though many of these studies report asymmetric and imperfect pass through of prices, the evidence is mixed and varies widely across commodities and geographic locations.

Furthermore, most of these studies focused on large-scale market chains in developed countries. As observed by Garcia and Salayo (2009), studies on market integration of fisheries and fishery products in developing countries are still lacking. The aim here was to address this need by investigating the price transmission, threshold behavior and asymmetric adjustment in the Ugandan fisheries sector. Uganda constitutes a particularly interesting case.

Although the operation of the local marketing system has been the subject of previous studies (Kirema-Mukasa and Reynolds 1991; SEDAWOG 1999), the distribution of fish and fish products in Uganda has improved over the last fifteen years, with increased channels involving middle agents that supply fish to factories involved in industrial fish processing and export, and traders that supply fish to rural and urban markets (Keizire 2006). By focusing on the African catfish (Clarias gariepinus) supply chain, the study was set out to understand how changes in ex-vessel and wholesale prices affect retail price and vice versa.

Using secondary data, the analysis looked at the wild-harvest African catfish (whole fresh) market along the production (ex-vessel), wholesale and retail channels. The ex-vessel prices from January 2006 to August 2013 were collected at landing sites (Kikondo, Buikwe district; Masese, Jinja district; and Ggaba, Kampala district) on Lake Victoria, while corresponding retail and wholesale price data were gathered from several fish markets (Nateete, Busega, Luzira, Mukono, Kalerwe, Nakawa, and Owino) in the Central region.

All prices, expressed in Uganda Shillings (UG Shs.) per kilogram, were deflated using consumer price index (CPI) deflator to account for inflation in the period covered. The CPI data for food stuff in central Uganda were drawn from Uganda Bureau of Statistics; using 2005/2006 as the base year (UBoS 2013).

The methodology used involved both traditional and threshold autoregressive approaches to determine whether price movements share a common long-run relationship, whether response of price shocks are symmetric or asymmetric, and the time path needed for shocks to be transmitted. The results revealed that prices in the Uganda catfish value chain are tied together by a long-run relationship, and that ex-vessel and wholesale price adjustments to retail price changes are symmetric while ex-vessel price adjustments to wholesale price changes are asymmetric. The direction of causal relationships was observed from the retail to the wholesale and ex-vessel markets, indicating that retailers are the price leaders in the Uganda catfish supply chain.

In explaining similar results, Sapkota et al. (2012) for instance, emphasized the lack of sufficient numbers of wholesalers capable of influencing the transmission of prices to retailers. Their explanation applies to most fish supply chains in developing countries such as Uganda, where until very recently, there was no large scale wholesale demand from institutional buyers such as supermarkets. This suggests that catfish wholesale prices may be influenced by retail prices, due to less organized behavior at the wholesale market level as compared to the retail market level. Other plausible explanations for the observed retail price leadership over wholesale and ex-vessel prices include the dispersed landing points, poor transportation, perishability of the product and lack of timely information about downstream markets (Sapkota et al. 2012).

Furthermore, the asymmetric price transmission behavior in the reseller markets was analyzed according to Ender and Siklos (2001) momentum-threshold autoregressive approach. The observed positive asymmetric price transmission behavior for the ex-vessel-wholesale price pair indicated that ex-vessel prices respond more to declining wholesale prices than to rising wholesale prices. Further analysis with the asymmetric error-correction model (AECM) revealed that price adjustment to the long-run equilibrium was not instantaneous and that both ex-vessel and wholesale prices adjust from below the threshold to restore the long-run relationship. The causality relationship was found to run from the wholesale market to the ex-vessel market level.

Overall, these findings have important implications for the catfish subsector in particular, and the Uganda fisheries sector in general. Firstly, the evidence of non-linear price adjustment in the ex-vessel-wholesale market channels suggests the existence of some barriers to free trade (Serra et al. 2006). Such barriers might include high transaction costs and imperfect information. As a start, this finding could be used by

policy makers to harmonize marketing strategies in the catfish supply chain, and to develop policies through which price distortions can be removed to promote free market practices.

The important objective for such policies should be improving access to credit, market information, transportation, and grading. Particularly, poor infrastructure, namely transport and communication services, gives rise to large marketing margins because of the high costs of delivering products to destinations. They may also hinder the transmission of price signals because of non-competitive behavior amongst traders. On the other hand, infrastructural development can play an important role in supporting the integration of catfish markets, facilitating competition, encouraging investment, and allowing a more efficient allocation of resources and enhancing market oriented production (Van Campenhout 2012).

Secondly, the analysis of market integration and market chain equips policy implementers with information on the transmission of incentives in the supply chain and this is relevant to the success of other policies concerned with market liberalization, price stabilization and food security. Practices like promoting fisher associations, demarcating landing points for product pooling and improvements in shelf-life increasing technologies would improve the stability of prices for this perishable product.

Calculating gross and net margins. The focus here was to examine market performance of small-scale fish traders selected randomly from a cross-section of nine fish markets in four districts in central Uganda. The data were collected in four districts (Kampala, Mpigi, Mukono, and Wakiso). Respondents were drawn from a cross-section of wholesale and retail fish traders operating in nine markets (Kasubi, Busega, Mpigi, Mukono, Bwaise, Kawempe, Nsangi, Nansana, and Wekembe). Data were collected through a structured questionnaire which was designed to solicit information on traders' socio-economic characteristics, marketing characteristics, operating costs and returns, and problems associated with fish marketing in the study area. Percentages were used to describe the socio-economic characteristics, market characteristic and problems associated with fish marketing while gross profit and marketing performance models were used to determine profitability, marketing margin, and operational efficiency, respectively. Although data collection was limited to marketing areas in central Uganda, the areas covered are places where most people are concentrated and marketing activity is most intense in the country.

The major costs revealed by traders in our sample are depicted in Figure 1, which shows there are four major cost categories observed for the two dominant marketing channels (retail and wholesale). For instance, marketing costs are higher in the retail channel (USh 284.73/kg) compared to the wholesale marketing channel (USh235.52/kg), which is not surprising considering that retailers usually sell in small quantity at a point in time, hence prolonging the time spent and expenditures on the various marketing functions. Particularly, storage costs represent a substantial amount of the cost in both wholesale (USh155/kg) and retail (USh146/kg) marketing channels, followed by transportation of fish from the landing sites to the markets at USh110/kg in the retail channel and loading/offloading at USh51/kg in the wholesale channel. The least cost component of the marketing chain for fish retailers was packaging (USh8/kg) while transportation (USh13/kg) was shown to be the least cost in the wholesale channel.
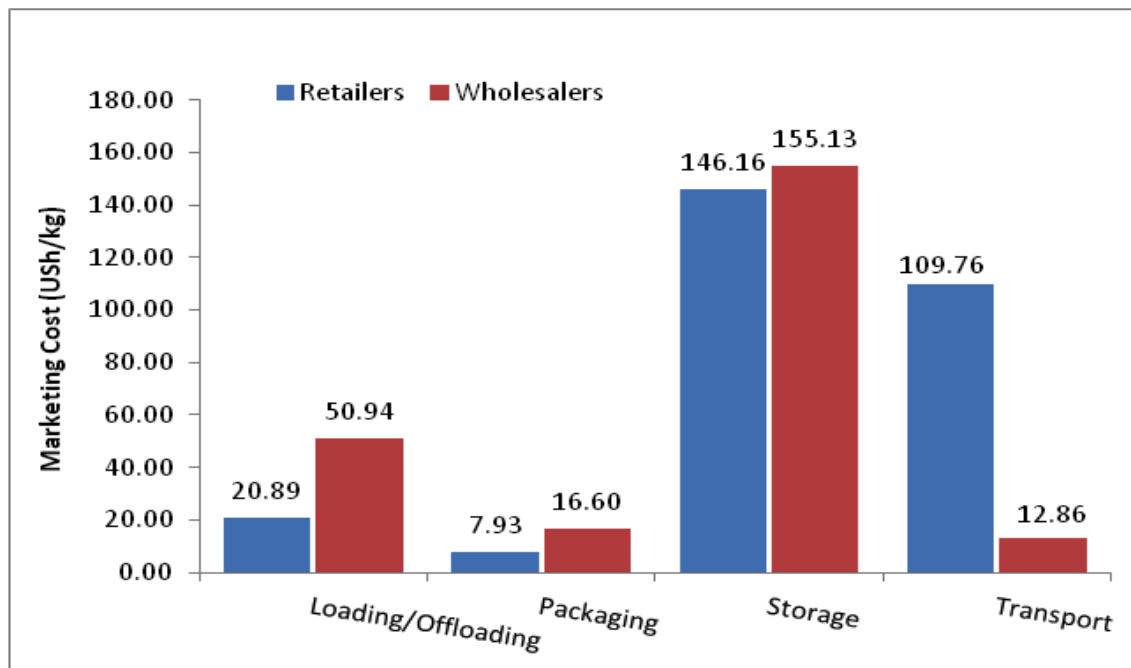
Figure 1: Cost of marketing fish in central Uganda (USh/kg).

Following previous studies (Olukosi and Isitor 1990; Gaya, Mohammed and Bawa 2007), market margin analysis was used to determine the deference between the price paid by consumers and that received by fish traders as:

$$(1) \quad \text{Market Margin} = \left[\frac{\text{Consumer Price} - \text{Supply Price}}{\text{Consumer Price}} \right] * 100$$

Also, market efficiency was computed using the value added concept as:

$$\text{Market Efficience} = \left[\frac{\text{Value added through marketing}}{\text{Cost of marketing services}} \right] * 100$$
(2)

In equation 2, the value added through marketing was estimated by subtracting the total cost price of fish as it follows through the market from the total selling price. The cost of marketing services was obtained from the total cost of providing marketing functions such as transportation, storage, packaging, loading/offloading and license charges.

The results in the table 8 show that profits made in both market channels (wholesalers and retailers) were positive, however, wholesalers realized higher absolute margins compared to retailers. As indicated, gross margin per kilogram (kg) of fish sold by wholesalers and retailers were USh358.40 and USh234.73 respectively, with overall market returns for the total sample estimated at USh262.96/kg. The marketing margins were estimated at 19.32 and 16.67 percent for the wholesalers and retailers respectively, with overall marketing margin for the total sample of 17.23 percent. Similarly, the market operational efficiency was 279.27 percent for the entire market in the study area.

Table 8. Estimated gross margin, marketing and efficiency margins.

Market Channel	Gross Margin (USh/kg)	Market Margin %	Market Efficiency %
Wholesale	358.4	19.3	187.1
Retailer	234.7	16.7	319.3
Total Market	263.0	17.3	279.3

Previous studies have highlighted several factors constraining the development of processing and trading food and agricultural products in Uganda including limited access to resources, insufficient credit facilities, inadequate transport means, bad roads, poor processing and marketing facilities to name a few. To ascertain the extent to which these among other factors are of concern to fish traders in the study area, the questionnaire asked traders to indicate what they perceive to be the major concerns in the fish marketing business.

A tally of their responses is summarized in Table 9, representing the proportions of the total sample that identified a particular issue to be of major concern. As shown in the table, the most pressing concerns are common to both retailers and wholesalers, including high fish supply cost (21.62%), low sales price (16.22%), low fish supplies (12.16%), and arrests for selling immature fish (18.92%). When looked at within the marketing channels, the results reveals that high supply cost (22.2%), low fish prices (18.5%), and arrests for selling immature fish (16.7%) are the major concerns highlighted by the retailers in the sample. On the other hand, unreliable fish supply (20%) in addition to high supply cost (20%) and arrests for selling immature fish (25%) ranked higher among wholesalers.

Table 9. Major problems faced by fish traders in central Uganda.

Problem	Retailers %	Wholesalers %	Overall Market %
Corrupt officials	11.1	0.0	8.1
High supply cost	22.2	20.0	21.6
Transportation	5.6	10.0	6.7
Limited capital	5.6	0.0	4.1
Low prices	18.	10.0	16.2
Low and unreliable supply	9.3	20.0	12.2
Post-harvest loses	11.1	5.0	9.2
High taxes/license fees	0.0	10.0	2.7
Arrests for selling immature fish	16.7	25.0	18.9

The major concerns highlighted by fish traders in the study area are not surprising given the reported increased decline of fish stock in Lake Victoria due to over exploitation and illegal fishing activities. Indeed, the practice of fishing, trading and consuming immature fish is hampering Uganda's hitherto lucrative fishing sector. To ensure continued business the existing laws for the protection of immature fish should be better enforced by increasing the personnel and material resources of the fisheries department and by combating corruption among the fisheries officers, an area that was also mentioned by the traders.

Finally, although not ranked high by traders other factors including inadequate market facilities, such as lack of ice plants, containers with aerating devices, processing facilities and protected (cold) storage facilities also limit the development of trading enterprises. Strategies to overcome these among other constraints for fish marketing would benefit both traders and consumers in the study area.

Policy. The findings have some economic and policy implications for the fisheries industry. Foremost, better and statistically tested knowledge on the transmission of price information in the markets can be used to justify domestic policies and infer whether the law of one price holds at the domestic fish production level. Particularly, the evidence of non-linear price adjustment in the market channels suggest the existence of some barriers to free trade. Such barriers might include high transaction costs and imperfect information as observed in similar studies.

In terms of marketing strategy (Objective 1), one finding from the study clearly points the way for Clarias producers. In a more detailed study, it was found that the causal direction of price transmission was from retail to the wholesale and ex-vessel markets. The results suggest that retailers are the price leaders in the Uganda catfish supply chain and that producers might use negotiated price and supply relationships to protect themselves from price swings and thin markets.

Among the important policy objectives, relevant authorities should focus on improving access to credit, market information, transportation, and grading. Particularly, poor infrastructure, namely transport and communication services, gives rise to large marketing margins because of the high costs of delivering fish and fish products to destinations. They may also hinder the transmission of price signals because of noncompetitive behavior amongst traders. Conversely, infrastructural development can play an important role in supporting the integration of fish markets, facilitating competition, encouraging investment, and allowing a more efficient allocation of resources and enhancing market oriented production.

Overall, the analysis of market integration and market chain as curried out in this study should equips policy implementers with information on the transmission of incentives in the market chain and this is relevant to the success of other policies concerned with market liberalization, price stabilization and food security. Practices like promoting fisher associations, demarcating landing points for product pooling, and improvements in shelf-life increasing technologies would improve the stability of prices for this perishable product. In brief, the study findings can be used by relevant authorities to harmonize marketing strategies and to develop guidelines through which price distortions can be removed to promote free market practices.

Development impact. Through the National Development Plan (NDP 2015 to 2020), fish has been chosen as one of the 12 agricultural commodities that will transform "Uganda from a Peasant (80%) to a Modern and Prosperous Country within 30 years." During this period the government will enhance agricultural production and productivity through commercialization, mechanization, and increased value addition. Therefore, this study is already aligned to the NDP and Vision 2040. Only fish and cattle are selected as animal protein sources to transform livelihoods through provision of employment and poverty reduction.

QUANTIFIED ANTICIPATED BENEFITS

- The main target groups were small-scale farmers. The findings revealed the potential for commercial fish farming at small-scale enterprises and availability of local markets;
- Participating fish farmers directly benefited from this work. They were informed of the results of the study through workshops and received recommendations on the best marketing strategies and the direction of price flow within the different market channels;
- The sector provides employment to fishermen, fisher mongers and those employed in fish processing. Therefore, enhancing the profitability of the sector has an important direct and indirect impact on poverty reduction efforts in the region. The direct benefits arise from direct dependence on the fisheries, especially the lake communities. Indirect benefits arise from secondary employment through services that are provided in support of fisheries;

- The project will strengthen the capacity of Uganda's extension system through the dissemination of the findings and identifying the needs for possible follow-up activities in the field of fisheries products marketing;
- Analysis of processed (food) markets for aquaculture (primarily African catfish and tilapia) products identified alternative production and marketing strategies for producers and processors that lead to increased economic returns;
- Increase sales and incomes for fish farmers;
- Fish production becomes more market oriented and reduces post-harvest losses;
- Reduced marketing and other transaction costs for farmers; and
- Improved market linkages and farm sales for farmed fish.

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